AN ANALYSIS OF THE LABOR MARKET FOR UBER'S DRIVER-PARTNERS IN THE UNITED STATES

JONATHAN V. HALL AND ALAN B. KRUEGER*

Uber, the ride-sharing company launched in 2010, has grown at an exponential rate. Using both survey and administrative data, the authors provide the first comprehensive analysis of the labor market for Uber's driver-partners. Drivers appear to be attracted to the Uber platform largely because of the flexibility it offers, the level of compensation, and the fact that earnings per hour do not vary much based on the number of hours worked. Uber's driver-partners are more similar in terms of their age and education to the general workforce than to taxi drivers and chauffeurs. Most of Uber's driver-partners had full- or part-time employment before joining Uber, and many continue in those positions after starting to drive with the Uber platform, which makes the flexibility to set their own hours especially valuable. Drivers often cite the desire to smooth fluctuations in their income as one of their reasons for partnering with Uber.

Over the past few years, much speculation has arisen as to whether the so-called on-demand economy will positively or negatively affect the future of work, but little evidence exists to support either position. In this article, we study the characteristics, labor supply, and earnings of workers who provide car rides using the Uber platform. Drivers who partner with Uber (Uber refers to them as "driver-partners") provide transportation services to customers who request rides using Uber's application (app) on their smartphones or other devices. Uber is a quintessential on-demand economy company, responsible for perhaps two-thirds of all activity in the platform-based labor market, according to Harris and Krueger (2015).

This study provides the first detailed analysis of a representative, national sample of Uber driver-partners. We draw on anonymized administrative data from Uber on the driving histories, schedules, and earnings of drivers who used the Uber platform from 2012 to 2014, and on two surveys

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conducted by the Benenson Strategy Group (BSG): a survey of 601 driver-partners conducted in December 2014 (BSG 2104) and a survey of 632 driver-partners conducted in November 2015 (BSG 2015). In addition, as a point of comparison, we report data on the characteristics of a representative sample of taxi drivers and chauffeurs, and of all workers, based on several government surveys.

Uber has grown exponentially since it was first launched in the United States. After driver applicants qualify to partner with Uber, they are free to spend as much or as little time as they like offering their services to passengers in any given month.[1] Whether drivers access the app on any given day, and when they decide to do so, is entirely up to the drivers' discretion. This flexibility is appealing to driver-partners, but it creates a complication for counting the number of active driver-partners because, at any time, drivers can choose to pursue other work opportunities or can spend time taking care of non-work obligations, refraining from utilizing the Uber platform for a period of time and then returning to use the Uber platform in later months. To address this issue, we calculated the number of driver-partners who provided at least four trips to passengers in a given month (which we refer to as the number of "active partners"). From a base of near zero in mid-2012, more than 460,000 driver-partners in the United States actively drove with Uber by the end of 2015. The number of active Uber driver-partners approximately doubled every six months from the middle of 2012 to the end of 2015. At this growth rate, every American would be an Uber driver within five years—which implies that the growth rate will inevitably slow down.

One theme that emerges from the following analysis is that a tremendous amount of sorting takes place in the on-demand economy, and, by dint of their backgrounds, family circumstances, and other pursuits, Uber's driver-partners are well matched to the type of work they are doing. Notably, Uber's driver-partners are attracted to the flexible schedules that driving on the Uber platform affords. The hours that driver-partners spend using the Uber platform can, and do, vary considerably from day to day and week to week, depending on workers' desires in light of market conditions. In addition, most driver-partners do not appear to turn to Uber out of desperation or because they face an absence of other opportunities in the job market—only 8% were unemployed just before they started working on the Uber platform—but rather because the nature of the work, the flexibility, and the compensation appeals to them compared with other available options. Even as the national unemployment rate fell to 5%, the number of active Uber drivers continued to rise.

These findings likely relate to a broader, more generalized demand by many individuals for workplace policies that favor flexible work schedules, family-oriented leave policies, and telecommuting arrangements, over the

[1]Although requirements vary by city, before they can utilize the Uber platform, a potential driver typically must 1) pass a background check and a review of his or her driving record; 2) submit documentation of insurance, registration, and a valid driver's license; 3) successfully complete a city-knowledge test; and 4) drive a car that meets a quality inspection and is less than a certain number of years old.

standard nine-to-five work schedule, in order to support a more family-friendly lifestyle. Historically, independent contractors have reported in surveys that they prefer their working arrangements to traditional employment relationships, and this tendency appears to be continuing in the on-demand economy. Demand for work opportunities that offer flexible schedules is partly driven by the aging of the workforce and the increase in secondary earners, and it will likely increase as a result of ongoing demographic trends. Flexible work opportunities such as Uber can also help workers smooth fluctuations in other sources of income (Farrell and Greig 2016a). In addition, if changes to the health care system help reduce job lock—by making health insurance more readily available and accessible to individuals—more people are likely to become entrepreneurs and take advantage of the flexibility and income-generating potential made possible by the on-demand economy. For these reasons as well, it is critical to understand how the on-demand economy is affecting work opportunities.

In this article, we provide a step toward understanding the nature of work in the on-demand economy by reporting new evidence on hours of work, income, and the motivations and backgrounds of participants in one of its important segments: driver-partners using the Uber platform. We rely on survey data on drivers' self-reported motivations and circumstances and on administrative data collected through the Uber app on driving histories, schedules, cross-city growth rates, and earnings. We also estimate Mincer-type wage regressions using a combination of survey and administrative data. The analysis provides a complement to the extensive literature on contingent and alternative work arrangements in the United States.

Literature Review

The size, growth, and nature of the contingent workforce in the United States has long been debated, and such debate continues with the advent of the on-demand economy.[2] One of the problems with this discussion, however, is that analysts have employed multiple definitions of contingent work, ranging from the self-employed to temporary workers to part-time workers to on-call workers. Contingent workers can be defined broadly or narrowly, and magnitudes and trends vary depending on the particular definition.[3]

In the Current Population Survey (CPS) administered in 1995, 2001, and 2005, the Bureau of Labor Statistics (BLS) included a supplemental module to collect information on various forms of contingent and alternative work arrangements. This survey provides the most informative data available, although it is now somewhat out of date.[4] The BLS Contingent Worker

[2]For example, in his critique of the "task rabbit" economy, Kuttner (2013) claimed, "The move to insecure, irregular jobs represents the most profound economic change of the past four decades."

[3]See Polivka (1996) for a thoughtful discussion of the definition of contingent and alternative work arrangements.

[4]The BLS plans to administer the contingent worker supplement again in May 2017.

Survey (CWS) found that the contingent workforce, defined as workers "who do not expect their jobs to last or who reported that their jobs are temporary," was relatively small and did not grow between 1995 and 2005 (BLS 2005). In 1995, between 2.2% and 4.9% of the workforce was employed in a contingent position, depending on the definition, and in 2005 these figures ranged from 1.8% to 4.1%.[5] These figures are clearly small, with no indication of an upward trend.

Claims that contingent workers represent a much larger share of the workforce generally count part-time workers as contingent workers, even though part-time workers typically are employed in traditional employment relationships. As the BLS reported, "the vast majority of part-time workers (91%) were not employed in contingent arrangements."[6] Nevertheless, data on part-time work do not point to an upward trend. As Bernhardt (2014: 5) noted, "After increasing during the 1970s, both the overall percent part-time and the percent involuntary part-time have been largely flat, with the exception of cyclical increases during recessions." The share of workers in part-time positions (which BLS defines as usually working less than 35 hours a week) has shown little secular trend over the past three decades. In 1995, according to data from the CPS, 17.8% of all workers reported that they usually worked part-time hours. That figure fell to 16.8% in 2005 and to 16.5% in 2007, and then rose to 19.8% in 2009 during the Great Recession but has since declined. In 2014, approximately 18.3% of workers were in part-time positions, a level that hardly differs from 20 years earlier.

Katz and Krueger (2016) extended the findings of BLS's CWS by including a subset of the questions on alternative work arrangements on the Rand American Life Panel in fall 2015. They found that the share of workers in alternative work arrangements—defined to include freelancers, workers who were contracted out by one firm to work for another firm, temporary help agency workers, and on-call workers—increased from about 11% in 2005 to nearly 16% in 2015. Note that the CWS and the Rand data are limited to each individual's main job. Many workers who participate in the on-demand economy may do so as a secondary job.

Counting both main and secondary jobs, Katz and Krueger (2016) further found that only 0.5% of the workforce was involved in providing services directly to customers through an online intermediary, such as Uber or TaskRabbit. About twice as many workers said they provided services to customers through an offline intermediary, such as Avon.

Other estimates also suggest that less than 1% of the US workforce participated in the on-demand economy in 2015, although the on-demand workforce was growing very rapidly. For example, Farrell and Greig (2016a) estimated that 0.6% of the working-age population (or approximately 0.4% of

[5]See Cohany (1996) and http://www.bls.gov/news.release/pdf/conemp.pdf for the BLS statistics on contingent and alternative work arrangements cited in this section.

[6]See http://bls.gov/news.release/pdf/conemp.pdf.

the workforce) worked in the on-demand economy based on the frequency of bank deposits from 30 online work platforms. Farrell and Greig (2016b) further found that, though decelerating, the annual growth rate exceeded 100% in the number of workers receiving income from these platforms each month during the fall of 2015. Based on data from Google Trends, Harris and Krueger (2015) inferred that Uber is by far the largest on-demand labor platform, which makes an understanding of the characteristics, labor supply behavior, and motivation of Uber's driver-partners all the more important.

BSG Survey of Uber's Driver-Partners

Uber contracted with the BSG to conduct a web survey of Uber's driver-partners in December 2014 in 20 market areas that represented 85% of all of Uber's US driver-partners (BSG 2014). The survey was conducted again in November 2015 in 25 market areas that currently represent 68% of Uber's US driver-partners (BSG 2015). A total of 601 drivers completed the 2014 survey and 833 drivers completed the 2015 survey. Although the response rate to the surveys was only around 10%, based on a comparison of aggregated administrative data, the (weighted) respondents do not appear to be dissimilar from the full set of driver-partners in terms of their average work hours or hourly earnings.[7] In this section we highlight findings from the surveys that are relevant for understanding the labor market for Uber's driver-partners and their motivations for partnering with Uber. We contrast the demographic characteristics of Uber driver-partners with those of taxi drivers and chauffeurs (US Census occupation code 9140), based on data collected in the American Community Survey (ACS), as well as contrasting with all workers. We emphasize findings from the 2014 survey, and note any significant changes between the 2014 and 2015 surveys.

Driver Demographics

Table 1 summarizes the demographic characteristics of Uber's driver-partners based on the 2014 BSG survey and reports the corresponding characteristics of taxi drivers and chauffeurs and the entire workforce in the same 20 markets surveyed by BSG, drawing from 2012 to 2013 ACS data.[8]

[7]The BSG survey utilized a stratified design, and weights were derived to make the sample representative of all drivers in terms of the services they offered (uberX [low-cost], UberBLACK [premium], or both); other strata were drawn in proportion to the population and are self weighting. All statistics reported here from the BSG survey are weighted to reflect the survey design. Where cited, question numbers refer to the BSG survey.

[8]The 20 markets in 2014 were Atlanta, Austin, Baltimore, Boston, Chicago, Dallas, Denver, Houston, Los Angeles, Miami, Minneapolis, New Jersey, New York City, Orange County, Philadelphia, Phoenix, San Diego, San Francisco, Seattle, and Washington, DC. The 24 markets in 2015 were Atlanta, Baton Rouge, Boston, Charlotte, Chicago, Columbus, Dallas, Denver, Detroit, Fresno, Houston, Indianapolis, Los Angeles, Miami, New York City, Oklahoma City, Philadelphia, Phoenix, Providence, Salt Lake City, San Antonio, San Francisco, Seattle, and Washington, DC. The 14 common markets were Atlanta, Boston, Chicago, Dallas, Denver, Houston, Los Angeles, Miami, New York City, Philadelphia, Phoenix, San Francisco, Seattle, and Washington, DC.

Table 1. Characteristics of Uber's Driver-Partners, Taxi Drivers and All Workers

Variable	*Uber's driver-partners (2014 BSG Survey) (%)*	*Taxi drivers and chauffeurs (2012–13 ACS) (%)*	*All workers (2012–13 ACS) (%)*
Age 18–29	19.1	8.5	21.8
30–39	30.1	19.9	22.5
40–49	26.3	27.2	23.4
50–64	21.8	36.6	26.9
65 +	2.7	7.7	4.6
Female	13.8	8.0	47.4
Less than high school	3.0	16.3	9.3
High school	9.2	36.2	21.3
Some college / Associate's	40.0	28.8	28.4
College degree	36.9	14.9	25.1
Postgraduate degree	10.8	3.9	16.0
White non-Hispanic	40.3	26.2	55.8
Black non-Hispanic	19.5	31.6	15.2
Asian non-Hispanic	16.5	18.0	7.6
Other non-Hispanic	5.9	2.0	1.9
Hispanic	17.7	22.2	19.5
Married	50.4	59.4	52.6
Have children at home	46.4	44.5	42.2
Currently attending school	6.7	5.0	10.1
Veteran	7.0	5.3	5.2
Number of observations	601	2,080	648,494

Notes: ACS data pertain to the same 20 markets as the BSG survey and are for 2012 and 2013. ACS, American Community Survey; BSG, Benenson Strategy Group.

Uber's driver-partners are spread throughout the age distribution, mirroring the workforce as a whole rather than taxi drivers or chauffeurs. Of Uber's driver-partners, 19% are under age 30, and 24.5% are age 50 or older. By contrast, taxi drivers and chauffeurs are substantially older, with 9% under age 30, and 44% age 50 or older. The greater representation of younger people among Uber's driver-partners likely reflects that Uber provides a new opportunity and that older workers are less likely to change jobs, but it may also reflect entry barriers into the taxi driver and chauffeur professions that make it more difficult for younger people to obtain such jobs.

Women make up 14% of Uber's driver-partners, which exceeds the percentage of taxi drivers and chauffeurs who are women in the same markets (8%) but is less than the share of women in the workforce overall.

Half of Uber's driver-partners are married, which is slightly below the corresponding figure for taxi drivers and chauffeurs but close to the figure for all workers, probably, at least in part, a reflection of the varying age distributions. Note, however, that Uber's driver-partners are slightly more likely to have children under the age of 18 living with them at home (Q17) than are taxi drivers and chauffeurs.[9] Additionally, 71% of Uber's driver-partners reported that they support financial dependents (Q19).

[9]A caveat, however, is that the BSG question directed respondents to "include children living with you part time."

Among those reporting an ethnic/racial background, Uber's driver-partners are more likely to identify their ethnicity/race as white non-Hispanic than are taxi drivers and chauffeurs in the same areas, although they are less likely to identify as white non-Hispanic than the workforce as a whole in those areas.[10] Uber's driver-partners are less likely to identify as black/African American non-Hispanic than are taxi drivers and chauffeurs, but the percentages who identified as Asian or Pacific Islander and Hispanic/Latino are similar for the two groups. Looking beyond the 20 market areas, the ethnic/racial composition of taxi drivers and chauffeurs in the United States as a whole closely matches that of Uber's driver-partners who responded to the BSG survey.[11]

Nearly half of Uber's driver-partners (48%) have a college degree or higher, considerably greater than the corresponding percentage for taxi drivers and chauffeurs (18%), and above that for the workforce as a whole as well (41%). Twelve percent of Uber's driver-partners have no postsecondary education, whereas more than half (52%) of taxi drivers and chauffeurs have no postsecondary education. Seven percent of Uber's driver-partners are currently enrolled in school, mostly taking classes toward a four-year college degree or higher. More highly educated individuals may be more likely to avail themselves of new technological options in the labor market when they become available, which may partly account for the higher level of education of Uber's driver-partners.

Seven percent of Uber's driver-partners are veterans of the armed services, and 1% are members of the reserves. In addition, 6% of driver-partners have household members who are military veterans, 3% have household members who are active duty members of the armed services, and 2% have household members in the reserves. Based on the ACS data, 5% of taxi drivers and chauffeurs—and the same percentage of all workers—in the 20 areas BSG surveyed are veterans.

Only two of the demographic characteristics that we examined registered statistically significant changes between the 2014 and 2015 surveys.[12] First, the driver-partners were somewhat younger in 2015 than in 2014: 23% were in the 18–29 age bracket in 2015 compared with 19% in 2014. Second, the driver-partners were more likely to hold a postgraduate degree in 2015 (13.6% compared with 10.6% in 2014). Given the large number of demographic characteristics examined, and these relatively modest differences,

[10]The BSG and ACS race and Hispanic ethnicity questions differ because Hispanic ethnicity is listed with the other racial identities in the BSG race/ethnicity question (Q56), and then Hispanic ethnicity is also asked about specifically for all those who did not select Hispanic in Q56 in the following question (Q57). We have attempted to align the two surveys by reporting anyone who identified as Hispanic in either question as Hispanic, and then reporting the other groups exclusive of those indicating Hispanic origin, and excluding the 11% of respondents who did not provide an answer to Q56 or Q57.

[11]The nationwide figures for taxi drivers and chauffeurs are 42.3% non-Hispanic white, 24.5% non-Hispanic black, 12.0% non-Hispanic Asian, 3.1% non-Hispanic other, and 18.0% Hispanic.

[12]For comparability, the samples were restricted to overlapping cities in 2014 and 2015 in these comparisons.

we interpret this as evidence that the basic demographic distribution of Uber's driver-partners was essentially unchanged from 2014 to 2015, despite the roughly fourfold increase in the number of driver-partners over this period.

Driver Employment History

The BSG survey provides retrospective information on driver-partners' work experience that offers a picture of what they were doing prior to partnering with Uber.

Approximately 80% of driver-partners reported that they were working full- or part-time hours just before they started driving on the Uber platform. Only 8% of driver-partners in 2014 (and 10% in 2015) said they were unemployed just prior to partnering with Uber. This low percentage is notable given that, for the economy overall, about 25% of new hires came from unemployment and 70% came from nonemployment in 2014 and 2015.[13] The large share of drivers who partnered with Uber while they had another job suggests the role that Uber plays in supplementing individuals' income from other sources.

Prior to partnering with Uber, 6% of drivers were students, 4% were retired, and 3% were stay-at-home parents. Among those working prior to partnering with Uber, 81% reported that they had a permanent job that would be there until they left, were laid off, or were fired, and many appear to have continued in those jobs after partnering with Uber.[14]

Uber's driver-partners worked in a wide range of jobs prior to partnering with Uber. Nearly 20% of drivers had worked in transportation services in their previous job, and 28% had worked as a driver at some point in their career, but no other industry accounted for more than 10% of drivers' previous jobs.

Just over one-third (36%) of driver-partners in 2014 were not actively looking for a new job prior to driving on the Uber platform. Only 25% were actively looking for a full-time job, another 25% were looking for a part-time job, and 10% were looking for either a part- or full-time job (Q8). Of those driver-partners actively looking for a job prior to partnering with Uber, 24% had been doing so for less than a month, 52% for one to six months, and 24% for more than six months (Q9). That more than one-third of driver-partners joined the Uber platform without actively searching for a job suggests that Uber provided a new alternative that enticed many people to engage in a work activity who might not have done so otherwise.

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[13]These figures are based on transition rates reported by Fallick and Fleischman (2004) at http://www.federalreserve.gov/econresdata/researchdata/feds200434.html.

[14]Among those who were working at a full-time job prior to partnering with Uber, 93% said their job was permanent.

Driving on the Uber Platform

In 2014, drivers were split almost evenly among those who reported having no other job in addition to partnering with Uber (38%), those who had a part-time job in addition to partnering with Uber (30%), and those who had a full-time job in addition to partnering with Uber (31%). The 2015 survey found that a much larger share of those who had a job in addition to driving with the Uber platform had a full-time job as opposed to a part-time job. In 2015, 52% of driver-partners worked full-time on another job, 14% of driver-partners had a part-time job apart from partnering with Uber, and 33% of driver-partners had no other job. Not surprisingly, the administrative data indicate that, on average, those who do not have another job work the most hours per week with the Uber platform, and those who have a full-time job apart from Uber worked the least hours per week with the Uber platform. For example, one-third of driver-partners who reported having no other job in 2014 worked more than 35 hours per week on the Uber app since starting to work with Uber, compared with 13% of those who reported having another part-time job, and 3% of those who reported having another full-time job.

The 2014 survey asked driver-partners whether a variety of possible motivations were a major reason, minor reason, or not a relevant reason for why they partnered with Uber (Q22). The most common reasons (combining major and minor reasons) were "to earn more income to better support myself or my family" (91%); "to be my own boss and set my own schedule" (87%); "to have more flexibility in my schedule and balance my work with my life and family" (85%); and "to help maintain a steady income because other sources of income are unstable/unpredictable" (74%).[15]

Driving on the Uber platform provides an important source of income for driver-partners. For one-fifth of driver-partners (20%), Uber is their only source of personal income; and for another 12%, Uber is their largest but not only source of income. Nearly half of driver-partners view income earned on the Uber platform as a supplement to their income but not a significant source (48%) (Q61).

Perhaps not surprisingly—given that most driver-partners had jobs they could, and often did, keep when they started partnering with Uber—71% of driver-partners in 2014 replied that partnering with Uber has increased their overall income, whereas only 11% replied that partnering with Uber has decreased their overall income (Q28R1).

A variety of questions suggest that Uber's driver-partners value the flexibility that the Uber platform permits, and many are drawn to Uber in large part because of this flexibility. Fifteen times as many drivers said Uber had made their lives better, rather than worse, by giving them more control over their schedule (74% compared with 5%). In addition, when asked directly

[15]The order was unchanged when considering only those reasons designated as a major reason, and the corresponding percentages were 76%, 64%, 63%, and 51%, respectively.

(Q52), "Which of the following would you most prefer regarding your driving with Uber?" with responses describing an employment relationship and an independent contractor relationship, 79% chose the latter. Furthermore, when the driver-partners were asked what they would do if Uber were no longer available in their area, 35% (the largest group) said they would use another ride-sharing app platform, while only 21% said they would look for a full-time job in an unrelated industry (Q32).[16] These findings suggest that considerable sorting occurs in the on-demand economy, and that those workers who value flexibility are the most likely to seek opportunities there.

Female driver-partners were more likely than men to highlight the need for flexibility as a reason for becoming a partner with Uber, but both men and women appear to value the opportunity to set their own schedule. For example, 42% of women and 29% of men said that a major reason for driving with Uber was that they "can only work part-time or flexible schedules" because of "family, education, or health reason[s]." Further, female driver-partners were nearly 30 percentage points more likely than men to work an average of 15 or fewer hours per week (67% compared with 38%).[17] Men, however, were slightly more likely than women to indicate that they would prefer a job where they choose their own schedule and can be their own boss over a nine-to-five job with some benefits (73% compared with 68%).

Another aspect of Uber's flexibility is that spending time on the platform can help smooth the transition to another job, as driver-partners can take off time to prepare for and search for another job at their discretion. Nearly one-third (32%) of driver-partners indicated that "to earn money while looking for a steady, full-time job" (2014: Q22R11) was a major reason for partnering with Uber, and this is particularly the case for students and for those who do not have another job or are working part-time on another job. Likewise, those who have no other job or another part-time job are about twice as likely as those with full-time jobs to say that they will continue with Uber until something better comes along (2014: Q50). These results suggest that Uber provides a helpful "bridge" for some driver-partners until they can find new jobs that are better matches for their skills and interests.

The BLS contingent worker survey found that independent contractors were less likely to have health insurance coverage than were traditional employees. In 2015, 38% of Uber's driver-partners received employer-provided health insurance—either from their own employer at another job or from a spouse or other family member's employer—which is down from 49% in 2014.

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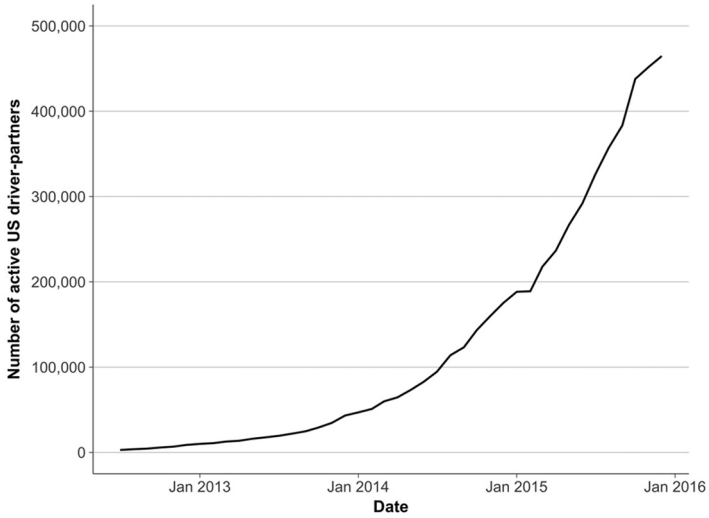
[16]Other responses were drive a taxi (8%), look for a part-time job (19%), not look for a new job (12%), and other (5%).

[17]Hours are measured by hours with the Uber app on. Given that drivers could have another app on simultaneously, or could be conducting personal tasks with the Uber app on, our hours measure is an imperfect measure of hours working on the Uber platform.

Figure 1. Number of Active Driver-Partners in United States Each Month



Source: Uber administrative data.
Notes: US UberBLACK and uberX driver-partners providing at least four rides in any month (1,085,765 individuals), which is how we define an active driver-partner.

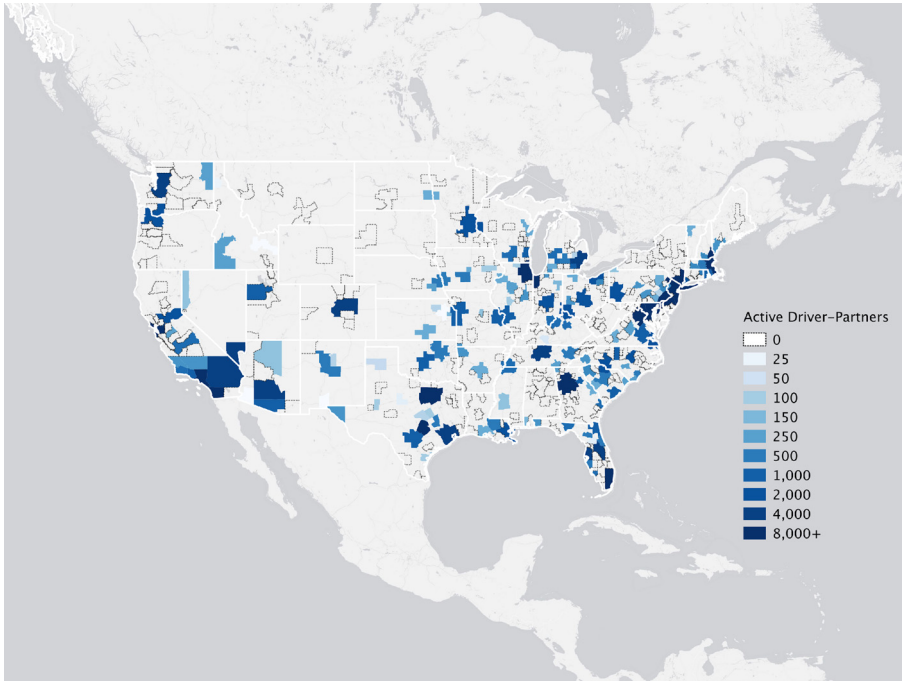
Overall, 81% of driver-partners said they are very satisfied or somewhat satisfied with Uber in 2015. This value is essentially unchanged from 78% in 2014.

Completing the Picture with Uber Administrative Data

Uber collects extensive data on driver-partners' trips, fares, and time through the Uber app. Below, we summarize findings based on Uber's administrative data using aggregated, anonymized tabulations from Uber's databases to round out the analysis of the labor market for Uber's driver-partners. In particular, the data set contains information on payments to drivers, time with the app on, number of trips, and miles driven (with and without a passenger in the car). Uber does not store any demographic information collected from the driver application and background check processes in its databases.

Figure 1 documents the exponential growth in the number of active Uber driver-partners in the United States from mid-2012, when uberX was launched, to the end of 2015. The spectacular growth of the number of active driver-partners over the past few years is evidence that Uber provides many workers a choice that they prefer to other available options or to not working at all. During the latest month for which we have data, December 2015, a total of 464,681 driver-partners completed four or more trips using the Uber platform.

Figure 2. Active Driver-Partners, by Census MSA



Notes: Number of Uber driver-partners who took at least four trips in October 2015, by Census Metropolitan Statistical Areas (MSA).

Geographically, Uber's driver-partners are distributed across the country and are most common in the larger population centers. Figure 2 shows that Uber driver-partners are particularly prevalent in the large urban areas of the Northeast, Southeast, Midwest, and upper and lower West Coast.

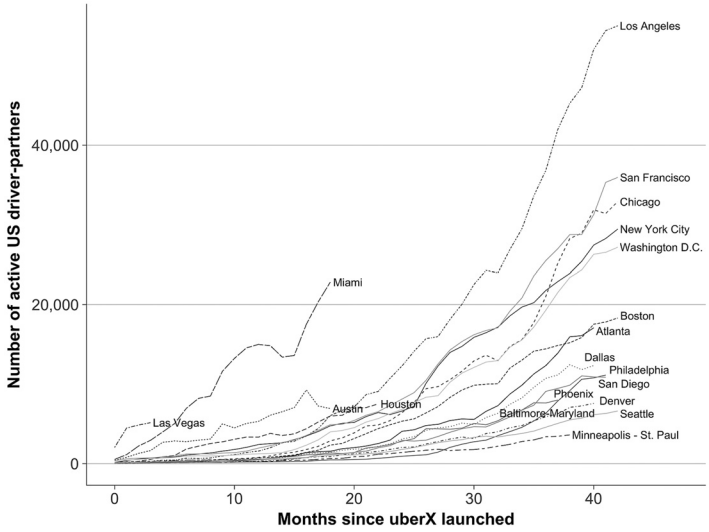
Figure 3 displays growth in the number of Uber's driver-partners in each of the BSG metropolitan areas, indexed to the number of months since Uber started operating in the city through January 2016.[18] The growth for the Austin market reflects the period prior to the suspension of operations in May 2016. The fastest growth in the number of driver-partners has been in Miami and Las Vegas, markets in which Uber only recently became fully operational. Future research can link these city-specific patterns to other city-level data to study the effect that Uber has had on the taxi industry and other outcomes.[19]

Predictors of the growth in the number of Uber drivers across cities provides some insights into the forces underlying Uber's success. The outcome

[18]The way in which Uber classified New Jersey trips in its database has changed over time, so, for the sake of consistency, New Jersey is omitted from this chart. Also, Orange County is reported as part of Los Angeles.

[19]One article in this vein is Greenwood and Wattal (2015), who examined the relationship between ride sharing and alcohol-related motor vehicle homicides across cities in California.

Figure 3. Active US Driver-Partners over Time, by City



Notes: Number of US UberBLACK and uberX driver-partners making at least one trip in the specified month, indexed to the number of months since Uber began in a given city or June 2012, whichever came later.

variable that we focus on is the log of the number of active driver-partners per month in 2015Q4 divided by the number of months that Uber has operated in the city. Because Uber started from a base of zero in 2009, the dependent variable reflects Uber's growth rate per month that it launched in each city. We compiled a set of city characteristics for 97 cities in which Uber operates and regressed the growth measure on these characteristics. Results are summarized in Table 2. Column (1) provides estimates for the full sample of 97 cities, and columns (2) to (4) restrict the sample to 80 cities for which we have information on the number of taxi licenses.

In all of the estimated models, the number of Uber drivers per month in operation rises with city population, and we cannot reject a unit elasticity. Cities with more taxi licenses per capita have added relatively more Uber drivers, suggesting an excess demand for ride-sharing services in cities with relatively more taxis, all else equal. Of note, the cost of a five-mile Uber ride has a statistically insignificant and small coefficient. The unemployment rate in a city is also unrelated to the growth in the number of Uber drivers, consistent with the observation made in light of Figure 1 that the exponential growth of Uber drivers held in periods of high and low unemployment. Real gross domestic product (GDP) and population density in a metropolitan area are both found to be unrelated to the number of Uber drivers. And, cities where Uber started earlier have added significantly more drivers per month than cities where Uber started later, suggesting that Uber was strategic in launching earlier in cities with greater latent demand for ride-sharing services.

Table 2. Determinants of Growth of Uber Driver-Partners across Cities

	Dependent variable			
	Log of average active monthly driver-partners in 2015 Q4 per number of months operating			
Variable	*(1)*	*(2)*	*(3)*	*(4)*
Months operating	0.045***	0.041***	0.041***	0.042***
	(0.008)	(0.008)	(0.007)	(0.007)
Log of MSA population (2010)	1.097***	1.098***	0.876***	0.895***
	(0.325)	(0.327)	(0.313)	(0.315)
Log of MSA density (2010)	0.122	0.132	0.012	0.022
	(0.090)	(0.100)	(0.100)	(0.101)
Log of MSA real GDP (2013)	–0.267	–0.201	–0.028	–0.048
	(0.293)	(0.298)	(0.282)	(0.285)
Log of MSA median taxi earnings (2015)	0.386	–0.056	–0.039	–0.093
	(0.606)	(0.628)	(0.590)	(0.598)
Annual unemployment (2014)	–0.061	–0.059	–0.035	–0.039
	(0.050)	(0.058)	(0.055)	(0.056)
Log of number of taxi licenses per 1,000 people			0.301***	0.289***
			(0.084)	(0.086)
Cost of a five-mile Uber trip in 2014			0.015	0.012
			(0.019)	(0.020)
Log of the number of cars per 1,000 (MSA)				–0.316
				(0.470)
Constant	–7.842***	–7.525***	–5.285**	–3.357
	(2.116)	(2.208)	(2.154)	(3.593)
Sample size	97	80	80	80
Adjusted R^2	0.880	0.894	0.908	0.907
Residual standard error	0.546	0.511	0.476	0.478
	(df = 90)	(df = 73)	(df = 71)	(df = 70)
F statistic	118.780***	111.545***	98.252***	86.710***
	(df = 6; 90)	(df = 6; 73)	(df = 8; 71)	(df = 9; 70)

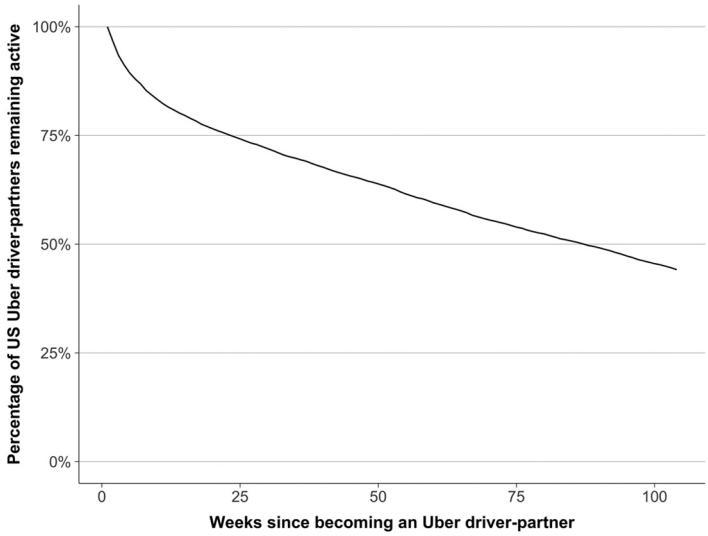
Sources: Data from Uber, Taxicab Fact Book (TLPA), US Census, and US Bureau of Economic Advisors.
Notes: MSA, Metropolitan Statistical Areas; GDP, gross domestic product.
*$p < 0.1$;**$p < 0.05$; ***$p < 0.01$.

Dynamics

Because Uber offers a flexible work option with low barriers to entry, a large number of workers try the service, and some discontinue using it after a period of time while others continue for an extended period. As described in the previous section, driver-partners vary their length of time using the platform for many reasons. Those spending fewer hours may find that Uber is not a good match for their lifestyle or they may use Uber only when they are between jobs; others may find that it provides them with a flexible work schedule and source of income they have been looking for and so continue using the platform for much longer. Figure 4 reports the weekly continuation rate (i.e., the survivor curve) for all driver-partners who started on the platform in the first half of 2013.

Within one month of becoming an active Uber driver-partner, 11% of driver-partners became inactive, which we defined as not using the service

Figure 4. Continuation Rate for US Driver-Partners over Two Years



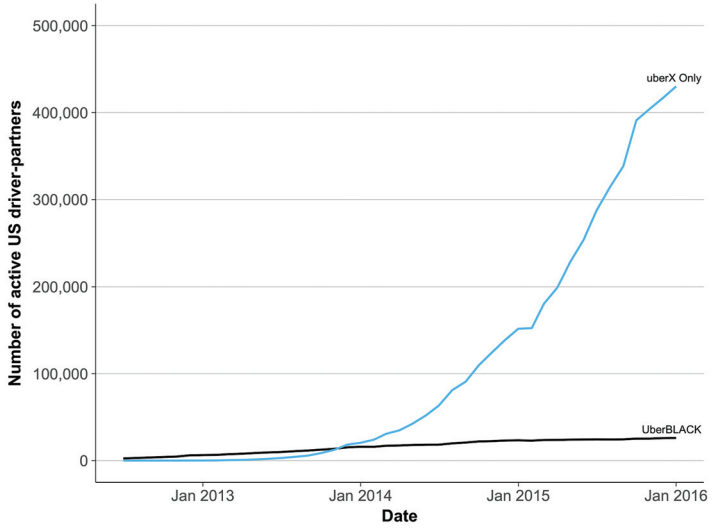
Notes: US UberBLACK and uberX driver-partners who made their first trip between January and June of 2013 and had subsequently made at least four trips (11,267 individuals). We classified a driver-partner as becoming inactive at the start of any period in which he or she does not record a trip for the next six (or more) months.

over the next six months. After half a year, 70% of those who started using Uber in the first half of 2013 were still actively using the system, and more than one-half of those who started in the first half of 2013 remained active a year after starting. One-third were still active two years after starting on the platform. These figures suggest that Uber provides a bridge for many people who are seeking another position in the labor market, and it provides a longer-term option for others.

Uber's driver-partners can select into providing various types of car service. The Uber platform offers several tiered service levels to potential riders. Roughly speaking, throughout the United States, UberBLACK is the premium option. Driver-partners on UberBLACK are commercially licensed drivers with "black cars" (i.e., limo-style cars) that adhere to specific vehicle standards. Many driver-partners on UberBLACK are employees or contract workers for limousine companies that use Uber's technology. In most markets (New York City being a notable exception), driver-partners on uberX, the lower-cost product offered on the platform, may drive their personal automobiles, utilizing commercial insurance (with $1 million in liability and uninsured/underinsured motorist bodily injury coverage provided through the Uber platform) when conducting commercial activity. As previously stated, all Uber driver-partners must pass a background check prior to driving on the platform.

Figure 5 indicates that Uber's exponential growth is fueled by the spectacular growth of uberX driver-partners. The rapid growth of uberX is likely

Figure 5. Active Uber Driver-Partners, by Service



Notes: All US UberBLACK and uberX driver-partners making at least four trips in any month (1,149,024 individuals).

because of its availability in more US markets than UberBLACK, because of greater customer demand for a lower-cost service, because of lower entry barriers (e.g., absence of need for a commercial license and luxury car), and because of Uber's promotional efforts.

As previously noted, approximately two-thirds of Uber driver-partners work either full-time or part-time on another job. Therefore, it should not be surprising that most who drive with Uber do so part-time. The platform is conducive to a wide range of work schedules, as evidenced by there being little discernible relationship between hourly earnings and hours spent on the platform. Table 3 illustrates this pattern for uberX drivers during October 2015, which we selected as a month to represent more normal market conditions, as it falls after Uber's summer fare cuts and before the holiday season. The table reports earnings per hour with the app on, broken down by amount of time spent driving per week in the six largest markets where Uber operates, and for the 2014 BSG markets combined.[20] Reported earnings here are net of Uber's fees but do not adjust for driver-partners' expenses, which we try to estimate below.[21] We also emphasize that the

[20]Trimmed 1% means are presented rather than medians because the results were similar and because it is more appropriate to average trimmed means across cities than it is to use medians to derive an aggregate measure.

[21]Note also that the tables do not include earnings from promotional offers and incentives (most often hourly and monthly price guarantees conditional on driving a certain number or set of hours) that Uber occasionally offers to drivers, most often at the beginning of a driver-partner's time on the network or around the launch of a new Uber market. This omission causes us to slightly understate drivers' earnings.

Table 3. Distribution and Trimmed 1% Mean of Hourly Earnings of uberX Driver-Partners by Hours Worked, October 2015

	Hours/week							
	1 to 15		*16 to 34*		*35 to 49*		*More than 50*	
Market	*Percentage of driver-partners (%)*	*Earnings per hour (US $)*	*Percentage of driver-partners (%)*	*Earnings per hour (US $)*	*Percentage of driver-partners (%)*	*Earnings per hour (US $)*	*Percentage of driver-partners (%)*	*Earnings per hour (US $)*
BOS	51	20.27	32	20.64	12	20.51	5	19.87
CHI	58	15.48	29	15.94	9	16.05	4	15.82
DC	52	17.71	31	18.27	12	18.21	5	17.57
LA	55	18.09	30	18.09	10	17.57	5	16.46
NY	24	23.13	32	24.46	27	24.48	17	23.86
SF	53	22.53	31	23.86	11	24.02	4	23.75
All BSG survey markets	53	18.75	30	19.41	12	19.33	5	18.81

Source: Uber.

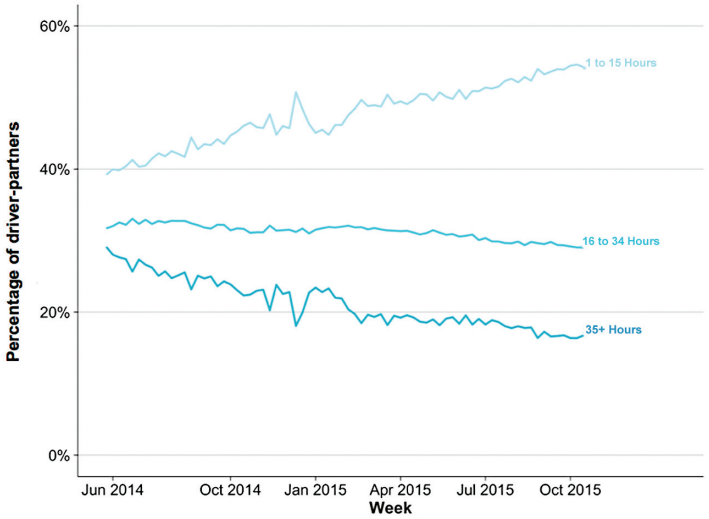
Notes: Data aggregated at the driver-partner-week level. Excludes incentive payments offered to new driver-partners in some markets. Earnings are net of Uber's fees but do not adjust for driver-partners' expenses. Final line reflects the 20 survey markets in the 2014 BSG surveys. Cities weighted by their trip distributions in October 2014. BOS, Boston; CHI, Chicago; DC, Washington; LA, Los Angeles; NY, New York City; SF, San Francisco; BSG, Benenson Strategy Group.

hours measure is an imperfect and probably overstated measure of hours worked, as drivers can have an app turned on for another ride-sharing platform while their Uber app is on, and they can conduct personal tasks while the Uber app is turned on.

In the combined set of 20 areas, more than half of uberX driver-partners chose to drive for 15 or fewer hours a week, and fully 83% chose to drive fewer than 35 hours a week.[22] Yet the largest difference in hourly earnings across workers in the various hours categories was $ 0.66 (about 4%) between those driver-partners driving 16 to 34 hours a week and those driving 1 to 15 hours a week. Across all uberX drivers, earnings per hour each week are negatively correlated with hours logged with the app on that week, although this negative correlation may partly be a statistical artifact of the imprecision in measuring hours, as noise in hours will tend to induce a negative correlation attributable to division bias. A regression that instruments for hours worked in week t using hours worked during week t–1 found no evidence of an effect of hours worked on hourly earnings. In any event, there is little evidence that uberX drivers who work longer hours per week earn more per hour than those who work shorter hours, which may make

[22]Driver-partners who provided service on both uberX and UberBLACK during October 2015 are excluded from Table 3. Drivers who utilized the UberBLACK platform tended to log longer hours per week than did uberX drivers: 52% of UberBLACK drivers used the platform for 35 hours or more a week.

Figure 6. Distribution of Uber Driver-Partner Hours over Time



Notes: All US uberX and UberBLACK driver-partners spending at least an hour online on the Uber app in a given week in 20 BSG US cities surveyed in 2014. BSG, Benenson Strategy Group.

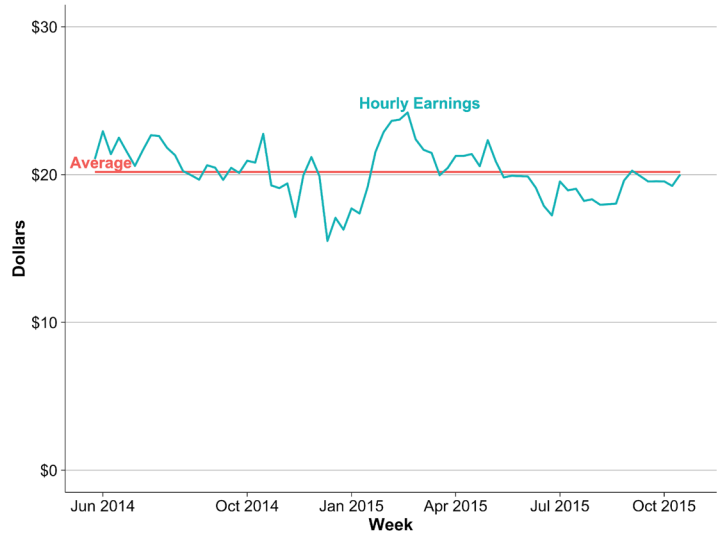
the platform particularly attractive to drivers interested in working short hours.

Figure 6 shows the distribution of weekly hours with the app turned on over time for all Uber drivers combined. As Uber has expanded, more driver-partners are utilizing the platform for 15 or fewer hours per week. At the same time, the percentage of those on the platform for more than 35 hours a week has declined. This result is due partly to uberX growing more rapidly than UberBLACK, and to uberX drivers driving fewer hours per week.

Figure 7 likewise provides an analysis of driver earnings over time. Specifically, for each city we calculated the 1% trimmed mean and then computed a fix-weighted average across cities to hold constant the shifts across cities. Driver-partner earnings fluctuate from week to week, but in the 20 markets in the 2014 BSG survey, the average was $20.19 from June 2014 through October 2015. A regression of hourly earnings on time found no evidence of a time trend. That fares have trended downward while hourly earnings display no time trend suggests that hourly earnings are anchored to the drivers' alternative wages, with the entry and exit of workers causing utilization rates to adjust to clear the market at a more or less fixed wage.[23]

[23]Hsieh and Moretti (2003) reached a related conclusion concerning the earnings of real estate agents, namely that entry and exit of real estate agents leads their real earnings to be invariant to fluctuations in housing prices.

Figure 7. UberX Driver Weighted-Average 1% Trimmed Mean Earnings over Time



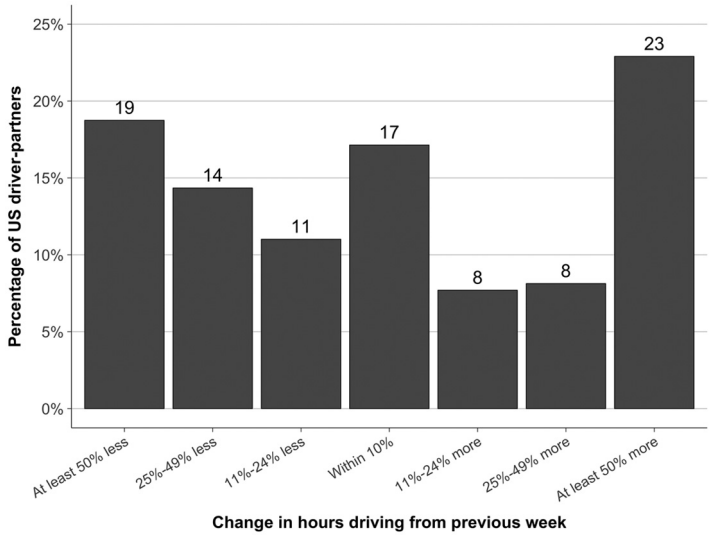
Notes: All US uberX and UberBLACK driver-partners spending at least an hour online using the Uber app in a given week in the 20 BSG US cities surveyed in 2014. A 1% trimmed mean of average hourly earnings across drivers was calculated for each city, and cities were weighted by the total number of trips provided in the city in October 2014 to hold constant changes in the distribution of drivers across cities. BSG, Benenson Strategy Group.

Uber versus Taxi

Table 4 illustrates the breakdown of Uber driver-partners (combining both UberBLACK and uberX driver-partners) by hours worked per week in October 2014, compared to taxi and limo drivers based on the ACS. Taxi drivers and chauffeurs work longer hours per week than do Uber's driver-partners, with more than one-third of taxi drivers usually working 50 or more hours per week. Slightly more than half of Uber drivers use the platform for 15 hours or fewer per week, compared with just 4% of taxi and limo drivers. This drastically different allocation of work time likely reflects that the medallions required to operate a taxi are typically leased on a daily or weekly basis, which gives taxi drivers an incentive to work long hours over the duration of the lease. Uber driver-partners do not face this incentive, which enables them to flexibly select their hours and to better align their work schedules to customer demand.

Figure 8 shows that driver-partners vary the number of hours in which they use the Uber platform by a considerable amount from week to week. In any given week, well more than half (64%) of driver-partners drive either 25% more or 25% less than the amount they drove during the previous week. Only 17% of driver-partners tend to drive within 10% of the amount of time they drove in the previous week. The within-driver, across-week coefficient of variation of hours with the Uber app turned on for drivers who

Figure 8. Distribution of Changes in Work Hours by Percentage from Week to Week



Notes: All pairs of weeks in which a US UberBLACK or uberX driver-partner spent at least one hour on the Uber app in the initial week. Sample period is August 31, 2014, through November 22, 2014 (170,505 individuals).

Table 4. Distribution of uberX Driver-Partners and Taxi Drivers and Chauffeurs by Hours Worked

Hours/week	*uberX driver-partners (October 2014) (%)*	*uberX driver-partners (October 2015) (%)*	*Taxi drivers and chauffeurs (ACS) (%)*
1–15	51	55	4
16–34	30	29	15
35–49	12	10	46
50 +	7	6	35

Sources: Uber and 2012-13 American Community Survey (ACS).
Notes: Data for Uber driver-partners pertain to each week when they worked at least one hour in October 2014. ACS hours based on "usual hours worked per week past 12 months." All data are for BSG surveyed market areas. BSG, Benenson Strategy Group.

were active throughout the same period is 0.35 for the 25th percentile driver, 0.54 at the median, and 0.81 for the 75th percentile driver. These figures indicate considerable variation in the amount of time drivers spend driving on the platform from week to week and are consistent with responses to the BSG survey, which indicated that drivers valued the flexibility that driving with the Uber app provides.

Since the Uber platform applies a new model to an existing industry, it is instructive to compare driver-partner earnings to those in similar occupations. In particular, we compare Uber driver-partners to taxi drivers, limo

Table 5. Comparison of Net Hourly Earnings (before Vehicle Expenses) of Uber Driver-Partners and Hourly Wages of Taxi Drivers and Chauffeurs, October 2015

	Earnings per hour or hourly wages	
Market	*Uber drivers-partners (net earnings per hour) (US $)*	*OES taxi drivers and chauffeurs (hourly wages) (US $)*
BOS	20.86	12.96
CHI	16.23	12.54
DC	18.45	14.26
LA	18.43	14.53
NY	23.69	15.74
SF	23.87	13.92
Average BSG survey Uber markets	19.35	12.56

Source: Uber.

Notes: Data aggregated at the driver-partner-week level. Drivers utilizing all Uber platforms are included in sample. Excludes incentive payments offered to new driver-partners in some markets. Earnings are net of Uber's fees but do not adjust for expenses. Final row reflects the 20 survey markets in the 2014 BSG surveys. Cities weighted by their trip distributions in October 2014. OES data from the May 2015 Occupational Employment Statistics survey (BLS 2014). OES, Occupational Employment Statistics; BOS, Boston; CHI, Chicago; DC, Washington; LA, Los Angeles; NY, New York City; SF, San Francisco; BSG, Benenson Strategy Group.

drivers, and chauffeurs based on the Occupational Employment Statistics (OES) survey (BLS 2014), which reports earnings for drivers who are employees (in contrast to Uber's drivers, who are independent contractors). Taxi drivers, limo drivers, and chauffeurs who are on payroll likely do not bear expenses for gasoline, vehicle maintenance, depreciation, and so on. By contrast, these expenses are incurred by Uber driver-partners (although may be deductible from income taxes in many cases). As a consequence, we subsequently present estimates of drivers' expenses to facilitate a comparison of net earnings.

The data in Table 5 indicate that Uber's driver-partners generally receive higher earnings per hour (before vehicle expenses) than do employed taxi drivers and chauffeurs. As long as drivers' costs are less than $6.79 per hour, the net earnings of Uber driver-partners would exceed those of taxi drivers and chauffeurs, on average.

Notice also that Uber's driver-partners tend to earn more in the same markets that taxi drivers and chauffeurs tend to earn more. The Pearson correlation across the 19 areas with available data is 0.52. At least in the long run, the process of labor market equilibration in the presence of varying local labor market conditions should generate a positive correlation in the wages of individuals doing similar work in the same market.

Expenses

Uber's driver-partners are not reimbursed for their driving expenses, such as gasoline, maintenance, depreciation, or insurance, but employed

driver-partners covered by the OES data may not have to cover these costs. Costs vary for each driver-partner depending on their model of car, driving style, traffic, and other factors. Note also that drivers may partially offset their costs by deducting work-related expenses from their income for tax purposes, including depreciation or leasing fees, gasoline, maintenance, insurance, mobile device and data fees, and license and registration fees. We disregard possible tax deductions in our calculation below, however, leading to a somewhat overstated estimate of driver costs.

To derive estimates of Uber driver-partner costs tailored to each category of vehicle that drivers operate, we utilize cost data from the American Automobile Association's (AAA) "Your Driving Costs" reports.[24] Each year, AAA reports estimates of the five-year cost of ownership for the top five selling vehicles in each of five categories: small, medium, and large sedan, truck, and minivan. We combine these data with estimates of average miles driven per hour while the Uber app is on, which is derived from drivers' Global Positioning System (GPS) data, for a random sample of 2,000 driver days per city in each of the 20 BSG cities surveyed.

Costs in the AAA report are broken down on a per mile basis for variable costs (e.g., gas) and a per year basis for fixed costs (e.g., insurance and taxes). Only one variable cost of interest is not explicitly provided, marginal depreciation. Instead, AAA provides annual depreciation estimates for vehicles driven 10,000, 15,000, and 20,000 miles per year. We derive *per mile* depreciation estimates from these data as follows: we assume that average per mile depreciation over the first 10,000 miles is the same as it is between mile 10,000 and mile 15,000. Additionally, we assume that the average per mile depreciation between mile 15,000 and mile 20,000 applies to miles driven in excess of 20,000.

We apply the AAA cost figures to two scenarios: driving full-time and driving part-time on the Uber platform. In the case of full-time driver-partners we include the fixed costs of the vehicle under the assumption that the individual purchased a new car specifically to earn money as a professional driver and otherwise would have had recourse to another car for personal use. For full-time drivers, we further assume that the car is used mostly for providing ride-sharing services, but partly for personal use. Specifically, fixed costs are spread across 35,000 business miles (approximately the distance one would travel in 2,000 hours of professional driving) and 15,000 personal miles. We compute costs for full-time drivers under two assumptions: 1) excluding insurance and registration fees, as these costs would be required if the car were to be used for personal driving absent Uber; and 2) including insurance and registration fees, as these costs would be additional if the car were used exclusively for professional driving or if the driver would not have used the car absent Uber. In the part-time case, we disregard fixed costs, assuming that drivers are using a car they already owned,

[24]See http://exchange.aaa.com/automobiles-travel/automobiles/driving-costs/#.Vx7mc5MrJdA.

Table 6. Estimated Hourly Expenses by Vehicle Type and Part-Time and Full-Time Driver-Partners

Vehicle type	*Part-time (US $) (1)*	*Full-time (US $) (2)*	*Full-time with insurance and registration (US $) (3)*
Small sedan	2.94	3.76	4.29
Medium sedan	3.60	4.79	5.33
Large sedan	4.25	5.83	6.38
4WD SUV	4.38	5.94	6.46
Minivan	4.02	5.34	5.84

Source: Authors' calculations based on AAA data and Uber.
Notes: Uber collects GPS data on average driving speed per hour with app on. See text for further details. AAA, American Automobile Association; GPS, Global Positioning System.

which would have depreciated regardless of driving on the platform and that they would have been responsible for insurance and registration fees regardless of occasionally driving on the Uber platform. Under these assumptions, Table 6 reports estimates of hourly costs for five vehicle types for part-time (column (1)) and full-time drivers (columns (2) and (3)).

Drivers' hourly expenses vary depending on their model of car and full- or part-time status. For part-time drivers, costs range from $2.94 to $4.38 per hour, and for full-time drivers they vary from $3.76 to $6.46 per hour. Thus, the AAA expense data suggest that, taking expenses into account, the average Uber driver-partner is likely to earn at least as much per hour, and probably more, than the average taxi driver and chauffeur.

Earnings Regressions

We next consider how earnings vary across Uber driver-partners. Table 7 presents earnings regressions using the BSG 2014 survey data, in which the dependent variable is the log of the earnings per hour net of Uber fees.[25] The column labeled (1) presents results from a model with explanatory variables that relate to driving with the Uber platform, such as whether the driver provides rides under the UberBLACK service and the driver's average weekly hours since partnering with Uber, as well as city dummy variables. The second column adds variables reflecting the drivers' personal characteristics, such as race, experience, and education. Tenure at Uber is defined as the number of months the driver has used the platform.

[25]It is not possible for us to link the BSG survey data back to Uber administrative data. Consequently, we are limited to the survey data collected by BSG and the administrative information that Uber provided to BSG. Thus, we cannot estimate driver expenses because we do not know the type of car or mileage that each driver drove. Moreover, the earnings per hour data provided to BSG indicated the decile interval of the drivers' hourly earnings in 2014, not the exact hourly earnings. We use the log of the midpoint of the interval as the dependent variable.

Table 7. Earnings Regressions for Uber Driver Partners, 2014

		Dependent variable	
		Log of midpoint of decile hourly earnings	
Variable	*Means*	*(1)*	*(2)*
Log of midpoint of weekly hours	2.987	–0.034	–0.013
		(0.066)	(0.061)
UberBLACK driver-partner (= 1 if yes)	0.354	0.562***	0.480***
		(0.165)	(0.158)
Finance car	0.472	0.099	0.064
		(0.099)	(0.085)
Lease car	0.103	0.271*	0.225
		(0.150)	(0.149)
Short-term rental/lease car	0.053	0.234	0.195
		(0.314)	(0.290)
Other car procurement	0.036	–0.832	–0.595
		(0.513)	(0.520)
New service fee	0.295		–0.132
			(0.257)
Education	2.396		0.013
			(0.009)
Tenure (time using Uber app in months)	6.712		0.054**
			(0.027)
Tenure squared	96.900		–0.002*
			(0.001)
Experience	7.074		0.010*
			(0.005)
Experience squared	361.562		–0.00000
			(0.0002)
Female	0.121		0.031
			(0.123)
Black	0.186		–0.181
			(0.228)
Hispanic	0.151		–0.399
			(0.254)
Asian	0.158		–0.273
			(0.177)
Other	0.140		–0.010
			(0.192)
City dummies		Yes	Yes
Constant		1.121***	0.916***
		(0.221)	(0.225)
Adjusted R^2		0.336	0.353
Residual standard error		1.246 (df = 575)	1.229 (df = 564)

Source: BSG 2014 survey data.
Notes: $N = 601$. Mean(Dep. var. = 2.40, SD(Dep. var.) = 1.53. BSG, Benenson Strategy Group.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

The city dummies are jointly highly significant, as might be expected in light of the results shown in Tables 3 and 5. Drivers who provide the UberBLACK service earn more per hour than those who exclusively provide uberX rides, which also might be expected given that UberBLACK requires

a luxury car and drivers who are typically commercially licensed. A quadratic relationship exists between earnings and accumulated seniority using the Uber platform, with earnings peaking after about 14 months. Drivers with more potential experience (defined as age minus education minus 6) also have slightly higher hourly earnings. Drivers' education, race, and sex are not statistically significant predictors of earnings.

Conclusion

In this article, we have attempted to provide the first comprehensive description of Uber's driver-partners, based on both survey data and administrative data. Several findings are worthy of emphasis and exploration in further research.

First, the Uber platform provides a great deal of flexibility for driver-partners, and this characteristic of work in the on-demand economy may attract workers who supply labor to the sector more generally. Responses to the BSG survey indicated that many driver-partners valued the flexibility to choose their hours and days of work. Furthermore, the administrative data indicate that a large share of driver-partners avail themselves of this flexibility and vary their hours from week to week. Compared with traditional taxi drivers, Uber driver-partners tend to work substantially fewer hours per week. For example, taxi drivers and chauffeurs were five times more likely to work 50 or more hours per week than were Uber driver-partners. The high fixed costs of obtaining a medallion to drive a taxi in many areas could explain the longer hours worked by taxi drivers. The finding that hourly earnings for Uber's driver-partners are essentially invariant to number of hours worked during the week also makes Uber an attractive option to those who want to work part-time or intermittently, as other part-time or intermittent jobs in the labor market may entail a wage penalty.

Second, Uber's driver-partners are more similar in terms of age and education to the general workforce than to taxi drivers and chauffeurs. Many factors may have contributed to this result. 1) The US economy was operating at less than full employment during the period studied, and so more highly educated and younger workers may have had fewer alternatives available than is normally the case. Uber may have represented a particularly attractive bridge option for these workers. 2) Entry barriers in traditional taxi and limo services may prevent a broader segment of the workforce from gaining such jobs. 3) A segment of the general public may be drawn to Uber over traditional taxi and chauffeur jobs because Uber permits greater flexibility in terms of scheduling. That new drivers continued to partner with Uber at an accelerating rate in late 2014 and 2015, when the economy strengthened and the unemployment rate fell below 6%, suggests that weakness in the economy was not the major reason driver-partners partnered with Uber. 4) Most driver-partners were employed prior to joining Uber. These considerations suggest that Uber has attracted

driver-partners with a wide range of backgrounds because they value the type of opportunity for flexible work that Uber provides.

Third, although it is difficult to compare the after-tax net hourly earnings of Uber's driver-partners with that of taxi drivers, it appears that Uber driver-partners earn at least as much as taxi drivers and chauffeurs, and in many cases they earn more. The prospect of higher compensation likely explains, in part, why the number of Uber driver-partners has grown at an exponential rate (along with lower entry barriers and flexibility). Another aspect of Uber that can influence the pay of driver-partners vis-à-vis taxi drivers is that customers rate their driver-partner when they take a trip with Uber, and driver-partners' ratings are made available to potential customers. This leads Uber's driver-partners to develop reputations, which may serve as an incentive to perform well to develop and maintain a good reputation. By contrast, taxi drivers typically are anonymous and customers are not aware of their reputations. Reputations matter in markets.[26] Driver-partners are rewarded for having a good reputation, which could lead Uber's driver-partners to earn more than taxi drivers. Furthermore, driver-partners who expect to do a good job and want to develop a strong reputation are more likely to be attracted to Uber than to traditional taxi service.[27] Estimating the impact of driver-partners' reputations on their earnings is an important topic for further research. The wage regressions that we present find little evidence of earnings differences by driver education, gender, or race, but we do find a return to early experience using the Uber platform.

Finally, Uber's growth rate has varied considerably across cities. Understanding why Uber grew more rapidly in certain cities could provide insights into the likely future path of the on-demand sector. For example, if inefficient taxi regulations and restricted supply of taxi licenses contributed importantly to Uber's rapid expansion, then demand for on-demand services may be slower in fields other than for-hire transportation services.

Uber likely represents a substantial fraction of the work facilitated by digital matching platforms, yet it seems to be part of a larger trend in work in the United States. Several recent studies documented the exponential growth in work facilitated by digital platforms,[28] much of which is not ride-sharing work.[29] Estimates of the size of the labor force that uses digital platforms for finding work vary widely and reach as high as 8% of all American adults over the course of a year (Smith 2016). Smith also documented that, among workers who report that digital platform income is "essential or important," the

[26]See, for example, Cabral and Hortaçsu (2010) for research on the relationship between sellers' ratings and sales on eBay, which, like Uber, is an online marketplace that uses a ratings system to build reputations for both sellers and buyers.

[27]This sorting effect could partly explain why Uber's driver-partners are more highly educated than traditional taxi drivers and chauffeurs.

[28]See, for example, Farrell and Greig (2016a, 2016b), Manyika et al. (2016), and Smith (2016).

[29]Smith's (2016) survey suggested that one-quarter of respondents who have worked using an online job platform in the past year worked in ride-sharing.

modal reason stated for using those platforms is a need to control their schedule. Manyika et al. (2016: 59) found that 87% of digitally enabled independent workers are independent "by choice," compared with 69% of independent workers as a whole. Topics for future research in this field include estimating the welfare gains associated with digitally enabled worker independence over scheduling, understanding what work is and is not amenable to platform-based allocation, and studying the impact of the emergence of digital platforms in certain sectors on traditional jobs in the same sector.

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