

Dependence and Precarity in the Platform Economy

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Abstract

Since its introduction in the late 2000s, there has been considerable debate about the impacts of the “sharing” economy. One focus of attention has been treatment of people who provide services via platforms. In this paper, we analyze conditions for platform providers on the basis of 102 in-depth interviews drawn from earners on six platforms (Airbnb, TaskRabbit, Uber, Lyft, Postmates and Favor). Interviews were conducted from 2013-2016. We find that providers have widely varying experiences, earnings and working conditions. A key axis of differentiation is the extent to which they rely on the platform to pay basic expenses versus use it to earn supplemental income. Dependent providers on a number of platforms experience low net earnings, inadequate demand, and less control, making the platforms a precarious way to earn a living. A second axis is that the platforms themselves vary considerably in terms of what providers can earn, conditions of work and their ability to produce satisfied workers.

Introduction

The erosion of full-time work in the US economy is a trend that scholars have been following since the 1980s. Early work by Eileen Applebaum and others (Appelbaum 1988; Christensen 1987) documented the rise of non-standard employment relations, comprising contingent, part-time, casual, temporary, and other arrangements. In 2011 the topic gained considerable prominence with the publication of Guy Standing's book *The Precariat: The new dangerous class* (Standing 2011), which argued that precarious employment was no longer a problem confined to the bottom tier of the labor market, but had become a widespread feature of even professional and white collar jobs. Over the last decade, research on the prevalence and nature of precarious work has proliferated (Kalleberg 2009; Pugh 2015). An influential recent treatment, David Weil's *The Fissured Workplace*, describes firms' shift from direct employment to arms' length relations with the people who work for them, as well as the violations of labor law this transformation has brought (Weil 2014). While precarious work, and fissured workplaces, have been widespread for decades, this trend has accelerated in recent years. A 2016 paper by Larry Katz and Alan Krueger (Katz and Krueger 2016) found that the fraction of "alternative work arrangements" (defined as temporary help agency workers, on-call workers, contract workers, and independent contractors or freelancers) increased substantially between 2005 and 2015, from 10.1% to 15.8%.¹ During the recessionary period 2005-2015, they find that all net employment growth was comprised of alternative work arrangements (Katz and Krueger 2016, 7).

The emergence of the "sharing economy" has fueled interest and debate about precarious work, as nearly all the for-profit platforms in this sector avoid direct employment in favor of "independent contractors," or what is colloquially known as 1099 work, in reference to the IRS

forms that independent contractors receive from the companies (Dubal 2017; Rogers 2015). The companies argue that the lack of a direct employment relation is a benefit to the workers, or “providers.” They contend that providers do not want employment, that they prefer the flexibility and autonomy of 1099 work and the ability to be their own bosses. They have even enlisted the rhetoric of micro-entrepreneurship to describe platform work (Ravenelle 2017). Academic observers such as Arun Sundarajan have heralded this trend, happily predicting “the end of employment” and the rise of a crowd-based capitalist system organized via these multi-sided markets (Sundararajan 2016). Economists have focused on the efficiencies to be gained from this type of business organization (Horton and Zeckhauser 2016).

Others are far more critical of the platforms, arguing that they are not realizing genuine efficiencies so much as avoiding regulation and taxation and engaging in unfair business practices (Baker 2014). Some have described them as a ‘neoliberal nightmare’ (Martin 2016). Kenney and Zysman note that “we are in the midst of a reorganization of our economy in which platform owners are seemingly developing power that may be even more formidable than was that of the factory owners in the early industrial revolution” (Kenney and Zysman 2016, 62). Other critics have focused on the idea that because they do not offer conventional employment, the platforms are setting off a race to the bottom, undermining wage norms and creating a “share the scraps” economy (Reich 2015). Trebor Scholz (Scholz 2016) has described platform labor as “uberworked and underpaid.” While much of this debate has taken place in the popular press, with anecdotal, rather than systematic evidence, studies of actual conditions of work and providers’ experiences are starting to appear. Alexandra Ravenelle conducted in-depth interviews with roughly 90 providers in New York City on a variety of platforms (Ravenelle

2017). She finds that they reject the “micro-entrepreneur” designation, experience multiple types of precarity, and struggle as they attempt to earn in this innovative sector. Similarly, Ladegaard, Ravenelle and Schor (2017) find that providers experience multiple sources of “vulnerability,” from threats to their bodily safety, to being cheated out of their earnings by unscrupulous customers, to being unwittingly drawn into criminal acts such as drug dealing, prostitution or violence. Rosenblat and Stark have argued that the software and review systems used by Uber are problematic surveillance mechanisms that undermine the much-touted flexibility, autonomy and entrepreneurial benefits (Rosenblat and Stark 2015).

Much of the debate has focused on questions of misclassification of employees as independent contractors, particularly as a series of lawsuits have wended their way through the courts (Dubal 2017). Uber, the largest of the platform companies, has been a prime target of critics, and has already lost a number of these legal battles. Conflicts over classification will undoubtedly continue, as will a vigorous debate about whether platform workers constitute a third type of employment relation that warrants new regulations (Harris and Krueger 2015). However, the policy debates, like the popular ones, have taken place with very little qualitative analysis of the experiences of providers. How do they see themselves? Are they really uberworked and underpaid? Is this type of work eroding their earning power? Do they have the flexibility and autonomy the platforms claim? What are their conditions of work? Are they happy on the platforms?

This paper reports on an ongoing study of providers across a number of platforms. Since 2013 we have been interviewing providers in the Boston area. We report on 102 in-depth interviews

with providers on six platforms (Airbnb, TaskRabbit, Uber, Lyft, Postmates and Favor). Interviews are ongoing, and in this paper we include data through the end of 2016. Here we provide a broad description of platform conditions for providers, focusing on the adequacy of earnings, the effort/earnings bargain, autonomy and flexibility, and overall satisfaction. We find a mixed picture, and have identified two major axes of differentiation. First, outcomes vary by the extent to which providers are dependent on the platforms as a primary income source. In cases where the income is supplemental, or the provider has multiple sources of income, satisfaction is higher, autonomy is greater, wage rates can be higher and conditions are better. By contrast, those who are dependent on the platform to fund basic living expenses express more dissatisfaction, and experience more precarity. The second axis of variation is across platforms. Although all platforms are technically open access, meaning almost anyone can join,² their asset requirements and the skill levels needed to succeed vary considerably. Outcomes and satisfaction differ across this spectrum as well.

Definitions and case selection

Because the “sharing economy” is so new, definitional issues are not yet resolved. What is generally understood to be the sharing economy sector is in reality a congeries of platforms, which include resale entities like ebay, home rental platforms such as Airbnb, labor services such as driving (Uber and Lyft), delivery (Postmates, Favor) and errands (TaskRabbit). There are also gifting and loaning platforms (Freecycle, Yerdle, Peerby) and platforms that crowd source finance (Kickstarter). Most of these are for-profit platforms in which transactions are monetized, but not all are. The examples we have mentioned are mainly peer-to-peer (i.e., person to person), however, other companies that are commonly thought to be part of the sharing economy are

largely or fully business-to-peer. The former include digital labor entities such as (Upwork and Mechanical Turk); an example of the latter is Zipcar. We have discussed these differences elsewhere (Schor & Fitzmaurice, 2015; Schor & Frenken, 2017). In this paper we confine our discussion to for-profit, P2P platforms. (For analyses of non-profit sharing entities, see Dubois, Schor, and Carfagna 2014; Schor et al. 2016; Schor and Fitzmaurice 2015). While Airbnb has seen some movement toward B2P activity, in other research (Cansoy and Schor 2017) we find that it is still mainly P2P—in our 200,000+ dataset of US listings, only 14% of hosts rent out more than 5 properties. As we argue below, the term “sharing economy” elides differences among platforms and is often ill-suited for analytic purposes. Therefore, it seems useful to differentiate among types of platforms.

In 2016 the Commerce Department proposed the first governmental definition of this sector, adopting the term “digital matching firms” (Telles 2016). The report identified four characteristics which define digital matching firms: 1) the use of information technology to facilitate P2P transactions, 2) the use of ratings systems, 3) flexibility for workers to choose hours and 4) worker-provided tools and assets necessary to do the job (Telles 2016, 3–4). While these criteria can be criticized on the grounds of being too broad—resale platforms like ebay arguably fit the definition but are generally not included in the conversation—we have used these criteria for our case selection. This results in the inclusion of labor platforms (Uber, TaskRabbit) and home rentals (Airbnb). However, it may be worth noting that the commonly used terms “gig” or “on-demand” labor are not generally applied to Airbnb and other home rental platforms. This is presumably because the bulk of the payment is not for labor (eg, the provisioning and cleaning that go into offering a room or home), but is attributable to a scarcity payment, or rent

(in the economic use of the term) for the space.

We also note that the extent to which the four criteria identified by Telles are satisfied appears to be changing over time, particularly 3) and 4). Our research, as well as anecdotal evidence from the popular press, suggests that platforms are becoming more aggressive in attempting to control providers' hours and volume of work, and they are also providing tools and assets. For example, in some cities ride hailing platforms now offer drivers cars under favorable conditions (including *gratis*) if they do a certain number of rides per week. In addition, our respondents report that the companies are exercising more control over the quality and age of vehicles. We find that conditions for providers on these platforms are not static. Remuneration rates, rules, requirements, and incentives are changed frequently. This can happen through subtle adjustments to algorithms that affect providers' bottom lines, through the blunter instrument of changes in rates, fees charged by platforms, or regulations, or even via wholesale alterations in the business model, as has occurred a number of times with TaskRabbit.

Methods

Our findings are part of a larger program of research on the sharing economy. In this paper, we draw on interviews and surveys with 102 earners on six platforms (Airbnb, TaskRabbit, Uber, Lyft, Postmates and Favor). Interviews are semi-structured, and range from 40-90 minutes.³ After the interviews, we ask respondents to complete a short survey that includes demographic information and a small number of questions about their earnings.⁴ Interviews are concentrated among people aged 18-34 because this group constituted nearly all users when the project was started. Over time, we have generally adhered to the age restriction to maintain comparability as

we added cases, however where providers tend to be older, we have expanded the range a bit. To date, young people remain heavily overrepresented as providers on these platforms. In the 2016 PEW Research Center survey of gig labor platforms, 42% of gig workers were aged 18-29 and another 39% were in the 30-49 year old range. Only 19% of their sample was 50+ (Smith 2016). For Airbnb and TaskRabbit, we did a first round of interviews in 2013 and went back into the field in 2015 and 2016. In 2015, we also conducted second interviews with 9 of the original 2013 respondents from these two platforms. Most of our interviews have been conducted in person with providers in the Boston area, although a small fraction of Airbnb and TaskRabbit were conducted via Skype with people in other cities.

We are aware that our sampling strategy introduces a selection bias, because it does not include people who are no longer active on the platforms, and therefore our findings may be skewed toward those who are more satisfied. For the purposes of this paper, the bias is not fatal: at a minimum we find that there are both satisfied and dissatisfied providers on the platforms, and identify the factors which determine satisfaction. We do not attempt to provide an estimate of the relative proportions of the sample who are satisfied/unsatisfied.

Here we offer a brief description of each platform. Airbnb is a P2P housing exchange that began in San Francisco in 2008. Originally, hosts offered rented rooms in their own homes and apartments, but over time a wider range of offerings became available, including whole apartments and houses, which now predominate (Cansoy and Schor 2017). Airbnb uses photos, listing descriptions, and ratings and reviews to match guests and hosts. Host responsibilities include provisioning the space (with décor and in many cases a limited supply of food and basic

items) and having it cleaned between stays. TaskRabbit is a general labor services site that was founded in Boston in 2008, under the name RunMyErrand. On this platform, customers hire “taskers,” to perform services such as house cleaning, deliveries, handyman work, pet sitting, moving and assembling furniture as well as online tasks such as being a virtual assistant or product tester, or doing translation. In 2013, during our first round of interviews, TaskRabbit used an auction model. Customers provided a description of the job they wanted done with a maximum price they were willing to pay for the task. Taskers bid for the job and the poster chose a provider. In 2014 the company underwent a radical redesign in which it eliminated auction pricing, set an hourly wage range for tasks, and raised its fees, including a first time fee of 30%. (Airbnb, by contrast, takes between 9-15%.) Uber and Lyft are ride-hailing platforms that match drivers to people who need rides. Our interviews were with drivers on UberX, rather than its “black car” service. Rides are hailed via an online app and as the case with all the platforms in this study, consumers rate and review drivers. Postmates and Favor are Uber-like delivery services. They were founded in 2011 and 2012 respectively, and were originally envisioned as bicycle courier services offering a range of deliveries. They now both specialize in delivering items from convenience stores, takeout from restaurants, and miscellaneous items from various retailers. Deliveries are carried out via a range of transportation options—bikes, cars, public transport and walking, with bikes and cars predominating. Couriers are provided with an electronic payment card which is preloaded with the precise amount of the purchase, so that neither the platform nor the customers can be overcharged.

In our discussion below we have amalgamated Uber and Lyft as one case, and Postmates and Favor as another. This is primarily because the services are so similar in terms of what they offer

and their technology. In addition, most of the providers we interviewed worked on both platforms simultaneously. However, there are differences among them. For example, Lyft's rates are generally better and they have other more "driver-friendly" aspects. However, for the purposes of this study, the similarities dominate.

Describing our respondents

Descriptive statistics about our sample can be found in Table 1. As noted, the sample size is 102, with 29 from Airbnb, 26 from Favor/Postmates, 14 drivers from Lyft/Uber, and 34 TaskRabbits. Some respondents are active on multiple platforms, for example Airbnb and TaskRabbit, however we have assigned each person to a platform based on the one they were more involved with or earned more from.

As noted above, our sample is young, with a mean age of 28.5. Drivers and taskers are slightly older than Airbnb hosts and Postmates and Favor deliverers. Our sample is roughly two-thirds male. While this is not surprising for the delivery and driving cases, it is somewhat unexpected for Airbnb and TaskRabbit. In the latter case, it may be due to a more favorable labor market for women in Boston, given the preponderance of medical and educational institutions. In the case of Airbnb it is partially an artifact of the fact that some hosts are part of heterosexual couples where we interviewed the man.

As expected, our sample is highly educated. Twenty have graduate degrees and 52 have college educations. Another 21 have completed some college. While we have a few college drop outs

most in this category are currently enrolled in school. Only seven did not go beyond high school and just one person in the sample did not finish high school. This is markedly different from the Pew sample, which had 42% with a high school degree or less (Smith 2016). This may be attributable to the high education levels of Boston and/or the fact that the type of work varies across the two samples. The largest category in the Pew survey was online tasks such as data entry and taking surveys, which our cases do not include.

We also asked our respondents about their social class. As expected, we find that the biggest group (44%) considered themselves middle class, with a sizable group (24%) identifying as lower middle class. Eighteen percent consider themselves “upper middle” or “upper class,” and 14% “lower class.” Table 1 also includes respondents’ reported monthly earnings on all sharing economy platforms, broken down by case. We find that the largest two groups (35% and 34%) earn either less than \$500 or between \$500 and \$1500. There is a substantial fraction (27%) who earn considerably more—between \$1500 and \$5000. A very small number (4 in total) report earnings of more than \$5000 per month. Two of these respondents are Airbnb hosts.

Findings

We find that experiences vary by the extent to which providers rely on the platform for their primary earnings (Table 2). Based on their answers to survey questions about what they use their money for as well as the qualitative data from the interviews, we coded our respondents into three categories. “Platform dependency” includes those who are wholly or primarily dependent on the platform for their livelihood (roughly equivalent to full-time workers). Partially-dependent includes those who rely somewhat on platform earnings, but either work on multiple platforms or

have part-time jobs, small businesses or other sources of income. Supplemental earners are those for whom the income is not part of their regular income source, and is considered extra, or supplemental. Many of the providers in this third category have full-time employment or activity (i.e., schooling).

According to this categorization scheme, we estimate that 27 of our sample are dependent on the platform for their primary source of income; 42 are partially-dependent and 33 are supplemental earners. Comparing our findings to those of the nationally representative 2016 Pew survey (Smith 2016)⁵ we find a similar fraction in the first category (dependence) and moderately similar results for the other two categories. Pew found that 29% of respondents who were involved in online gig work reported that the income they earned “is essential for meeting my basic needs” compared to our 26.5%. Their second category—it is an “important component of my budget, but not essential”—was 27%, compared to 41% in our middle category. And in the Pew survey, 42% say the income is “nice to have, but I could live comfortably without it,” compared to our 32%.

As expected, this distribution varies considerably by platform. On Airbnb, none of our respondents relies on rental income as his or her primary source. Sixty-one percent are partially dependent and the remainder regard the income as supplemental. Postmates and Favor workers show a relatively equal distribution across the three levels of dependency, with 27% fully dependent, 35% partially-dependent and 38.5% using their earnings as an income supplement. Drivers are much more dependent than on the other platforms, with nearly 79% driving for a living, and just a few in the other categories. Finally, among our TaskRabbit participants, we

have 9 (26.5%) who are dependent, 14 (41%) who are partially dependent and 13% who use the platform for supplemental income. We have also calculated monthly earnings broken down by platform dependency (Table 3). As expected, those who use income as a supplement tend to earn less, with 48% in the under \$500 category and only 14% at the \$1500-5000 level. Among the middle category of partial-dependence, the largest group is in the middle range. Finally, 43% of those who are dependent on the platform for their primary income source earn in the \$1500-5000 range. However almost half of that group earns less than \$1500 per month.

Overall, we find that platform dependency has a strong relationship to satisfaction and to precarity. People who are not dependent on the platforms have better experiences and more control over when and how they work. They are more discriminating about whom they accept as customers, the amount of time they work, their conditions of work, and their schedules. They can more easily avoid exchange that they suspect will be unsafe, which will yield low earnings or financial risk, or will turn out to be negative experiences. These axes of control serve to enhance satisfaction, raise earnings, and ensure safer and more pleasant working conditions. By contrast, participants who rely on the platforms to pay their basic expenses feel more pressure to accept work, and are less able to be discriminating. They express more concern about the rating system and their reputations and standing on the platform. They experience their situations as more precarious. The extent of dissatisfaction varies by platform, as we discuss below. As noted, the degree of platform dependency varies across our four cases, as do the specifics of the work experience. Accordingly, we have organized our findings by case.

Platform Independence

“Someone, you know, sleeps in the bedroom for a couple days, and you got a couple hundred bucks. So, good deal.” Dennis, 23-year-old Airbnb host

As we noted above, Airbnb providers are earning not mainly from their labor effort, but from the economic rents they can command from property they either own or control via leases. Because capital is generally scarcer than labor, especially during the high unemployment period in the early years of the recession, we expected that Airbnb respondents would be more satisfied on average. They have valuable assets to rent out and hosting does not require much labor effort. This is borne out by our data.

Airbnb hosts are the most satisfied group across our cases. Their hourly earnings are by far the highest and their work burdens are low. In addition, a large subset also experience a substantial non-pecuniary benefit from their hosting—meeting and getting to know new people. This is an appealing combination: high earnings, low work effort and significant social benefit. Albert, a 33-year-old software worker, was drawn to the platform because “well, it’s good income, first of all, for not very hard work I would say,” while he also likes “meeting different people” and “having people around.” To most of our participants, the least enjoyable aspect of hosting is the cleaning—but even this is seen as a simple task. One host reports that cleaning is “fairly easy. We had like a washer machine in the apartment, and so we just changed the sheets, washed them, and good to go. ... I guess I don’t mind doing it, and in some ways it’s simpler than dealing with [a professional cleaner] and scheduling them especially if it’s like every two or three days or whatever.”

Even among those who are partially dependent on the platform, for example, to help pay rent, the effort bargain is attractive. Dennis, 23, and his wife began hosting to earn some extra money and because “life is expensive here.” He also talks about the effortless nature of hosting. “Someone, you know, sleeps in the bedroom for a couple days, and you got a couple hundred bucks. So, good deal. ... Like, oh this is really easy, you don’t have to do much. People just want to be kind of left alone most of the time and so do we.”

Some of the most satisfied hosts we’ve talked to live in Cambridge, where there is heavy demand from guests who are highly educated and highly employed, e.g. they are going to academic conferences or attending graduations. Karen, a 33-year-old Harvard researcher, had friends renting space in her home for “next to nothing” until she discovered Airbnb. She now has dozens of guests every year, has hired a professional cleaner and makes about \$2,500 a month.

I honestly think it was within five minutes [after creating a profile], somebody booked the room for 10 days. It was \$1000 within two seconds. A really amazing woman from Japan was coming to visit her daughter who was graduating from Harvard. And so it’s sort of been like that ever since, where there’s definitely lulls. I mean, you’re not going to get rentals really between November and March. It’s Boston. It’s cold and that’s fine because the heating costs go really high. I don’t want to be responsible for shoveling out somebody’s path. But from March to November, you can.

Rather than creating precarity, as we find on other platforms, Airbnb hosting adds to people's economic security and sense of agency and enables lifestyles that they could not otherwise afford. Thirty-year-old Hannah moved into the expensive Beacon Hill neighborhood, "which I didn't think I could even live in on a teacher's salary because it's like a joke in Boston." A number of our hosts are using their earnings to pay off educational debt, finance luxury spending (such as a spectacular wedding) or travel more. Ethan and Marge, a couple who met through the Airbnb platform, have hosted approximately 500 times and used some of the income to fund a trip around the globe. "We saved everything we made from Airbnb for about a year to a year and a half and then quit our jobs last November, and we did a six-and-a-half-month trip around the world...it was beyond phenomenal." While not everyone is this enthusiastic, most hosts are highly satisfied, earning well and enjoying the experience.

TaskRabbit providers who have other jobs and use the platform for supplemental income also report high satisfaction. They like the flexibility, control and high hourly wages they can earn. In the Pew survey (Smith 2016), 42% of gig workers reported they work on platforms "for fun or to do something in [your] spare time," although this question allowed multiple answers so a fraction of these respondents also need the money. Many of our taskers also note the appeal of using their time off work "productively," explaining that they are otherwise bored. Earning money under these circumstances is a boon.

Members of this group tend to have flexible schedules, low living costs, and are more likely to be students. Charles is a 28-year-old Chinese American graduate student in social work who has earned roughly \$750 per month over his four months on the platform. He regarded his earnings

as “kind of like a safety net income, I guess” and stressed, like many, the flexibility of the platform. “If I feel like working, I’ll see if there is anything out there, and if I don’t, then I won’t.” Even though Charles’ skill set is not particularly specialized, he can wait for higher paying, more convenient tasks. TaskRabbit has replaced the income he earned from a catering job that was an “undesirable position” were managers treated workers poorly. For people like Charles, platform labor is an alternative to low-end work in the conventional economy, rather than spurring a race to the bottom.

The ability to be discriminating about tasks also matters for Ernest, a 26-year-old African-American who is studying mechanical engineering. He earns most of his income driving for an upscale furniture store. He is able to vary his hourly rate by the desirability of the task, and earns from a high of \$150 to a low of \$75, for tasks he does not like, such as standing in line. He reports being “really picky” about tasks, and only does about three per month. Ernest likes heavy lifting because “nothing can go wrong with the heavy lifting” and he often finishes the task in thirty minutes, but is paid for the full hour. Ernest is able to charge high wages because he doesn’t need the work. Other providers also tell us they’ve learned to pick up tasks they know will take much less time than advertised (such as snow-shoveling), thereby yielding high hourly rates.

Maria also has the freedom to optimize her labor across three sources of income: a part-time hotel job (which gives her benefits), TaskRabbit and Uber. A 38-year-old immigrant from Brazil with only a high school education, Maria reduced her time at the hotel after her divorce so that she could accommodate her children’s schedule. At the time of the interview, she was working

40 hours a week driving for Uber, grossing \$50 an hour. However, because she is responsible for expenses with Uber, she prefers a wage of \$35 on TaskRabbit. On TaskRabbit Maria has been able to raise her hourly rates (for house cleaning) to \$39 and \$50 (for basic and deep cleaning), and likes the fact that once a task is booked, she will definitely be paid for it, unlike with Uber where low demand may reduce earnings.

We find that some taskers build stellar reputations via large numbers of successful tasks and are then in a position to command high rates. They are helped by the platform's algorithm, which pushes "elite" or "lead" taskers to the top of the list where customers see them first. Christopher is a 24-year-old Haitian-American with a bachelor's degree from Harvard who earns \$3,500 per month on TaskRabbit, in addition to a full-time EMT job. (His EMT schedule is flexible, and accommodates his platform work.) Christopher has been active on the site for years and has done more than 500 tasks. He tends not to maximize his hourly rate, but prefers to get more work. However, his rate is high—\$60 per hour for physical labor jobs—and he explains that he has "so many reviews at this point, like, if someone doesn't want to hire me at the price that I set it at then, like, I'm not going to feel bad." Similarly Mark, for whom managing Airbnb apartments is his main source of income, says he's "learned how to really push, really push up my rates" by completing many jobs and earning positive reviews.

While the experiences of most of this group are quite positive, we find that there are barriers to earning on this platform. It is easy to join, but can be hard to get tasks. Because the algorithm favors those with extensive task experience, the platform appears to be increasingly operating like a "winner take all" market.

Part-time or casual drivers on ride-hailing apps who are supplementing a main source of income report similarly positive experiences. They feel liberated from the nine-to-five work structure, and perhaps more than anything else, they like that they don't have to report to a boss. They are enthusiastic about this software that creates novel economic opportunities and enables strangers to connect in an environment of trust.

Nathan says Uber is “probably the best thing ever,” because he now has an easy and convenient way to make extra cash, for example when he picks up passengers on the commute to his full-time job or when he has some spare time. “When I’m bored, instead of playing videogames I just turn on the app, wait for a ride and just go on my hustle.” He’s not earning as much in his full-time job as he’d like and especially feels he’s not saving enough for retirement (because his employer doesn’t give a 401K match), so he’s putting his Uber earnings into a retirement account. Twenty-eight-year-old Bobby, who is white and works as a digital media instructor in a public school while also pursuing an MA in education, has used ridesharing as a means to supplement the income from his teaching job and to reduce commuting expenses. “I saw [Lyft] as an opportunity to now make money in a different way on my own time...I start driving when I leave work, and sometimes I like to kind of stick around Winthrop and East Boston, hoping that they go through the tunnels, cause then they'll pay for the toll, and then I don't have to. (Laughter) You know, so I do that and it's worked a few times, it's worked a bunch, actually.” He says that he works 6-10 hours a week, depending on “where I am financially” and if “I want to do specific things that are going to cost more money” such as going to a concert or out to dinner.

The weekend before the interview he “ran like straight out of money on a Friday,” so he drove some hours to pay for concert tickets.

More than a third of the deliverers on Postmates and Favor are supplemental earners. Tamara was a chipper, black woman in her late twenties who loved to regale the interviewer with stories of thrift. Tamara came from a military family, married a plumber, and moved from the South to Boston to work as a special education assistant. She and her husband had a young baby and were trying to create a stable middle class life for themselves. While Tamara did not make much as a special education assistant, she prided herself on being resourceful. She began making deliveries as a Postmates courier, which she liked because the baby slept well in the car. As she put it:

My husband and I, we’re really, we’re kind of entrepreneurs ourselves. He actually just started an Airbnb thing...We are subletting in our house, and then we are running two other houses. So we’re on Craigslist a lot, and I saw it on Craigslist about a year ago, and I was like, hey, I think I will give this a try. He was like, well, yeah we could kind of use the money. I was like, well, I mean, it’s something I can take a little one with me while you are at work or you’re late. I was like; it’s something we don’t really have to worry about.

Tamara did not feel pressure to accept jobs she didn’t want to take, and didn’t hesitate to speak up when she thought a customer was being unreasonable. Asked about safety concerns, she explained: “I don’t feel any. I like it [Postmates] because I don’t have to go in their house, and that’s a perk for me. Then plus, when it gets dark out, I don’t get out of the car. I make them come down and get it. Which, I love being able to do that.”

Chris was an undergraduate at Boston College who occasionally worked on Postmates when surge pricing was in effect and the premium made it worth his while. He didn't depend on Postmates for an income, stating, "Most of it goes towards student loans or car payments. And some of it's for recreation." He liked that it allowed him to be noncommittal, being on the app only when he wanted to. Chris enjoyed listening to fantasy football and driving, which fit well with the work. He thought that Postmates paid well, even if they didn't pay what was advertised:

I mean, I do [think it's fair] because you know what you're getting into. Like, no one was lied to and told, "You're going to be getting health insurance." Like, Postmates kind of said, like, "You can make up to \$35/hour," and that's bullshit. Like, on a good night I've made \$20-\$25/hour and, like, that's a very good night. I've never made less than \$10. Like, if I'm actually working every hour I've never made less than \$10/hour.

Because the income is supplemental for him, Chris also has the luxury of being unconcerned about how ratings were determined or how the system allocated work. When asked if he ever worried about his rating, he replied: "Like, I have a 4.9 and I'm, like, what they would call an 'awful worker.' Like, they give you these food bags to keep the food fresh, and these stickers that you put on the bag that say, like, 'Have a nice day.' I, like, don't use my food bag unless it's going to be more than 20 minutes."

Michelle, a Japanese-American woman in her late-twenties, worked as a software engineer before quitting to "explore music as a hobby" at the Berklee College of Music. She was quick to point out that she did not need the income, stating that she only joined the platform because she met a courier outside her apartment in the Back Bay who said if she attended an orientation and

provided his name, he'd receive a promotion. As she put it, "Well, this is great because I like biking around anyway. So it's, like, why wouldn't I just... Sometimes I just wanted an extra workout." When we asked about how she decided when and for how long to work, Anna said that it all depended on how bored she was: "A lot of the times it's, like, if I feel restless and I want to, like, just, you know, bike around or something. I remember when I first started I really enjoyed it because it's like you feel so useful, you know? Like, maybe I'm, like, 'Okay, I don't have anything to do right now,' and then it's, like, 'Oh, there are these people who want dinner.'" Michelle's discretionary approach towards work on Postmates is revealed by the way she earmarked the money she earned on the platform. "I think of it as going towards food expenses, because I'm delivering food. And it's not really that much, you know?"

In general, the delivery providers who did not need their income were able to avoid the undesirable aspects of the work. They did not feel pressure to be on platform disagreeable hours, accept difficult orders, or say "no" to a task or customer out of fear about its impact their ratings. Perhaps not surprisingly, participants who did not depend on Postmates or Favor for an income generally expressed greater satisfaction in terms of pay than couriers who relied upon the platform for their primary income.

One implication of these findings is that the platforms are free riding on conventional employers who offer full-time work and benefits. The satisfaction of these providers depends on their having those other sources of income, security and risk-management and needing only supplemental earnings from their platform activity. This allows the platforms to attract productive and successful employees, who provide good service and reliability. While critics

have noted that the platforms are getting an unfair advantage by not paying taxes or being subject to regulations, this arrangement constitutes another source of advantage. As we note below, this may be unsustainable in a world where stable full-time employment is becoming increasingly scarce.

Precarity and Dependence on the Platform

“Working for TaskRabbit is just a fantastic way to always stay at the poverty level, right? –
Derek, 48 year old tasker, displaced software engineer

Our findings for dependent providers are significantly different than for those who use the platforms to supplement their full-time earnings. Many dependent providers also enjoy the work or prefer it to their existing alternatives, as we would expect. However, they are far less satisfied, report much less flexibility, and have less freedom to hold out for higher wages. Their situations are much more precarious, in a variety of ways. Particularly if they do not have housing from parents or significant spousal incomes to rely on, their accounts yield a much more mixed picture. While the dystopian visions of critics are by no means fully realized, there are indications that a shift to a greater number of dependent providers could yield reduced autonomy, and greater vulnerability, dissatisfaction and precarity.

Among the taskers, nine of our respondents are attempting to earn full-time on the platform. Some of these were recent college graduates, who were hoping to land regular jobs. They were more sanguine about their experiences, and their dissatisfaction related more to the labor market

than their treatment on the platform. However, a number of them were also interviewed in the early period, a time when providers felt the platform “had their back,” which a number of respondents felt was no longer the case after the platform engineered a “pivot.” Providers farther removed from college, or who had experienced job loss, were not so positive. Derek formerly had a \$200,000 a year job but has been unable to find new employment in software, picking up jobs on TaskRabbit and Craigslist. He also finds off-platform work through contacts he meets via TaskRabbit, which he considers a great benefit of the platform. However, his experiences are varied. He described one day when he had no other work, so he picked up a delivery job that in the end yielded only \$10 an hour and was “the stupidest thing I ever did...I mean like there are many times that you do this and you think, I’d be way better off working at McDonalds because I’d make the same amount of money and I’d have free fries.” At the same time, he does discuss some lucrative tasks.

Julian, a single white 32-year-old male is also articulate about the pitfalls of relying on the platform. With TaskRabbit, it’s “actually really a race to the bottom.” He reports that one poster told him “it’s almost exploitative the things she can get people to do for \$10.” Julian was trying to be an entrepreneur, selling and writing about software. He had lost a full-time job as a surgical technician, and along with it his home. So he sold all his possessions and bought a membership in a co-working space that offered Internet and some free food. He tried to hide his homelessness by running to the co-working space every morning so that it looked like he needed a shower because of his exercise routine, rather than his homelessness. “It’s absolutely mentally exhausting to keep up all these projects and this farce about my living situation.” At the time of the interview, he’d earned only \$4500 on the platform.

Julian discussed the precarity of his situation in frightening terms: “It’s like I’m going to die because I’m not going to buy food, or I’m going to freeze to death in the wintertime...I made it work though.” But Julian saw his situation as temporary. He was learning a programming language that he felt confident would guarantee him a job and \$80,000 a year. “So it’s really going to be a 180 for me to go from, like, hustling around and doing Task Rabbits for 25 dollars to being really employable and having a really valuable skillset.” At the same time, he really enjoys a lot of the work, finds it “pleasurable” and rates the platform a “10.”

While our respondents mentioned race to the bottom a number of times, the platform’s switch away from the auction model seems to have raised wages, and as we noted above, many taskers earn more than \$50 an hour. Those who we interviewed twice generally agree that the hourly wages have gone up. Racquel reports her personal wage floor is \$25 per hour. Another tasker reports a \$17 per hour wage. But the higher wages that have prevailed since mid-2014 are likely a key factor explaining why demand is not more robust, and must be seen in the context of low total earnings. (The company also increased its service fee to 30% for first-time transactions.) These hourly rates work well for those who have other full-time work. But Racquel’s \$25 per hour will only be yielding her about \$10,000 this year. Derek is earning \$12,000-20,000 a year. As he explains: “Working for TaskRabbit is just a fantastic way to always stay at the poverty level, right? But at least you can pay your phone bill and you can buy some food and the landlord isn’t upset with you.” Findings from New York (Ravenelle 2017) suggest an even more competitive environment with less work for taskers.

Some of the providers are noting shortfalls in demand, an issue that rarely arose in our 2013 interviews. Racquel explains that “I actually get more tasks through this new platform” (because she’s more skilled) although she also says it’s “harder” to get the tasks now. This is true despite the fact that Boston has only a few hundred taskers. Racquel reported being hired by the company to drum up new business in what she described as “monied” neighborhoods. Our researcher’s experience also supports the idea of inadequate work. While it was easy for him to sign up on the platform over a period of months he was unable to get any tasks.

We also found evidence of deteriorating provider conditions on the platform. A number of our early respondents stopped participating. Among those who stayed active for a while, ratings of the experience dropped sharply. “They used to really, like, I don't want to say fight for us, but they were definitely like more responsive, I should say... Most TaskRabbits feel that way though, it's not just me.” Another explained that the company used to care about the individual rabbits, but no longer does.” A third went farther: “We really are just cannon fodder...They don’t really care about us.”

On the other hand, some of the dependent providers were able to make it work. But a number of them, like Racquel and Mark, live with their parents. Mark, a white 24 year old, is an evening college student who does tasks during the day. He’s earning about \$25 per hour, which is above what providers on some of the other platforms, like Postmates and Favor, earn. He’s able to put 20% of his earnings into savings and the rest is for his personal expenses, which mostly includes transportation and eating out. He takes the 6:30 AM train to the major urban area and then works until he takes the train back for evening classes. Since he is already committed to spending the

day working, Mark places his wages below the average price for a given task so that he can fill his day with work. He isn't comfortable with some tasks, like building IKEA furniture, and doesn't own a car to do deliveries, so he relies heavily on the "quick assign" market. (Quick assign is when a purchaser does not select the tasker but instead puts out a request and the first tasker to accept the job wins it.) Mark is also in a situation where he feels he needs to take almost every task he can. He has lost the much-vaunted temporal flexibility of the platforms, as has adopted the regular early commute and full day of work. He has also lost the ability to choose or to set a good rate, because he needs to underbid for tasks in order to get enough work.

Similarly, participants who relied on the delivery platforms for an income tended to accept nearly every request. It was not uncommon for these participants to work on multiple courier platforms simultaneously, waiting in their car or on their bike for one of their apps to come through with a job. Favor was preferred by these couriers, as it guaranteed \$15 an hour for the hours worked, unlike Postmates, where respondents reported waiting for hours without receiving a request or earning anything at all. But Favor shifts are limited, and tend to go fast. However, there is a downside to Favor's wage guarantee, which is that couriers cannot turn down deliveries without incurring a penalty. This means that they must take jobs they know or suspect will be problematic for one reason or another. We found that full-time couriers often sign up for Postmates shifts only after they commit to Favor. Even without the wage guarantee there is a benefit to signing up for a Postmates shift, which is that they give algorithmic priority to people who reserve shifts in advance (in comparison with those who just turn on the app). However, none of our respondents actually knew how much that priority actually helped.

All of the participants who were dependent on the platforms felt it was a less than ideal working arrangement. However, many felt they had no other options. Some had lost conventional jobs or were unable to find work. Some were shut out of other platforms. Bernie, a black man in his late 20s, had worked for Uber prior to signing up with Favor, but was deactivated when Uber changed the minimum model requirements for its drivers. Bernie had moved to Boston from Oakland, California to attend graduate school for social work. He described himself as “lower class,” and when asked how he settled on Favor, Bernie replied, “So I needed the money and I have a car. I actually was doing Uber before, but my car is too old. I have a 2000 or 2001. They changed their policies... The money [on Uber] was better than Favor, yeah.” Bernie had just graduated, but was struggling to find work and was desperately trying to save enough money to move to Philadelphia. As the interview progressed, he appeared increasingly overwhelmed. When asked what he needed the money for, Bernie said, “Saving to move, my credit card bill, car repair because I need to get that in the shop, so yeah. I’ve been kinda, you know, not knowing because I know it’s gonna be expensive. All I know is it’s only gonna get worse. But it’s like, do I keep my car and risk it getting worse or do I take it in now and take this huge financial blow?” Bernie’s one asset, besides his graduate degree (which was not paying off at this time) was breaking down when he needed it the most.

Another participant, Charles, had a criminal record and found getting steady work very difficult. He was hoping to eventually start college with the dream of becoming a therapist, but he was not sure when he’d be stable enough to start. For now, Charles was taking the bus from Connecticut to sleep in his brother’s dorm room and make deliveries. He explained: “I’m from Waterbury, which is, like, one of the most impoverished cities in Connecticut. So it's a bunch of, you know,

not even average middle- to lower-class, so I just had to get out of there. And, you know, my brother have an opportunity to come to Boston I figured...You know, I'd visited a couple times, and then he told me about another company called Favor, which is similar to Postmates.”

Charles often seemed only able to work in spurts, as his scooter would break down and in the winter he would have to find a car. One day, on an online courier group, it was announced that Charles won \$100 for his excellent customer service. He was delivering a lunch order when he was rear-ended in traffic. Although he complained of whiplash, the post proclaimed that Charles nonetheless completed the order in the time allotted. By the logic of the platform, it was his lucky break, but in terms of physical well-being, he felt compelled to keep working immediately after an accident, foregoing needed medical attention.

These participants also report that earnings are erratic. While supplemental earners are able to turn off their apps when business is slow, traffic is bad or weather is forbidding, dependents find themselves locked into undesirable situations. For drivers and deliverers this can be because they have to front money for a vehicle. This was the case for Horatio, a courier who did not own a car. At times, he would take advantage of Zipcar promotions, explaining that any money was better than no money, regardless of the razor thin margin. “I don’t have to pay for gas with a Zipcar. Because you pay \$30.00 Monday through Thursday if you get the car from 6 p.m. to 8 a.m., so with Favor you could have probably a good four or five hours, so if you make at least the \$30 within the first two hours, then the rest of it is profit. It depends. Sometimes you get better nights than others, sometimes it’s worth it and sometimes it’s not.” Despite having a bachelor’s degree in business, Horatio was unable to find full-time work, and was cobbling

together an income on various delivery platforms. He seemed genuinely at a loss in terms of what he should be doing. He was tired and lacked optimism about his future.

Daria, a white woman in her early twenties, came from a poor family and seemed to be constantly on the move. She described her dad as a “deadbeat,” and she wasn’t in contact with her mother. After following an ex-boyfriend to Boston, Daria began looking for work that would keep her from having to live on the streets. Her first job was at a convenience store downtown making breakfast sandwiches for construction workers. This wasn’t enough to cover rent, so she began looking for additional work and stumbled across Favor. While it gave her an opportunity to earn some extra money, it was a grueling schedule. As Daria recalled:

I would bug my boss at the convenience store for the schedule to be on time please for that week and then as soon I had that I would put every hour that I wasn’t working at the convenience into my like Favor availability and then I’d just like work all the time. I would do like weird hours at the store. I’m like not really much of a morning person. So I would start Favor when they opened, which I think changed from like 11:00-10:00 or like 11:00-9:00 or 10:00-9:00, something like that. It got earlier during the time I was working there and I would just take first shifts and then I would go over to the convenience store like 2:00 and work from 2:00 until 10:00 and then I would go back to Favor from like 10:00 until midnight or 10:00 until 1:00 or whatever, depending on the day.

Eventually Daria began to work full-time as a courier, first for Favor, and then for a local non-platform courier company. She found this work paid better than Postmates and Favor, while also

being more consistent. Like Horatio, Daria seemed tired, fatalistic, and resigned to a future of low-wage, unsteady work.

Eleven of the fourteen Uber and Lyft drivers we interviewed are dependent on the platform. Not surprisingly, dependence undermines the flexibility and autonomy that rideshare companies tout and many drivers desire. Some of the respondents who have resisted full-time driving are the most articulate at explaining why. Thomas, a 27-year-old Uber driver is “partially dependent,” earning about \$12,000 a year from the platforms. He says it’s “impossible” to have a decent hourly wage if you simply drive whenever you want. To match the hourly wage of a bus driver, he has to catch the rush both in the morning and in the afternoon, and ideally also be on the road as early as five in the morning, when there’s substantial airport traffic.

The way I see it, if I want to make \$20.00 an hour like after my expenses, right, so after Uber takes their cut, after I pay for my car and all the vehicle expenses, right and car washes and some of that other stuff that don’t fall under vehicle expenses could go in there...so to make it what I would earn say I was driving a bus around the city, for the city, I wanted to earn \$20.00 an hour, I could not drive the hours that I want, like it wouldn’t even be close. So in order to be a full-time driver and make a living wage you have to drive every rush hour, you have to drive rush hour. Whether you drive all the rush hours in the morning or all of them in the evening or drive all of them in the morning and then like Friday night, the bar scene, so there’s like those three different times, you know, morning rush hour, evening rush hour and weekends late at night.

Forty-one-year-old Alice, who has two children and drives between 15 and 30 hours a week to boost her family's household income is like Brett in the sense that she is unwilling to drive full-time and also because she feels compelled to drive when the demand is high.

Maybe 1:00, and then I know it's busy, and then I maybe stop for a little bit and go back out at 5:00 when there is rush hour. Then again in the nighttime, there might be a game and I take everyone to the game. Then after the game I'm out there again, you know. ... I'm a hustler, you know. I'm a very hard working person. It's just me. Because everyone, we all like, we have bills, and we all like, we like nice things. We all want better things in life, so yeah, sometimes I, I starve myself. I'll just eat later, you know. It's not the best thing to do, but if it's busy, and I'm needed on the road I'm going to be on the road you know. I don't think I'm going to starve myself to death, you know. Eventually I will get something to eat. ...It's like, why work from 1:00 [to 3:00] PM for half the price when you know, I can work from 3:00 to 5:00 and make double the money in less time. You know?

Thomas and Alice's experiences suggest that the workday of a driver has a substantial vacuum of activity in the middle of the day, and the lost income will have to be recouped by driving when the app tells them there's demand. In many cases that means that they feel compelled to work outside of the conventional office hours, e.g. weekends and late evenings. Rather than freeing up time for family and social leisure activities, drivers have little work when everyone else is at work, and more when everyone else is free.

Changing conditions also present problems for drivers, increasing precarity and anxiety. They report that platform rules and rates are in continual flux and that they cannot rely on conditions at any point in time. Many of our participants are anxious about the direction the platform is going, in large part because they feel powerless about the changes. Drivers might not have a boss who tells them what to do, but they are constrained by the platform's measuring stick, and the threat of sanctions.

Boris, 33, has been driving for Uber for several years and is currently leasing a few cars to other rideshare drivers. He suggests that driver jobs are precarious.

Uber...kind of force people to...They say that there is no... need to stay online on certain hours unless you want to. But then, if you are online and you don't accept certain trips, basically your acceptance rates go down...And they require like at least, what, 95% acceptance rate. And then when you go lower than 95 acceptance rate, you have a chance of being deactivated...And that goes not only by acceptance rates as well as like by canceling the trips. Although they are saying like you have a full right to cancel the trip. ...So, whenever the time comes, they will have an excess of drivers or they will need to get rid of some bad drivers... they hold their right to cancel you.

Boris says that drivers are also squeezed by top-down decisions that hit everyone, regardless of their ratings and scores.

I mean, you're kind of limited to those rules that are set by Uber. And then you're looking right in terms of the profits. And then, on top of all that, the rate can be decreased at any time without any explanation ... [if] you figured, like, okay, here it is, \$1.50 a mile

[for gas], and I think I can make money out of it, you went on and bought a brand-new Prius ... And then when you put all this stuff together and you have a great tool to operate, and then ... the rate cuts half, you're like, what should I do? The only thing left is just to cry and say, like, oh, these are bad guys.

None of the Airbnb hosts fall into the category of “dependent on the platform.” However, they do experience certain kinds of precarity. One source is the contested legal and regulatory environment in which Airbnb is operating. Many Airbnb rentals are illegal in the cities they are taking place and authorities periodically attempt to identify and act against illegal rentals. In our largely Boston-based sample, where regulatory crackdown has not been much of an issue, fear of landlords, condo boards and neighbors has been a source of insecurity. One of our interviewees, Aaron, had a successful run as a host, earning for the purpose of financing a lavish wedding. Sadly, both the marriage and the hosting went sour. His condo board sued him for ten thousand dollars, on the grounds that his Airbnb activity was not allowed by the terms of the association. At the time of our second interview, the suit was ongoing and had consumed a great deal of mental energy and money for lawyer’s fees. He also reported that his partner left him soon after the wedding. The year of hosting, which required that they vacate the condo, had taken a larger toll on his partner than on him. Another host, Mark, reported that after he rented to an African-American family who came when their daughter ran the Marathon, tenants in his upscale building (and all White and Asian building) complained about these guests. They asked him to stop on the grounds that these “outsiders” might rape or murder their daughter. One of the objecting tenants was a lawyer, so Mark did stop for 6-8 months. A freelance photographer in NY with marginal earnings from her work described an intricate, ongoing dance with her

landlord—when she was late with her rent, he'd threaten over the unauthorized rentals; when she paid him he expressed appreciation for her ability to earn the money via Airbnb.

A number of renters expressed fears about their landlords and described their efforts to keep their hosting activity from them. Amir, 21, says his landlord is unaware of his Airbnb activity, and like many others he doesn't want to ask for her permission. "I don't know if she would be okay with it. I have my concerns because she's a little bit old school. So I don't even know she knows of Airbnb...I thought about telling her many times, because I thought that's kind of the right thing to do. But I was like, maybe not."

Dennis is also keeping his hosting secret from the landlord. The concern, he explains, is that if he finds out, they will have to stop.

That's like part of the reason when our neighbor's doorbell got rang, we were like, that's not great because she said like, oh, I'm staying at an Airbnb. We were like... it's clearly like an apartment building. You don't just say that because you don't know the person's situation....They couldn't get their key to work because it's an old door. You just have to push a little bit. To me, I'm like, I live in a city. There's plenty of old doors you have to push, and that's not uncommon. But our neighbor was going in with that guest, and they were like, oh, we're staying up there with Joe. I was like, oh cool. That's like, that's the way you handle it, like act as if you know us or just don't mention Airbnb, but that person who rang the doorbell mentioned Airbnb.

Variation Across the Platforms

We have found that income dependency is key to platform outcomes. But that is not the only factor. Conditions also vary widely by platform. Much of the conversation about the platform economy has treated the sector as a monolith. However, our research suggests it is better understood hierarchically, more akin to the conventional labor market. This point seems obvious, but the tendency to lump these platforms together obscures important differences. We find a vertical structure across a number of dimensions.

First, there is the asset structure. Airbnb requires access either via ownership or lease to an apartment. In addition, the location of the property determines its ability to attract guests. Cansoy and Schor (2017) find that listing volume varies by income, educational status and race. In conjunction with other findings on occupancy rates, prices, and ratings, which also favor these groups, we interpret these findings to mean that hosts who are white, have higher incomes, and have a BA are more likely to have the opportunity to successfully earn on the platform. Similarly, TaskRabbit appears to require either a college degree or at least college enrollment. Nearly a quarter of taskers have graduate degrees. This platform yields much higher wages than those which specialize in delivery or driving, so it seems that lack of formal education is functioning as a barrier to high earnings. We believe one reason is that the customers are highly educated themselves and prefer to hire others of their educational class, even for manual or low skilled work, such as house cleaning or moving. By contrast, the driving and delivery platforms require less in the way of assets. Until recently the driving apps only required a car of a relatively

recent vintage. (Exact requirements fluctuate.) Now both Uber and Lyft have offered deals that give free cars, but only if drivers satisfy a quota of weekly rides. If they miss their quota, whatever the reason, they are subject to high monthly payments for the car. The delivery apps can be joined with no physical assets (or education).

While we do not have accurate hourly wages to compare remuneration structures, there does seem to be a hierarchy across the four platforms, which conforms to the asset requirements. From the qualitative data we know that Airbnb yields by far the highest earnings, and as noted, labor requirements are low. Hosts typically earn from \$50 to \$350 per night depending on the property. TaskRabbit wages are generally above \$25 an hour, and range to more than \$100 as noted above. We don't have good data on hourly earnings from drivers, in part because of the need to subtract a variety of expenses, as well as the complex bonus structures now in place on these apps. Postmates and Favor couriers seem to be consigned to the ten dollar an hour economy. The comparison between these two cases can be seen to some extent in Table 3, where monthly earnings for drivers are much more likely to be in the \$1500-5000 category than they are for couriers, almost none of whom earn more than \$1500.

From the interview data we also find that conditions and control vary. Airbnb hosts face the lowest levels of threat or precarity. Taskers experience precarity of earnings, but generally have far more control over their work than providers on the bottom two platforms. Drivers are experiencing declining levels of autonomy and control, and increasing competition for business. Only couriers who are not platform dependent are able to retain control or autonomy.

Conclusion

In this paper we have emphasized the importance of platform dependency, as well as the variation in platforms as key axes of differentiation across the sharing economy. Our findings suggest that access to alternative sources of income and security are crucial for platforms to provide appealing experiences to providers. However, as noted above, they are free riding on other employers who provide decent incomes, benefits and stability. This suggests that the platforms may work well as parasitic employers, but our findings suggest that as a primary source of income, they are not nearly as successful. This bodes ill for some visions of the future of employment, such as Sundarajan's (Sundarajan 2016), who predicts that platforms will wipe out conventional employment. Should that happen we foresee at least two possibilities. First, the dystopian predictions of critics are realized. Employment conditions get worse and providers are increasingly exploited. Alternatively, platforms will be forced to shoulder the costs they are now externalizing and even dependent providers will have decent incomes and working conditions. However, under this assumption it is not clear that the platforms' business models are viable.

Finally, we note that the question of the trajectory of the platforms is an important one, which we have not fully explored in this paper. We find evidence of declining conditions on the ride-sourcing platforms as they cut rates and increase control. TaskRabbit changed in ways that taskers were unhappy about. As pressure to increase market share and/or profits intensifies, conditions for providers may be deteriorating. Our work suggests that to understand how the platform economy is operating, one must recognize it is a moving target.

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Table 1: Sample Characteristics

	Airbnb	Favor/Postmates	Lyft/Uber	TaskRabbit	Total
<u>Age</u>					
<i>N</i>	28	26	14	34	102
<i>Mean</i>	28.00	25.50	31.50	29.94	28.49
<u>Gender</u>					
<i>N</i>	28	26	14	34	102
<i>Female</i>	10 (35.7%)	7 (26.9%)	3 (21.4%)	13 (38.2%)	33
<i>Male</i>	18 (64.3%)	19 (73.1%)	11 (78.6%)	21 (61.8%)	69
<u>Race</u>					
<i>N</i>	27	26	14	33	100
<i>White</i>	21 (77.8%)	16 (61.5%)	5 (35.7%)	19 (57.6%)	61 (61.0%)
<i>Black</i>	1 (3.7%)	5 (19.2%)	5 (35.7%)	5 (15.2%)	16 (16.0%)
<i>Hispanic</i>	2 (7.4%)	2 (7.7%)	4 (28.6%)	5 (15.2%)	13 (13.0%)
<i>Asian</i>	2 (7.4%)	2 (7.7%)	0 (0%)	2 (6.1%)	6 (6.0%)
<i>Other</i>	1 (3.7%)	1 (3.8%)	0 (0%)	2 (6.1%)	4 (4.0%)
<u>Education</u>					
<i>N</i>	28	26	14	33	101
<i><High School</i>	0 (0%)	0 (0%)	0 (0%)	1 (3.0%)	1 (1.0%)
<i>High School</i>	0 (0%)	3 (11.5%)	4 (28.6%)	0 (0%)	7 (6.9%)
<i>Some College</i>	1 (3.6%)	8 (30.8%)	3 (21.4%)	9 (27.3%)	21 (20.8%)
<i>College</i>	19 (67.9%)	12 (46.2%)	6 (42.9%)	15 (45.5%)	52 (51.5%)
<i>Graduate</i>	8 (28.6%)	3 (11.5%)	1 (7.1%)	8 (24.2%)	20 (19.8%)
<u>Class</u>					
<i>N</i>	27	19	9	32	87
<i>Lower</i>	1 (3.7%)	5 (26.3%)	4 (44.4%)	2 (6.3%)	12 (13.8%)
<i>Lower-Middle</i>	2 (7.4%)	4 (21.1%)	1 (11.1%)	14 (43.8%)	21 (24.1%)
<i>Middle</i>	14 (51.9%)	5 (26.3%)	4 (44.4%)	15 (46.9%)	38 (43.7%)
<i>Upper-Middle</i>	1 (3.7%)	5 (26.3%)	0 (0%)	0 (0%)	6 (6.9%)
<i>Upper</i>	9 (33.3%)	0 (0%)	0 (0%)	1 (3.1%)	10 (11.5%)
<u>Monthly Earnings</u>					
<i>N</i>	27	23	11	28	89
<i><500</i>	6 (22.2%)	13 (56.5%)	0 (0%)	12 (42.9%)	31 (34.8%)
<i>500-1500</i>	10 (37.0%)	9 (39.1%)	1 (9.1%)	10 (35.7%)	30 (33.7%)
<i>1500-5000</i>	9 (33.3%)	1 (4.3%)	9 (81.8%)	5 (17.9%)	24 (27.0%)
<i>5000></i>	2 (7.4%)	0 (0%)	1 (9.1%)	1 (3.6%)	4 (4.5%)

Table 2: Platform Dependency

	<u>Airbnb</u>	Favor/Postmates	Lyft/Uber	TaskRabbit	Total
<i>N</i>	28	26	14	34	102
Supplemental	11 (39.3%)	10 (38.5%)	1 (7.1%)	11 (32.4%)	33 (32.4%)
Partially-Dependent	17 (60.7%)	9 (34.6%)	2 (14.3%)	14 (41.2%)	42 (41.2%)
Dependent	0 (0%)	7 (26.9%)	11 (78.6%)	9 (36.5%)	27 (26.5%)

Table 3: Platform Dependency by Monthly Earnings

	Supplemental	Partially-Dependent	Dependent	Total
<u>Monthly Earnings</u>				
<i>N</i>	29	39	21	89
<500	14 (48.3%)	11 (28.2%)	6 (28.6%)	31 (34.8%)
500-1500	10 (34.5%)	16 (41.0%)	4 (19.0%)	30 (33.7%)
1500-5000	4 (13.8%)	11 (28.2%)	9 (42.9%)	24 (27.0%)
5000>	1 (3.4%)	1 (2.6%)	2 (9.5%)	4 (4.5%)

Notes

¹Perhaps surprisingly, Katz and Krueger find that between 1995 and 2005 the fraction of alternative employment held steady, although this may be mainly due to the high growth of total employment during this period.

²There are some barriers such as certain types of criminal records or lack of institutional banking although these vary by the platform, with some being more discriminating/demanding.

³Recruitment differed slightly by platform. In all cases, we first eliminated users who were obviously outside our age range. We also required that the person had been active on the platform at least five times to be eligible for the study. (The vast majority have done far more jobs/hostings, with some providers doing hundreds of jobs.) On TaskRabbit, we posted the interview as a task, which readily yielded informants. On Airbnb we queried providers via the platform, and once we made contact we let them know we were interested in interviewing them. The platform repeatedly deactivated our account when it realized that we were attempting to interview hosts. We created multiple accounts but eventually reverted to snowball sampling. On Postmates and Favor our researcher attended orientations and met people who he later attempted to interview. He also joined online fora (Facebook primarily) and recruited there. For Uber and Lyft we also tried to recruit via online groups but that was not successful. We ended up taking rides and approaching people as they drove us and we also attended meetings of drivers. We posted on Twitter and occasionally used Facebook ads to recruit, however these methods were largely unsuccessful.

⁴The survey data, which we include below, includes a number of case specific questions as well as some open-ended questions, and respondents were free to answer as they liked. Case differences included the units in which earnings were measured, to conform with platform custom (i.e., Airbnb hosts think monthly, on other platforms they calculated weekly earnings). This resulted in differences in how respondents interpreted questions so we have done some re-coding to create comparability across cases. Furthermore, as the project evolved we introduced some changes in the survey to reflect changing practice as well as some shifts in research questions.

⁵Among the first two categories (for whom income is essential or important), nearly half (49%) are online workers, 31% work in ride-hailing, and 25% do house cleaning and laundry. (Totals exceed 100% because some people do multiple types of gig work.)