Freelancing Online During the COVID-19 Pandemic

Version: 27 July, 2020
Steve Sawyer✧, Isabel Munoz✧, Michael Dunn✢, Fabian Stephany#, Raghav Raheja✧, Gabrielle Vaccaro✢, Vili Lehdonvirta #
✧ - School of Information Studies, Syracuse University, NY, USA
✢ - Department of Management & Business, Skidmore College, NY, USA
- Oxford Internet Institute, University of Oxford, UK

Abstract

We combine market-level data about changes in jobs offered via online labor platforms and interviews with online freelance workers to highlight how they are responding to the economic upheaval due to the novel coronavirus's presence. Our focus on online labor markets and online workers reflects enduring interest in knowledge work, with a particular attention to precarious forms of this work. Market data show dramatic shifts in work availability (supply) and changes in worker availability (demand) as the United States' economy struggles with the emerging pandemic. Interview data illuminate how these changes to online freelance worker's already-precarious work arrangements are magnified by the uncertainty that is the core of the pandemic. Data show work flexibility is also diminishing. We further observe that these effects vary by occupation and are more keenly experienced by women freelancers, both of which warrant additional attention.

Keywords: Online labor markets; Platforms; Precarity; Freelance work; Work flexibility; COVID-19; Occupations; Knowledge work.

Introduction

We combine market-level data about changes in jobs offered via online work platforms and interviews with freelance workers who use one online work platform, to report on online freelance workers' initial responses to the novel coronavirus's economic impacts in the United States (U.S.). We pursue this work recognizing that as the global COVID-19 pandemic continues, the implications to workers and labor markets are profound. That is, even conservative estimates of the global outbreak foresee significant global macroeconomic impacts (Atkeson,

2020; McKibben & Fernando, 2020). Early research reports highlight demographic and market differences due these changes (e.g., Wenham et al., 2020; Stephany et al., 2020).

Online freelancers and the online labor markets where they seek work are a relatively recent subset of labor markets. To this point, the global market for online labor has grown approximately 50% over the past three years, with an estimated 56 million online freelancers globally (Kässi & Lehdonvirta, 2018; Stephany & Kässi, 2020). These markets are seen by many as both a means to provide opportunities for workers seeking flexible employment arrangements - short term 'gigs' - and for organizations to help absorb market shocks (Gray and Suri, 2019; Kalleberg, 2003; Lehdonvirta et al., 2019). Freelancing is project-based: there is little commitment between employer and worker beyond the specifics of the project's contract (Wood et al., 2019). Seeking this work online makes them susceptible to greater competition by reducing barriers for other workers to enter and compete (Dunn, 2017). In countries like the U.S., online freelancers are independent contractors. This means they lack benefits like health care, retirement, leave, and other workplace protections afforded full-time workers (ILO, 2016; McKay et al., 2019). So, what are the experiences and expectations of online freelance workers in the face of rapid market changes and the uncertainty of an ongoing global pandemic? What do precarious workers do when their working lives and working arrangements become more precarious?

Responding to these questions, this paper is developed in five sections. Next, we provide an overview of online labor markets and online freelance work, followed by a second section where we highlight the contrasting potential effects of the pandemic. Sections three and four contain insights drawn from market-level data about online freelance labor, and insights drawn

from an ongoing panel study of freelance workers in the U.S. The final section contains a discussion of these findings, followed by some contemporary conclusions.

Overview of Online Labor Markets and Online Freelance Work

Focusing on freelance work secured online also means looking at online labor platforms (and the online labor market), which is where freelancers find their work. Online labor platforms are websites that mediate between buyers (clients) and sellers (workers) of *remotely deliverable cognitive work* (Horton, 2010). Online labor platforms can be subdivided into freelancing platforms (eg. Upwork), where payment is on an hourly or milestone basis, and microtask platforms (eg. Amazon Mechanical Turk), where payment is on a piece rate basis (Lehdonvirta, 2018; Gray and Suri, 2019). Functionality provided by these platforms provides means to match clients and workers. This includes allowing clients to post projects for bidding and allowing freelancers to post resumes for clients to evaluate. Platforms also support the entire contractual engagement to include time tracking, monitoring, billing, and dispute resolution. Online labor platforms like Upwork are often called gig-work platforms. But, the work they support is distinct from Uber or Deliveroo, which involve physical on-site service delivery (Wood et al., 2019).

Pandemic's potential effects on online labor supply and demand

The COVID-19 pandemic is impacting the world's economies and it is reasonable to expect impacts on the supply of labor on online labor markets.[1] It may be that the number of workers offering services online might increase because the pandemic and its countermeasures have led to record-high unemployment in the U.S. and many other countries, freeing up skilled

[1] Supply generally consists of two elements: the number of workers offering their services through online platforms, and the number of hours that they are willing to supply (Horton, 2010).

workers (e.g., del Rio-Chanona et al., 2020). Workers who were already offering hours online, beyond their regular work (ie. moonlighting; Pesole et al., 2018), might increase the hours offered as a result of being laid off. Hours supplied online might also decrease as a result of workers falling ill or having increased care and housework duties, as schools and daycare centers close or household members fall ill.

The effects of the pandemic can also be expected to influence demand for online labor. Even before the current market shocks, many companies in the U.S. used nonstandard workers as a flexible buffer that can be rapidly adjusted in the face of economic changes, protecting core workers in downturns (Kalleberg, 2003). In response to the pandemic, companies could be cutting their use of online labor platforms to engage employees and longer-term contractors. Conversely, it is conceivable that online labor markets are well-positioned to accommodate new needs. Companies looking to engage new contractors might now favor remote online contractors hired through web-based platforms. It is also possible that some companies might be moving existing contractor relationships to online labor platforms, in what is known as the "bring your own freelancer" model (Corporaal & Lehdonvirta, 2017). All this suggests that diametrically opposed outcomes are possible (Stephany et al., 2020). That is, the number of jobs and opportunities could increase, leading to a higher earnings and greater job security. Alternatively, the supply of workers could increase, leading to greater competition for jobs, greater uncertainty for future prospects, and lower earnings.

Flexibility and access to work online

One of the most-often-noted reasons by people pursuing work online is the autonomy and flexibility it affords (Malone, 2004; Horton, 2010; Gratton & Johns, 2013; Kuek et al., 2015; Sundararajan, 2016; Wheatly, 2017). Early accounts highlighted how online gig work provides

"... a flexible working schedule [that] allows individuals to take better care of their families, continue to study, or start their own businesses while working and earning a salary" (Kuek et al., 2015). Recent accounts are more critical (see Wood et al., 2019b).

Understanding flexibility in online freelance work builds from other technology-enabled flexible working arrangements such as telework/telecommuting, flexitime, and flexplace, all important topics of scholarship since the 1990s (see Baltes et al., 1999). These literatures have identified potential advantages to flexible scheduling, such as reducing work-family conflict (Shockley & Allen, 2007) and allowing paid work to be combined with life circumstances that prevent regular work (Silver & Coldschejder, 1994). However, studies of flexible scheduling have highlighted ambiguous results (Baltes et al., 1999), and call into question what exactly is meant by flexible scheduling (Shockley & Allen, 2007).

Relevant to the role of work flexibility, studies have begun to distinguish worker-controlled flexible scheduling from manager-controlled flexible scheduling (Henly et al., 2006). Many of the potential advantages of flexible scheduling are associated with worker- controlled flexibility, while manager-controlled flexibility is associated with the opposite effects, because from the worker's point of view it creates uncertainty and inhibits planning (Hyman et al., 2005; Lambert et al., 2012). And, the boundary between worker- controlled and manager- controlled flexibility is ambiguous as the practices of negotiating working times can be bound up in the power relations of the workplace (Lambert et al., 2012, Wood, 2016).

For instance, Wood's (2016) supermarket workers were formally free to declare the hours that they were available to work. In practice, however, they had to accept disruptive shifts or risk no longer being offered work. Likewise, the freelance technical contractors studied by Barley and Kunda (2006) were formally free to set their own working hours. Yet, many worked through

evenings and holidays because they believed that this would decrease their chances of being laid off and increase the chances of future contracts (see also Fraser & Gold, 2001; Gold & Mustafa, 2013; Gray and Suri, 2019)

Thus, while the early literature on flexible scheduling framed this as a matter of freedom from formal constraints such as mandatory working hours, more recent literature has emphasized structural factors on workers' ability to actually manage their time. Gray and Suri (2019) identified both technological (e.g., access to reliable internet connection), familial (e.g., working around care commitments) and social (e.g., fitting conventions on gender roles or the construction of worker identity). Lehdonvirta's (2018) study of online gig workers concluded that a worker's ability to schedule their work was ultimately determined by two factors: how easily available the gigs were and how dependent the worker was on income from the gigs. If many gigs are available, then workers can schedule their work relatively freely. But if gigs are scarce and the worker depends on income from gigs, the worker has to remain constantly on call, ready to sign up for gigs as soon as they become available(see also Wood et al., 2019b).

What all this suggests are reflected in the questions that guide the work we report on: (1) What are the experiences and expectations of online freelance workers in the face of rapid market changes and the uncertainty of an ongoing global pandemic? (2) What do precarious workers do when their working lives and working arrangements become more precarious?

Macro-level evidence on Online Freelance Work in the U.S.

We draw on Oxford's Internet Institute's Online Labor Index (OLI)[2] for a macro-level view of online labor markets viz. the COVID-19 pandemic, with a specific focus on the U.S..

[2] See: http://ilabour.oii.ox.ac.uk/online-labour-index/. The OLI is an open data set and interactive online visualization, updated daily.

The OLI is an index that measures the utilization of online labor platforms over time and across countries and occupations (Kässi & Lehdonvirta, 2018). As such, the OLI serves a similar function as conventional labor market statistics on new vacancies. The index is constructed by collecting data, in near real-time, on tasks and projects posted to online labor platforms. The OLI data provide a global perspective on online labor markets and helps make clear that online labor demand is unevenly distributed. As shown in Figure 1, in 2020, more than 40% of global demand stems from the U.S., suggesting global online labor demand is shaped by the U.S.

Changes in online labor demand

Data in Figure 2 make clear that over the past several years, U.S. online labor demand has shown a clear seasonal pattern: demand drops during the year-end holiday season, and then rises again to reach a plateau in March, which normally persists until June. This is not the case for 2020. By mid-March, when the World Health Organization declared COVID-19 was a global pandemic, online labor demand in the U.S. was in steep decline relative to 2018 and 2019. Then, in April 2020 demand began to rise again, surpassing the usual level of previous years at comparable times. This suggests that the U.S.'s online labor demand growth, after an initial drop, reflects a response to the pandemic's effects on job availability (labor demand).

Insights on occupations for online freelancers in the United States

The OLI data allow us to disaggregate the online labor market into six occupations: Clerical and data entry, professional services, software development and technology, creative and multimedia, sales and marketing support, and writing and translation.[3] To align these analyses with the subsequent insights from the panel study interviews, we simplify the six OLI occupational categories into three groups: (1) Administrative work (comprising "clerical and

[3] For a more detailed description of these categories, see Kässi and Lehdonvirta (2018)

data entry" and "professional services" categories), (2) Creative work ("creative and multimedia," "sales and marketing support," and "writing and translation") and (3) Technological work ("software development and technology").

We are able to observe the number of registered worker profiles on a smaller set of online labor platforms.[4] This serves as an imperfect proxy for the number of workers offering services through online labor platforms. Data in Figure 3 show the change in demand and registered workers in the U.S. As seen in the top panel, not all occupations experienced a drop in demand. Demand in creative work shrunk significantly as the pandemic unfolded. But requests for technological work remain largely unaffected, rising in April, 2020. This finding aligns with the idea that the rapid push by companies towards videoconferencing and other remote operations has created additional demand for freelance IT specialists. These initial insights are also consistent with the idea that companies are cutting non-essential freelance contracts, such as marketing and sales campaigns, while maintaining freelance work essential for continued business operations, such as information technology support and services.

The lower panel of Figure 3 illuminates that the number of registered workers has remained on pre-pandemic levels for administrative work and has shown significant increases in workers registered for creative jobs (approximately 20% growth between April and June 2020). In technology work, however, the number of registered workers has surged: there were about 60% more by the end of May than in pre-pandemic times.

[4] The raw data (used in Figures 3 and 4) are collected by periodically sampling workers from four major online labour platforms: Fiverr, Freelancer, Guru, and PeoplePerHour - http://ilabour.oii.ox.ac.uk/measuring-the-supply-of-digital-labour-how-the-oli-worker-supplement-is-constructed

Competition for online jobs

The ratios of registered workers per requested project for the three occupational groups in the U.S. are presented in Figure 4. Pre-pandemic, the worker-to-project ratios differ across occupational groups. On average, at the beginning of the timespan, the ratio of workers to projects is roughly three times higher in administrative work than in creative work and almost four times higher than for technological jobs. This suggests there is more competition for administrative jobs, on average, than for technology work. This aligns with the experiences expressed in the interviews of freelancers, as we discuss below.

Beginning in March, 2020, the ratio increases for all occupations. However, the increase in creative work is much steeper than for administrative work. In both domains, the upward trend slows down in May, with job competition in administrative work reaching pre-pandemic levels, while the worker-to-project-ratio in creative work remains higher than in February 2020. For technological work, developments are quite different. The ratio starts to increase in early March but the upward trend steadily continues until the end of the measured time span. By the end of May, competition, measured by the ratio of workers to projects, has increased nearly 50% as compared to February 2020. Taken together, findings indicate competition for new creative work and for technology jobs has increased during the crisis. The competition in administrative work was high before the crisis and was less affected by the pandemic.

Insights from interviews with freelance workers in the US

Interview data come from an ongoing panel study of 68 freelance workers located in the U.S. and seeking work online via the online labor platform Upwork.[5] Here, we draw on an interim analysis of these freelancers, 30 of whom spoke with us since mid-March, when we

[5] Upwork is one of many online labor platforms and routinely seen as a dominant player. See http://upwork.com.

began asking how they were faring in the face of the COVID-19 pandemic. This interim analysis builds from reviewing interview transcripts, drawing on field notes, and looking to secondary sources for additional insight and triangulation[6] (See Table 1 for summary statistics).

The panel study is designed around a carefully constructed sample of people who pursue freelance work as a primary or secondary source of income. This sample reflects a range of work types, skill levels, online experience, gender, race, and success with this work. Participants are hired and paid as they would for any job found on Upwork.[7] Once hired, participants complete a 15' survey that provides us an overview of their working arrangements and experiences, then a 45' interview. This interview draws on the survey data and follows a meticulously designed protocol of semi-structured questions.[8] Specific to comparing with the OLI, the panel study design and this initial analysis relies on the job classifications provided by Upwork,[9] grouped into three broader categories, as discussed earlier, administrative, technology, and creative work.

Data from the panel study provide substantial evidence of decreased worker-controlled flexibility. This is true for both long-term freelancers and new freelancers, and for both full- and part-time freelancers. Freelancers indicated significantly more competition, resulting in both fewer proposals accepted and lower compensation, likely due to increased competition. A female

---

[6] In particular, we looked at active sub-threads for experiences with platform work, generally, and Upwork, specifically, found in both the online platform Reddit and in relevant Facebook groups.

[7] To reduce the need for Upworkers to bid (as this costs them precious bidding resources), we invite them to the work. Six of 10 do: acceptances and declinations are tracked. Research guidelines require paying those who agree to this job even if they do not finish: this work is voluntary and they can cease working at any time. About one in 10 do not finish. All who begin are rated five stars (as performance ratings matter greatly for online workers). Many of those who have completed the work leave a positive review of the work. There are no negative reviews.

[8] Interviews were done by one of the six members of the digital work research group, a joint effort of Syracuse University and Skidmore College, both in New York, U.S. These team members were trained on the protocol and meet frequently and routinely to review the protocol and pursue interim analyses (as is customary in field studies).

[9] Upwork keeps changing its categorization of workers, making classification an ongoing challenge.

freelancer reflects: *"I think more people are trying to find online work because they're out of their normal jobs [...] I think there's a lot less work to go around than usual because everyone is scrambling to make money, either while they are at home because they can't go into their office, or while they're laid off [...] So this current state definitely makes it more difficult" [FPAC0407202O1]*.

Some freelancers reported that the new jobs being posted reflect lower rates, leading to a sense that clients are taking advantage of workers during the pandemic: "[...] *there is going to be a lot of taking advantage of workers and their need to put food on the table" [FPAC042620201]*. Additionally, stable long-term clients who provided a dependable source of income are stopping current projects and not requesting new work: *"The two [clients] that I lost due to this virus were long term. One of them I had been working with for approximately a year and the other one was several months, but I don't know what's going to go on with them, if they're even going to come back or anything" [FPAC042520202]*.

Interview insights align with the market-level data presented in Figures 3 and 4 and the survey data collected from freelancers as summarized in Table 2. These data show decreases in weekly earnings between 12% to 47% for freelancers, and significantly greater difficulty in securing work since the start of the pandemic.

Analysis provides evidence that routines around freelance work have also changed. With spouses and partners being laid off or having to work from home, and children also home due to prolonged day-care and school closures, survey data shows that 40% of respondents are experiencing changes in their work routines. More than a third of participants mention being responsible for caregiving during this time. These changes are leading the freelancers to alter their own working arrangements and reduce their work availability. Overall, freelancers reported

feeling less productive and more "scattered" with some having to shuffle work arounds to nights and weekends with children now home: *"The other thing that has affected me is that my kids are home now, so I'm having to homeschool my two children on top of trying to stay productive and earn income for myself, so I'm definitely feeling it" [FPAC04222020]*.

Data indicate earnings loss varies by occupation. Those doing administrative work (admin) show the smallest decrease (-12%), followed by creative workers (-30%), then technology workers (-47%). We asked before the pandemic and after the start of the pandemic how difficult it was to find work in their respective fields. Respondents report significantly greater difficulty in finding work as the pandemic unfolds, with technology workers seeing the greatest differences and admin workers seeing the smallest differences. Furthermore, respondents in the survey differed in the average number of jobs/proposals bid-on, with admin bidding on more than 80% more jobs on a weekly basis than those in technology. These findings align with the data presented in Figures 3 and 4 showing greater numbers of workers registered per job available, suggesting greater competition per job.

Data further show the differences in the way workers from different occupational categories engage with the work. Respondents in creative occupations, by a wide margin, had greater dependency on the wages from gig work (it was their primary source of income). Furthermore, while our data showed that the majority (~59%) of workers did not have health benefits, 70% of the respondents in the creative occupations did not have health benefits. Given that the economic shock that they are experiencing is driven by a virus-centered pandemic, the magnitude of freelancers' precarity is even more profound.

Data illuminate gender differences associated with these findings. Research has shown that women are over-represented in the occupations associated with the admin and creative

categories in this study (Foone et al., 2018). Foone et al. (2018) also found that women across the entirety of the Upwork platform earned significantly less per hour than the median man on Upwork, even when controlling for key variables such as work experience, highest education level, and job category. In addition, Foone et al. (2018) found that women's lower hourly bill rates were coupled with a higher number of total hours worked on the platform.

Moreover, it is continually re-established that women bear a greater share of domestic responsibilities (Barulescu & Bidwell, 2012; Blau & Kahn, 2016; Wiswall & Zafar, 2018). During the current pandemic, these gendered differences in responsibility appear to be magnified in households with children because of the continued closure of schools and the lockdowns. Our data are consistent with recent research showing mothers doing paid work at home are more likely than fathers to be spending their work hours trying to care for children while also working (Institute for Fiscal Studies, 2020). They report mothers are able to do one hour of uninterrupted work for every three hours done by fathers. Mothers are also taking on more chores and spending more time with children in homes where there is both a working mother and father (Institute for Fiscal Studies, 2020). Likewise, mothers are more likely than fathers to have left paid work and experienced a larger reduction in their hours. And, these findings are amplified in single-parent families with female heads of households.

Discussion

The COVID-19 pandemic's impact continues to unfold around the globe, challenging most societies' ability to deal with the overlapping issues of health, safety, and economic viability. The research reported here focuses attention to the impact of this pandemic's disruption on the online labor markets and online freelance workers in the U.S., as it comprises the largest share of online labor demand.

The OLI data show demand for online freelancers has recovered to pre-pandemic levels after a sharp dip, but all occupation categories are facing an increase in labor supply. Data also show the pandemic's effects impact occupational categories differently, with competition - measured by the ratio of workers to projects - steadily increasing for all occupations from March.

Results from interviews reinforce what is learned from the OLI data. Since the onset of the pandemic in the U.S., freelancers on Upwork have faced increased competition when seeking work and experienced decreases in compensation. These freelancers' circumstances are further complicated by the precarity that arises from the structural and legal nature of their work, including not being eligible for unemployment and lacking access to employer-provided healthcare. The precarity of freelance work is particularly pronounced among those in creative occupations. Creative workers are particularly vulnerable as they report a greater dependency on the wages from gig work and have the lowest reported access to health benefits. These workers also report greater unpredictability of weekly earnings and experienced the largest drop in hours spent across freelancing websites when comparing pre-COVID-19 data to post-COVID-19 data.

Panel data show online freelance workers across all occupations are aware of the decreased supply of jobs and increased competition. Surprisingly, the data show the number of hours freelancers report working has decreased for all occupations since the start of the pandemic. We surmise the decrease in hours may be explained by the realities of freelancers having to re-balance their household lives. This includes accommodating the changing nature of work arrangements, with spouses and children who are home from school now competing for time and space in the household. The effects of re-configured family arrangements vary by occupation and have a greater effect for women freelancers' motivation and ability to do work. Building from this, we need to better understand the impacts of increased complexity and

changes to household life during a crisis such as the COVID-19 pandemic, especially among women who are breadwinners.

Taken together, findings suggest that the concept of work flexibility, one of the primary reasons for pursuing this type of work, might be better understood in the context of this pandemic and market shock as work desperation. Motivated by flexibility, freelance workers pursued online work that fit with household arrangements. Such work is always precarious, as our data show. But this precarity seemed a reasonable risk to preserve flexibility, pre-pandemic. Market shocks change the calculation in ways that seem to overwhelm motivation, leading workers to eschew flexibility as they scramble for work, even in the face of less flexible household arrangements and more demands. As online freelancers continue to experience desperation amid increased work supply and lowering wages, they will likely succumb to market forces and continue to bid for more work, even when this strategy is not in their best interest.

Conclusion

Combining market-level and interview data, this research provides additional empirical and nascent conceptual insights into some of the impacts of COVID-19 on the online labor market and experiences of online freelancers. Data show that market shocks like that of COVID-19 lead to rapid changes in online labor markets and that these rapid changes reshape the ways in which freelance workers seeking work online frame and pursue their work.

The premise of flexibility, a core reason for pursuing online freelance work, is challenged by these data. Findings show that flexibility for pursuing work is constrained by changes in people's household arrangements. And, the flexibility to select work that aligns with one's interests and schedules is challenged by the whipsaw changes in the competition for online work as magnified by the increase in the number of people seeking work online (more supply).

We are particularly keen to offer these insights to scholars of work and designers of online labor platforms, seeking to draw their expertise to better understand how workers and platforms will accommodate the structure of precarious work and the context of economic shock. On this last, we see the COVID-19 pandemic as a powerful instance of economic shock. It may be a once-in-a-lifetime economic shock, but it follows 12 years from the 2008 economic shock driven by financial greed, and stands as the current marker for the next shock. As noted above, online labor markets are what Kalleberg (2003) calls a buffer space for companies to protect their full-time workers from economic shocks. Our data make clear that these labor markets are very difficult places and ways in which to make one's living.

Acknowledgements

This work is supported in part by a grant from Syracuse University's Vice President of Research and from The National Science Foundation, via grant SES 1665386. The findings and opinions reflect those of the authors and not the funders. We thank Ms. Angelica Torcivia, Ms. Emma Allen, and Ms. Ritika Shetty for their contributions as student research staff on this project. We are deeply appreciative of the many participants for taking the time to share their insights and reflections about their working and working lives.

References

Atkeson, A. (2020). What will be the economic impact of COVID-19 in the US? Rough estimates of disease scenarios (Working Paper 26867). National Bureau of Economic Research.

Barbulescu, R., Bidwell, M. (2012). Do Women Choose Different Jobs from Men? Mechanisms of Application Segregation in the Market for Managerial Workers. Organization Science 24, 3 (June 2012), 737–756. https://doi.org/10.1287/orsc.1120.0757

Barley, S.R. and G. Kunda (2006), Gurus, Hired Guns, and Warm Bodies: Itinerant Experts in a Knowledge Economy. (Princeton, NJ: Princeton University Press). https://doi.org/10.1515/9781400841271

Blau, F., Kahn, L. (2016). The Gender Wage Gap: Extent, Trends, and Explanations. Technical Report 21923. National Bureau of Economic Research. 1–77 pages. https://www.nber.org/papers/w21913.pdf

Baltes, B.B., T.E. Briggs, J.W. Huff, J.A. Wright and G.A. Neuman (1999), 'Flexible and Compressed Workweek Schedules: A Meta-Analysis of Their Effects on Work-Related Criteria', Journal of Applied Psychology 84, 4, 496–513. https://doi.org/10.1037/0021-9010.84.4.496.

Corporaal, G.F., & Lehdonvirta, V. (2017) *Platform Sourcing: How Fortune 500 Firms are Adopting Online Freelancing Platforms.* Oxford: Oxford Internet Institute.

del Rio-Chanona, R. M., Mealy, P., Pichler, A., Lafond, F., & Farmer, D. (2020). Supply and demand shocks in the COVID-19 pandemic: An industry and occupation perspective. arXiv preprint arXiv:2004.06759.

Dunn, M. (2017). Digital Work: New Opportunities or Lost Wages? *American Journal of Management*, 17(4), 10–27. https://doi.org/10.5465/ambpp.2016.11689abstract

Foone E., Vincent N., Hecht B., Gerber E. (2018). Women (Still) Ask for Less: Gender Differences in Hourly Rate in an Online Labor Marketplace. Proc. ACM Human-Computer Interactions. 2, CSCW, Article 53. https://doi.org/10.1145/3274322.

Fraser, J. and M. Gold (2001), ''Portfolio Workers': Autonomy and Control Amongst Freelance Translators', Work, Employment & Society 15, 4, 679–697. https://doi.org/10.1017/s0950017001006791

Gold, M. and M. Mustafa (2013), '"Work Always Wins": Client Colonisation, Time Management and the Anxieties of Connected Freelancers', New Technology, Work and Employment 28, 3, 197–211. https://doi.org/10.1111/ntwe.12017

Gratton, L. and T. Johns (2013), 'The Third Wave of Virtual Work', Harvard Business Review, January-February, 2–9.

Gray, M. & Suri, S. (2019) Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass, Houghton Mifflin Harcourt, Boston.

Henly, J.R., H.L. Shaefer and R.E. Waxman (2006), 'Non-standard Work Schedules: Employer- and Employee-Driven Flexibility in Retail Jobs', Social Service Review 80, 4, 609–634. https://doi.org/10.1086/508478

Horton, J. J. (2010). Online Labor Markets. In A. Saberi (Ed.), *Internet and Network Economics* (pp. 515–522). Springer: Berlin Heidelberg. https://doi.org/10.1007/978-3-642-17572-5_45.

Hyman, J., D. Scholarios and C. Baldry (2005), 'Getting on or Getting by? Employee Flexibility and Coping Strategies for Home and Work', Work, Employment and Society 19, 4, 705–725.

International Labour Organization (2016). *Non-standard employment around the world: Understanding challenges, shaping prospects.* ILO Publications: Geneva. https://www.ilo.org/global/publications/books/WCMS_534326/lang--en/index.htm.

Institute for Fiscal Studies. (2020, May 27). *Parents, especially mothers, paying heavy price for lockdown*. Retrieved from https://www.ifs.org.uk/publications/14861

Kalleberg, A. L. (2003). Flexible Firms and Labor Market Segmentation: Effects of Workplace Restructuring on Jobs and Workers. *Work and Occupations,* 30(2), 154–175. https://doi.org/10.1177/0730888403251683.

Kässi, O., & Lehdonvirta, V. (2018). Online labour index: Measuring the online gig economy for policy and research. *Technological forecasting and social change*, *137*, 241-248. https://doi.org/10.1016/j.techfore.2018.07.056

Kuek, S.C., C. Paradi-Guilford, T. Fayomi, S. Imaizumi, P. Ipeirotis, P. Pina and M. Singh (2015), The Global Opportunity in Online Outsourcing. (Washington, DC: World Bank).

Lambert, S.J., A. Haley-Lock and J.R. Henly (2012), 'Schedule Flexibility in Hourly Jobs: Unanticipated Consequences and Promising Directions', Community, Work & Family 15, 3, 293–315. https://doi.org/10.1080/13668803.2012.662803

Lehdonvirta, V. (2018). Flexibility in the gig economy: Managing time on three online piecework platforms. *New Technology, Work and Employment,* 33(1), 13–29. https://doi.org/10.1111/ntwe.12102.

Lehdonvirta, V., Kässi, O., Hjorth, I., Barnard, H., & Graham, M. (2019). The Global Platform Economy: A New Offshoring Institution Enabling Emerging-Economy Microproviders. Journal of Management, 45(2), 567–599. https://doi.org/10.1177/0149206318786781

Malone, T.W. (2004), The Future of Work: How the New Order of Business Will Shape Your Organization, Your Management Style, and Your Life. (Boston: Harvard Business School Press).

McKay, C. Pollack, E. and A. Fitzpayne (2019). "Automation and a Changing Economy," The Aspen Institute Future of Work Initiative, April, 2019. Available online at: https://assets.aspeninstitute.org/content/uploads/2019/04/Automation-and-a-Changing-Economy_The-Case-for-Action_April-2019.pdf. Last accessed on 19 April, 2020.

McKibbin, W. J., & Fernando, R. (2020). The Global Macroeconomic Impacts of COVID-19: Seven Scenarios. SSRN Electronic Journal. https://10.2139/ssrn.3547729

Pesole A, Urzí Brancati MC, Fernández-Macías E, Biagi F, González Vázquez I (2018) *Platform Workers in Europe.* JRC Science for Policy Report. Brussels: European Commission.

Shockley, K.M. and T.D. Allen (2007), 'When Flexibility Helps: Another Look at the Availability of Flexible Work Arrangements and Work-Family Conflict', Journal of Vocational Behavior 71, 3, 479–493. https://doi.org/10.1016/j.jvb.2007.08.006

Silver, H. and F. Coldschejder (1994), 'Flexible Work and Housework: Work and Family Constraints on Women's Domestic Labor', Social Forces, (72)4, 1103–1119. https://doi.org/10.2307/2580294

Stephany, F.; Dunn, M.; Sawyer, S.; Lehdonvirta, V. (2020). Distancing bonus or downscaling loss? The changing livelihood of US online workers in times of Covid 19. *Tijdschrift voor Economische en Sociale Geografie*, Available online at: http://dx.doi.org/10.1111/tesg.12455

Stephany, F., Stoehr, N., Darius, P., Neuhäuser, L., Teutloff, O., & Braesemann, F. (2020). The CoRisk-Index: A data-mining approach to identify industry-specific risk assessments related to COVID-19 in real-time. arXiv preprint arXiv:2003.12432.

Sundararajan, A. (2016), The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism. (Cambridge, Massachusetts: MIT Press)

Vidal, M. (2013). Low-autonomy work and bad jobs in postfordist capitalism. *Human Relations*, *66*(4), 587-612. https://doi.org/10.1177/0018726712471406

Wenham, C., Smith, J., & Morgan, R. (2020). COVID-19: the gendered impacts of the outbreak. *The Lancet*, 395(10227), 846-848. https://doi.org/10.1016/s0140-6736(20)30526-2

Wheatley, D. (2017). Autonomy in paid work and employee subjective well-being. *Work and Occupations*, *44*(3), 296-328. https://doi.org/10.1177/0730888417697232

Wiswall, M., Zafar B. (2018). Preference for the Workplace, Investment in Human Capital, and Gender. The Quarterly Journal of Economics 133, 1 (Feb. 2018), 457–507. https://doi.org/10.1093/qje/qjx035

Wood, A.J. (2016), 'Flexible Scheduling, Degradation of Job Quality and Barriers to Collective Voice', Human Relations 69, 10, 1989–2010. https://doi.org/10.1177/0018726716631396

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good gig, bad gig: autonomy and algorithmic control in the global gig economy. *Work, Employment and Society*, *33*(1), 56-75. https://doi.org/10.1177/0950017018785616

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019b). Networked but Commodified: The (Dis)Embeddedness of Digital Labour in the Gig Economy. *Sociology*, 53(5), 931–950. https://doi.org/10.1177/0038038519828906.

Table 1: Summary Statistics

Job Classification	
Administrative	43%
Technology	16%
Creative	41%

Gender	
Female	64%
Male	36%

Age	
Min	23
1st Qu.	30.75
Median	35.5
Mean	38.09
3rd Qu.	45.25
Max	75

Length on Digital Platforms (years)	
Min	0
1st Qu.	2
Median	3
Mean	5.10
3rd Qu.	8.00
Max	20

Table 2: Summary of Select Survey Questions by Occupation

Q: Is freelance work your primary source of income?		
	Yes	No
Admin	41%	59%
Creative	67%	33%
Technology	46%	54%

Q: Do you have health benefits?		
	Yes	No
Admin	50%	50%
Creative	30%	70%
Technology	42%	58%

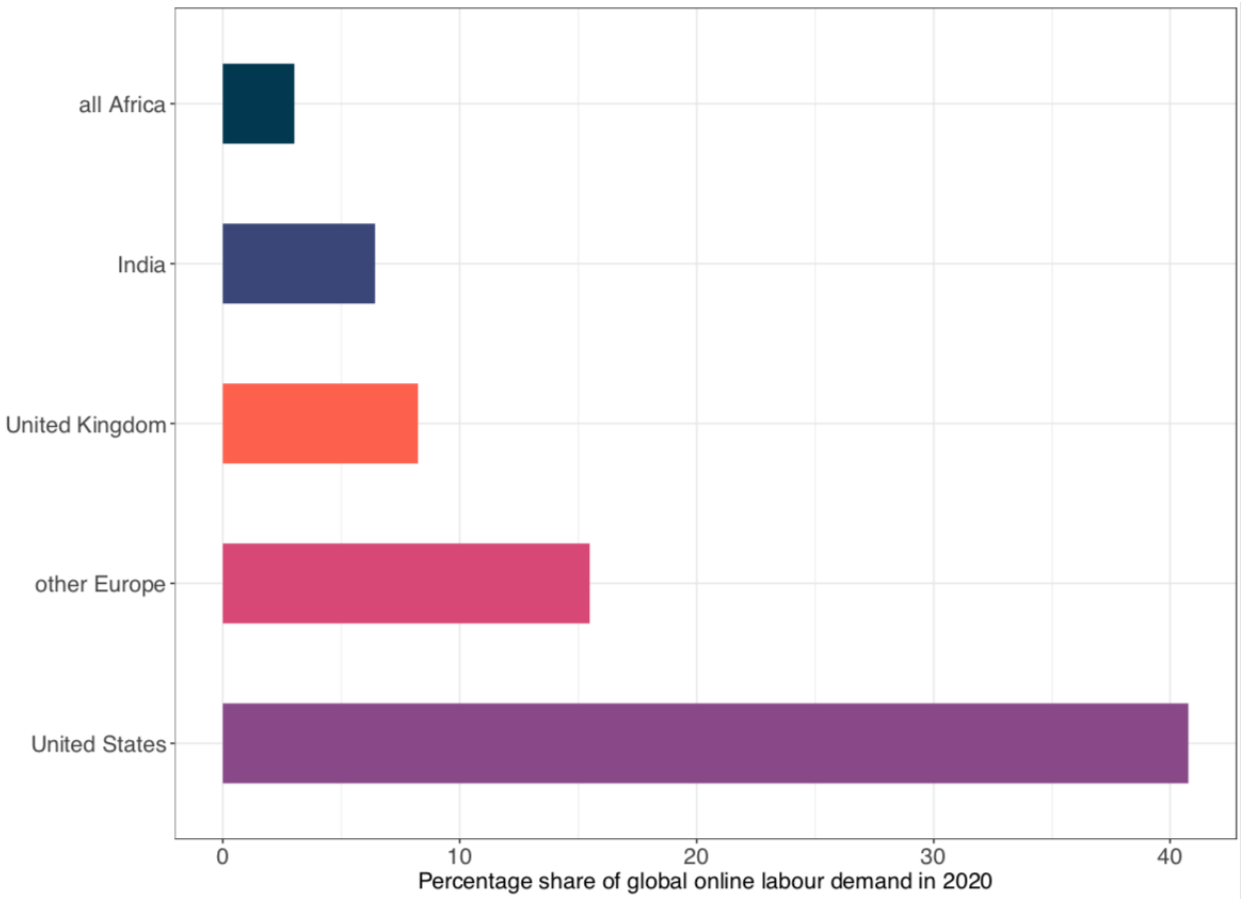
Respondents who indicated difficulty in securing work on the platform		
	Pre COVID-19	Post COVID-19
Admin	8%	50%
Creative	44%	88%
Technology	22%	100%

Q: In an average week, how many jobs do you bid on?	
Admin	9.05
Creative	6.03
Technology	5.00

Q: What is your average earnings per week?			
	Pre COVID-19	Post COVID-19	% Difference
Admin	$403.33	$354.41	-12%
Creative	$583.33	$406.70	-30%
Technology	$437.50	$233.33	-47%

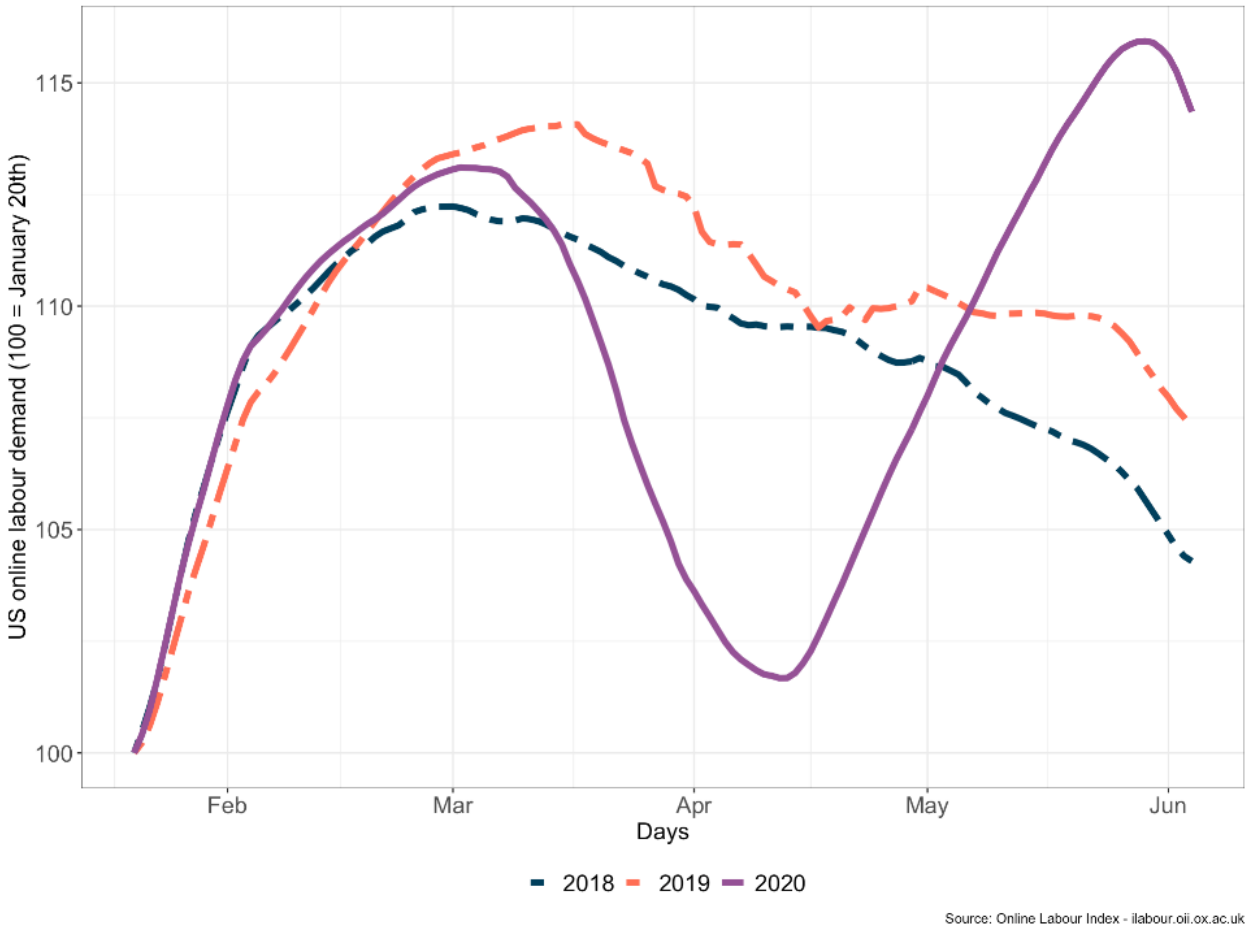
Respondents who indicated that their weekly earning is unpredictable		
	Pre COVID-19	Post COVID-19
Admin	50%	60%
Creative	39%	67%
Technology	38%	33%

Figure 1: Share of Online Labor Market by Country



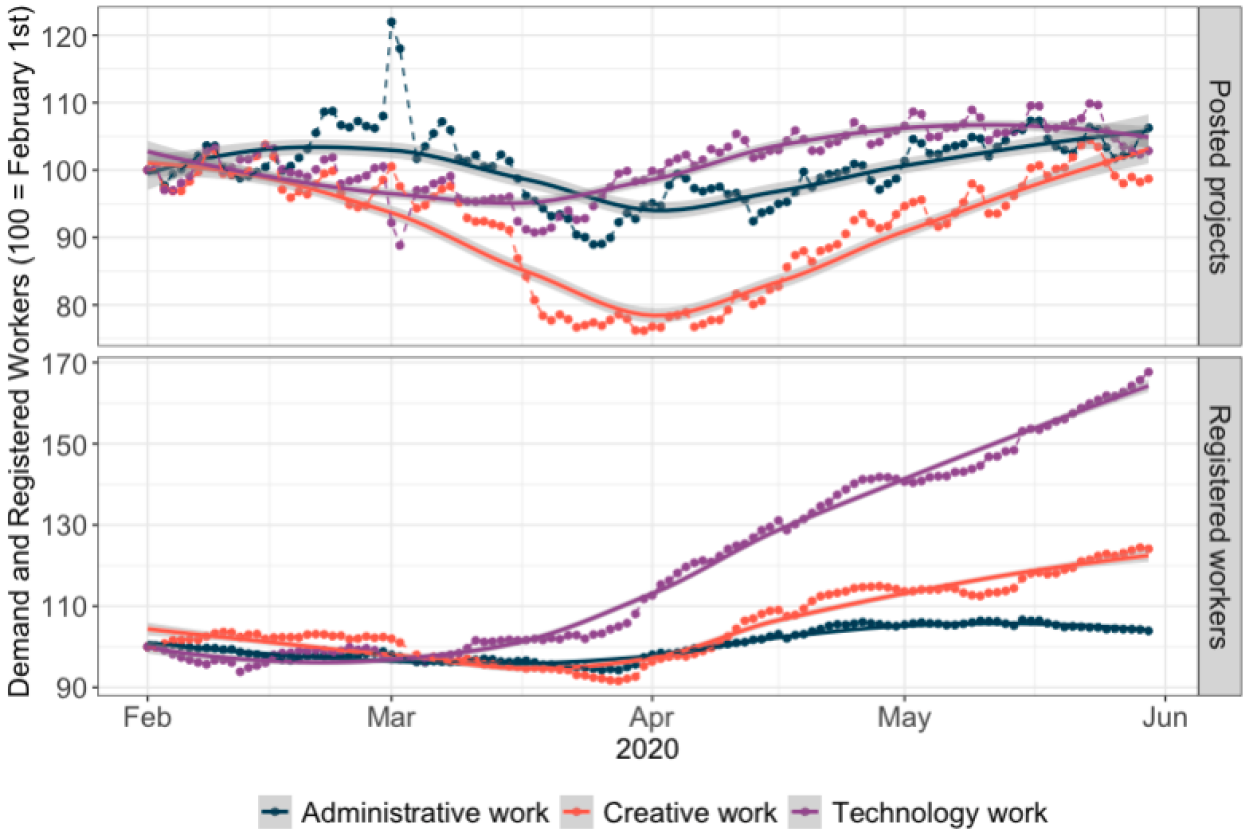
Note: In 2020, the largest share of online labor demand stems from the United States.

Figure 2: ***Demand on Major U.S. Online Labor Platforms, 2018-2020***



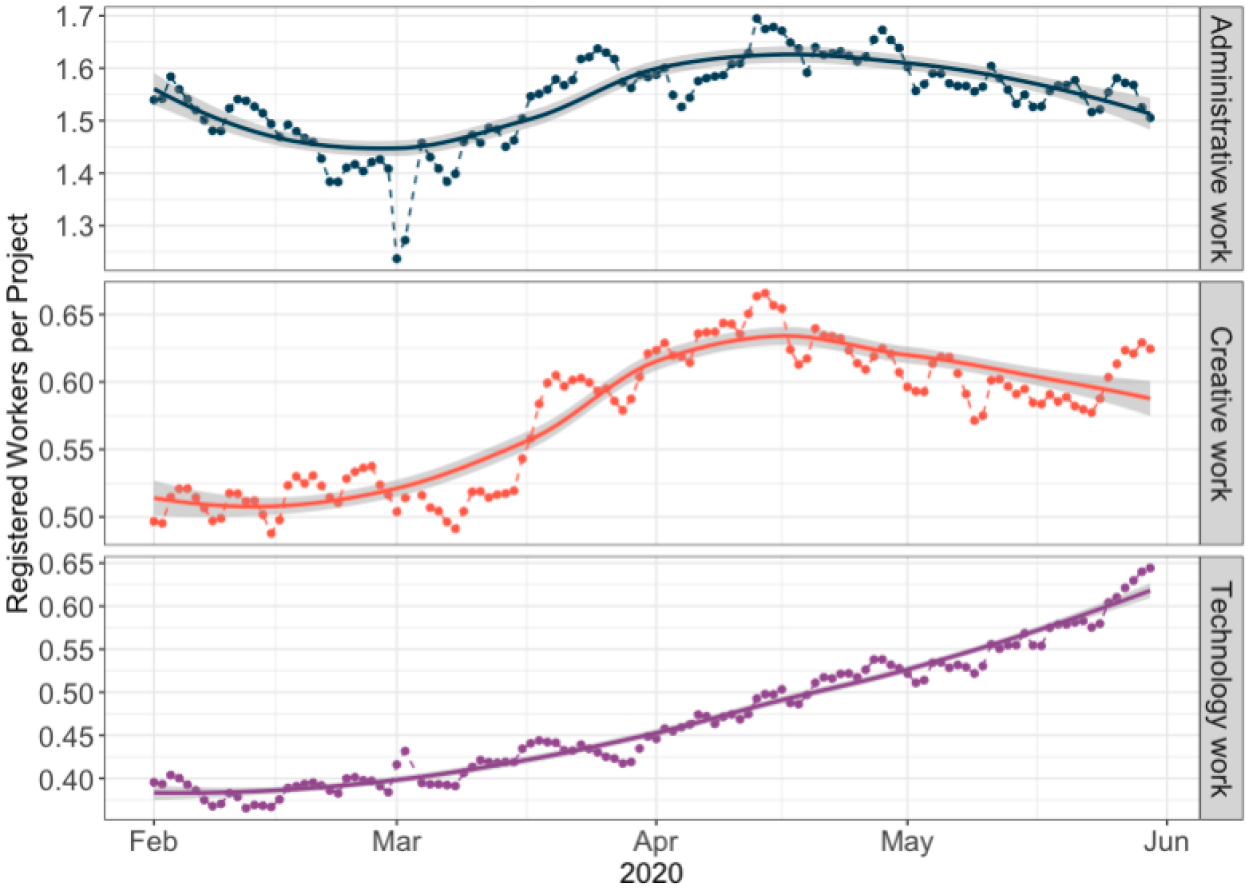
Note: January 20th to June 4th (2018-2020), relative to the start of the year.

Figure 3: Online Labor Demand and Number of Registered Workers in the U.S., by Occupation



.

Figure 4: ***Average Number of Registered Workers per Project in the U.S., by Occupation***


Registered Workers per Project
1.7
1.6
1.5
1.4
1.3
Administrative work
0.65
0.60
0.55
0.50
Creative work
0.65
0.60
0.55
0.50
0.45
0.40
Technology work
Feb
Mar
Apr
May
Jun
2020