

How Freelancers Experience Online Labor Marketplaces during a Pandemic

Elizabeth M. Gerber and Eureka Foong

Northwestern University

Abstract

During the global pandemic induced economic downturn, the number of people who do freelance work is rapidly increasing. With increased participation, it is important to understand how freelancers are experiencing the online labor marketplace. To shed light on this current phenomenon, we survey 392 U.S. freelancers (both new and experienced) to understand their initial perceptions of the experience. We uncover both negative and positive impacts on freelancers which include more competition, less time to complete work, change in pay, and risk aversion, as well as more time to complete work, new jobs, and more time to attract clients. Future work will explore the impact based on gender, age, work experience, geographic demographics, and wage setting. To better support the rapidly evolving gig economy during the pandemic, we encourage longitudinal evaluation of freelancers in online labor marketplaces.

Keywords

Future of work; online labor marketplaces; freelance work; economic downturn

Introduction

Within the US, more than 35% of U.S. workers freelance. Employers pay freelancers to work on a project or hourly basis with no contract for long-term employment. Freelancers are attracted to the flexibility of freelance work, the ability to do work remotely, and the freedom to select the projects on which they want to work (Freelancing in America, 2019).

Increasingly, skilled freelancers find short-term employment through online platforms such as Upwork, Outsourcely, and Freelancer. For example, a freelance designer may find a 60-hour job post to create a website for a start-up or a copy editor may find a five-hour job post to proofread a health clinic brochure. With online platforms making it easier for skilled workers to find freelance work and employers to hire freelance workers, more freelancers are working full-time and relying on freelancing as their primary income source. If a person is laid off from full-time employment and unable to find a new full-time job, they may register with online platforms to do freelance work to earn a living.

Early research suggests that freelance work in online labor marketplaces is changing rapidly in the face of the pandemic-induced economic downturn when more than 40 million people across the U.S. have filed for unemployment and companies are looking to cut costs (Dunn et al., 2020). Despite the rapid growth of online marketplaces in the past five years, our understanding of the skilled freelancers' experience is limited. We know even less about the experience of freelancers during a pandemic-induced economic downturn. To gain much-needed insight, we designed and implemented a qualitative survey to understand the freelancer experience. Our research seeks to answer the following question: **How does the pandemic influence U.S. skilled freelancers in the online labor market?**

By understanding the impact of a pandemic-induced economic downturn on skilled freelancers in the online labor marketplace, we can identify opportunities to refine and redesign these marketplaces to improve the user experience and to better recruit and sustain participation during uncertain economic times (Kraut and Resnick, 2011).

We organize this paper into three sections. The first section introduces freelance work, online labor marketplaces, and related COVID-19 pandemic research. The second section presents our findings, identifying negative and positive outcomes from the freelancer's perspective. The discussion section considers the impact of gender, age, work experience, [geography](#), and wage setting to inform the design of online labor marketplaces to improve freelance work.

Prior Work

The study of online labor marketplaces combines elements of freelance work, online platforms, and economic impacts. Therefore, we examine research from computer-supported cooperative work and economics. Through each lens, we seek to sharpen our theoretical expectations for how freelancers might experience online labor marketplaces during a pandemic.

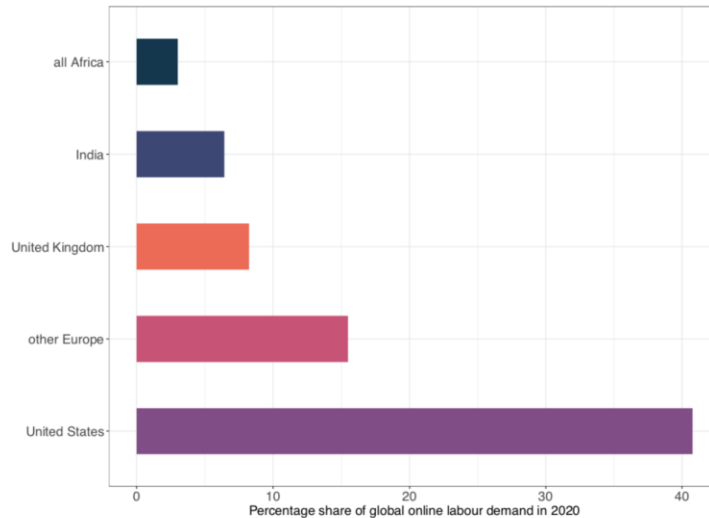
Freelance Work

The World Bank estimated that workers' earnings aggregated across online labor marketplaces would reach USD \$4.8 billion worldwide in 2016 (Kuek et al., 2015). In 2020, the U.S. has the largest share of online labor (Dunn et al., 2020, see Figure 1). According to a 2019 survey of freelancers, freelancing now contributes one trillion dollars, or 5% of the U.S. Gross Domestic Product (Freelancing in America, 2019).

Online labor marketplaces maintain databases of freelancers in dozens of categories. Employers hire freelancers to increase and decrease the capacity to meet rapidly changing business demands. For example, if workload increases, employers may hire freelancers on a project basis with no-long term contract rather than hiring new full-time employees and incurring fixed costs. Because freelancers can be hired quickly and on demand, remote project work may also make freelancers more substitutable with one another over time. Further, there are fewer labor regulations governing freelance work in the U.S. than in other industrial countries (McKay,

Pollack and Fitzpayne, 2019). Given the precariousness of online freelance work, it is susceptible to greater competition (Stephany et al, 2020a).

Figure 1: Share of Online Labor Market by Country (Dunn et al., 2020)



Despite the increased opportunities to freelance, freelance work still stands in contrast to the wage or salary worker who earns a predictable salary. Freelancers must have the capacity to do many tasks (Lazear, 2005). Unlike long term employment with a single employer, freelancers must continuously find work with existing clients or by attracting new clients. While this reduces the risk of being dependent on one employer for paid work, it increases the amount of unpaid labor to search for new work.

In online labor marketplaces, employers may review a portfolio or resume and request a freelancer complete a job, or a freelancer may search possible jobs and request to complete a job posted by an employer. When the freelancer completes the job, they submit the work to the employer who rates and pays the freelancer for their work. While freelancers and offline workers alike rely on professional networks to earn a living, only freelancers must take time to regularly curate online portfolios, or collections of completed work, to attract potential clients.

While freelancers can complete a range of work, skilled freelancers make up the largest group of freelancers (45%). These freelancers offer skills, such as writing, design, IT, computer programming and marketing, and business consulting. Other freelancers offer unskilled services such as dog walking, ridesharing services, or cleaning (30%), sell goods (26%) or perform other activities (20%) (Freelancing in America, 2019). People who freelance tend to be younger than traditional workers. The average age of a freelancer is 40 compared to 42 of a traditional worker. Highly educated workers are attracted to freelance work; 41% of freelancers have advanced degrees (Freelancing in America, 2019).

Due to the flexibility of freelance work, people who have been unable to work are now able to earn an income. 46% of freelancers could not hold a traditional job because of personal

circumstances, such as caregiving responsibilities (40% of those who said they could not have a traditional job) and health challenges (43% of those who said they could not have a traditional job). In the US, most women who participate in the gig economy report that the flexible work allows them to more easily attend to domestic responsibilities than conventional jobs (Hyperwallet, 2017). Increasingly, freelancing is capturing the attention of workers who work full-time for a single employer.

In a survey of non-freelancers, 80% report a willingness to do freelance work to make more money and 60% anticipate doing freelance work in the future (Freelancing in America, 2019). While the online gig economy cannot solve the challenge that women engage in more unpaid labor than men, it offers women the opportunity to arrange when and where they work and earn more equal pay to men (Foong et al., 2018).

Online Labor Marketplaces

Millions of freelancers take part in rapidly growing online labor marketplaces (Kassi & Lehdonvirta, 2016). Online platforms support transactions between employers and freelancers for short-term labor (Kuek et al., 2015, Kuhn, 2016) and allow workers to seek short-term gigs when they are able to, providing more flexible paid labor opportunities (Kassi & Lehdonvirta, 2016).

Compared to long-term employment, freelancing introduces several new challenges and opportunities for workers. Freelancers must regularly seek new work. This unpaid labor directly impacts one's ability to earn a living. Freelancers must set competitive bill rates. Online platforms provide unprecedented transparency into the bill rates of other freelancers which allows freelancers to make more informed decisions.

Impact of the Pandemic

While our understanding of online labor marketplaces during a time of relative economic prosperity is limited, our understanding of this phenomenon during economically challenging times is even more so.

Economic Impact

Early research expects significant global macroeconomic impacts from the COVID-19 pandemic (McKibben & Fernando, 2020). Distinct demographic and industry differences are likely to occur (Wenham et al., 2020; Stephany et al., 2020b). Researchers are currently looking at market data and finding large shifts in work availability (supply) and worker availability (demand) in the U.S. (Dunn et al., 2020). Initial findings suggest work flexibility, a core motivation for doing freelance work, may be diminishing because freelancers are more desperate for work and must take what they can (Dunn et al., 2020). Freelancers are finding jobs increasingly scarce as more people are creating new profiles and seeking freelance work online (Stephany et al., 2020a).

Although demand for online labor initially fell in early March 2020, it is rapidly recovering (Stephany et al., 2020a). The CEO of Upwork, Stephane Kasriel, believes that freelancers on the Upwork platform feel more secure during the current economic downturn because of freelancing. She explains that they can build a portfolio with multiple clients, so if one has to pull back, they would not lose everything (Fortune, 2020). The job skills she is seeing companies gravitate toward right now track with how businesses have had to shift during the coronavirus crisis. Businesses have had to shift during the coronavirus crisis toward three skills: 1) technical skills to build out web presences; 2) marketing and advertising work to redeploy messaging; and 3) customer support and operations.

Working Conditions

The Center for Disease Control and states' recommendations for social distancing are changing work conditions. People who can work from home may be working from home rather than in an office. They may have partners who are also working from home and they may be homeschooling children who are unable to go to campus.

Methods

Study Design

We followed a grounded theory approach and performed a survey study with a representative sample of participants from Upwork, one of the most popular online labor platforms for freelancers (Bailey and Horvitz, 2010). As is typical with grounded theory (Strauss and Corbin, 1994), this study was initiated with open qualitative data collection. Given the limited research in this domain, the study was framed with a broad research question: **Has the COVID-19 pandemic affected freelancing on online labor platforms? If so, how?**

We analyzed participants' open-ended text responses about the impact of the global COVID-19 pandemic on their freelance work. As one member of the research team began exploring the data, they noticed three types of effects of the pandemic on participants' work (i.e. positive, negative, no observable effect). This team member then proceeded to assign these descriptive codes to each participant's response (Miles et al, 2014). Because we were primarily interested in using these codes to provide additional insight into *how* participants were affected by the pandemic and did not plan to conduct statistical tests on this data, we did not create formal coding schemes.

Description of Sample

While an examination of a diverse set of participants including from multiple platforms and work categories is ultimately needed to provide a rigorous framework for how people experience freelance work during the pandemic, we began with a representative set of creative skilled

workers. We focused on creative skilled workers because people who work in creative fields, such as writers or graphic designers, disproportionately freelance (Woronkowitz, & Noonan, 2019) as freelance work is well suited to the project-based nature of creative work (Marksen, 2006). For example, writers are often hired for content creation on short-term contracts and graphic designers perform one-off gigs. The flexibility of freelance work supports creative professionals' ability to juggle multiple projects (Menger, 1999).

Participants Representative of Gender Distribution of Writers and Designers

Our final sample consisted of 392 participants (60% women, 38.8% men, 1.2% self-described gender or non-binary), half of whom identified "Writing" (n=191, 48.7%) and "Design & Creative" (n=178, 45.4%) as their primary job category. We received 399 complete responses to our survey and removed participants who were younger than 18 years old (n=3, 0.8%) and who did not disclose their gender (n=4, 1.00%). The gender distribution of the writers (62.3% women, 36.1% men, 1.6% self-described or non-binary) and designers (57.3% women, 42.1% men, 0.6% self-described or non-binary) in our sample was representative of the population of writers and designers based on a previous study of Upwork (Foong et al., 2018).

Henceforth, we will refer to participants as "writers" and "designers" for simplicity, although participants in the "Design & Creative" category included videographers, illustrators, and other types of creative professionals. Participants also identified other primary job categories on Upwork, including "Sales & Marketing" (2%, n=8), "Administrative Support" (1.8%, n=7), "Web, Mobile, & Software Development" (0.8%, n=3), "Translation" (0.5%, n=2), "Engineering & Architecture" (0.3%, n=1), "Accounting & Consulting" (0.3%, n=1), and "Legal" (0.3%, n=1).

Participants Representative of Writers and Designers in the U.S. and Found Freelance Work Very Important to their Livelihoods

In general, participants were representative of writers and designers in the U.S. More than a third of participants had more than 10 years of work experience (38.5%) and a quarter had less than three years of work experience (25.8%), while half (54%) had less than three years of experience working as freelancers. The majority (70.7%) of participants were part-time freelancers, and 38.8% reported being employed elsewhere while freelancing. The majority of the sample was between 25-34 years of age (39.6%), had a bachelor's degree (49.1%), were single (49.6%), and had no children (69.5%). In general, our sample may have included fewer participants from non-metropolitan areas than expected (9.3% of participants who provided zip code, n=24, compared to 14.8% in the U.S. population in 2013; Rothwell et al., 2013).

Participants More Successful on the Platform than Expected, but Many Still New to the Platform

Participants in this sample were more successful at being hired for work on the platform compared to the broader population of workers on Upwork. Prior literature suggests that roughly

80% of the population on Upwork in the U.S. has worked 0 hours on the platform (Foong et al., 2018). In comparison, only a third of our sample (35%, $n=137$) had worked 0 hours on the platform, excluding the time it took for them to complete the survey (22.2% worked 1-9 hours, 22.5% worked 10-99 hours, 14% worked 100-999 hours, 6.4% worked more than 1000 hours). Similarly, 38% ($n=147$) of the sample had earned no money on the platform, while 18.6% ($n=73$) earned less than \$100, 31.1% ($n=122$) earned between \$100 and \$9,999 and 12.76% ($n=50$) had earned more than \$10,000 on the platform. While the sample may not have been representative of this dimension, we believe that understanding the experiences of freelancers who have earned money on Upwork would provide us with insight on more successful freelancer experiences.

In general, many of the participants in our sample were relatively new to working on Upwork and women had generally spent less time on the platform than men. Among workers who provided the information ($n=374$), half of participants had worked at least six months on the platform, while almost a third ($n=117$) had only started working on the platform within the prior month. On average, participants had worked about 1.82 years on Upwork ($SD=2.89$ years). Across all categories, women spent a median of 0.33 years on the platform ($M=1.64$, $SD=2.76$), significantly less than men who had spent a median of 0.75 years on the platform ($M=2.14$, $SD=3.10$, statistic=15814, $p<0.05$).

More Women Freelanced Part-time and Had Less Work Experience on the Platform than Men

While we did not find significant gender differences in the majority of the demographic variables, significantly more women reported freelancing part-time and having between one and three years of work experience compared to men. Using chi-square analyses (McHugh, 2013), we found that a significantly higher proportion of women in our sample reported freelancing part-time (80.4% of women) compared to men (55.8% of men, $\chi^2=24.48$, $p<0.001$). This was the case for both writers (80.8% of women vs. 58.6% of men, $\chi^2=9.23$, $p<0.001$) and designers (78.1% of women vs. 52.1% of men, $\chi^2=12.72$, $p<0.01$). Women who were employed part-time were also more likely to report not being employed elsewhere (43% of women) than men in our sample (28.3% of men, $\chi^2=16.25$, $p<0.001$). As we brought up earlier, women as a whole had spent significantly less time on the platform ($M=1.6$ years, $SD=2.76$, median=0.33) compared to men ($M=2.14$, $SD=3.1$, median=0.75, statistic=15814, $p<0.05$), but there were no significant differences within the writing and design job categories. Significantly more women also had between one and three years of work experience (24.3% of women) compared to men (11.2% of men, $\chi^2=12.18$, $p<0.05$). We did not include self-described or non-binary participants in the chi-square analyses due to the small size of our sample ($n=5$).

We found no other significant gender differences in our sample in terms of earnings on Upwork ($\chi^2=6.92$, n.s.), importance of freelancing at the time of the survey (statistic=16377.5, n.s.), years of work experience as a freelancer ($\chi^2=5.2$, $p=n.s.$), age range ($\chi^2=3.50$, n.s.), education level ($\chi^2=9.43$, n.s.), marital status ($\chi^2=2.26$, n.s.), number of children ($\chi^2=0.51$, n.s.), or location (urban-rural classification based on freelancers' zip code; $\chi^2=3.36$, n.s.)

Findings

We present evidence from the open-ended surveys with freelancers. 38.1% of freelancers experienced negative outcomes including more competition, less time to complete work, change in pay, and risk aversion while 10.6% of freelancers experienced positive outcomes including more work, new jobs, and more time to attract new clients. While we categorize negative and positive outcomes as distinct from each other, in reality, they are interrelated. Within each category, we present the findings in the order of prevalence for freelancers (Table 1). We find that 29.5% of participants reported no observable effect on their experience freelancing on online labor marketplaces and 21.7% of participants reported having just actively starting or restarting freelancing and not having a baseline to which to compare.

Table 1: Perceived negative and positive outcomes of freelancers in online labor marketplaces during an economic downturn.

Negative Outcomes	Positive Outcomes
More competition	More work
Less time to complete work	New jobs
Change in pay	More time to attract new clients
Risk aversion	

Negative Outcomes

38.1% of respondents reported negative outcomes including more competition, less time to complete work, change in pay, and risk aversion.

More Competition

Respondents reported more competition for work due to the increase in the number of people freelancing due to unemployment. A 25-34 year old female freelance writer who charges \$20/hr. and has been on the Upwork platform for three years describes her need to more quickly respond to requests for work due to the increased competition.

“...there are people who may have had regular jobs prior to this pandemic that now depends on freelance work to make a living full-time. This somewhat limits the number of projects that are available to me. I have to move a lot faster.”

Less Time to Work

In addition to more competition, some respondents reported less time to do freelance work because of additional caretaking responsibilities. When asked whether the pandemic-induced downturn has influenced her experience, a 35-44 year old Artistic Director and Graphic

Designer with two children who has been on Upwork since 2015 described her experience. Because her kids who were typically at school during the day were now at home, she had less time to devote to doing freelance work.

“YES! I now spend most of my time taking care of my kids, who are no longer in school because of the pandemic. My partner has a typical 9-5 job and, although he is temporarily working from home, he has zero flexibility in his work hours. Because my work is flexible and his is not, I spend most of my time homeschooling and caring for kids and do very little freelance work, which means I don't get paid.”

Change in Pay

Respondents reported a change in pay for their work. An experienced 55+ year old male freelancer from a small town in Maryland explains how the pandemic has influenced how his client pays him by project rather than through a retainer.

“One of my clients suspended our retainer arrangement. I'm now being paid for each project I'm assigned instead of receiving a fixed sum every month.”

An 18-24 year old graphic designer in a small Midwest city who recently lost her job describes how she relies on freelancing as her primary source of income since losing her job.

“Since the COVID-19 pandemic I have lost my full time job, which has left me with no source of income. I also got denied for unemployment benefits, so freelancing has been my only financial support for the past 3 weeks.”

Risk Aversion

A 35-44 year old female writer who recently joined the Upwork platform described employers' concerns about hiring a new client.

“Yes, people are more concerned about money so tightening their belts a bit more. They're less likely to take a risk on someone new without a lot of guarantee that they're safe.”

A graphic designer and marketing expert who joined Upwork in February 2019 describes how she changed her rates to still attract clients when money was tight.

“Amidst this pandemic, I have strategically adjusted my hourly rate. Over the past few months, I have been working for \$50-\$65 dollars an hour. But I have lost a lot of work beginning in March because my clients have been suffering adverse effects due to COVID-19. Therefore, I have needed to make more money. I increased my profile amount to \$95/hour, because I strongly believe that my reviews/Top Rated status justify this cost. However, since I am a little more "desperate" for work right now, I will apply to jobs at a lower rate (more like the rate I had in Jan/Feb — \$50-\$65). I understand that when I apply for a job, the client will also see my "normal" rate, which is \$95. They then feel like they are getting a "good deal" because I

proposed a lower rate than my profile communicates I'm used to receiving. I have had good luck with this strategy so far."

Positive Outcomes

While more people experienced negative or no impact, 10.6% of all respondents reported positive outcomes including more work and new jobs during the pandemic induced downturn.

More Work

Some freelancers reported getting more work during the pandemic. A single digital content creator from New York, New York who works as a full-time freelancer (35 hours or more), reported an increase in the number of requests for work. He attributes the increase to people having more time to pursue their business ideas. He explains:

"To my surprise, I have seen a huge rise in business since the Covid-19 pandemic. Now that everyone is at home, they have more time to dedicate to projects and business ideas that they did not have time for before. So, I've received a lot of requests for websites for small businesses, social media content/assets, graphics etc."

New Jobs

In addition to getting more work, some freelancers reported getting more work that was directly related to the pandemic. A married 30-year-old copy editor from the greater Seattle area explains why she believes work has increased.

"Because my field is writing and editing, more clients want to put out material related to COVID-19, or the healthcare field in general. While the number of freelancers may have increased (this is my speculation based on unemployment rates), it seems COVID-19 has also opened up some unique freelancing jobs, especially for writers."

More Time to Attract New Clients

In addition to getting more paid work, some freelancers reported having more time to get more work. A male writer in his late 30s explains:

"Yes, I have had a lot more free time to market myself online and create profiles to attract new clients."

Discussion

Through our preliminary analyses, we identified negative and positive outcomes of freelancing in the online labor marketplace during the pandemic. Freelancers experience more negative outcomes than positive outcomes and some have not experienced either positive or negative

outcomes. Our results suggest that online labor marketplaces are being shaped by the pandemic-induced economic downturn we are seeing in the traditional full-time offline labor market. Like the traditional full-time market, we suspect that many factors exogenous to the platform influence one's experience.

Future Work

Our initial findings suggest a number of areas for future research and design as the pandemic-induced economic downturn continues.

Personal Factors

Future analysis is required to understand how personal factors may influence experiences of freelance during a pandemic, such as gender, domain, network, and web-oriented digital literacy (Hargittai 2005). For example, an accomplished copyeditor with an established network of clients may experience work differently than a novice writer whose portfolio and network is limited. The actual and perceived size of a freelancer's client network, their online presence, and bill rate may influence their experience. For example, a freelancer who sets his rate at \$100/hr. and has a large client network may experience a pandemic differently than a freelancer who sets his rate at \$20/hr. and is a newcomer to a particular platform. Recently published work in progress suggests that impacts of the pandemic may vary by occupation and are more keenly experienced by female freelancers (Dunn et al., 2020).

Professional Skills Factors

Future qualitative and quantitative work is required to understand how professional skills such as communication, sales, project management skills, and online presence influence experience. One might assume that people who have been freelancing for a longer period of time might have developed more of these skills, but it is also possible that their skills do not as easily translate to an online context.

Wage Setting

Future analysis will also consider the individual strategies people use to set wages and entrepreneurial behavior to recruit new clients. Initial evidence suggests that freelancers use dynamic pricing strategies to set rates and optimize total pay (Foong and Gerber, 2020).

Employer Experience

Future qualitative and quantitative research is needed to investigate how employers rely on online labor marketplaces during uncertain financial times. Initial evidence suggests that they may relinquish retainers and rely on existing relationships with freelancers.

Location-Based Work

In this study, we focus on remote work opportunities through online labor marketplaces. Future work will consider how freelancers who rely on-demand location-based work on platforms such as Uber experience the pandemic. Given the location-based nature of the work, we expect freelancers to experience concerns about safety, health, and communication.

Questions of Responsibility

Our research raises a difficult question we have raised before: whose responsibility is it to create more equitable online labor marketplaces (Foong et al., 2018)? On the one hand, our initial analysis suggests that factors related to structural differences in society (e.g. who earns the primary income, whose job is flexible, and who does the caregiving) influence how different freelancers experience the online labor market during an economic downturn. These factors are independent of online platforms. On the other hand, this work highlights an opportunity for more data transparency that online platforms have not yet realized. Platforms could implement specific pricing guidelines that address the financial needs of freelancers.

Conclusion

Online labor marketplaces are fundamentally changing the way people work. Continued participation can have a profound influence on the economy during a pandemic by influencing who and how people can work. However, human-computer interaction designers have a large unrealized opportunity to design the interactions between the freelancers, employers, and the technology that connects them, to ensure positive, equitable, and fair outcomes among the diverse participants.

Acknowledgements

We are grateful to Gustavo Umbelino for his contributions to data analysis and to the informants who participated in the research.

References

- Bailey, B. P., & Horvitz, E. 2010. What's your idea? A case study of a grassroots innovation pipeline within a large software company. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 2065-2074).
- Dunn, M., Stephany, F., Sawyer, S., Munoz, I., Raheja, R., Vaccaro, G., & Lehdonvirta, V. 2020. When Motivation Becomes Desperation: Online Freelancing During the COVID-19 Pandemic.

Freelancing in America, <https://www.upwork.com/i/freelancing-in-america/2019/>, Accessed June 19, 2020

Foong, E., Vincent, N., Hecht, B., & Gerber, E. M. 2018. Women (still) ask for less: Gender differences in hourly rate in an online labor marketplace. *Proceedings of the ACM on Human-Computer Interaction*, 2(CSCW), 1-21.

Foong, E., & Gerber, E., 2020. Understanding Gender Differences in Pricing Strategies in Online Labor Marketplaces. Working Paper.

Hargittai, E. 2005. Survey measures of web-oriented digital literacy. *Social science computer review*, 23(3), 371-379.

Hyperwallet. 2017. The Future of Gig Work is Female. Technical Report. Hyperwallet. https://www.hyperwallet.com/app/uploads/HW_The_Future_of_Gig_Work_is_Female.pdf?mkt_tok=eyJpIjoiTVRjMU9UQmI0aWk1TW1WaSlInQioiJYhVQrNEtTTzUzNWliUzZOSTQ3R2wxTnlwY00xZG9MZmErTnVXUkJVdGhMRm9EUW9GWTFcL1huaXZPbnBmdGN1RnBaWjAwa2tjTW5PXC82NnR5Z0o1VFcrOFhWbEZMbVd3UGcramZvdTg0Y1Y0Q3orMjlcL1wvVUpJaFBROVhMeXRyU1QifQ%3D%3D Accessed July 2, 2020

Kassi O, & Lehdonvirta, V. 2016. Online Labour Index: Measuring the Online Gig Economy for Policy and Research. Technical Report 74943. <https://mpra.ub.uni-muenchen.de/74943/>

Kraut, R. E., & Resnick, P. 2012. *Building successful online communities: Evidence-based social design*. Mit Press.

Kuek, S., Paradi-Guilford, C., Fayomi, T., Imaizumi, S., & Ipeirotis, P. 2015. The global opportunity in online outsourcing. Technical Report ACS14228. The World Bank. 1–74 pages. <http://documents.worldbank.org/curated/en/138371468000900555/The-global-opportunity-in-online-outsourcing>

Kuhn, K. 2016. The Rise of the Gig Economy and Implications for Understanding Work and Workers. *Industrial and Organizational Psychology* 9, 1 (2016), 157–162. <https://doi.org/10.1016/j.bushor.2012.09.002>

Lazear, E. 2005. Entrepreneurship. *Journal of Labor Economics* 23: 649–680.

Miles, M. B., Huberman, A. M., & Saldaña, J. 2014. *Qualitative data analysis: A methods sourcebook*. 3rd.

McHugh, M.L. 2013. The Chi-square test of independence. *Biochemia Medica*. 23, 2 (Jun. 2013), 143–149. DOI:<https://doi.org/10.11613/BM.2013.018>.

McKay, C., Pollack, E., & Fitzpayne, A. 2019. *Automation and a Changing Economy*. Aspen Institute. Accessed July 1, 2020.

McKibbin, W. J., & Fernando, R. 2020. The global macroeconomic impacts of COVID-19: Seven scenarios. Centre for Applied Macroeconomic Analysis working paper.

http://www.sensiblepolicy.com/download/2020/2020WorkingPapers/2020_19_CAMA_COVID19_mcKibbin_fernando_0.pdf Accessed July 1, 2020.

Menger, P. M. 1999. Artistic labor markets and careers. *Annual Review of Sociology*, 25(1), 541–574.

Markusen, A. 2006. Urban development and the politics of a creative class: Evidence from a study of artists. *Environment and planning A*, 38 (10), 1921–1940.

Rothwell, C.J. et al. 2013. 2013 NCHS Urban–Rural Classification Scheme for Counties. National Center for Health Statistics.

Schallom, R., May 31, 2020 Why the Upwork CEO believes the pandemic will lead to more work with freelancers, *Fortune*, <https://fortune.com/2020/05/31/upwork-remote-work-freelancers-coronavirus/> Accessed June 26, 2020.

Stephany, F., Dunn, M., Sawyer, S., & Lehdonvirta, V. 2020a. Distancing bonus or downscaling loss? The changing livelihood of US online workers in times of Covid-19. SocArXiv papers. <https://doi.org/10.31235/osf.io/vmg34>

Stephany, F., Stoehr, N., Darius, P., Neuhäuser, L., Teutloff, O., & Braesemann, F. 2020b. 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.

Strauss, A., & Corbin, J. 1994. Grounded theory methodology. *Handbook of qualitative research*, 17(1), 273-285.

Thebault-Spieker, J. Terveen, L., & Hecht, B., 2017. Toward a Geographic Understanding of the Sharing Economy: Systemic Biases in UberX and TaskRabbit. *ACM Trans. Comput.-Hum. Interact.* 24, 3 (April 2017), 21:1–21:40. <https://doi.org/10.1145/3058499>

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](https://doi.org/10.1016/s0140-6736(20)30526-2)

Woronkowicz, J., & Noonan, D. S. 2019. Who goes freelance? The determinants of self-employment for artists. *Entrepreneurship Theory and Practice*, 43(4), 651-672.

Valentine, M., Retelny, D., To, A., Rahmati, N., Doshi, T. & Bernstein, M. 2017. Flash Organizations. In the 2017 CHI Conference. ACM Press, New York, New York, USA, 3523–3537. <https://doi.org/10.1145/3025453.3025811>