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**Learning to hire? Hiring as a dynamic experiential learning process
in an online market for contract labor***

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***** Conditionally Accepted at Management Science *****

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Learning to hire? Hiring as a dynamic experiential learning process in an online market for contract labor

ABSTRACT

We know a job applicant's social category affects an employer's likelihood of hiring them, but we do not know whether, or how, employers update their beliefs regarding members of these social categories. I examine how prior negative and positive hiring experiences of employees from particular countries affects an employer's subsequent likelihood of hiring applicants from those countries. Analyses of over 26 million applications, from freelancers worldwide, for over 2.2 million jobs on an online labor market demonstrate that employers react more strongly to negative hiring experiences than positive ones. Employers are 14% *less* likely (versus 8% *more* likely) to hire freelancers from a country following a prior negative (versus positive) experience. The similarity of the prior job moderates this effect. Prior negative experiences with similar jobs (versus dissimilar jobs) lead employers to be 92% less likely (versus 7% less likely) to hire from that country. Conversely, positive experiences with similar jobs (versus dissimilar jobs) lead employers to be 23% more likely (versus 3% more likely) to subsequently hire from that country. The consequences for switching countries, following negative experiences, are analyzed and wage differences, made to compensate for employer reactions, are calculated. Contributions to the hiring discrimination, impression formation, and gig-economy literatures are discussed.

KEYWORDS

Hiring, learning, labor markets, freelancing, discrimination, evaluation, country of origin

How do employers react to past hiring experiences of members of specific social categories? It has long been recognized that the visible social category of a job applicant affects their likelihood of being hired. Most empirical evidence demonstrates that employers exhibit preferences for or against job applicants because of their race, gender, or country of origin, when deciding whom to hire. Some recent findings reveal: employers for low skilled jobs are more likely to call back or hire whites over African American job seekers (Pager et al 2009); skilled temporary female workers are disadvantaged, relative to their male counterparts in their cumulative earnings over time (Fernandez-Mateo 2009); openly gay men are less likely to receive callbacks, when they indicate their sexual preference on resumes (Tilcsik 2011); and job seekers from Latin America are less likely to get their visas approved by the Department of Labor, for jobs in the United States (Rissing and Castilla 2014).

Despite the influence a job applicant's social category has on an employer's hiring decision, scholars have rarely explored whether or how employers may learn or update their beliefs regarding members of certain social categories (c.f. Pager and Karafin 2009). Given that, "hiring in the market is to be regarded as sampling, and revising conditional probabilities ... The whole process is a learning one" (Spence 1973: 358). The question of whether an employer's preferences for hiring members of particular social categories are malleable is a central, though seldom highlighted, element to scholarly theorizing. For example, (Arrow 1973: 31) explicitly acknowledges the importance of how employers obtain their beliefs regarding social category members, in his original formulation of the statistical discrimination perspective on hiring, by concluding, "One must consider still more precisely how individual employers acquire knowledge which will modify their initial estimates of distributions as differing between groups."

Understanding how employers react to past experiences is a pervasive concern because the impressions employers form of members of certain social categories are likely to be derived from interactions with those individuals (Allport 1954, Pettigrew 1998). However, if we assume that the dominant process through which employers come into contact with employees is by hiring them (Sterling 2014), then the impressions employers form of members of particular social categories may be endogenously determined and difficult to change (Denrell 2005). For example, if hiring decisions are

subject to prior experiences; a prior negative experience with an employee from a particular social group may dramatically dissuade an employer from hiring from that social group again. If the negative impressions formed are strong enough to influence the likelihood of an employer's future hiring of a successive job seeker from that social category, then the employer's initial negative impression is unlikely to be corrected. Negative beliefs may therefore be perpetuated. Conversely, positive hiring experiences with particular employees may induce additional hiring from those social groups, thereby reinforcing possible pre-existing beliefs. Finally, the impressions of hired employees may or may not be isolated to the particular jobs they were hired for; thereby affecting how broadly hiring experiences will impact future decisions. Regrettably, we lack an understanding of how employers react to past negative and positive hiring experiences. Instead of examining the potential dynamics of social group impressions, some scholars make the simplifying assumption that employers hold *ex ante* beliefs regarding individuals from particular social categories (Aigner and Cain 1977) or they assume that employers are motivated by dominant in-group preferences (Tilly 1998). Scholars have therefore left the mechanisms that explain whether and how these preferences arise, as well as their implications on labor markets, as an uninvestigated, but vital, component of employer decision-making (Reskin 2000).

Whether employers react to prior hiring experience, and how, is also of substantive interest. For example, policies such as affirmative action are proposed to correct any hiring bias employers may hold against applicants, from particular social categories, by encouraging them to hire individuals whom they may normally not have come into contact with. One explicit outcome might be that employers alter their future behavior, precisely because they then re-evaluate individuals from previously avoided social groups differently. However, while affirmative action studies may show "that when anti-discrimination laws are enforced, they contribute to workplace integration" (Reskin 1997: 249), without the benefit of observing whether employers alter their hiring decisions over time, we cannot be sure if these effects are due to the employer's changes, in their beliefs, being reflected in their hiring practices or other external reasons (Baron et al 1991). Additionally there is no evidence that labor market gains for minorities, under affirmative action, may persist once those policies are eliminated (Coate and Loury 1993).

Our lack of understanding about how employers may learn from past hiring experiences stems from at least three shortfalls in the previous literature. Firstly, most research programs focused on examining hiring as a point-in-time decision and did not look at it from a longitudinal perspective. For example, correspondence and audit studies, while addressing causal inference concerns, drew their conclusions regarding employer choices from a specific instance. Archival studies also examined hiring outcomes without regard to past decisions employers made, and did not link employer's decisions to their subsequent hiring choices. The few studies that did invoke a longitudinal employer perspective focused on how employers might have learned about a specific individual employee, and not how their past experiences may have affected the employment opportunities (with them) for subsequent job applicants from particular social groups (Sterling 2014). For example, the wages of specific employees change over time to reflect an individual's underlying ability, which is hard to observe, and which means that employers may rely on more superficial signals, at the time of hiring, that become less correlated such as education (Altonji and Pierret 2001) or race (Pinkston 2006).

Secondly, for the most part, labor market examinations concentrated on understanding the outcomes for the job seeker, at the expense of understanding the hiring decision process of the employer. This is understandable because the prominent sociological perspective of labor market inequality is grounded in conflict theory (Blumer 1958, Tilly 1998), which portrays employer actions as being the product of a privileged group who are protecting their beneficial position. Unfortunately, this perspective is limited in its ability to explain the heterogeneity in employer actions across modern workplaces, neither can it identify the specific process where this behavior manifests (Reskin 2000). Therefore, employers represent a relatively under-examined role in the market, despite the recognition that hiring in labor markets is the result of a two-sided matching process (Fernandez and Weinberg 1997). This emphasis has hindered our ability to develop a deeper understanding of employer decision making, leaving the hiring process a relative "black box" (Oyer and Schaefer 2011, c.f. Pager and Karafin 2009, Rivera 2012).

Finally, and perhaps most crucially, another reason investigators have been hampered is the non-trivial data requirements needed to investigate how employers may alter their hiring behaviors based on

past experiences. Developing a longitudinal perspective of employers' hiring behavior requires observations of employers' hiring decisions over time, which includes visibility into which applicants applied and who was eventually hired. Furthermore, employee specific information is also needed, such as signals of quality, because while ability may be correlated with social category membership it is unobservable to the researcher. Finally, the nature of the hiring interaction, for example whether the experience was positive or negative, must also be observed as we would need to be able to link the valance of the interaction with the subsequent behavior. For example, while Pager and Karafin (2009) explicitly explored whether and how employers linked their past experiences of African American employees to subsequent applicants, they were limited by self-reported behaviors and did not have access to actual hiring outcomes.

I address these substantial challenges by examining the hiring of freelancers in an online market for contract labor: Elance.com. This is a worldwide platform that connects skilled workers, who are willing to work on a temporary contract basis, with those seeking to employ them. I conceptualize hiring as a *dynamic experiential learning process* (Denrell and LeMens 2007, Erev and Roth 2014) and investigate hiring by an employer as a sequence of events that occurs, repeatedly, over time.

Therefore, I explicitly portray hiring as a cognitive process and impression formation of social groups as being structured by the prior hiring decisions employers make (Fiske 1998, Reskin 2000). I begin with the observation that hiring is an opportunity for the employer to observe an employee's abilities, and also to develop inferences regarding members of that employee's social category. In my setting, I examine how employer hiring experiences, of freelancers from a particular country, affect the subsequent likelihood of their hiring other freelancers from that same country. I investigate whether the outcomes of prior hiring experiences that were unambiguously positive or negative affect subsequent hiring decisions. I proceed from the straightforward assumption that a positive interaction is most likely to lead to additional hiring while a prior negative interaction is most likely to lead to a lower likelihood of hiring again. I ask, do employers react more or less strongly in response to a negative versus a positive

hiring experience? Furthermore, how does the similarity or dissimilarity of the subsequent job, to the prior experience, moderate this effect?

This setting, while innovative and important in its own right, overcomes several crucial obstacles that prevented past researchers from investigating these questions. Firstly, it affords the researcher repeated observations of employers' hiring over time, because all transactions are recorded by the platform, thus providing a richly detailed data source. Secondly, a feedback mechanism indicates whether a hiring experience was unambiguously positive or negative, directly from the employer. Finally, as a researcher, I have visibility into the set of applicants who apply to every job posted on the platform, as well as who was ultimately hired. In addition to the analytical leverage this platform affords, temporary contract work (Barley and Kunda 2004, Leung 2014), and more generally non-standard work (Pedulla 2016), is a quickly growing, non-trivial labor force category. Some estimates suggest that at least 53 million individuals in the US have attempted to freelance or to work on a contract basis, at least part-time (Freelancer Union 2012).

Longitudinal analyses of over 26 million applications from freelancers worldwide, for over 2.2 million job postings from 557,416 employers, demonstrate that employers who have any negative experience with a freelancer from a particular country are subsequently 14% less likely to hire other freelancers from that same country. Conversely, any prior positive experiences will increase an employer's likelihood of hiring a freelancer from that country by 8%. Consistent with a negativity effect, prior negative hiring experiences exert a significantly greater magnitude than do prior positive experiences. I also find that this behavior is moderated by the similarity of the past job. That is, prior hiring experiences exert a greater effect on subsequent hiring when the employer is seeking to employ a freelancer for a similar job than a dissimilar one. Specifically, any prior negative hiring experiences lead employers to be (dramatically) 92% less likely to hire freelancers from that country, for similar subsequent jobs, while only being 7% less likely to hire them for dissimilar subsequent jobs. This pattern holds for prior positive experiences as well – employers are 23% more likely to hire a freelancer from a

particular country following a positive experience, with freelancers from that country, for a similar job, while only being 3% more likely to hire for a dissimilar job, following prior positive experiences.

I also investigate the implications of this behavior for both employers and job applicants. We know learning may be poorly calibrated with reality (Pernell-Gallagher 2015). Here, I also find that employer behavior seems poorly calibrated when they overreact to negative experiences by subsequently hiring from a different country. Analyses of actual switching behavior demonstrate that employers fail to hire from countries with a smaller proportion of poorly rated freelancers, following a negative experience. The implications for job applicants are also explored, specifically whether an employer's prior negative experience is costly for a freelancer to overcome. A freelancer would need to bid \$105, relative to the \$396 average winning price of a job on the platform, (about 3.7 fewer times) to be equally likely to be hired compared to identically qualified freelancers from countries where the employer has had no prior negative hiring experience for a similar job. Freelancers facing employers with negative country experiences, for dissimilar jobs, need to be willing to work for \$350. Conversely, freelancers from countries where employers have had any positive experience can enjoy a premium wage by bidding \$608 for a similar subsequent job and \$421 for a dissimilar subsequent job. At the same time they enjoy the equal likelihood of being hired, relative to an identical freelancer from a country where the employer has had no positive experiences in the past. I conclude with a discussion of the implications of these findings for hiring, discrimination, and impression formation of stereotypes.

COUNTRY OF ORIGIN AS AN EMPLOYMENT CUE

It is well-recognized that people hold beliefs regarding individuals from certain countries. Take, for example, the contrasting perceptions that Americans hold of immigrant job seekers from Latin America and Asia. On one hand, Burns and Gimple (2000) found that Americans generally hold negative perceptions of Latino immigrants, perhaps because they are viewed as lazy or maybe because they are seen as a threat to job opportunities. On the other hand, current beliefs held among Americans about recent Asian immigrants characterize them as being professional and well-educated (Ho 2003, Liu 1992).

Impressions are far from universal. People's opinions about individuals from particular countries of origin can vary depending on the characteristics of either the observer or the target. For example, because highly educated people value cultural diversity more than less educated individuals, more educated people are found to be less racist and more likely to believe that immigrants generate positive benefits for their country (Hainmueller and Hiscox 2007). The negative sentiments harbored against Latino immigrants are heightened by the level of economic insecurity felt by the observer for their racial group and are further exacerbated if the observer lives closer to the immigrants (Burns and Gimpel 2000). Discriminatory feelings against immigrants from negatively perceived countries also seem to vary as their relative numbers change. Negative sentiments increase following commensurate increases in the relative proportion of immigrants in the population and negative sentiments abate as the relative size of the immigrant population decreases (Hainmueller and Hangartner 2013).

These impressions that individuals hold affect employment decisions. This is because employers use beliefs about individuals that are based on their social category, such as their country of origin, to generalize about the characteristics that those groups of people will possess (Fiske 1998). Actual measures of skill or ability are difficult to obtain before hiring, so in lieu of those, decision makers often fall back on stereotypes which are based on the perceived abilities of a typical worker from an identical social group, in order to draw inferences about the particular job applicant's suitability. For example, Rissing and Castilla (2014) demonstrated how country of origin can act as a cue that decision makers rely on in employment. They investigated the US labor certification process, where immigrant visa seekers were vetted by the Department of Labor for approval to work in the US. They found that the DoL's reviewers were more likely to approve applicants from Asian countries and significantly less likely to approve applicants from Latin American countries, under conditions where little information was available regarding the visa seeker's abilities. However, when auditors were presented with additional relevant job information, they found no differences in the approval rates of visa seekers. This suggested that the outcomes of visa approvals were likely to be the result of the DoL's investigators relying on beliefs they held of stereotypical Latin Americans versus Asian applicants.

More specifically, employers probably develop specific associations, over time, regarding individuals from a particular country and their fitness for particular types of jobs. A historic example can be found in the link between Chinese immigrants and laundry services, which can be traced back to the mid-1800s. After Chinese laborers were excluded by law from many labor-intensive industries, because of a perceived economic threat, they took lower status jobs such as cooking and doing laundry, thereby linking employees of a certain country with a particular set of occupations (Prasso 2005). More recently, individuals may hold perceptions that recent Latin American immigrants are lower-skilled, thereby making them more appropriate for jobs requiring manual labor (Matoo et al 2007). Additionally, the current recognition that Asians are stereotypically associated with “tech industry immigrants” underscores the idea that the pairing of people from particular countries with certain occupations may be reasonable (Lee and Fiske 2006). While it seems reasonable that employers hold beliefs as to how individuals from particular countries are suited to particular jobs, I now turn to an investigation, below, of whether and how employers develop these impressions.

LEARNING FROM POSITIVE VERSUS NEGATIVE HIRING EXPERIENCES

Employers are motivated to resolve hiring uncertainty and one way they attempt to do this is by trying to learn about an employee’s ability, through observing them performing job relevant tasks. For example, trial employment in the form of internships (Sterling 2014, Baron and Kreps 1999) or job screening tests (Autor and Scarborough 2008) represent employer actions to possibly reduce the risk of hiring poor performers. More directly, employers also develop insight into the underlying ability of an employee by observing them on the job. This allows employers to incorporate feedback as to whether an employee did well or poorly on the job as a way of learning about those specific individuals over time (Farmer and Terrell 1996, Oettinger 1996). This dynamic learning process suggests that employers should incorporate employee specific prior experiences into setting their future wages, and that over time employee wages should begin to be less correlated with their level of education, which likely served as a noisy cue at the

point of hire, and more with individual characteristics, such as cognitive skill, an unobserved measure of the underlying ability of the employee (Altonji and Pierret 2001).

Because insight into a job candidate's ability is challenging to obtain, employers are motivated to draw on prior hiring experiences to improve their future hiring decisions. Therefore, experiences with past employees present an opportunity for employers to infer the ability, not just of those specific individuals, but of other individuals from that employee's social group as well. The most straightforward feedback an employer might glean would be whether the particular employee performed poorly or well at their job. On one hand, a negative experience with an employee will most likely be contrary to what the employer had expected. Because a negative experience is unexpected, it acts as a diagnostically useful experience, forcing the employer to consider how they evaluate future job applicants. Following a negative experience, employers will cast about to seek cues as to how a possible hiring mistake may be ameliorated. In evaluating a freelancer, individual measures of skill, such as education and past experiences, will be harder to dispute as they are quantifiable indicators. Employers will be unlikely to alter their beliefs regarding these indicators. However, employer perceptions of the link between unobservable quality and the social group membership of individuals will be easier to re-interpret. Social category membership, such as country of origin, necessarily suggests perceptions of similarity among those individuals, as ultimately, these are what stereotypes are (Fiske 1998). For this reason, a subsequent job candidate's membership in that social category becomes a predictor of a poorer ability following a negative interaction with another individual from that social category. Therefore, a negative event should serve to decrease the likelihood of an employer's subsequently hiring from that social category.

On the other hand, a positive hiring experience should serve to increase the likelihood that an employer will hire from that country in the future. Individuals enjoy positive interactions and would therefore be more likely to seek out future interactions that are also positive (Denrell 2005). In terms of hiring, having a positive experience should serve to improve the impression an employer may have of individuals from the country where they previously hired, and will increase the likelihood of hiring from that country again.

While past positive and negative hiring experiences should both serve to alter an employer's successive hiring decisions, they probably do not exert similar magnitudes of reactions in employers. Negative hiring events should be more important than positive ones because, "a small number of negative experiences may hold especially strong weight in shaping attitudes" (Pager and Karafin 2009: 87 from Fiske (1998)). Therefore, a stronger reaction is more likely to occur following a negative event than a positive or neutral one (Rozin and Royzman 2001). One reason for this negativity effect could be that hiring is a relatively expensive endeavor, leading employers to be more risk adverse. In these instances, employers will attempt to reduce Type 2 errors by avoiding *any* job applicants who may be a poor hire, even at the expense of excluding some possibly good applicants. Losses will therefore loom larger than gains (Kahneman and Tversky 1979) and a negative event is more likely to encourage employers to make bigger changes in how they hire employees than positive ones. Negative events also present disconfirming evidence which serves to make a stronger impression on decision makers than positive events, and which are generally considered confirming evidence doing little to alter a decision-maker's original beliefs (Ross and Anderson 1982). Finally, poor hiring choices present more salient cues about the extent to which negative hiring experiences may be relatively rarer than positive ones. These illusory correlations mean that negative events disproportionately affect observers' constructions of their perceptions, of social groups, because their rarity makes them more memorable. In sum, while employers likely react to both negative and positive hiring events, prior negative events will exert a stronger reaction than prior positive events.

LEARNING FROM SIMILAR VERSUS DISSIMILAR HIRING EXPERIENCES

Jobs vary in their similarity to one another, which should serve to alter how an employer's past hiring experiences affect their future hiring decisions (Leung 2014). Take, for example, the case of feature film actors. Acting in one type of film genre, a particular type of task, most likely requires different skills than acting in a different film genre. The difference in the skills that are required to be successful, in different film genres, leads casting directors to be more likely to hire an actor who has previously worked in an

identical genre than one that has worked in a different one, because the best indicator available to them in making a hiring decision is demonstrated experience in an identical role (Zuckerman et al 2003). This suggests that the reaction an employer will have from their previous hiring experiences should be moderated by the similarity or difference in the subsequent jobs they attempt to hire for.

Following a poor experience of hiring for a certain type of job, employers will believe that employees from that particular country are ill-suited to work on those types of jobs, but perhaps not others. Because the impressions we form are generally case-based (Gilboa and Schmeidler 1995, Gonzalez et al. 2003) we limit the extent of our impressions of past experiences to predict future experiences that are similar in nature. In the case of experiences with employment, a negative hiring experience with a particular freelancer would not necessarily lead us to assume that all freelancers from that country are poor performers. Instead, beliefs regarding poor performance would most likely be relevant to similar subsequent jobs to the one previously hired for. Conversely, employees who perform poorly in one type of job may not influence the impression an employer forms, of those employees, for a different type of job.

Conceptually, we can imagine that the skills necessary to be successful at a certain task comprise of a set of skills which are task specific plus a set of skills which are more general in nature, akin to the dichotomy between firm-specific and general skills Becker (1964) identified. In situations where an employer observes an employee as either successful or unsuccessful in performing a task, the relevance of their observation to subsequent hiring situations will be contingent on how the specific and general skills would translate into the future task. In the case where the employer is hiring for a subsequent job which is identical to the one they previously hired for. In this case, the impression they formed from their previous hiring experience will apply most directly, because both the task specific skills and the general skills they have observed would apply to the future employment decision. For similar jobs, previous hiring experiences should weigh heavily on successive decisions. Conversely, if an employer were hiring for a different job, then the prior experiences they had with an employee would only partially apply. The employer's impression of job specific skills would not be relevant in this case, while their impression of

more general skills would be informative. Therefore, the effect of prior experience on subsequent hiring will be moderated by the similarity or dissimilarity of the prior and successive jobs.

Scope conditions

There are at least four scope conditions worthy of highlighting. Firstly, the employer needs to have memory of prior hiring events. Because learning can only occur when an experience is noted and then reflected upon, the next time a similar event is encountered, employers who are unable to recall past hiring experiences are unlikely to be swayed by past experiences in making subsequent decisions. For example, hiring decisions within an organization may not necessarily be made by the same individuals. In these situations, institutional memory may not persist or may not be recalled appropriately. Even if an employer were willing to update their beliefs regarding the social group with which they had a negative hiring experience, they may not be able to. Secondly, the outcome of an employment decision has to be relatively clear in terms of whether it was a success or not. This may be difficult, for example, when employees work in teams or if their success is less a reflection of their skills and is subject to other factors, such as external market conditions or competitive forces. The less ambiguous the hiring outcome, the clearer the link will be between a cue and ability in the beliefs developed by an employer. Thirdly, employers are only able to alter their hiring choices to the extent they have a choice of job applicants from multiple social categories to hire from. Take the canonical example of gender differences in employment (Ridgeway 1997). Given the prevailing notion that there are generally two salient genders, employers may be limited in altering whether they hire female or male applicants because, simply put, they may not have a choice given who applies. Fourthly, the social category membership under consideration needs to be a visible characteristic during the hiring process. For example, sexual preference may not be a visible social category that employers could use to infer skill during hiring, despite the fact that employers react negatively when attention is drawn to such a cue (Tilcsik 2011).

A GLOBAL MARKET FOR ONLINE FREELANCING

I seek evidence of employer learning using data from an online market for freelancing labor, Elance.com.

Contract workers are a quickly growing labor market role (Cappelli 1999, Barley and Kunda 2004) and highly skilled individuals are consistently faced with the decision of whether to consider temporary employment or not (Bidwell and Briscoe 2009). Temporary “gig-economy” work, in general, and skilled freelancing in particular, have both seen rapid recent growth as an employment relationship. A recent investigation revealed that a full 15.8% of the US Labor force consider themselves employed in non-standard work, in 2015, up from 10.1% in 2005. This includes skilled temporary contract labor and part-time employment (Katz and Krueger 2016). Other estimates, that include individuals who dabble part-time as self-employed freelancers, suggest up to 53 million individuals have attempted to freelance at least part-time (Freelancer Union 2015). While still only a proportion of the overall freelance market, online platforms that enable temporary contract work are growing tremendously quickly (Farrell Greig 2016). Scholars recognize this trend as replacing traditional work relationships with a market-based, on-demand workforce (Cappelli 1999), and industry analysts and consultants have all identified them as being a critical sector of the job market (Gartside et al 2013), leading the popular press to suggest we are in “the age of the virtual worker”.

E lance serves as a worldwide platform to connect employers seeking to hire freelancers with individuals who are willing to work virtually, on a contract basis. Elance, merged with oDesk in 2014 to form UpWork. The combined entity is the largest and oldest online platform in this domain and has completed over \$2 billion worth of transactions, since Elance’s founding in 1999. Today over 200,000 jobs are posted monthly with an average price of \$396 per job. There are over eight million registered employers and over four million registered freelancers¹ representing 223 countries on the platform.

The hiring process

The hiring process begins with an employer filling out a job posting on the website. As illustrated in Figure 1, job postings include basic information describing the scope of the project. This information is structured by the website (not free form text) and includes budget requirements (i.e. <\$500, \$500-\$1000,

¹ Though I refer to all job seekers on this website as freelancers, 72% of them are individuals while 28% of them are firms. Results, run solely on the population of individual freelancers, yield substantially identical results.

etc.), expected timeframe for completion and the specific skills that the employer is seeking. The job posting also includes a text description of the job details.

From the employer’s perspective, all bidders for each job are summarized by their country of origin on the right hand side of the job posting, as shown in Figure 1. This is visible to an employer when they return to the job posting to see who has applied, and it underscores how salient the website makes a freelancer’s country of origin. This particular job posting in Figure 1, for example, attracted seven freelancers from North America and eleven from Eastern Europe and India/Southern Asia (as well as freelancers from other parts of the globe).

[Insert Figure 1 about here]

Job postings are organized into job categories which represent the spectrum of business tasks that can be accomplished virtually. The project listed in Figure 1 is under the job category of “Architecture” and is organized under the domain of “Engineering & Manufacturing” jobs. In all, there are 162 categories of jobs on Elance, examples of which include logo design, website programming, legal advice, and voiceovers. The top 30 job categories, listed in Table 1, represent 75% of all the jobs posted on this platform. A full list appears in the Appendix. Every posted job is required to be listed under one, and only one, of these categories. These job categories are useful because they organize similar tasks into recognized groups and assist freelancers in seeking work, as they can search listings according to the category they are posted. The job categories also assist employers in identifying how the previous experiences of freelancers on the website may be relevant (Leung 2014). Because these categories serve to group similar tasks and to exclude dissimilar ones, they usefully delineate jobs which are similar to one another from jobs which differ from one another. For example, a web programming job would be differ from a logo design job, as the skills required to complete one job differ from the skills required to complete another.

[Insert Table 1 about here]

Once a job posting is published on the website, there are no barriers to applying and any freelancer is able to apply to any job by submitting a job proposal. All freelancer applications are listed

for the employer to view. Figure 2 shows an abbreviated list of the freelancers who applied to the job in Figure 1. At this summary level, an employer can view a freelancer's profile photo, the price at which they are willing to complete the described tasks, along with a summary of the freelancers' qualifications.

[Insert Figure 2 about here]

Note, that the country of origin for each freelancer is prominently displayed in the form of their country's flag as well as the name of the country. The country of origin, for each freelancer, is not ambiguous on this website. Each freelancer is associated with one and only one country. Freelancers on this platform hail from 223 countries and autonomous regions (such as Hong Kong). The top five countries, which account for 75% of the volume of application activity, are the United States, India, Pakistan, Great Britain, and Canada. A list of the top 20 countries, which represents 92% of all application activity, is reported in Table 2. This identifier is accurate as Elance authenticates a freelancer's identity through the use of bank records and their IP address.

[Insert Table 2 about here]

Once freelancers have submitted job proposals, the employer can review each freelancer's application and can see a specific freelancer's background in more detail. See Figure 3 for an example of a detailed freelancer profile. Information regarding the price at which the freelancer is willing to complete the task and details about their background of past jobs and employee ratings are visible to an employer. The detailed freelancer profile also displays their country of origin prominently, in the form of a flag and the name of their country right below their user name, next to their photo. On the right side of the freelancer proposal, are statistics that point to the past successes of the freelancer. The 'level score' is a numerical value that ranges from 0 to 13 (in our observation window) that represents a measure of quality as calculated by Elance. This measure, the algorithm is proprietary to Elance, takes into account information such as the number of jobs a freelancers has completed, the star rating they have received, the number of successful bids as a ratio of unsuccessful ones, as well as private feedback ratings. The statistics on the right side also include the number of jobs the freelancer has completed, the public star

ratings (on a 1-5 scale) they have received from past employers, the number of clients they have had, and their total earnings to date.

[Insert Figure 3 about here]

After applications are submitted, an employer is free to choose to hire whomever they wish. If an employer chooses to hire anyone, 90% of the time they hire just one freelancer, though they are able to hire more. Once a freelancer is hired, employer and employee exchange job details and the job is completed virtually. Payment is completed through the website.

Upon completion of the job, an employer is urged by Elance to submit feedback regarding the freelancer's performance on their job. Feedback is solicited straight after an employer pays for the job and indicates that it is complete. The website displays a screen asking the employer to rate the freelancer on the recently completed job. See Figure 4 for the feedback page that each employer is asked to complete. The first question, "How likely are you to recommend this freelancer to a friend or a colleague?" allows responses from 1-10. Elance uses this question to gather private information regarding whether an employer has had a positive or negative experience with the freelancer they recently hired². It is important to note that the answer to this question is hidden from the freelancer themselves. I use this fact, that an employer can leave private feedback of this nature, to identify whether an employer has had a positive or negative experience with a particular freelancer. Finally, employers also leave star ratings for a freelancer, which are reported in their public profile and listed next to each completed job.

[Insert Figure 4 about here]

Appropriateness of setting

With regard to the scope conditions outlined above, this setting is particularly well-suited to explore the idea of employer learning. Firstly, a vast majority of the employers on this platform are either individuals (42%) or small businesses consisting of <10 employees (43%) (Elance survey 2012). Therefore,

² Functionality on this website has been changing. In the past, the employer was asked, "Would you consider hiring this freelancer again," with choices being "Yes", "Maybe" or, "No". However, an employer may like the performance of a freelancer but have no need to hire them again in the future. The question was reworded to ask about an employer's likelihood of recommending them to a "friend or colleague."

employers will have memory because sequential hiring decision will either be made by the same individual or among very few individuals in an employing organization. Contrast this to hiring in large companies, where decisions are a confluence of input from a variety of different individuals, such as HR intermediaries or multiple interviewers. Experiences will rarely be consistent and information is likely not to be shared broadly.

Secondly, the tasks that freelancers are hired for on this website are well-circumscribed and self-contained – freelancer performance outcomes are therefore unambiguous. By definition, the jobs on this platform are task-based, of a fixed-duration, and produce a specified product. For example, one of the most popular jobs on the platform is logo design –the outcome of which is, simply, a logo. There is therefore dramatically less ambiguity as to how the performance of a freelancer should be evaluated than if we contrast these tasks with the opened-ended performance of other business related jobs. For example, it more difficult to infer ability when hiring a manager, as outcomes may be subject to team dynamics, external market forces, or ambiguous goals. Therefore, the positive or negative impressions that an employer may form of a freelancer are likely attributable to the individual on this platform.

Thirdly, as described above, a very wide breadth of countries is represented in this market, thereby satisfying the fact that employers will be able to choose from a broad range of countries. A large percentage of the active freelancers on this platform reside in twenty different countries. More specifically, each job posting receives applications from an average of six different countries with a maximum of freelancers from 66 different countries bidding for a single job.

Finally, the social category membership of a freelancer’s country of origin is clearly identified and displayed on the platform. Indeed, despite the measures of skill that are provided by the website, inferring underlying freelancer ability from their country of origin is an active discussion topic. While this is an active topic of conversation among bloggers, who discuss hiring strategies on virtual labor market platforms, there are contradictory recommendations. For example, William Shaker, a self-described “thirteen year online business veteran,” writes, in a blog post titled, *How To Effectively Use Elance and Odesk To Outsource Quality People*, that one of his tips is to, “... mostly hire from India and the

Philippines – these people have amazing work ethics and show up when you ask them to.” An in-depth discussion of whether certain freelancers from particular countries possess better skills appears on the website TimeDoctor.com. Under the blog post, *How to Outsource Anything Using 6 Top Outsourcing Website*, their advice is, "In general most of our experiences with workers from India, Bangladesh and Pakistan have been negative ... [they] will often create really poor excuses for not reaching milestones ...". They go on to comment on other countries as well, for example, "Former Soviet Union (Russia, Belarus, Ukraine etc.) – a good place to find low cost, technically superb coders," and freelancers from the, "Philippines – incredibly diligent workers in all areas. It's possible to find good writers, marketers, researchers and programmers." Finally, on the website hostadvice.com, the blog post, *Elance freelancers research 2015 - Which country is the best?* summarizes my point well, by publishing the results of a survey they conducted on which countries provide the best freelancers for certain jobs. While they caution that one should, "refrain from being racist, or attribute some stereotypes on one nation or another," they nevertheless go on to conclude that, "nationality is a clear differentiator." Along with a host of other results from their survey, they provide advice such as, "Don't hire a Canadian designer to do a German designer's work," and answer the question, "Do you need a good programmer?" by suggesting you should, "hire Argentinians and stay away from Australians."

Data and Variables

I examined activity on the website from its inception, in late 1999, through till March 2013. This encompassed 26,694,447 applications from 496,077 freelancers for 2,248,605 jobs posted by 557,416 different employers. I restricted the sample in the following ways. Firstly, employers who have hired a freelancer in the past will have obtained private information about that freelancer's ability or skill. From the time of the website's origin through to March 2013, the average number of freelancers an employer hired was 6.5. This distribution is skewed with a standard deviation of 32.9. 21% of employers have hired six or more freelancers. A decision to hire a previously employed freelancer is therefore confounded by both the potential informational value provided by their country of origin, but also the private information

the employer holds about that job applicant. For example, if freelancers that were employed in the past apply to successive jobs, the employer's prior experience with them could merely alter the likelihood of the employer's hiring *that* freelancer again and not *another* freelancer from the same country. Therefore, including all freelancers will obscure the effect of an employer's experience on *other* freelancers from that country. In order to better isolate the information value of a job applicant's country of origin on their likelihood of being hired, I eliminated all *jobs* where a freelancer applied, who had worked with the employer in the past. I thereby estimate the likelihood that an employer will hire a freelancer among complete sets of job applicants whom they have never employed before. Analyses conducted on the whole sample, by including jobs with previously employed freelancers, do not alter the results.

Secondly, employers reside in 168 different countries, with 70% of the jobs originating from the top five countries which are: the US, India, Great Britain, Canada, and Pakistan. Because of the potential heterogeneity in hiring behaviors among employers from different countries of origin, I isolated my analyses solely to US-based employers. The US is the largest employing country, accounting for 45% of the jobs on this platform. Isolating analyses to one employing country eliminates concerns due to heterogeneity between employer countries that may be reflected in the reactions employers may have on positive and negative experiences with freelancers. Results do not change on the full sample of employers.

Dependent variable

The dependent variable is whether a freelancer was hired for a job, conditional on applying to it. For each of the applications that an employer received for their job posting, I coded the freelancer that was hired as '1' and those that were not as '0'. On average, each job received 12 job applications. The number of applicants ranged from 1 to 877 with a standard deviation of 13.

Independent variables

I used the private response that employers left to the question about whether they would recommend the recently hired freelancer to a friend or a colleague as an indicator of their positive or negative experience

with that freelancer. As described above, responses to this question were stored in the form of a “Yes,” “Maybe,” or “No” and from a 1-10 scale. Of the 157,240 responses to the Yes/Maybe/No feedback posted by employers, 137,460 (87.4%) are “Yes”, 9,432 (6%) are “Maybe”, and 10,348 (6.6%) are “No.” Of the 1,143,921 responses posted by employers on the 1-10 scale, 14,017 (1.23%) were a ‘1’ while 959,498 (83.9%) of responses were ‘10’, suggesting positive experiences were the modal response employers had with the freelancers they hired. Because the Yes/Maybe/No scale only accounted for 10% of observed employer feedback with the 1-10 scale accounting for the remaining 90%, I included both scales into one measure of negative or positive feedback. Analyses run on the Yes, No, Maybe scale and the 1-10 scale separately do not differ from the results of the combined scale. Figure 5 reports the distribution of responses.

[Insert Figure 5 about here]

Because responses were so skewed, I focused on the extremes. Specifically, I considered a “No” response and a ‘1’ response to indicate that the employer had had a negative experience with that freelancer. Responses of “Yes” or “10” were coded as a positive experience³. I created two time-varying indicators for each employer as to whether they had *any previous negative* experiences with freelancers from a particular country and whether they had *any previous positive* experiences with freelancers from a particular country. These indicators were set to 0, until the employer indicated their first negative or positive experience, after which they were coded as 1. Theoretically, first impressions are such a strong indicator of any future perceptions an observer may hold, that an indicator seemed most appropriate (Tetlock 1983). Empirically, log-likelihood tests conclude that the use of an indicator variable to capture positive and negative experiences results in a statistically significant better model fit than the use of a cumulative sum or the logged cumulative sum of positive and negative experiences.

In order to investigate effects of similar versus dissimilar jobs, I created four indicator variables of positive and negative experiences, in and out of the focal job category that the employer was hiring for.

³ Sensitivity analyses show different coding methods, i.e. 1-2 as negative and 9-10 as positive, do not alter results. Results of yes, no, maybe alone mimic results of the 1-10 scale.

Recall that all jobs on the website are categorized into one, and only one, job category. I use this categorization system as a proxy for the similarity and dissimilarity of jobs that employers hire for, with the assumption that jobs in identical job categories are probably more similar to one another than jobs in different job categories (Leung 2014). Specifically, I created a variable indicating whether the employer had previously had a *negative hiring experience* from a particular country *in the focal job category* they were hiring for. I created another variable indicating whether the employer had had a previous *negative hiring experience* from a particular country *outside of the focal job category* they were hiring for. I also created variables indicating whether the employer had previously had a *positive experience hiring* from the country *in the focal job category* they were currently hiring for and a variable indicating whether the employer had previously had a *positive experience hiring* from a particular country *outside the focal job category* they were currently hiring for.

Control variables

I included controls at the level of the bidder, the country they were from, and the employer. For the bidding freelancer, I included an indicator as to whether they had a free account (which limits the number of bids they can place), a time-varying count of the number of previous jobs they had completed before placing their bid (as a measure of experience (+0.01 and logged)); their time-varying level score and an indicator as to whether they had no level score (=1), a time-varying star ratings (as measures of quality) and an indicator as to whether they had ANY star rating (=1); the amount of their bid in USD (+\$0.01 and logged to account for \$0 bids) and an indicator as to whether the freelancer bid \$0 (=1). In order to account for potential time-varying levels of competition and quality from a freelancer's fellow countrymen, I included the number of other bidders, from this country, for this job as a measure of the competition any individual bidder may face as it pertains to their fellow freelancers. I also included the time-varying average level score of all freelancers from that country, as a measure of overall country quality bidding on the job at a particular time. At the level of the employer, I included the time-varying

number of freelancers (+0.01, logged) they had previously hired in total, from a specific country, as employers likely repeat hiring habits.

Freelancers from different countries vary in quality in ways that may not be observable to a researcher, but are visible to an employer – therefore affecting the results. For example, poor grammar or spelling in their job applications could signal poorer freelancer skills in a particular country. The top 20 countries accounted for 92% of all bidding activity in this market and I addressed these concerns by including dummy indicators for the top 20 countries and a single indicator variable for freelancers from all the remaining countries (with Freelancers from the US as the omitted category). Therefore any variation we observe will be within-country and will take into account any time invariant heterogeneity among countries. Summary statistics and correlations appear in Tables 3a and 3b.

[Insert Tables 3a and 3b about here]

MODEL AND RESULTS

I test whether, and how, past negative and positive experiences with freelancers alters an employer’s likelihood of hiring a freelancer from that country again by regressing the indicator of prior negative and positive experiences an employer has had with freelancers from particular countries on whether a freelancer was hired. Specifically, I estimate the following two models:

$$\text{Hired}_{ijkl} = \beta_1 * \text{PriorNegExp}_{ij} + \beta_2 * \text{PriorPosExp}_{ij} + \beta_3 * \text{FreelancerControls}_i + \beta_4 * \text{CountryControls}_k + \beta_5 * \text{EmployerControls}_i + \gamma_k + \varepsilon_k \text{ (Model 1)}$$

$$\text{Hired}_{ijkl} = \beta_1 * \text{PriorNegExpInCategory}_{ij} + \beta_2 * \text{PriorNegExpNotInCategory}_{ij} + \beta_3 * \text{PriorPosExpInCategory}_{ij} + \beta_4 * \text{PriorPosExpNotInCategory}_{ij} + \beta_5 * \text{FreelancerControls}_i + \beta_6 * \text{CountryControls}_k + \beta_7 * \text{EmployerControls}_i + \gamma_k + \varepsilon_k \text{ (Model 2)}$$

Where the likelihood of freelancer ‘i’, from country ‘j’, applying for job ‘k’, listed by employer ‘l’ to be hired is a function of whether employer ‘l’ has had a Prior Negative or Prior Positive experience with freelancers from country ‘j’ before posting job ‘k’. I include vectors of controls for the freelancer, the country where they reside and the employer. Finally, γ_k represents job fixed-effects and ε_k the error term. Model 1 examines the effect of positive and negative prior experiences. I expect that $\beta_1 < 0 < \beta_2$, suggesting that employers are less likely to hire another freelancer if they had a negative past experience

with others from that country and more likely to hire a freelancer from that country if they had a prior positive experience versus no experience. Furthermore, I expect $|\beta_1| > |\beta_2|$, because negative experiences will exert a stronger effect on subsequent hiring than positive ones. Model 2 tests the differential effects of similar and dissimilar prior hiring experiences. I expected that $\beta_1 < \beta_2 < 0$ and $0 < \beta_4 < \beta_3$, because prior hiring experiences in identical job categories will exert a greater effect on subsequent hiring dissimilar ones.

Because the outcome is dichotomous, with either '1' for winning the bid and '0' otherwise and because freelancers can only be hired for jobs they have applied to, I model this as a conditional logit regression clustered by job posting, a McFadden choice model (1974). The conditional logit should allay concerns that freelancers from different countries apply to different kinds of jobs. Any general differences, between different types of jobs and different types of job categories, are unlikely to drive the empirical patterns. The main source of identifying variation is within-country differences in the prior negative or positive hiring experiences employers have had with them.

Results

Conditional logit estimates predicting if a freelancer was hired are reported in Table 4. Model 1 includes estimates for the control variables only. Overall, free accounts are less likely to be hired than paid accounts. Applicants who have more experience, and who possess a higher level score (indicators for experience and quality) are more likely to be hired. Interestingly, freelancers with no level score are more likely to be hired, perhaps indicating the willingness of employers to hire less experienced/new people. Star ratings exert a positive effect on hiring as does having ANY feedback at all, likely because a non-rating is considered an implicit negative rating. The effect of the amount bid is negative and significant, so employers prefer to pay less, all else equal. However, freelancers who bid \$0 are significantly less likely to be hired, probably because such a low bid indicates a lack of confidence, desperation, or lack of skills. At the level of the country, the greater the competition from other freelancers from the same country as an applicant, the less likely that freelancer will be chosen, suggesting that employers are

sensitive to within country competition. The average level score for each country decreases the likelihood of any freelancer from that country being hired, perhaps due to increase in quality of competition from others from the freelancer's country. Finally, at the level of the employer, the number of freelancers from the focal country they have hired, the more probable it is that they will continue to hire from that country.

[Insert Table 4 about here]

To test how employers respond to prior hiring experiences, I included the two indicators for prior positive and negative experiences that an employer has had with freelancers from a country separately in Models 2 and 3 and together in Model 4. In Model 4 the estimated effect of a prior negative experience is negative and significant ($\beta=-0.13$, $\sigma= 0.02$) demonstrating that employers pay attention to their prior hiring experiences by incorporating the negative experiences into their subsequent hiring decisions. Specifically, if an employer increases from no negative experience to at least one negative hiring experience they are, holding all other variables at their means, 14% ($1/\exp[-0.13]$) less likely to hire an applicant from that country again, for any type of job. Note, comparing this effect to the base rate of hiring of 8% suggests that prior experiences substantially alter future hiring preferences. Conversely, prior positive experiences that an employer has had with freelancers from a particular country significantly increase their likelihood of hiring another freelancer from that country for any job ($\beta=0.08$, $\sigma= 0.01$). Substantively, going from no positive hiring experiences to at least one positive hiring experience increases the likelihood of a freelancer from that country being hired by 8% ($\exp[0.08]$), holding all other variables constant at their means. Therefore, employers seem to respond as expected following negative and positive hiring experiences. Furthermore, post estimation tests comparing the magnitudes of the coefficient of prior negative and prior positive hiring experiences demonstrate that prior negative experiences exert a significantly stronger effect on subsequent hiring than prior positive experiences ($\chi^2 = 3.86$, $p<0.05$), thereby demonstrating that negative experience exert a considerably greater effect than positive ones do in altering future hiring behavior.

Results of tests for how similar and dissimilar prior experiences may moderate this effect are reported in Table 5. Model 1 includes the separate indicator variables of any prior negative experiences in an identical job category and outside of that job category, Model 2 includes separate indicator variables for any prior positive experiences, and Model 3 includes all four variables. Results in Model 3 support the idea that similar prior jobs exert a greater effect than dissimilar jobs. The effects are illustrated in Figure 6, where I plot the differential magnitudes of going from no prior experience to having any prior negative or positive hiring experiences, for similar versus dissimilar jobs, on the likelihood of hiring a subsequent freelancer from that country (holding other variables constant at their means).

Specifically, prior negative experience in a similar job leads an employer to be less likely to hire a freelancer from that country again, but at a much lower likelihood than prior negative experiences with dissimilar jobs ($\beta=-0.65$ versus $\beta=-0.07$). Post estimation tests conclude that the effect on subsequent hiring, following negative experiences with a country in the focal job category, is significantly greater than the effect of prior negative experiences with a country in a different job category ($\chi^2 = 56.7$, $p<0.001$). Substantively, having any prior negative hiring experience decreases the likelihood of that employer hiring another freelancer, from that same country for an identical job, by a dramatic 92% ($1/\exp[-0.65]$) than having no previous negative hiring experience from that country for that job. Compared to this there is a 7.3% ($1/\exp[-0.07]$) reduction in the likelihood of employers hiring freelancers from a country where an employer had a prior negative hiring experience for a dissimilar job.

Conversely, employers are significantly more likely to hire a freelancer from the same country, following a positive experience with a freelancer from that country, for a similar job compared to their hiring for a subsequent dissimilar job ($\beta=0.21$ versus $\beta=0.03$, ($\chi^2 = 363.8$, $p<0.001$)). Substantively, this suggests that employers are 23% ($\exp[0.21]$) more likely to hire a freelancer, following a positive hiring experience with a freelancer from that country, for a similar job. On the other hand, employers are 3% ($\exp[0.03]$) more likely to hire a freelancer from a country where they have had a prior positive experience, if it was in a dissimilar job category.

[Insert Table 5 about here]

[Insert Figure 6 about here]

Additional considerations

Are these results endogenous to the employer's hiring experience? The employer action of leaving negative or positive feedback for previous freelancers could change the quality or quantity of freelancers who subsequently apply, suggesting that the results are not a function of learning, but rather changes to employer opportunities to hire. While the "would work with again" ratings were private, star ratings are public. The negative or positive private feedback that is left by employers is correlated with the public star ratings they leave for freelancers, after a job is complete. This is observable to other freelancers and could possibly alter their likelihood of applying to an employer's subsequent job. This has the potential of differentially affecting the pool of applicants an employer receives, as a function of their experiences. Employers may therefore receive more or fewer freelancers applying from particular countries or receive lower or higher quality freelancers applying.

The regressions above include controls for the number of applicants from each country, the overall quality of the applicants from that country and also all observable indicators of freelancer quality, which should guard against this issue. However, to further allay concerns, I investigate whether a poor (good) review by an employer negatively (positively) affects the overall observable quantity and quality of the applicants from that country. I estimate two dependent variables. Firstly, I estimate the number of applicants from a particular country for a particular job, as a quantity measure. Secondly, I estimate the average level score of all applicants from a particular country who applied to a particular job, as a measure of quality. The independent variable of interest is the indicator that an employer has had a negative or positive prior hiring experience with freelancers from that country. I modeled the count of job applicants by country with a Poisson regression⁴ and I modeled the level score dependent variable with an

⁴ Employers do not receive applicants from all countries for all jobs. Because there are so many countries, it is probable that an employer will receive no applications for a job posting from freelancers in smaller countries. To guard against this, I also modeled this as a logistic regression with 1 indicating whether ANY freelancer from a particular country applied and a 0 indicating no freelancer from that country applied. Conditional on the employer receiving any applicants from that country in

OLS. To account for employer heterogeneity, in their feedback activity and also job-type heterogeneity, I ran within-employer and within job-category fixed-effects models. Results, unreported for the sake of brevity, demonstrate that leaving positive or negative feedback does not substantively alter the quality or quantity of the set of job applicants from a particular county that an employer receives in the future.

Readers may be concerned that employers who had a negative experience differ from those that did not. For example, employers without any recorded hiring reactions are significantly less active than those that have. I account for this in two ways. Firstly, I created a matched sample with the CEM procedure in Stata 12.0 and ran identical models, reported in Table 4. Specifically, I matched employers by the total number of jobs they have hired for on the website, the total number of different job categories they have hired across, and also by the total number of different countries – thereby more stringently controlling for the size of the employer, the breadth of their hiring needs, and the variety of freelancers they have hired in the past. Results that are unreported, for the sake of brevity, continue to yield identical results. Secondly, I also accounted for this by estimating within employer fixed-effects models. This does not consider those employers who have not had a negative hiring experience and allows me to control for the time-invariant differences among employers. Unreported results demonstrate that the expected effects continue to persist in the employer-fixed effects regression.

IMPLICATIONS FOR EMPLOYERS AND APPLICANTS

These results raise additional questions about the implications these employers' experiences have on both employers and employees. From an employer's perspective, a motivating factor in altering their hiring preferences is to improve the applicants they hire. Does switching the country they subsequently hire from, as a reaction to a previous negative experience, result in hiring from a country populated with less negatively rated freelancers? From the perspective of the job applicant, the negative and positive hiring experiences employers have alter the wages they may be able to demand, in compensation for the change

past job postings, results, unreported for brevity, demonstrate there is still no effect of ratings on subsequent applicants from that country.

in their likelihood of being hired. How much do job applicants have to alter their bids by, in order to compensate for the positive and negative impressions employer's form of freelancers from their country?

Country switching following negative experiences

Employers were dramatically less likely to hire from a country following any negative experience with a freelancer from that country. They likely do so in the hopes of hiring from a new country with a lower proportion of poorly rated freelancers, thereby increasing the likelihood of hiring a better freelancer.

Switching countries may be a reasonable hiring strategy for at least two reasons. Firstly, hiring repeatedly to sample a specific country is probably costly. The expense of hiring a large enough sample to accurately assess the underlying distribution of freelancer ability in a country may mean employers have to react to very few (or one) negative experiences. Another perspective could be that there is little downside risk to switching as a hiring and learning strategy because not hiring from a social category considered 'bad' does not necessarily result in any realized penalties. For example, in this setting, there are enough countries represented that it is costless to ignore a country after one poor hiring experience.

Conversely, we know accurate inferences are impossible to draw from such a relatively small sample (1 in most cases). Yet, decision makers often draw correlations between factors that are likely unrelated in forming their superstitious beliefs (Pernell-Gallagher 2015). Invariably, inferences made from a single negative hiring experience are unlikely to convey accurate information regarding the actual underlying ability of a whole social category of individuals, so decision are made prematurely. Second, the actual differences between social groups are likely much smaller than employers may suspect (Pager and Karafin 2009), which suggests that extreme reactions may not result in markedly better outcomes. Therefore, employers who react to negative hiring experiences, especially small samples, are likely to be overemphasizing the negative experience. Altering hiring behaviors and avoiding the country from where an employer has had a previous negative experience is unlikely to lead to hiring from a country populated with a larger proportion of better rated freelancers.

To investigate this I compared the countries, where a negative employment outcome was experienced, to the countries employers hired from after this negative experience. I first identified poor freelancers among the complete population of job seekers who have completed at least one job on the website, as those who received *any* negative feedback, defined as a ‘1’ rating⁵. I then calculated the percentage of non-poorly rated freelancers in each country and assigned this value to that country. The distribution of percentage of non-poorly rated freelancers is reported in Figure 7. Most freelancers are tightly clustered at the 98% mark, suggesting there is little variation among freelancers from different countries. There is a long tail of freelancers who hail from countries with a large proportion of poorly rated freelancers, but these are very small countries and the distribution reflects that. For example, the worst countries are Liberia and Guinea which consist of 50% of the freelancers who received a poor rating, of which there are a total of six individuals. Freelancers from the largest countries such as the US and India have a higher proportion of good freelancers and are also at or close to the average. The United States is the modal country, with exactly 98.02% of freelancers who have not been rated poorly.

[Insert Figure 7 about here]

Of the total 24,365 negative hiring experiences, 16,462 of them resulted in an employer changing the country they hired from on a subsequent job⁶. A test of the difference of means, reported in Model 1 in Table 6, of the percent of good freelancers between the first country, with a negative hiring experience, compared with the subsequent country that the employer hired from demonstrate no differences (Diff=2.0e-06, σ =0.0002, p =0.992). Employers who change countries do not subsequently hire from a country with a higher percentage of ‘good’ freelancers. Perhaps employers may be more successful while gradually changing countries to hire from. In this case, the first switch may not yield better results but subsequent ones might? I partition the results between the first switch and subsequent switches. Model 2 reports only the first switches; that is the initial bad experience an employer had. In Model 3, I examine

⁵ I choose to examine poorly rated freelancers because the modal outcome is a positively rated freelancer, so negative ratings are more salient. This is a conservative way to identify good and bad freelancers because there are likely fewer bad freelancers, as this is an extreme way to distinguish them. This would only serve to strengthen my results because the distribution of skill among countries will further narrow. Calculating the percent of freelancers from each country who received ‘10’ does not change results.

⁶ A non-switch effectively yields an identical barrel to draw from, so if they were treated as ‘switches’ it would effectively be zero improvement.

the subsequent switches occurring after the first one⁷. Results in both Models 2 and 3 yield substantively identical results; employers' switching countries to hire from does not result in hiring from countries populated by a lower percentage of poorly rated freelancers, whether after the first negative experience (Diff=1.5e-05, σ =0.0003, p=0.953) or after subsequent ones (Diff=-3.4e-05, σ =0.0003, p=0.908).

[Insert Table 4 about here]

Compensating negative and positive experiences with change in amount bid

The models demonstrate that negative prior experiences reduce the likelihood that a subsequent job applicant will be hired, controlling for all observable measures of ability. Positive prior experiences result in the opposite effect. An interesting implication is the impact these experiences have on the change in the bidding amount that subsequent job applicants, from these countries, would need to propose, in order to realize an identical likelihood of being hired compared to applicants from countries where the employer had no such positive or negative experiences.

To investigate this, I follow the technique outlined by Dahl and Sorenson (2010) and calculate the point at which an average job applicant would be equally likely to be hired by an employer due to an decrease or increase in the amount they bid ($\Delta_{\text{bid amount}}$) following a negative or positive experience, respectively:

$$\beta_{\text{bid amount}} \Delta_{\text{bid amount}} = \beta_{\text{negative}} \text{ and } \beta_{\text{bid amount}} \Delta_{\text{bid amount}} = \beta_{\text{positive}},$$

where $\beta_{\text{bid amount}}$, β_{negative} , and β_{positive} are the conditional logit coefficients for, respectively, the effect of the amount bid on a job, the effect of a prior negative hiring experience, and the effect of a prior positive hiring experience. Because the amount requested was specified in terms of logged amount, the trade-off expected will vary as a function of prior negative or positive experiences. The effect of negative and positive prior experiences on the amount required can be interpreted as follows:

⁷ Model 3 switches are therefore conditional on employers having more than one bad experience.

$$\Delta_{\text{bid amount}} = \exp^{\frac{\beta_{\text{negative}}}{\text{bid amount}}} \text{ and}$$

$$\Delta_{\text{bid amount}} = \exp^{\frac{\beta_{\text{positive}}}{\text{bid amount}}}.$$

The above equations produce, in percentage differences, the change in the amount of the bid required to reach parity in an applicant's likelihood of being hired and residing in a country where the employer subsequently had a negative or positive experience, respectively. We can quantify these changes into dollar equivalents by calculating the percent change at the average bid amount accepted for each job. Results of these calculations, as deviations from \$396, which is the average amount of a winning bid, are reported in Figure 8.

[Insert Figure 8 about here]

Specifically, if an applicant hailed from a country where the employer had had a prior negative experience in the job category they were currently hiring for, they would have to offer to work for \$105, compared to the average wage paid for all jobs of \$396, in order to compensate for that negative experience and to be as equally likely to be hired as a freelancer from a country where the employer had no negative experience. Applicants from countries where an employer had had a prior negative experience, but not in the job category they were currently hiring for, needed to be willing to work for \$305, a discount which reflected the weaker effect a negative experience had on hiring for a different job. The impact of negative hiring experiences on subsequent freelancers' abilities to bid was large; reflecting how loss averse employers are.

Conversely, prior positive experiences increased the likelihood that an employer would hire another freelancer from that country. This preference resulted in a freelancer being able to increase their bid to \$608 if the positive experience was in an identical job category, or to increase their bid to \$421 (both from the average job price of \$396) and still remain as equally likely to be hired as an equivalent freelancer from a country from where an employer has had no prior experience. While still substantial, positive experiences do not exert as dramatic an impact on job applicant wages as negative experiences.

DISCUSSION AND CONCLUSION

I framed hiring as an experiential learning process and investigated whether employers responded to past hiring experiences by altering their subsequent hiring decisions in the employment of temporary contract workers on an online platform for gig-economy freelancers. My investigation revealed that employers are much less likely to hire a job applicant from a particular social group, in my case country of origin, following prior negative hiring experiences with freelancers from those countries. Positive prior experiences increased their likelihood of further hiring freelancers from that country. However, these effects were not symmetric: negative experiences exerted a stronger effect than positive ones. More interestingly, I also demonstrated that these prior positive and negative experiences were moderated by how similar the prior experiences were to the job the employers were subsequently hiring for. Employers' prior experiences with freelancers, for jobs that are more similar to the ones they were currently hiring for, exerted a substantially stronger effect than prior experience hiring for different jobs. This was the case for both negative and positive prior experiences.

Additional analyses explored the fact that the negative reactions that the employers adopted, by hiring freelancers from a different country, did not seem to result in their hiring from countries with a lower proportion of negatively rated freelancers. An investigation into the impact of these experiences on the subsequent bids that job applicants would need to offer in order to compensate for these employer reactions revealed that prior negative experiences required unrealistically lower negative bids (3.7 times lower than the average job wage). The freelancer had to offer a lower bid in order to ensure they would have an equal likelihood of being hired, as an identical freelancer with whom the employer had not had a prior negative experience, for a similar job. Prior positive experiences allowed freelancers to bid slightly lower than equally qualified freelancers from countries where the employer had no prior experience.

The distribution of the responses by employers on this platform was skewed, with the majority of responses being positive and very few negative ones. This could be associated with the fact that an employer's prior notion of the underlying distribution of freelancer ability is mostly positive, in which case a negative experience would reasonably taint their beliefs dramatically. Would the results change if

the underlying distribution of responses was different? Part of the mechanism behind how negative experiences elicit a stronger reaction than positive ones is due to their rarity. However, if the domain under study were one where positive and negative events were equally likely, then we may expect results to differ. For example, perhaps employers of unskilled labor are equally likely to encounter good and bad employees (Pager et al 2009). Then reactions to positive and negative hiring experiences may be more balanced because a negative hiring experience will not be as rare, thereby providing less insight into an employee's social group. Future work can investigate settings where the distribution of workers is less skewed to see if employers would be less sensitive to these asymmetric effects I observe.

This investigation informs several streams of research. Firstly, it clearly addresses the literature on discrimination in labor markets. It has been challenging to identify the mechanisms that contribute to the hiring disadvantages individuals from particular social groups face. This paper points to one potential avenue of investigation, that employer past experiences may impact their future hiring decisions (Pager and Karafin 2009). This perspective departs from either the notion that beliefs are *ex ante* determined or motivated by in-group dominance. Instead, employer beliefs are portrayed as a result of a *cognitive process* that informs their decisions over time. Without a perspective as to how these experiences may come about, we limit not only our theoretical understanding of these phenomena but the possible opportunities to correct them (Reskin 2000).

While the investigation here centered on hiring as a function of a job applicant's country of origin, we can clearly draw implications to other social categories, such as race or gender. For example, we know that employers likely hold perceptions of gender and success at certain jobs being correlated; such as women being ill-suited for technical jobs and better-suited to writing tasks. Perhaps these impressions are formed as a function of societal expectations and norms. However, we could speculate that employer impressions may be able to be altered through the hiring of women for non-typically female jobs and that the rarity of women being hired for non-traditional jobs could be what contributes to the persistence of such beliefs. Yet, policies that may induce employers to hire non-traditional applicants may backfire if those applicants are not similarly qualified. As my findings suggest, potential negative

experiences exert substantial reactions. So while perceptions are likely malleable, and positive reactions are more likely, interactions themselves may not always produce the desired affects (Allport 1954).

Secondly, it highlights the potential endogeneity of impression formation due to the choices we make to sample, or not, individuals from particular social groups (Denrell 2005). In the abstract, if employers hired an adequate cross-sample of job applicants then the inferences they draw would better reflect the underlying skill distributions among different social categories more closely. Unfortunately, as Denrell (2005) pointed out, and as my results demonstrate, the process of sampling employees is highly restricted. Because the impressions employers form of applicants from particular social categories are limited to whom they hire, and to the extent that hiring and observing employees is a relatively expensive undertaking, then the impressions employers form will probably be drawn from relatively few instances. The fact that any negative hiring experience dramatically dissuades employers from subsequently hiring job applicants from that social category means that an employer will be at risk of developing severely poorly informed beliefs.

More alarming is the implication if employers are already predisposed to harbor positive or negative sentiments about applicants from particular social groups and are very unlikely, given these findings, to update them in the future. One scenario holds that employers are prone to hold lower expectations for performance of particular groups, even if actual ability does not vary (Correll et al 2007). In these instances, even hiring an employee of a negatively perceived social group would lead employers to not only be likely to rate them poorly, but also to use that experience to consider not hiring members from that group again, thereby leaving their negative impression fixed. For example, take the relatively well-entrenched beliefs that employers may already hold regarding African American (Pager and Karafin 2009) or female (Ridgeway 1997, Fernandez Mateo 2009) job seekers that would be much more difficult to overcome. This is particularly true given the findings of this paper, which suggest that employers would be highly unlikely to consider hiring again from those specific social groups where they had a poor previous experience. If evaluations of an individual's performance is biased by preconceived notions, it is reasonable to extend these findings to explain why discriminatory beliefs continue to persist.

Finally, my paper also contributes clearly to the more nascent stream of work that has investigated the phenomenon of the rise in temporary contract work, or the “gig” economy, as a consequential labor market category of the workforce (Cappelli 1999, Barley and Kunda 2004, Katz and Krueger 2016) and more specifically, the impact of virtual platforms on both workers and employers. Temporary contract work induces employees to be constantly searching for new jobs to apply to. An understanding into how employees may process these applications, and the perspectives they may bring to evaluating them, provide us with insight into the challenges that a large temporary contract workforce may face. For example, the paradigm that complete transparency will allow employers to make the ‘best’ decisions may be called into question by my findings, because employers do not seem to ‘use’ the information to their best advantage. Instead, this could suggest that guided application matching on the part of the virtual platform, to better identify appropriate workers through the use of algorithms, may be a viable point to investigate.

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FIGURE 1
JOB POSTING

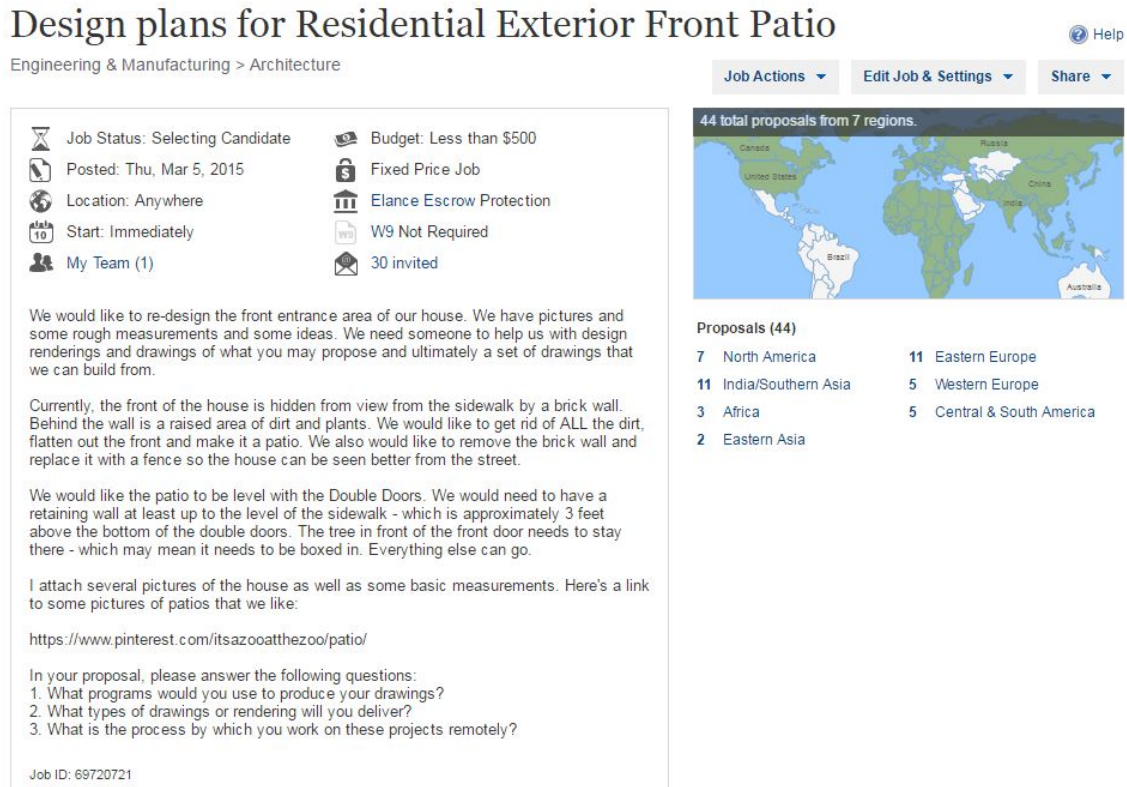


TABLE 1
TOP 30 JOB CATEGORIES
(75% OF TOTAL JOBS, N=2,248,605)

Job Category	Volume	Percent	Job Category	Volume	Percent
Web Programming	253,386	11.3%	Simple Website	31,290	1.4%
Web Design	224,481	10.0%	Database Development	31,252	1.4%
Logo Design	143,125	6.4%	Copywriting	30,434	1.4%
Graphic Design	112,396	5.0%	Virtual Assistant	29,607	1.3%
Article Writing	112,145	5.0%	E-books and Blogs	29,407	1.3%
Web Content	76,546	3.4%	Editing & Proofreading	27,913	1.2%
Website Development	67,243	3.0%	Illustration	27,042	1.2%
Application Development	58,330	2.6%	Writing Services	25,919	1.2%
Data Entry	46,967	2.1%	Transcription	20,443	0.9%
SEO & SEM	42,537	1.9%	Academic Writing	20,429	0.9%
Handhelds & PDAs	38,259	1.7%	Search & Online Marketing	19,340	0.9%
Translation	35,509	1.6%	Brochures	18,789	0.8%
Design	35,068	1.6%	Videography & Editing	18,537	0.8%
Blogs	34,577	1.5%	Page & Book Design	18,050	0.8%
Research	33,861	1.5%	Ghost Writing	17,785	0.8%

FIGURE 2
JOB APPLICANT LIST

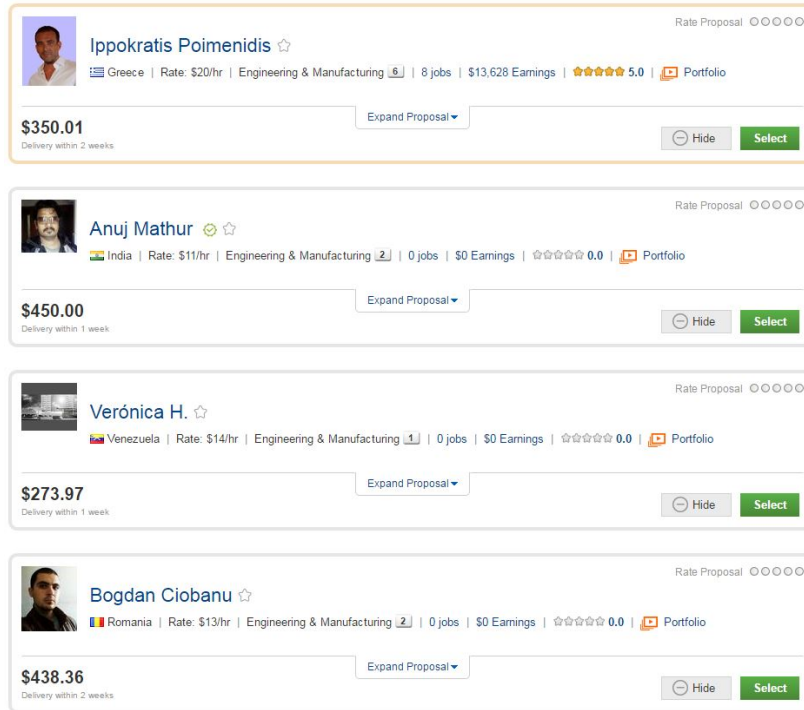



TABLE 2
TOP 20 COUNTRIES BY NUMBER OF APPLICATIONS
(91% OF THE 26,694,447 APPLICATIONS MADE BETWEEN 1999-2013)

Country	Number Applications	Percent	Country	Number Applications	Percent
United States	8,118,342	30.4%	Bulgaria	334,936	1.3%
India	8,027,371	30.1%	China	311,648	1.2%
Pakistan	2,291,951	8.6%	Russian Federation	265,759	1.0%
Great Britain	880,867	3.3%	Indonesia	137,270	0.5%
Canada	866,507	3.2%	France	127,931	0.5%
Romania	626,617	2.3%	Serbia	125,456	0.5%
Australia	486,154	1.8%	Sri Lanka	114,546	0.4%
Philippines	482,509	1.8%	Ukraine	110,291	0.4%
Bangladesh	390,900	1.5%	Spain	100,200	0.4%
Argentina	357,267	1.3%	Italy	99,519	0.4%

FIGURE 3
FREELANCER PROFILE PAGE



Overview

Job History

Portfolio

Resume/C.V.

Add to Watch List

[Tweet](#) [G+](#) [Like](#)

Last Sign-in: Mar 16, 2016

Ippokratis Poimenidis

Architecture, Modeling, Rendering, Drafting

Greece | Athens, Attica | 12:57 am Local Time

Overview

Minimum Hourly Rate \$20

I am an experienced ARCHITECT in design & construction and awarded internationally CAD EXPERT.

I have designed, drafted and modeled almost every kind of building. Although I am an Architect, I have a strong understanding of Structural and MEP design.

Fluent in English, available on PHONE, VIBER, SKYPE, HANGOUTS, EMAIL.

I have completed successful projects all over the world. Some of them are:

- Four Seasons Hotel in Sharm el Sheikh, Egypt
- Residencies in Blue City, Oman
- Mon Repos ex-Palace restoration in Corfu Greece
- General Hospital...

[Read More »](#)

Job History

Private Job
 Dec 30, 2015 | Architecture | \$440 | Completed | ★★★★★ 5.0

Consulting on Development of Small Housing Units
 Dec 22, 2015 | Architecture | \$1,130 | Completed | ★★★★★ 5.0

Private Job
 Jul 9, 2015 | Architecture | \$200 | Completed | ★★★★★ 5.0

Private Job
 Jun 28, 2015 | 3D Modelling | \$50 | Completed

Hire Me »

My Snapshot

Engineering & Mfg. LEVEL 6

12 months | Lifetime

Jobs	8	Total
	11	Milestones
	711	Hours
Reviews	3	★★★★★ 5.0
	N/A	Recommend
Clients	6	Total
	50%	Repeat
Earnings	\$13,628	Total
	\$2,271	Per Client

Identity

Username: ipomenidis

Type: Individual

Member Since: July 2014

Ealance URL: http://ipomenidis.elance.c

Verifications: \$ 📞 🌐 0

FIGURE 4
FREELANCER JOB FEEDBACK PAGE

How likely are you to recommend this freelancer to a friend or a colleague?



Your Feedback Rating of liuhz:

Overall Rating: 5 (Positive)

What does this rating mean?

- 4.0 - 5.0 Positive
- 3.0 - 3.9 Neutral
- 1.0 - 2.9 Negative

How is overall rating calculated [?](#)

Quality of work: 5—Quality of work above expectations.



Responsiveness: 5—Response immediate (within 12 hrs.) Proactive updates.



Professionalism: 5—Very professional, with polished communication and style.



Subject Matter Expertise: 5—Very competent. An expert in the field.



Adherence to Cost: 5—Hit the budget exactly, or better.



Adherence to Schedule: 5—Project exactly on schedule (if not before).



FIGURE 5
DISTRIBUTION OF FEEDBACK REPOSSES

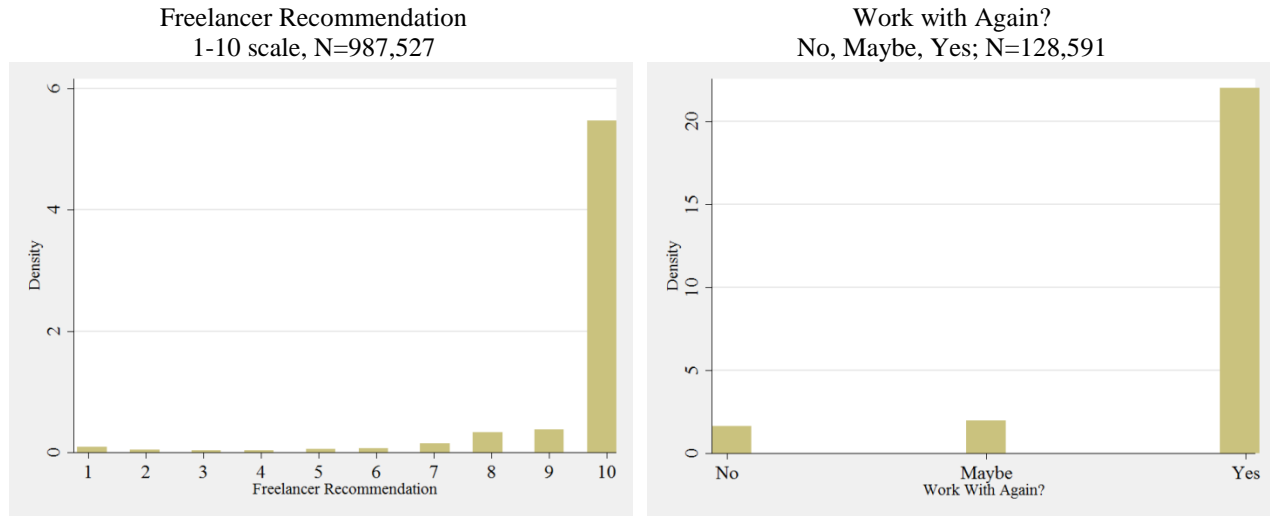


TABLE 3A
SUMMARY STATISTICS
N=26,421,726

Variable	Mean	Std. Dev.	Min	Max
Hired (=1)	0.1663	0.3724	0	1
Free Account Bidder (=1)	0.2914	0.4544	0	1
Number of previous jobs (logged)	2.5646	3.4295	-4.6051	9.6610
Amount of bid (logged, in USD)	4.5143	3.0436	-4.6051	29.3861
Bid \$0 (=1)	0.0847	0.2784	0	1
No Level Score (=1)	0.4033	0.4905	0	1
Level Score	3.3018	3.7474	0	18
Has Star Rating (=1)	0.8256	0.3794	0	1
Star rating	3.6593	1.7400	0	5
Number bidders from same country	8.0545	10.599	1	391
Average level score of bidders from this country	2.2388	1.8583	0	16.1453
Number Previously Hired from Freelancer Country (logged)	-2.5662	2.6697	-4.6051	7.7608
Employer/Freelancer from same country (=1)	0.0379	0.1910	0	1
Had Prior Negative Country Experience (=1)	0.0204	0.1414	0	1
Had Prior Positive Country Experience (=1)	0.3040	0.4600	0	1
Had Prior Similar Negative Country Experience (=1)	0.0021	0.0458	0	1
Had Prior Dissimilar Negative Country Experience (=1)	0.0186	0.1353	0	1
Had Prior Similar Positive Country Experience (=1)	0.1723	0.3776	0	1
Had Prior Dissimilar Positive Country Experience (=1)	0.2000	0.4000	0	1

TABLE 3B
CORRELATIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Hired =1	1									
(2) Free Account Bidder (=1)	0.0221	1								
(3) Number of previous jobs (logged)	0.1543	-0.3233	1							
(4) Amount of bid (logged, in USD)	0.0731	-0.0428	0.0177	1						
(5) Bid \$0 (=1)	-0.1142	0.0077	-0.0215	-0.9116	1					
(6) No Level Score (=1)	-0.0443	-0.1468	-0.1679	0.0571	-0.0224	1				
(7) Level Score	0.0802	-0.0416	0.4925	-0.0717	0.0614	-0.7244	1			
(8) Has Star Rating (=1)	0.1529	-0.2706	0.8261	0.0335	-0.0417	-0.1433	0.3433	1		
(9) Star rating	0.1553	-0.264	0.8281	0.0269	-0.0352	-0.1589	0.3715	0.9664	1	
(10) Number bidders from same country	-0.1215	0.0457	-0.0483	0.0187	0.0134	-0.0241	0.0014	-0.0581	-0.0593	1
(11) Average level score of bidders from this country	0.0189	0.2141	0.0827	-0.1109	0.0751	-0.6502	0.5653	0.0125	0.0386	0.0258
(12) Number Previously Hired from Freelancer Country (logged)	0.5674	0.0305	0.0858	0.0485	-0.0704	-0.0359	0.0554	0.0908	0.0881	0.1282
(13) Employer/Freelancer from same country (=1)	-0.0016	-0.0055	-0.063	-0.0001	0.0008	-0.0575	0.0124	-0.0409	-0.0403	-0.0677
(14) Had Prior Negative Country Experience (=1)	0.0139	-0.0204	0.0026	0.0098	-0.0045	0.0439	-0.0325	0.0088	0.0044	0.0331
(15) Had Prior Positive Country Experience (=1)	0.2664	0.0252	0.0519	0.0178	-0.0422	-0.0455	0.0524	0.0606	0.0651	0.1205
(16) Had Prior Similar Negative Country Experience (=1)	0.0227	0.0066	-0.0005	0.0035	-0.0012	-0.0009	-0.0012	0.0026	-0.0005	0.0136
(17) Had Prior Dissimilar Negative Country Experience (=1)	0.0084	-0.0239	0.0028	0.0095	-0.0045	0.0475	-0.0347	0.0085	0.0048	0.0303
(18) Had Prior Similar Positive Country Experience (=1)	0.2945	0.0302	0.0523	0.0214	-0.0504	-0.0514	0.0601	0.0666	0.0747	0.0826
(19) Had Prior Dissimilar Positive Country Experience (=1)	0.172	0.0176	0.0397	0.0095	-0.0215	-0.034	0.0388	0.036	0.0379	0.0963
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)		
(11) Average level score of bidders from this country	1									
(12) Number Previously Hired from Freelancer Country (logged)	0.0279	1								
(13) Employer/Freelancer from same country (=1)	0.0338	-0.02	1							
(14) Had Prior Negative Country Experience (=1)	-0.0531	0.0757	-0.0232	1						
(15) Had Prior Positive Country Experience (=1)	0.036	0.4853	0.0005	0.0971	1					
(16) Had Prior Similar Negative Country Experience (=1)	0.0044	0.0817	-0.0067	0.3181	0.043	1				
(17) Had Prior Dissimilar Negative Country Experience (=1)	-0.0585	0.0565	-0.0225	0.9551	0.0903	0.0494	1			
(18) Had Prior Similar Positive Country Experience (=1)	0.0506	0.5428	-0.0123	0.0525	0.6904	0.0508	0.0413	1		
(19) Had Prior Dissimilar Positive Country Experience (=1)	0.023	0.2867	0.0064	0.108	0.7565	0.0355	0.1041	0.224		

TABLE 4
CONDITIONAL LOGIT ESTIMATES OF LIKELIHOOD OF BEING HIRED
(JOB FIXED-EFFECTS AND COUNTRY DUMMIES)

	Model 1	Model 2	Model 3
Free Account Bidder (=1)	-0.1965*** (0.0069)	-0.1963*** (0.0069)	-0.1963*** (0.0069)
Number of Previous Jobs (logged).....	0.0934*** (0.0015)	0.0937*** (0.0015)	0.0936*** (0.0015)
Amount of Bid (logged, in USD).....	-0.4871*** (0.0035)	-0.4870*** (0.0035)	-0.4869*** (0.0035)
Bid \$0 (=1).....	-7.3633*** (0.0412)	-7.3599*** (0.0412)	-7.3595*** (0.0412)
No Level Score (=1).....	0.3575*** (0.0108)	0.3569*** (0.0108)	0.3569*** (0.0108)
Level Score	0.0174*** (0.0012)	0.0173*** (0.0012)	0.0174*** (0.0012)
Has Star Rating (=1)	0.3905*** (0.0234)	0.3938*** (0.0234)	0.3939*** (0.0234)
Star Rating	0.1493*** (0.0048)	0.1478*** (0.0048)	0.1478*** (0.0048)
Number Bidders from Freelancer Country.....	-0.0098*** (0.0008)	-0.0098*** (0.0008)	-0.0098*** (0.0008)
Average Level Score of Bidders From this Country	-0.0663*** (0.0076)	-0.0658*** (0.0076)	-0.0660*** (0.0076)
Number Previously Hired from Freelancer Country (logged)	0.5517*** (0.0022)	0.5562*** (0.0022)	0.5519*** (0.0022)
Had Prior Negative Country Experience (=1).....	-0.1302*** (0.0225)		-0.1311*** (0.0226)
Had Prior Positive Country Experience (=1)		0.0847*** (0.0071)	0.0849*** (0.0071)
Top 20 Country Dummies	Yes	Yes	Yes
Observations	7300910	7300910	7300910
Jobs.....	573144	573144	573144
Pseudo-R ²	0.6701	0.6701	0.6701
Log-Likelihood.....	-441843.1	-441787.6	-441770.6
χ^2	1794679.6	1794790.5	1794824.5

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 5
CONDITIONAL LOGIT ESTIMATES OF THE LIKELIHOOD OF BEING HIRED
(JOB FIXED-EFFECTS AND COUNTRY DUMMIES)

	Model 1	Model 2	Model 3
Free Account bidder (=1).....	-0.1957*** (0.0069)	-0.1966*** (0.0069)	-0.1958*** (0.0069)
Number of Previous Jobs (logged).....	0.0946*** (0.0015)	0.0934*** (0.0015)	0.0945*** (0.0015)
Amount of Bid (logged, in USD).....	-0.4866*** (0.0035)	-0.4871*** (0.0035)	-0.4866*** (0.0035)
Bid \$0 (=1).....	-7.3520*** (0.0412)	-7.3632*** (0.0412)	-7.3515*** (0.0412)
No Level Score (=1).....	0.3543*** (0.0108)	0.3573*** (0.0108)	0.3541*** (0.0108)
Level Score	0.0171*** (0.0012)	0.0174*** (0.0012)	0.0171*** (0.0012)
Has Star Rating (=1)	0.4072*** (0.0234)	0.3914*** (0.0234)	0.4081*** (0.0234)
Star Rating	0.1423*** (0.0048)	0.1491*** (0.0048)	0.1422*** (0.0048)
Number Bidders from Freelancer Country.....	-0.0096*** (0.0008)	-0.0098*** (0.0008)	-0.0096*** (0.0008)
Average Level Score of Bidders From this Country	-0.0670*** (0.0076)	-0.0662*** (0.0076)	-0.0671*** (0.0076)
Number Previously Hired from Freelancer Country (logged)	0.5560*** (0.0022)	0.5530*** (0.0022)	0.5531*** (0.0022)
Had Prior Similar Positive Country Experience (=1).....	0.2087*** (0.0074)		0.2086*** (0.0074)
Had Prior Dissimilar Positive Country Experience (=1).....	0.0258*** (0.0071)		0.0260*** (0.0071)
Had Prior Similar Negative Country Experience (=1)		-0.6535*** (0.0732)	-0.6503*** (0.0735)
Had Prior Dissimilar Negative Country Experience (=1) ...		-0.0645** (0.0232)	-0.0669** (0.0233)
Top 20 Country Dummies	Yes	Yes	Yes
<i>Observations</i>	7300910	7300910	7300910
<i>Jobs</i>	573144	573144	573144
<i>Pseudo-R²</i>	0.6704	0.6701	0.6704
<i>Log-Likelihood</i>	-441459.7	-441815.4	-441415.6
χ^2	1795446.3	1794735.1	1795534.5

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

FIGURE 6
MARGINAL CHANGE IN LIKELIHOOD OF HIRING A FREELANCER FROM A PARTICULAR COUNTRY
FOLLOWING ANY PRIOR NEGATIVE OR POSITIVE EXPERIENCE
(FOR SIMILAR AND DISSIMILAR JOBS)

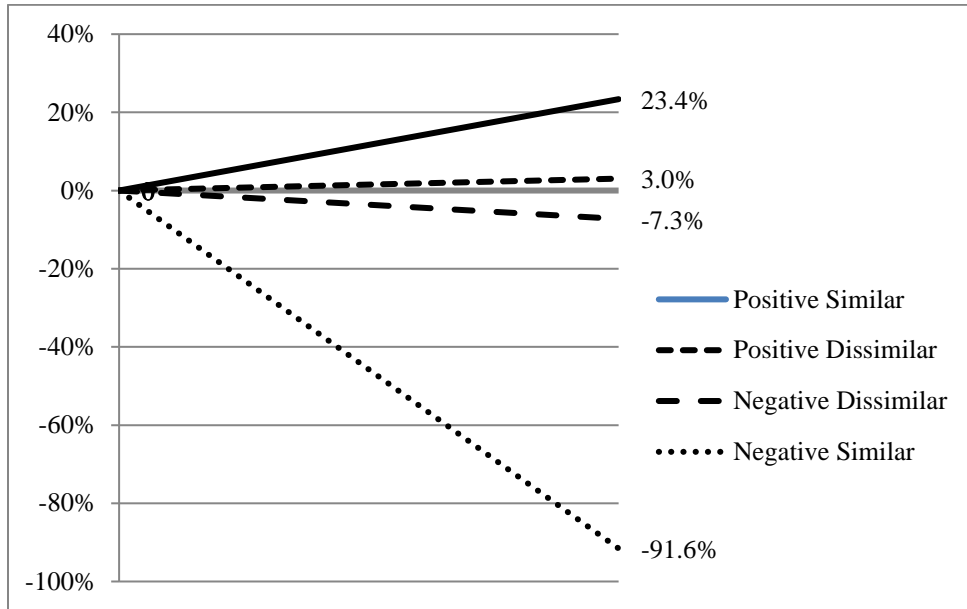


FIGURE 7
HISTOGRAM OF FREELANCERS BY PROPORTION OF
NON-POORLY RATED FREELANCERS' COUNTRIES OF ORIGIN

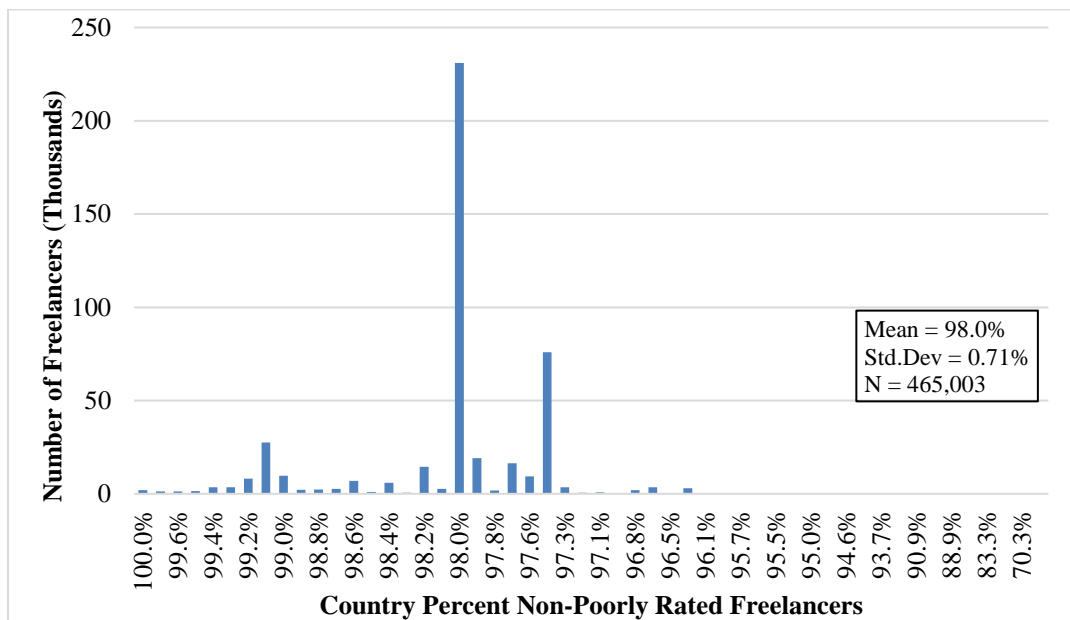


TABLE 6
COMPARISON OF PERCENT OF NON-POORLY RATED FREELANCERS
FROM NEGATIVE EXPERIENCE COUNTRY TO SUBSEQUENT COUNTRY OF HIRE
(PAIRED T-TESTS)

	(1) All Negative Experiences	(2) First Negative Experience	(3) Negative Experiences After First One
Negative Experience Country Mean	0.97663 (0.00002)	0.97627 (0.00002)	0.97762 (0.0002)
Subsequent Country Mean	0.97663 (0.00002)	0.97625 (0.00002)	0.97765 (0.0002)
Difference (Country mean – Subsequent Country Mean)	2.0e-06 (0.0002)	1.5e-05 (0.0003)	-3.4e-05 (0.0003)
Observations	16462	12040	4422
D.F.s	16421	12039	4421

Notes: Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

FIGURE 8
BID AMOUNT NECESSARY TO COMPENSATE FOR ANY PRIOR
POSITIVE OR NEGATIVE EXPERIENCE WITH FREELANCER’S COUNTRY
(COMPARED TO AVERAGE JOB VALUE OF \$396)

