

Diasporas and Outsourcing

Evidence from oDesk and India

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Abstract

This paper examines the role of the Indian diaspora in the outsourcing of work to India. The data are taken from oDesk, the world's largest online platform for outsourced contracts. Despite oDesk minimizing many of the frictions that diaspora connections have traditionally overcome, diaspora connections still matter on oDesk, with ethnic Indians substantially more likely to choose

a worker in India. This higher placement is the result of a greater likelihood of choosing India for the initial contract, due in large part to taste-based preferences, and substantial path dependence in location choices. The paper further examines wage and performance outcomes of outsourcing as a function of ethnic connections.

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1. Introduction

The economic integration of developing countries into world markets is an important stepping stone for economic transitions and growth. This integration can be quite challenging, however, due to the many differences across countries in language, cultural understanding, legal regulations, and much more. As a consequence, business and social networks are valuable mechanisms for achieving this integration (Rauch 2001). Ethnicity-based interactions and diaspora connections are a prominent form of these networks. The benefits typically cited for diaspora networks include stronger access to information (especially very recent or tacit knowledge), matching and referral services that link firms together, language skills and cultural sensitivity that improve interactions, and repeated relationships that embed trust in uncertain environments and provide sanction mechanisms for misbehavior. Such traits are hard to construct yet crucial for business success in many developed and emerging economies. The history of these connections stretches back to the earliest of international exchanges (e.g., Aubert 2001), and studies continue to find diasporas important for trade flows, foreign investments, and knowledge diffusion.

Over the last two decades, the Internet has become a potent force for global economic exchanges. The Internet links customers and companies together worldwide, enables labor to be provided at a distance, provides instant access to information about foreign locations, and much more. How will the Internet affect the importance of diaspora networks? On one hand, the substantial improvements in connectivity and reduced frictions of the Internet may reduce the importance of diaspora connections. On the other hand, the online capabilities may provide an effective tool that complements traditional diaspora connections (e.g., Saxenian 2006). To shed light on these important questions, we investigate the role of the Indian diaspora in online outsourcing to India using data from oDesk. oDesk is the world's largest online labor market, processing \$30 million per month in contracts as of May 2012. It provides a platform for companies to post job opportunities, interview workers, monitor performance, and pay compensation. Workers worldwide bid on these jobs, complete tasks, and receive public feedback on their performance.

India is the largest country destination for outsourced contracts on oDesk, with more than a third of the worldwide contract volume. We investigate the role of the Indian diaspora using

both descriptive and analytical techniques. A key feature of our data development, described in greater detail below, is that we identify company contacts located anywhere around the world who are likely of Indian ethnicity using ethnic name matching procedures. Our measures of diaspora-linked outsourcing to India build upon this identification of ethnic Indians (e.g., those with the surnames Gupta or Desai) who are using oDesk.

The first main finding is that overseas ethnic Indians are more likely to outsource to India than non-ethnic Indians. In relative terms, the increase in likelihood is 16%. This higher likelihood is evident among many types of contracts and at different points of time, but its key feature is its importance in initial contract placement. These initial contracts are vital because the location choices of outsourced work for company contacts are very persistent, so long as the company contact achieves good performance on the initial contract.

We then use a variety of approaches to assess why initial outsourcing contracts tend to have an important ethnic bias. The most prominent factor in the data appears to be taste-based preferences, where members of ethnic groups prefer to work with each other. While we are unable to say whether the taste-based preferences lie more with the ethnic Indians or more with the comparison groups (e.g., Anglo-Saxon company contacts being less inclined to utilize India), these biases clearly play an important role in initial choices. These choices then have lasting consequences, as employers are less likely to experiment with hiring new groups of workers if their past contracts achieve an acceptable level of performance. Beyond taste-based factors, we examine other noted diaspora attributes—such as overcoming uncertainty, better information flows, better bargaining power, and more productive matches—and find their roles to be weaker.

An analysis of wage and performance outcomes on oDesk helps to inform the above conclusions, and this work is interesting in its own right. We find that diaspora connections provide cost advantages to the company contacts sending work to India relative to the other contracts that these company contacts form on oDesk. These cost advantages may come with small deteriorations in performance, but the wage savings are larger in magnitude. On the other hand, the workers in India are paid wages on diaspora-based contracts that are typical on oDesk for the type of work being undertaken in India. Likewise, workers' current performance and future careers appear to be very similar across the contract types.

In addition to analyses that examine evidence of diaspora connections within the oDesk data, we demonstrate how the broader Indian diaspora in a country—measured as migrants from India as a share of country population—systematically connects to a greater ethnic Indian use of oDesk and a larger share of contracts being sent to India from the country. This background connects studies that consider diasporas from a macro perspective (e.g., linking trade flows to diaspora shares by country) with studies that consider micro evidence (e.g., that international patent citations are more likely among inventors of the same ethnicity).

These results are quite striking. oDesk’s business model minimizes many frictions and barriers to outsourcing—for example, providing companies with knowledge of workers for hire overseas and their qualifications, providing infrastructure for monitoring and payments between companies and workers, and creating a labor market where workers build reputations that enable future work and higher wages. These frictions that oDesk minimizes, of course, are frictions that diaspora networks have historically been used to overcome. Our work suggests that diasporas continue to be important in an online world—if for no other reason than the taste-based preferences that shape contract placement. We view our results as a lower bound on the importance of diasporas in settings where frictions to interactions are larger.

At a higher level, the Indian diaspora likely played an important, but modest, role in India’s rapid development on oDesk. At several points, we provide descriptive evidence of the magnitudes of these interactions that place upper bounds on how large this role could have been. For example, ethnic Indians account for 3.9% of oDesk company users in the United States by contract volume, while 29% of outsourced contracts from the United States go to India. We likewise find that only 5.7% of workers in India who complete three or more jobs on oDesk had their initial contract with an overseas ethnic Indian employer. These magnitudes suggest that diasporas continue to use online platforms in an effective manner, but that they played a modest role in the overall development of online work, at least for a country of India’s properties.

With these results in mind, it is important to place our study of the Indian diaspora in perspective. We focus on a single ethnicity in this analysis, rather than undertaking a multi-ethnicity comparison study, to facilitate greater depth around one example. India was the natural choice given its worldwide importance for outsourcing. India also has operational advantages in that its common names are fairly distinct from other ethnic groups. Yet it is also important to

consider India's properties and the generalizability of our results. India's conditions suggest that it may be an upper bound in terms of the aggregate impact from these connections. It may also be the case that other ethnic diasporas may face a steeper trade-off in terms of wage rates and performance outcomes than the Indian case that we describe below.¹

Our work also contributes to a developing literature that explores the operation of online labor markets and the matching of firms and workers. Agrawal, Lacetera, and Lyons (2012) find that workers from less-developed countries have greater difficulty contracting work with developed countries on oDesk. This is especially true for initial contracts, and the disadvantage closes somewhat with the worker's platform experience. The authors suggest that some of this difficulty may be due to challenges that companies in advanced economies encounter when evaluating workers abroad. Our study suggests that diaspora connections to advanced economies help workers access these initial contracts, although as noted above this effect is of modest size relative to the overall development of oDesk in India. Mill (2013) studies statistical discrimination and employer learning through experience with hiring in particular countries. We find patterns similar to those in Mill's work that are consistent with employer learning about groups of workers, and our work on ethnic connections provides an important foundation for understanding how this learning process commences and locating its boundaries. Using a creative experimental study on oDesk, Pallais (2011) finds that employers experiment with inexperienced workers too infrequently from a social-welfare perspective (e.g., Tervio 2009). Our path dependency results offer a related message to Pallais, demonstrating there is limited experimentation if initial selections are performing at an acceptable level. Finally, Stanton and Thomas (2011) document that intermediation has arisen in the oDesk market to overcome information problems about worker quality.²

¹ First, India's wage rate is low enough that it can be very attractive for outsourcing, and such gains would be weaker for higher-wage locations (e.g., the European diaspora). Second, India possesses several attractive traits needed for oDesk to operate effectively: proficiency with the English language, Internet penetration, available banking facilities, etc. To the extent that countries lack these necessary ingredients, it will be harder for diaspora connections to emerge around online labor outsourcing. Third, and most speculatively, there may be required levels of critical mass, in terms of the diaspora abroad and the potential workers in the country. Future research needs to analyze these traits more broadly.

² Autor (2001) and Horton (2010) review online labor markets. Montgomery (1991) models social networks in labor markets. Beyond labor markets, Forman, Ghose, and Goldfarb (2009) study the interplay between

The findings in this paper also relate to research investigating the outsourcing of work from advanced economies, the emergence of incremental innovation in developing countries, and connections between immigration and outsourcing.³ More broadly, these findings contribute to understanding the role of diasporas and ethnic networks in economic exchanges across countries. Ethnic networks have been shown to play important roles in promoting international trade, investment, and cross-border financing activity, with recent work particularly emphasizing the role of educated or skilled immigrants.⁴ This work has further emphasized the role of diaspora connections in technology transfer.⁵ Our analysis is among the first to be able to study outsourcing as a channel, and we derive evidence that links diasporas to both greater use of oDesk by ethnic Indians in a country and greater flows of outsourced work to India.

These findings are important for managers. Generally, the development and growth of online labor markets represents an enormous change in terms of human resource decisions that firms make. Labor has traditionally been among the most localized of resources to a firm, and the ability of managers to use platforms like oDesk to globally outsource work effectively and cheaply will influence how competitive their firms are going forward. This lesson will more broadly apply to many other forms of trade in services as well. With respect to innovation and entrepreneurship, many companies are already using platforms like oDesk to outsource

local and online consumer options. Freedman and Jin (2008) and Agrawal, Catalini, and Goldfarb (2012) study social networks in online lending. An example of off-line work in this regard is Fisman, Paravisini, and Vig (2012).

³ For example, Feenstra and Hanson (2005), Liu and Trefler (2008, 2011), Amiti and Wei (2009), Blinder and Krueger (2009), Ebenstein et al. (2009), Puga and Trefler (2010), Ottaviano, Peri, and Wright (2010), Mithas and Lucas (2010), Harrison and McMillan (2011), and Tambe and Hitt (2012). Banerjee and Duflo (2000), Khanna (2008), and Ghani (2010) consider aspects of these phenomena for India specifically. Wang, Barron, and Seidmann (1997), Cachon and Harker (2002), and Novak and Stern (2008) provide related models of the sourcing choice.

⁴ Broad reviews of diaspora effects include Rauch (2001), Freeman (2006), Clemens (2011), Docquier and Rapoport (2011), and Gibson and MacKenzie (2011). Evidence on foreign direct investment includes Saxenian (1999, 2002, 2006), Arora and Gambardella (2005), Buch, Kleinert, and Toubal (2006), Kugler and Rapoport (2007, 2011), Bhattacharya and Groznik (2008), Docquier and Lodigiani (2010), Iriyama, Li, and Madhavan (2010), Huang, Jin, and Qian (2011), Nachum (2011), Hernandez (2011), Javorcik et al. (2011), Rangan and Drummond (2011), and Foley and Kerr (2012). Evidence on trade includes Gould (1994), Head and Ries (1998), Rauch (1999), Rauch and Trindade (2002), Kerr (2009), Rangan and Sengul (2009), and Hatzigeorgiou and Lodefalk (2011).

⁵ Recent work includes Kapur (2001), Kapur and McHale (2005a,b), Agrawal, Cockburn, and McHale (2006), MacGarvie (2006), Nanda and Khanna (2010), Oettl and Agrawal (2008), Kerr (2008), Agrawal et al. (2011), and Foley and Kerr (2012). Singh (2005), Obukhova (2009), Choudhury (2010), and Hovhannisyan and Keller (2010) study related forms of international labor mobility and technology diffusion, and Keller (2004) provides a review. Marx and Singh (2012) consider knowledge flows and borders versus distance.

technological work to cheaper locations. Blinder and Krueger (2009) estimate that 34% to 58% of jobs in the professional, scientific and technical services industry can be offshored from the United States, two or three times higher than the national average. This outsourcing has become especially common among cash-strapped start-up companies for website development and mobile apps (e.g., Kerr and Brownell 2013). We provide new insights about how diaspora connections shape these contract flows and the biases that managers may have in their choices. Our work also provides insights on the overall effectiveness of outsourcing contracts to India.

2. oDesk Outsourcing Platform and Ethnicity Assignments

oDesk is an online platform that connects workers who supply services with buyers who pay for and receive these services from afar. Examples include data-entry and programming tasks. The platform began operating in 2005. oDesk is now the world's largest platform for online outsourcing.⁶ The oDesk market is a unique setting to study the diaspora's impact on economic exchanges due to its recent emergence and exceptionally detailed records. One important feature is that any worker can contract with any firm directly, and all work takes place and is monitored via a proprietary online system. In exchange for a 10% transaction fee, oDesk provides a comprehensive management and billing system that records worker time on the job, allows easy communication between workers and employers about scheduled tasks, and takes random screenshots of workers' computer terminals to allow monitoring electronically. These features facilitate easy, standardized contracting, and any company and any worker can form electronic employment relationships with very little effort.

A worker who wants to provide services on oDesk fills out an online profile describing his/her skills, education, and experience. A worker's entire history of oDesk employment, including wages and hours, is publicly observable. For jobs that have ended, a feedback measure from previous work is publicly displayed. Figure 1 provides an example of a worker profile.

⁶ oDesk's expansion mainly reflects increasing demand for online labor services over time. Statistics from compete.com, a company that tracks Internet traffic, show that unique visits to oDesk and its four largest competitors (some of which pre-date oDesk) increased simultaneously in recent years. Overall growth of online outsourcing slowed with the financial crisis, but oDesk has continued to grow rapidly.

Companies and individuals looking to hire on oDesk fill out a job description, including the skills required, the expected contract duration, and some preferred worker characteristics. After oDesk's founding, most of the jobs posted were hourly positions for technology-related or programming tasks (e.g., web development), but postings for administrative assistance, data entry, graphic design, and smaller categories have become more prevalent as the platform has grown. After a company posts a position opening, workers apply for the job and bid an hourly rate. Firms can interview workers via oDesk, followed by an ultimate employment relationship being formed.

We study the role of the Indian diaspora in facilitating oDesk contracts to India. Our data begin at oDesk's founding in 2005 and run through August of 2010. The data were obtained directly from oDesk with the stipulation that they be used for research purposes and not reveal information about individual companies or workers. oDesk does not collect a person's ethnicity or country of birth, so we use the names of company contacts to probabilistically assign ethnicities. This matching approach exploits the fact that individuals with surnames like Chatterjee or Patel are significantly more likely to be ethnically Indian than individuals with surnames like Wang, Martinez, or Johnson. Our matching procedure exploits two databases originally developed for marketing purposes, common naming conventions, and hand-collected frequent names from multiple sources like population censuses and baby registries. The process assigns individuals a likelihood of being Indian or one of eight other ethnic groups.⁷

Several features of this work should be noted. First, some records cannot be matched to an ethnicity, either due to incomplete records for listed ethnicities (e.g., very obscure names) or to uncovered ethnic groups (e.g., African ethnicities). Second, this approach can describe ethnic origins, but it cannot ascertain immigration status. For example, a U.S.-based company contact with the surname Singh is assigned to be of ethnic Indian origin, but the approach cannot say whether the individual is a first- or later-generation immigrant. Third, while we focus on the Indian ethnicity, attempting to match on all nine ethnic groups is important given that some names overlap across ethnicities (e.g., D'Souza in the Indian context due to past colonization).

⁷ The ethnic groups are Anglo-Saxon, Chinese, European, Hispanic, Indian, Japanese, Korean, Russian, and Vietnamese. Kerr (2007, 2008) and Kerr and Lincoln (2010) provide extended details on the matching process, list frequent ethnic names, and provide descriptive statistics and quality assurance exercises. Stanton and Thomas (2011) further describe the oDesk platform.

Finally, while we use the terminology “Indian” for our ethnic assignment, it is worth noting that the procedure more broadly captures South Asian ethnic origin. Names originating from India, Pakistan, Bangladesh, etc. overlap too much to allow strict parsing.⁸

We assign ethnicities to company contacts undertaking hiring on oDesk, with a match rate of 88%.⁹ The company contact is the individual within each firm that hires and pays for the service. In most all cases, this company contact is the decision maker for a hire. This is good for our study in that we want to evaluate the role of ethnic connections in outsourcing decisions, and this structure illuminates for us the person within the larger firm making the hiring choice.¹⁰

It is important to note that during our sample period job postings only list the company location, not the company contact’s name. We know the contact’s identity through oDesk’s administrative records, but potential job seekers do not observe the names of individuals. This asymmetry removes the potential sorting of job applicants across contract opportunities in terms of company contact ethnicity (e.g., workers in India bidding more frequently for postings from ethnic Indians in the United States). Conditional on the year, job type, and country of the company contact, there are no statistical differences in the rate at which workers in India apply for the jobs posted by ethnic Indians versus other ethnic groups.¹¹

⁸ We do not believe this name overlap has material consequences. The imprecision will lead to our descriptive estimates being slightly off in terms of their levels, but not by much given that India has by far the largest South Asian diaspora. For regressions, measurement error would typically result in the estimates of network effects being downward biased, but even here this is not clear to the extent that other South Asians more likely to work with India. Significantly, the estimations in Table 10 use specific data on diaspora and paint a similar message, including showing how a higher Indian diaspora strongly correlates with our ethnic Indian measure on oDesk.

⁹ This match rate rises somewhat when removing records that are either missing names or have non-name entries in the name field (e.g., either the company is listed in the name field or a bogus name like “test”). The four most common surnames linked with the Indian ethnicity are Kumar, Singh, Ahmed, and Sharma.

¹⁰ A related limitation, however, is that the oDesk data do not easily link company contacts into larger firms. This structure limits our ability to describe the firm size distribution on oDesk, but for most applications this has limited consequence. For researchers, this structure is operationally quite similar to patent assignee codes/names.

¹¹ Our data do not indicate whether side arrangements form between companies and workers. We suspect, but cannot verify, that the number of cases where an employer asks a pre-arranged contact to enlist on oDesk in order to employ them is low due to the fees that oDesk charges. It is more likely that successful employment relationships move offline and into side arrangements to circumvent oDesk fees. This would potentially impact our analysis to the extent that the likelihood of moving offline was greater for diaspora-based connections. We have not seen evidence to suspect that side arrangements have an ethnic bias to them.

3. Descriptive Features

Table 1 presents the top 20 countries outsourcing work to India on oDesk. The United States is by far the largest source of oDesk contracts going to India, with 31,261 contracts over the five-year period. A majority of all contracts on oDesk originate from the United States. The distribution of contract counts has a prominent tail. The United States is followed by Australia, the United Kingdom, and Canada, which combined equal about a third of the U.S. volume. Spain, the 10th largest country in terms of volume, has less than 1% of the U.S. volume.

Columns 4 and 5 show the share of contracts originating from each country that go to India, both in total and relative to cross-border contracts only (i.e., excluding oDesk contracts formed with workers in the source country). Contracts to India represent a 29% share of all contracts originating from the United States and a 33% share of cross-border contracts. Across the top 20 countries, India's share of a country's contract total volume ranges from 18% in Switzerland to 55% in the United Arab Emirates (UAE). The unweighted average of the top 20 countries is 28%. The UAE is an exceptional case that we describe further below.

Column 6 documents the share of company contacts in each country with an ethnically Indian name, regardless of how they use oDesk, while Column 7 provides the ethnic Indian percentage of company contacts on contracts that are being outsourced to India. For the United States, 3.9% of all company contacts who use oDesk are ethnically Indian, while the share is 4.6% for work outsourced to India.¹² This higher use for India specifically can be conveniently expressed as a ratio of 1.18 between the two shares. The average ratio across all 20 countries is 1.30, with 13 nations having a ratio greater than one. Finally, Column 8 of Table 1 lists the average hourly wage paid to Indian workers on outsourced contracts. The range across the top 20 countries is from \$7 to \$12, with an average of \$10. As the average wage on oDesk for data entry

¹² To put these figures in perspective, 0.9% of the U.S. population in the 2010 Census of Populations was born in India. These numbers are not exactly comparable, as our measure is based off of ethnicity, rather than country of birth, and includes South Asia more generally. Nonetheless, even after taking these features into account, the role of Indians on oDesk is perhaps twice as strong as the overall Indian population share. As a second comparison point, Kerr and Lincoln (2010) estimate the ethnic Indian share of U.S. inventors to be about 5% in 2005 using patent records from the United States Patent and Trademark Office. This second comparison point uses the same name matching approach as the current project. It thus suggests that Indians may use oDesk somewhat less as a share of total users compared to their general presence in high-tech sectors.

and administrative support jobs is below \$3 per hour, the contracts being outsourced to India represent relatively skilled work that involves programming and technical skills.

Thus, the descriptive data suggest a special role for diaspora connections in sending work to India. The next sections more carefully quantify this role when taking into account potential confounding factors (e.g., the types of projects being outsourced), finding that this special role persists. But we also should not lose sight of the absolute quantity of the shares. Ethnic Indians in the United States account for about 5% of the U.S.'s outsourced work to India. The average across the top 20 countries is 7%, falling to 3% when excluding the UAE. While ethnic Indians are more likely to send work to India, the rise of India to be the top worker source on oDesk also appears to have much broader roots than diaspora connections.

The unpublished appendix provides additional descriptive statistics. The top company contacts that send work to India display significant heterogeneity in terms of their geographic location and the overall degree to which they rely on India for outsourcing work. These company lists also highlight that, while much of the diaspora's effect comes through the small actions of many individuals, the actions of a few can have an enormous impact. In particular, there is one company contact in the UAE that accounted for 906 of the UAE's 989 contracts to India. This outlier is an ethnic Indian entrepreneur who uses oDesk for placing and managing outsourcing work, much of which is sent to India. Studies of diaspora networks often speculate about the concentrated importance of single individuals (e.g., Kuznetsov 2009), and oDesk provides some of the first quantifiable evidence of this concentration. This individual accounts for 7.7 times more contracts being sent to India than the next highest company contact and 2.4 times the volume from the Netherlands, the sixth-ranked country in Table 1.

4. Persistence in Outsourcing Patterns

Our analysis of diaspora connections on oDesk involves three steps. This section begins by describing the persistence in the geographic placement of contracts by company contacts. This persistence emphasizes the important role of initial contracts, which we analyze in greater detail in Section 5. Section 6 then considers wage and performance outcomes.

Table 2 describes the key path dependency that company contacts display in the way they engage with India on oDesk. The sample includes all first and second contracts formed by

company contacts located outside of India. The first row documents that 39% of ethnic Indians choose India for their initial outsourcing contract. This rate compares to 32% for non-ethnic Indians, and the 7% difference between these shares is statistically significant at the 1% level. The next two rows show a strong contrast when looking at second contracts. Differences across ethnicities no longer link to differences in propensities to choose India; the more critical factor is whether the initial contract outsourced by the company contact went to India. Subsequent contracts have similar properties to the second contract. Thus, with all the caveats that need to be applied to sample averages, these simple descriptives suggest that ethnicity could play an important role in initial contract placements, with path dependency then taking on a larger role.

What drives this strong persistence in geographic choices? A very likely candidate is whether or not the company contact has a good experience on the first contract. Good experiences can create inertia where other options are not considered or adequately tested. Table 3 examines this possibility with linear probability models of the location choice of second contracts. The first column considers the second contracts formed by company contacts that chose India on their initial contracts. The estimating equation takes the form

$$Outcome_i = \eta_{jc} + \delta \cdot FirstContractSuccessful_i + \beta \cdot CompanyContactEthnicIndian_i + \chi \cdot FirstContractSuccessful_i \cdot CompanyContactEthnicIndian_i + \varepsilon_i,$$

where contracts are indexed by i . In the first column, the dependent variable is an indicator variable that takes the value of one if the company contact chooses India again. The primary independent variables are an indicator variable for the first project being a success (“good” performance rating or higher on the public feedback score or a successful evaluation in the private post-employment survey), the probability that the company contact is of ethnic Indian origin¹³, and their interaction. To control for many potential confounding factors, regressions include fixed effects for the (year t) x (job category j) x (country c) of each company contract. Thus, the analysis compares, for example, ethnic Indians and non-ethnic Indians outsourcing

¹³ This probability is assigned from the name matching algorithm. Indian names are linked to 5.3% of company contacts. Indian names are fairly distinct, so that in 90% of these cases the ethnic assignment is unique to the Indian ethnicity. Where the Indian assignment overlaps with another ethnic group due to a shared name, the regressor takes a proportionate value between zero and one. Table 2 excluded fractional values for convenience. By comparison, about 0.2% of contracts to Indian have a common surname, indicating the broader foundation of these ethnic connections than that likely due to family-based connections or similar.

web development work from the United Kingdom in 2009. Regressions are unweighted and report robust standard errors.

The results in the first column speak very strongly for how good experiences on initial contracts generate persistence. Success on the first contract raises the likelihood of staying in India by 6.3% compared to a baseline of 57%. Ethnic Indians are somewhat more likely to choose India again, conditional on the rating of the first project, but these differences are not statistically significant. Column 2 shows that this effect is tightly linked with whether or not the company contact continues at all with outsourcing on oDesk. In total, 63% of company contracts that post a first contract to India use oDesk again in the future, and this return to the platform is closely connected to how well the first experience went. Finally, Column 3 shows the mirror image effect when looking at company contacts that outsourced their initial contracts outside of India. A successful first experience for a company contact outside of India lowers the likelihood of India being selected for the second contract by 3% compared to a baseline of 20%.

Table 4 combines and extends the insights from Tables 2 and 3 by estimating across the full oDesk sample the likelihood of selecting India separately by experience levels of company contacts. These estimations take the form

$$ContractToIndia_i = \eta_{ijc} + \beta \cdot CompanyContactEthnicIndian_i + \varepsilon_i.$$

The dependent variable is an indicator variable for selecting a worker in India. Regressions continue to be unweighted and include fixed effects for year x job type x country of company contact. We report standard errors that are two-way clustered by company and worker.¹⁴

Panel A includes the full sample of contracts, excluding firms located in India. The first column is for all contracts regardless of type. In the full sample, we find a significant increase in the likelihood of selecting India as a destination for outsourcing contracts when the company contact is of ethnic Indian origin. An ethnic Indian is 4.7% more likely to select India as an outsourcing destination than other ethnicities. This represents a 16% increase in the likelihood of

¹⁴ This clustering strategy takes into account the repeated nature of our data for both companies and workers. It is important to note that the likelihood of being ethnically Indian is not a generated regressor from the data. It is a metric based off of the individual's names and external classifications of names. As the contact names are exactly known, this metric is the same as any other known trait of the person like gender or location.

selecting India relative to the sample mean of 29%. If conditioning on year x job type fixed effects, rather than year x job type x country of company contact fixed effects, the effect is 8% in absolute terms and 30% in relative magnitude.

This remarkable increase in ethnic placement could result from many factors, and our subsequent analyses discern the most likely interpretations. Panel B starts by isolating cases where a worker from India applies for the position before the contract is awarded. This is a natural first check against explanations that center on ethnic Indians posting job opportunities that are simply a better fit for Indian workers. For example, there may be distinct skills that Indians worldwide specialize in that our fixed effects do not adequately control for. The ethnicity bias in Panel B is comparable in absolute terms to what is observed in Panel A, and it represents a 6% increase on the restricted sample's mean. These results show that the effect is quite similar when isolating contracts where the company contact has a known option of choosing India.

Columns 2-4 split the sample by initial versus subsequent contracts, in the spirit of Table 2's descriptive tabulations. We again see a very prominent role for ethnicity in the location choice of the first contract placements. The estimates in Column 2 for initial contracts are very similar in magnitude to the 7% differential in sample means in Table 2, with the regression fixed effects now removing many potential confounding variables. Ethnicity's role in the placement of subsequent contracts is again lower in point estimate than the initial contracts. Unlike Table 2, these estimates do not condition on the first contract being in India, so a more substantial ethnic role can be measured due to the path dependency off of the initial contract.

Columns 5-8 further examine the third and later contracts of company contacts. Column 5 shows that the ethnic bias in this group, along with the means of the dependent variables, is quite similar to Column 4. Columns 6-8 separate these subsequent contracts into three groups based upon their prior experiences. The reported means of the dependent variables are critically important. In Panel A, India is selected 35% of the time when the company contacts have had prior success outsourcing to India, 27% of the time when they have prior experience but no success, and only 13% of the time if they have not utilized India before. Thus, path dependency plays a key role. With the die so strongly cast, ethnicity is second order after accounting for past experience. The one exception appears to be the greater likelihood of ethnic Indians returning to India after unsuccessful experiences. We obtain very similar results when instead using six

months of experience on oDesk to categorize experienced company contacts and their subsequent contracts.

5. Ethnic Diaspora Placements and Initial Contracts

The previous section emphasizes the persistence in geographical placements of outsourcing contracts, and thus the lasting importance of initial contract choices. It is in these initial decisions that much of the ethnic effect occurs. Continuing with the regression framework of Table 4, Table 5 analyzes these initial contracts to learn more about the role of ethnicity. Column 1 repeats the base specification for initial contracts. The next columns split the initial contracts in various ways to look for clues within oDesk itself for what may be behind the ethnic bias.¹⁵

A starting point is evaluating whether the ethnicity bias is connected to the very early days of oDesk's founding and the development of online outsourcing. Many accounts of diaspora connections suggest that they provide stability and structure in settings where formal institutions are weak, and perhaps the initial contract ethnicity bias stems from a similar environment during oDesk's emergence. Columns 2 and 3 split the sample by contracts formed during 2008 and earlier versus contracts formed during 2009 and after. This partition suggests that the Indian placement effect is growing over time. The means of the dependent variables, moreover, highlight that India's share of initial oDesk contracts is declining from its level in 2008. These patterns suggest that the differences seen in initial contracts are not due to diasporas overcoming initial uncertainty about oDesk. These patterns do not completely rule out a role for uncertainty, however, as one could imagine a growing pool of heterogeneous workers in India increasing uncertainty about quality in the later period, leading to fewer contracts and a larger ethnic bias.¹⁶

¹⁵ A limit exists for how well internal variations can represent use of the platform as a whole. That is, we can understand more about the role of diaspora connections for overcoming uncertainty by comparing settings in oDesk characterized by more or less uncertainty. This internal variation, however, only imperfectly captures the extent to which diasporas overcome overall uncertainty regarding online outsourcing and oDesk.

¹⁶ This time pattern is further striking given the evidence from Agrawal et al. (2012) that workers in developing countries have an initial disadvantage on oDesk—one may have expected that diaspora-based links could have provided a fruitful opportunity to overcome the initial uncertainty about workers. In general for India, the ethnic diaspora appears to have played a limited role in “unlocking careers” by giving workers in India a start. 9.4% of workers in India start with an ethnic Indian employer from outside of India. Of workers in India who complete three or more jobs on oDesk, 5.7% of these workers started with an ethnic Indian employer, as noted in the introduction.

As a second candidate explanation, accounts of diaspora connections often emphasize the ability of these networks to transfer specialized or tacit knowledge across places. India represents a large share of high-end contract work on oDesk, and it could be that the bias is due to the facilitation of this high-end work. Columns 4 and 5 split the sample by whether the job type is high-end or not.¹⁷ The ethnic bias is present in both categories, but it is bigger in low-end jobs. This suggests that while knowledge transfer may play a role, it is not the primary driver.

Columns 6 and 7 provide some of our most important results. Our data indicate whether the hiring employer contacted workers directly after using the search feature of oDesk while recruiting workers. This search feature allows company contacts to select regions in which to search, and they can also utilize search strings like “SQL programmer India.” Unfortunately, our data only record if the company contact contacted individual workers prior to an organic job application initiated by the worker, not the details of the search. Column 6 isolates initial contracts where employers did not utilize this capability, while Column 7 considers where employer searches were used. The composition of potential hires in the first sample is dictated purely by the workers who respond to the job posting; employers actively shape the composition of their candidate pool in the latter case. The difference between the two groups is striking—the ethnicity bias among initial contracts built upon employer searches is two to four times stronger.

This difference suggests employer recruiting behavior is an important part of the overall explanation for the ethnicity bias, and it is helpful to pause and review potential explanations. Our analysis so far suggests that the bias is not due to uncertainty during oDesk’s founding or due (in large part) to the easier transfer of specialized or tacit knowledge. At a minimum, the search results leave four remaining possibilities for why ethnic Indians would disproportionately outsource initial contracts to India: 1) taste-based preferences, 2) information advantages that ethnic Indians possess, 3) greater bargaining power of ethnic Indians with workers in their home region, and 4) productivity advantages that ethnic Indians possess when working with India.

For the taste-based preferences hypothesis, it is important to note that the bias is observationally similar if the preferences are held by non-ethnic Indians. For example,

¹⁷ High-end contracts include networking and information systems, software development, and web development. The appendix shows that these categories have the highest wages on oDesk.

individuals of Anglo-Saxon or Hispanic ethnicity may prefer to not work with India, and this would look the same to us as ethnic Indians preferring to work with India. We thus do not make a strong (or normative) interpretation of the patterns, but simply use the terminology of taste-based preferences to describe members of the same ethnicity wanting to work with each other simply due to tastes, rather than productive rationales or similar.

For the information hypothesis, these advantages could come in two forms. First, ethnic Indians could possess superior knowledge that outsourcing to India is a strong option. The data already suggest that this is not a central factor. In particular, the biases remain constant or increase in Table 5 when Panel B conditions on a worker from India being among the candidate pool. More generally, outsourcing and India are so commonly associated with each other that any awareness gap should be minimal. The second form of information asymmetry could come through ethnic Indians being better able to evaluate worker candidates in India on oDesk. This would include, for example, an ability to navigate poor English language skills.

Table 6 casts some early doubt on this hypothesis by showing that the traits of hired workers in India at the time of hire seem similar for ethnic and non-ethnic Indian company contacts. Panels A and B consider contracts lacking and including employer searches as part of the recruitment, respectively. The regression format is similar to that described for the analyses in Table 4. The differences in Panel A are minimal, while Panel B shows that ethnic Indians engaging in employer searches are more likely to hire a worker with greater self-reported proficiency in the English language. When hiring an experienced worker, they are also more likely to hire a worker with lower wage histories. These facts are consistent with a greater propensity to hire workers in India¹⁸, and the results do not suggest special roles for communication or worker screening. In the next section we further analyze the future performance of the hired workers to ascertain whether there is evidence of ethnic Indians being able to discern talents that these recorded attributes at the time of the hire do not capture.

Our ensuing analysis continues with separating these hypotheses. Before doing so, we return to Table 5 and close with two important robustness checks. Column 8 shows that the results in the total sample are robust to dropping the outlier UAE firm noted earlier (note too that

¹⁸ Mean English proficiency scores are 4.88 for workers in India and 4.72 for workers outside of India.

this firm only has one initial contract). Column 9 shows similar patterns when looking at fixed-price contracts. Contracts on oDesk can either be a negotiated hourly wage or a fixed-price deliverable. We focus primarily on hourly contracts given that wage rates are defined and negotiated for these workers. It is nevertheless helpful to see that a similar ethnic bias exists in fixed price work, too.

6. Wage and Performance Effects of Ethnic-Based Contracts

This section analyzes wage rates and performance effects of diaspora connections to shed light on the hypotheses about their origin. Table 7 considers wage and performance effects of diaspora-based contracts using variation among workers in India. Conceptually, this analysis provides the workers' perspectives about the gain or loss from taking on a contract with an overseas Indian. The regression format is similar to that described for the analyses in Table 4, and the four panels provide wage and performance metrics for a sample of workers located in India. Column headers provide additional details about sample composition or estimation approach.

Panel A reports the log wage rate paid on the contract, and Panel B takes an alternative route where we compare the wage rate paid to the hired worker to the median proposal made by other workers that bid on the same job opportunity. This latter approach provides an attractive baseline of comparison as the bids made by other workers are informative about how the work opportunity and its technical difficulty were perceived. By comparing selected bids to the set of proposals that company contacts receive, we better isolate the ethnic role in wage determination.

The estimates suggest very limited wage effects from the perspective of the worker in India. Most variations find that diaspora-based contracts pay the worker about one percent less than comparable outsourcing contracts (i.e., same job category, year, and country of company contact). The appendix shows that this holds under further sample splits and variations.¹⁹

Panels C and D consider performance outcomes. Panel C considers an indicator variable that takes a value of one if the public feedback reported about the contract is “good” or better.

¹⁹ Computational issues require that we report bootstrapped standard errors with re-sampling over workers for estimates with worker fixed effects. For comparison, the estimate in Column 1 would be -0.029 (0.013) with bootstrapped standard errors.

Panel D is constructed similarly, but it is instead taken from a private post-job survey conducted for oDesk company contacts. The results in both panels indicate that there are no performance differences for diaspora-based contracts relative to their peers. Effects are very small in economic magnitude and not statistically significant. The appendix shows that this null result holds regardless of whether employer search is used and for four other measures of performance: obtaining a wage rate increase on the contract, being hired again on oDesk, being rehired by the same company contact, and the worker's wage rate on the next contract that he or she signs.

We interpret these results as suggesting that workers in India operate in a competitive environment where they are paid market rates, regardless of whether or not a contract is diaspora-based. These results have strong implications for our four hypotheses of what determines initial location choice. First, they are consistent with taste-based preferences existing on the part of company contacts, but they are not consistent with significant levels of taste-based preferences among workers in India. Second, the null results for performance, especially the lack of rehiring of workers, do not align with stories about ethnic Indians having special information advantages or screening capabilities for workers in India. Similar to observable traits examined in Table 6, the future performances of the hired workers are not different for ethnic Indians. Third, the very small wage declines suggest that greater bargaining power by ethnic Indians in their home region is not likely. Finally, the overall lack of wage or performance consequences is not consistent with explanations related to productivity advantages of ethnic collaborations.

Table 8 next repeats this analysis, but instead uses variation across contracts initiated by ethnic Indians living outside of India. Conceptually, this analysis shifts from the worker's perspective to that of the hiring ethnic Indian. This sample provides a nice contrast with Table 7. This analysis is also informative about whether ethnic Indians have a general "technology" advantage in their work that is being captured in our study of their connections to India, but would also be reflected if we looked at other locations. The wage effects in Table 8 are much stronger than in Table 7 and suggest that ethnic Indians pay about 7.5% less when outsourcing to India than to other locations. Interestingly, we also see some suggestive evidence of performance declines compared to other locations, but these shifts are much smaller than the wage effects. Comparing Tables 7 and 8 suggests that the advantages of the diaspora connection, at least using

the variations available with oDesk itself, accrue more to the overseas ethnic Indian, while the workers in India have compensation and performance more in line with market conditions.

Table 9 closes this analysis by considering broader variations across ethnic Indian and non-ethnic Indian company contacts. We analyze the aggregate consequences of company contacts outsourcing a lot of their work to India. Indexing company contacts by f , we first calculate the aggregate share of their contracts that are placed into India. We then relate this to the overall wage and performance outcomes of the company contacts with the specification

$$Outcome_f = \eta_{jc} + \delta \cdot ShareContractsInIndia_f + \beta \cdot CompanyContactEthnicIndian_f + \chi \cdot ShareContractsInIndia_f \cdot CompanyContactEthnicIndian_f + \varepsilon_f.$$

Our outcome variables are the cumulative wages paid and performance consequences of these contracts for company contacts, as indicated in the column headers of Table 9. We interact the India share metric with whether the company contact is ethnically Indian. Regressions are unweighted, include fixed effects for (year that company contact started on oDesk) x (modal job type of company contact) x (country of company contact), and report robust standard errors.

The results suggest that greater outsourcing to India is broadly associated with paying lower wages and being less satisfied with performance. This is measured in comparison to other company contacts that started on oDesk in the same year and from the same country with similar types of jobs. While this pattern is itself interesting, our main focus for this study is on the interaction term that delivers null results across the board. This pattern says that all of the consequences (good and bad) from outsourcing to India come through greater engagement with the country, not from being an ethnic Indian. This stark set of results is consistent with a taste-based preferences account, and it is inconsistent with most other accounts of why ethnic Indians are placing work into India (e.g., productivity advantages). From these and prior results, we conclude that taste-based preferences among oDesk actors in the originating countries is the key driver of the ethnic bias observed in outsourced contract placement to India.

7. Link to Broader Diaspora Connections

To this point, our analysis has only exploited data derived from oDesk itself, and yet at multiple points we have framed our analysis in terms of the general diaspora literature. There remains a

gap, as it could be the case that use of oDesk by ethnic Indians across countries is uncorrelated with the general Indian-ethnicity populations of countries. Rauch and Trindade (2002), for example, relate trade flows to the distribution of the ethnic Chinese population across countries, rather than the greater likelihood that two observed traders are Chinese.

Table 10 closes this gap using empirical models similar to the gravity framework from the trade literature. The dependent variable in Columns 1-7 is the share of contracts originating from a country on oDesk that are outsourced to India. We focus on shares of contracts, rather than contract volumes, as the adoption of oDesk across countries as a platform for e-commerce is still underway and somewhat idiosyncratic to date. Shares allow us to consider the choice of India for outsourcing independent of this overall penetration of oDesk.

The core regressor is taken from the World Bank's Bilateral Migration and Remittances 2010 database. This database builds upon the initial work of Ratha and Shaw (2007) to provide estimates of migrant stocks by country. We form the Indian diaspora share of each country's population by dividing these stocks by the population levels of the country. We complement this diaspora measure with distances to India calculated using the great circle method, population and GDP per capita levels taken from the United Nations, and telephone lines per capita in 2007 taken from World Development Indicators. We also calculate a control variable of the overall fit of the country's outsourcing needs with the typical worker in India.²⁰

Column 1 presents our base estimation. We have 92 observations, and we weight by the log number of worldwide contracts formed on oDesk. The first row shows the connection of oDesk outsourcing to the diaspora population share, which is quite strong. A 1% increase in the Indian diaspora share of a country is associated with a 1% increase in the share of oDesk contracts outsourced to India. The country-level placement of oDesk contracts in India systematically followed the pre-existing levels of Indian diaspora communities. Looking at the other covariates, distance does not matter in the oDesk context like it does in many estimates of

²⁰ We calculate this control by first measuring the share of contracts outsourced from the country in nine job categories indicated in the appendix. We likewise measure the distribution of oDesk work performed in India across the nine job categories, independent of where the company contact is located. We then calculate the sum of the squared deviations of these two distributions to measure how closely the work typically filled in India matches the needs of a given country. We subtract this sum of deviations from one, so that positive values represent a better fit, and we transform the measure to have unit standard deviation to aid interpretation.

economic exchanges. In fact, the share of contracts sent to India increases with spatial distance.²¹ The overall fit of a country's outsourcing needs with the skillsets of Indian workers predicts that greater shares of work are sent to India. On the other hand, country population levels and telephone penetration do not play an important role. We likewise find similar weakness in Internet penetration measures, but they are not as uniformly available. Finally, countries with higher GDP per capita send less of their work to India conditional on the other covariates.

Many countries on oDesk have very few contracts, which can generate noisy share estimates. Our main estimations thus weight by contract volume to focus attention on better measured data and more meaningful observations; we utilize log weights to not overly emphasize the United States experience in particular. Columns 3 and 4 show similar results when we weight by log country population or when we exclude the weights. In both cases, the coefficients decline somewhat and the standard errors grow given the greater emphasis placed on noisy outcomes, but the role of diasporas remains economically and statistically significant. Column 5 shows similar results when adding a control for the total worldwide count of contracts on oDesk by a country. This variable picks up the negative effect earlier associated with GDP per capita. Column 6 tests whether this connection is simply following on existing business relationships that countries have with India. We measure the extent to which India is a trading partner of the focal country by the total volume of trade in 2007 between India and the country divided by the country's GDP. Introducing this as a control does not affect our results.

Column 7 shows that the elasticity declines when excluding the outlier UAE firm, but overall the pattern remains similar and statistically significant.²² Column 8 finds similar results when examining the dollar share of contracts being sent to India rather than the count share. The

²¹ Unreported estimations also find that time zones do not play a strong role in contract placement. The coefficient values suggest a negative effect of being further apart in terms of time zone, but these results are very small in magnitude and not statistically significant. Two important details to note are 1) many oDesk contracts (e.g., data entry) do not require extensive synchronous interaction, and 2) for those that do, many Indian workers are willing to work the originating country's business day if that is needed for securing the job.

²² The results are not overly-dependent upon a single country, and we find very similar results when excluding the United States, Pakistan, and similar. Excluding the UAE has the largest effect, resulting in a point estimate of 0.878 (0.660), which is not very surprising given that the Indian diaspora's share of 35% in the UAE is by far the largest, twice that of the next-highest states of Qatar (18%) and Oman (17%). As a second approach, we find a point estimate of 1.629 (0.654) when winsorizing outlier diaspora shares to Oman's value to cap the UAE's extreme value. The role of the diaspora community is also very similar when including a control for English language proficiency, which we are able to assemble for about half of the countries in our sample.

coefficient declines but remains economically and statistically important. Finally, Column 9 provides an important connection to our earlier estimation approaches. The dependent variable is the share of company contacts using oDesk in the focal country that are of ethnic Indian origin (independent of whether or not the work is contracted with India). Larger Indian diaspora shares in a country's general population are highly correlated with a larger share of oDesk company contacts for the country being of ethnic Indian origin.²³

8. Conclusions

Diaspora-based exchanges have been important for centuries, but the online world reduces many of the frictions these networks solved. This study investigates the importance of Indian diaspora connections on the oDesk platform for outsourcing. We find strong evidence that diasporas still matter and influence economic exchanges, even when many frictions are minimized. While diaspora connections may not have been the driving force in India becoming the top destination for oDesk contracts, they remain important for shaping the flow of outsourcing contracts. In fact, our case study suggests that the Indian diaspora's use of the platform is increasing with time.

Our study suggests that this importance comes from path dependency in location choices and a greater likelihood of overseas ethnic Indians selecting India for their first contract. Initial contracts are a very important, almost experimental, period where long-term habits form, and ethnic Indians are more likely to choose India initially. Our analysis suggests that taste-based preferences play the largest role for these initial choices. This preference may be on the part of the ethnic Indians, or it could reflect non-ethnic Indians being more reluctant to select India for work. Other factors such as better trust within diasporas in uncertain environments could also exist, but our analyses suggest that these alternatives are of secondary importance.

These findings have important managerial consequences. The initial biases of managers can result in imperfect long-term arrangements, as path dependence and contentment with the status quo produce inertia in further experimentation. As online markets increase competition—in oDesk's case by breaking down the strong spatial partitions that have traditionally existed with

²³ Using some of the partitions discussed earlier, the diaspora coefficient is 0.893 (0.263) for 2008 and prior, 1.085 (0.240) for 2009 and later, 0.798 (0.238) for high-end contracts, 0.592 (0.113) for low-end contracts, 0.448 (0.232) for initial contracts, and 1.134 (0.334) for subsequent contracts.

labor markets—these biases may hurt firm performance in significant ways. Innovation and entrepreneurship will be particularly sensitive to these pressures given the high potential for outsourcing technical and scientific work and the globalization of this field’s labor force.

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Figure 1: Example of a worker profile in oDesk



Naveen Bali

Expert in PHP/ Mysql/ JS/ Ajax/ web scraping /jQuery/ codeignitor

📍 Panchkula, India

\$22.22/hr

★★★★★
30 jobs completed
1,234 oDesk hrs

[Post a job](#)
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[Contact](#)

What's the difference ?

Skills

- php
- mysql
- ajax
- jquery
- html

[more...](#)

Tests Taken

PHP4 Test
92th percentile

PHP5 Test
90th percentile

Overview

Master in Project development i have deep knowledge of every stage of software development lifecycle . My last job was at Yahoo banglore my designation was senior software engineer in web development department. my area of skills is PHP5.0,mysql,javascript,jQuery,Ajax,JSON,HTML5.0 i have good understanding of MVC Architect i have worked in codeigniter and Zend framework . i have completed lot of projects in web scraping as well

Naveen Bali has added 7 portfolio pieces. [Create an account to review them.](#)

Work History & Feedback

PHP Development & Support
May 2012 – Jun 2012 / \$3,030.56 (124 hrs @ \$24.44/hr)
★★★★★ Naveen did a great job with very little instruction.

Data Scraping
Mar 2012 – May 2012 / \$315.44 (fixed-price)
★★★★★ Naveen is great to work with and has a strong skill-set. For scraping we had some fields missing from the initial test runs but Naveen was quick to fix these and the final deliverables were spot on. You cannot go wrong working with him.

Web Scraping / Data Harvesting
Sep 2011 – Mar 2012 / \$582.05 (fixed-price)
★★★★★ Naveen was is very professional and a great resource to work with.

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Table 1: Country distribution of companies hiring workers in India

N	Country	Number of contracts with worker in India	India's share of total contracts originating from country	India's share of total cross-border contracts originating from country	Share of company contacts with Indian ethnic name	Share of company contacts hiring in India with Indian ethnic name	Average wage in US dollars paid on contracts with worker in India
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	United States	31,261	0.285	0.329	0.039	0.046	10.28
2	Australia	4,162	0.287	0.293	0.033	0.029	10.04
3	United Kingdom	3,583	0.280	0.290	0.065	0.079	9.75
4	Canada	2,921	0.285	0.294	0.065	0.082	9.87
5	UAE	989	0.545	0.546	0.906	0.941	11.71
6	Netherlands	384	0.297	0.299	0.026	0.013	9.68
7	Germany	360	0.227	0.230	0.020	0.024	10.35
8	France	310	0.264	0.270	0.017	0.018	10.23
9	Ireland	305	0.300	0.301	0.029	0.059	11.41
10	Spain	269	0.237	0.243	0.010	0.019	11.93
11	Italy	232	0.375	0.387	0.010	0.011	11.25
12	Sweden	219	0.270	0.275	0.026	0.014	12.03
13	Israel	216	0.229	0.233	0.035	0.079	8.90
14	Belgium	170	0.276	0.278	0.023	0.038	10.33
15	Switzerland	170	0.184	0.184	0.008	0.024	10.41
16	New Zealand	165	0.198	0.198	0.038	0.012	7.17
17	Singapore	159	0.212	0.215	0.068	0.038	7.43
18	Denmark	149	0.246	0.247	0.004	0.017	9.70
19	Norway	135	0.325	0.325	0.010	0.000	10.00
20	Hong Kong	125	0.282	0.286	0.014	0.000	9.43

Notes: Table describes the country distribution and traits of companies hiring workers in India. Ethnicities are estimated through individuals' names using techniques described in the text.

Table 2: Path dependence for contracting with Indian workers

	Ethnic Indians	non-Ethnic Indians	Difference
	(1)	(2)	(3)
Share of company contacts selecting India on:			
First contract	0.39	0.32	0.07***
Second contract, having chosen India on first contract	0.58	0.57	0.01
Second contract, having not chosen India on first contract	0.20	0.19	0.01

Notes: Tabulations consider contracts formed with company contacts located outside of India for whom the name classification algorithm perfectly classifies Indian ethnicity. Third and subsequent contracts are similar to second contracts. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: Success dependence for contracting with Indian workers

	Sample: Hired in India on first contract DV: (0,1) Stay in India on 2nd contract	Sample: Hired in India on first contract DV: (0,1) Continue to use oDesk	Sample: Hired outside of India on first contract DV: (0,1) Switch to India on 2nd contract
	(1)	(2)	(3)
(0,1) Success on first contract	0.063*** (0.013)	0.057*** (0.012)	-0.030*** (0.007)
Probability that hiring contact is of ethnic Indian origin	0.061 (0.043)	-0.011 (0.043)	0.021 (0.031)
Interaction of success on first contract and probability that hiring contact is of ethnic Indian origin	-0.028 (0.054)	0.013 (0.050)	-0.013 (0.037)
Observations	6,615	9,180	14,674
Year x job type x country of company contact FE	Yes	Yes	Yes
Mean of dependent variable	0.572	0.625	0.197

Notes: Regressions consider persistence in location choice on second outsourcing contracts formed on oDesk by company contacts. The sample excludes company contacts located in India. Column headers indicate sample composition and dependent variables. The success regressor is a binary variable that takes unit value if the first contract of the company contact garnered a "good" performance rating or higher according to an internal survey or the public feedback score left for the employee. Estimates are unweighted, include fixed effects for year x job type x country of company contact, and report robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Selection of India by ethnic origin of company contacts -- oDesk experience levels

	Total contract sample	Initial contracts	Initial restricted to repeat users	Subsequent contracts	Third and later contracts for company contact			
					Total sample with two or more prior contracts	With prior successful experience in India	With prior unsuccessful experience in India	Without prior experience in India
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable is a (0,1) indicator for choosing a worker in India Estimates include fixed effects for year x job type x country of company contact								
Panel A: Total sample, excluding Indian companies								
Probability that hiring contact is of ethnic Indian origin	0.047*** (0.010)	0.059*** (0.012)	0.070*** (0.016)	0.042*** (0.012)	0.037*** (0.014)	0.029 (0.019)	0.064** (0.032)	0.016 (0.013)
Observations	157,922	35,863	21,289	122,059	100,770	59,203	12,717	28,850
Mean of dependent variable	0.289	0.319	0.311	0.280	0.274	0.346	0.272	0.125
Relative effect	0.163	0.185	0.225	0.150	0.135	0.084	0.235	0.128
Panel B: Panel A conditional on a worker in India applying								
Probability that hiring contact is of ethnic Indian origin	0.041*** (0.011)	0.073*** (0.016)	0.099*** (0.021)	0.029** (0.014)	0.019 (0.016)	-0.010 (0.020)	0.064 (0.039)	0.050 (0.032)
Observations	71,668	20,525	11,644	51,143	40,651	27,674	5,048	7,929
Mean of dependent variable	0.637	0.559	0.570	0.669	0.677	0.739	0.684	0.455
Relative effect	0.064	0.131	0.174	0.043	0.028	-0.014	0.094	0.110

Notes: Contract-level regressions estimate propensities to select a worker in India by the ethnic origin of the company contacts. The sample excludes company contacts located in India. The dependent variable is an indicator variable for selecting a worker located in India. Panel A documents the whole sample, and Panel B considers cases where a worker from India applies for the position. Column headers indicate sample composition. Initial and subsequent contracts are from the perspective of the company contact. Regressions are unweighted, include fixed effects for year x job category x country of company contacts, and report standard errors that are two-way clustered by originating company and worker. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Selection of India by ethnic origin of company contacts -- Base traits of initial contracts

	Sample of initial hourly contracts made by company contacts							Total sample dropping UAE outlier firm	Sample of fixed-price contracts
	Initial contract sample	2008 and prior	2009 and later	High-end contracts	Low-end contracts	Excluding employer searches	Only employer searches		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable is a (0,1) indicator for choosing a worker in India Estimates include fixed effects for year x job type x country of company contact									
Panel A: Total sample, excluding Indian companies									
Probability that hiring contact is of ethnic Indian origin	0.059*** (0.012)	0.040* (0.024)	0.072*** (0.014)	0.044*** (0.017)	0.089*** (0.017)	0.030* (0.015)	0.127*** (0.021)	0.046*** (0.010)	0.042*** (0.010)
Observations	35,863	10,888	24,975	19,753	16,110	24,005	11,858	156,507	138,315
Mean of dependent variable	0.319	0.403	0.285	0.443	0.170	0.330	0.301	0.287	0.234
Relative effect	0.185	0.099	0.253	0.099	0.524	0.091	0.422	0.160	0.180
Panel B: Panel A conditional on a worker in India applying									
Probability that hiring contact is of ethnic Indian origin	0.074*** (0.016)	0.040 (0.028)	0.087*** (0.019)	0.045** (0.019)	0.127*** (0.027)	0.049** (0.019)	0.104*** (0.026)	0.038*** (0.011)	0.068*** (0.015)
Observations	20,511	6,241	14,270	13,081	7,430	15,224	5,287	70,821	58,302
Mean of dependent variable	0.559	0.701	0.498	0.669	0.369	0.520	0.675	0.633	0.555
Relative effect	0.132	0.057	0.175	0.067	0.344	0.094	0.154	0.060	0.123

Notes: See Table 4.

Table 6: Descriptive traits of workers in India hired by ethnicity of company contacts

Indicator for hired worker having prior oDesk experience	Self-reported English proficiency of worker	Indicator for missing English proficiency	Sample of experienced workers		
			Worker's average past wages	Worker's total oDesk hours worked	Worker's past average good performance rating
(1)	(2)	(3)	(4)	(5)	(6)

Column headers indicate trait of worker analyzed

Total sample of company contacts located outside of India that are hiring abroad

Estimates include fixed effects for year x job type x country of company contact

Panel A: Worker traits for company contacts not utilizing worker search features

Probability that hiring contact is of ethnic Indian origin	0.001 (0.010)	-0.010 (0.011)	0.003 (0.005)	0.048 (0.131)	-0.523 (2.665)	0.010 (0.011)
Observations	70,364	67,245	70,364	54,168	54,168	26,622
Mean of dependent variable	0.770	4.789	0.044	7.569	62.73	0.550
Relative effect	0.001	-0.002	0.068	0.006	-0.008	0.018

Panel B: Worker traits for company contacts utilizing worker search

Probability that hiring contact is of ethnic Indian origin	-0.007 (0.010)	0.032** (0.014)	-0.005 (0.005)	-0.409** (0.162)	1.438 (3.650)	-0.002 (0.011)
Observations	71,989	67,988	71,989	57,103	57,103	28,824
Mean of dependent variable	0.794	4.705	0.056	9.925	87.18	0.589
Relative effect	-0.009	0.007	0.000	-0.040	0.016	-0.003

Notes: Contract-level regressions estimate differences in traits of initial workers hired by ethnicity of the hiring company contact outside of India. Panel A documents employers not using the search functionality, and Panel B considers cases where the functionality is employed. Traits of workers are indicated by column headers and further described in the text. Regressions are unweighted, include fixed effects for year x job type x country of company contact, and report standard errors that are clustered by originating company. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Wage rate and performance effects among workers in India due to ethnic-based contracts

	Base estimation	Including prior feedback and controls for worker experience	Experienced oDesk workers with controls for lagged wages and feedback	New oDesk workers without prior wages or experience	Including worker fixed effects	Companies with past experience with hourly hiring in India	Companies with past successful experience with hourly hiring in India	Dropping UAE outlier firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The sample is contracts formed with workers in India Estimates include fixed effects for year x job type x country of company contact								
Panel A: DV is log hourly wage paid to worker								
Probability that contract is ethnicity-based	-0.029 (0.019)	-0.023 (0.019)	-0.011 (0.011)	0.053 (0.046)	-0.016** (0.006)	-0.026 (0.027)	-0.013 (0.031)	-0.030 (0.019)
Observations	45,656	45,656	30,423	7,043	45,656	27,699	22,830	44,848
Mean of DV	2.120	2.120	2.155	2.008	2.120	2.130	2.123	2.116
Relative effect	-0.014	-0.011	-0.005	0.026	-0.008	-0.012	-0.006	-0.014
Panel B: DV is percentage differential between accepted contract and median proposal								
Probability that contract is ethnicity-based	-0.011* (0.006)	-0.010* (0.006)	-0.008 (0.007)	0.015 (0.020)	-0.012** (0.005)	-0.007 (0.009)	-0.012 (0.011)	-0.013** (0.006)
Observations	45,654	45,654	30,421	7,048	45,654	27,698	22,830	44,846
Mean of DV	-0.012	-0.012	-0.008	-0.029	-0.012	-0.008	-0.008	-0.012
Panel C: DV is a (0,1) "good performance" indicator from public feedback scores (feedback score greater than 4.5/5)								
Probability that contract is ethnicity-based	-0.005 (0.017)	-0.004 (0.017)	-0.009 (0.019)	0.023 (0.036)	-0.016 (0.012)	-0.014 (0.023)	-0.002 (0.025)	-0.009 (0.017)
Observations	36,040	36,040	25,018	5,647	36,040	21,658	18,366	35,409
Mean of DV	0.540	0.540	0.535	0.520	0.540	0.582	0.630	0.533
Relative effect	-0.009	-0.007	-0.017	0.044	-0.030	-0.024	-0.003	-0.017
Panel D: DV is a (0,1) "good performance" indicator from private post-job survey								
Probability that contract is ethnicity-based	0.003 (0.017)	0.004 (0.017)	0.002 (0.018)	0.037 (0.042)	-0.008 (0.014)	0.006 (0.024)	0.030 (0.027)	0.001 (0.017)
Observations	35,790	35,790	24,866	5,617	35,790	21,536	18,278	35,160
Mean of DV	0.620	0.620	0.627	0.593	0.620	0.638	0.680	0.616
Relative effect	0.005	0.006	0.003	0.062	-0.013	0.009	0.044	0.002

Notes: Contract-level regressions estimate wage and performance effects from ethnicity-based contracts using variation among workers in India. The sample includes contracts formed between company contacts located outside of India and a worker in India. Regressions are unweighted, include fixed effects for year x job type x country of company contact, and report standard errors that are two-way clustered by originating company and worker. Fixed effect regressions bootstrap standard errors. Performance observation counts are lower due to ongoing jobs (99% of cases) or missing values. Worker controls include an indicator variable for whether the worker has previous experience, an indicator variable for an experienced worker without feedback, the number of prior jobs, and the feedback score as of the job application. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Wage rate and performance effects among ethnic Indian company contacts due to contracts with India

	Base estimation	Including prior feedback and controls for worker experience	Experienced oDesk workers with controls for lagged wages and feedback	New oDesk workers without prior wages or experience	Including company fixed effects	Companies with past experience with hourly hiring in India	Companies with past successful experience with hourly hiring in India	Dropping UAE outlier firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The sample is contracts formed with ethnic Indian company contacts Estimates include fixed effects for year x job type x country of company contact								
Panel A: DV is log hourly wage paid to worker								
(0,1) indicator that worker is in India	-0.151*** (0.041)	-0.145*** (0.042)	-0.056*** (0.019)	-0.252 (0.165)	-0.166*** (0.059)	-0.138* (0.073)	-0.164** (0.073)	-0.113*** (0.029)
Observations	7,640	7,640	4,538	1,528	7,640	4,348	3,686	6,225
Mean of DV	2.013	2.013	2.023	2.001	2.013	2.045	2.045	1.915
Relative effect	-0.075	-0.072	-0.028	-0.126	-0.082	-0.067	-0.080	-0.059
Panel B: DV is percentage differential between accepted contract and median proposal								
(0,1) indicator that worker is in India	-0.023** (0.010)	-0.022** (0.010)	-0.017* (0.009)	-0.004 (0.023)	-0.017 (0.010)	-0.009 (0.011)	-0.008 (0.013)	-0.032*** (0.009)
Observations	7,640	7,640	4,538	1,528	7,640	4,348	3,686	6,225
Mean of DV	0.000	0.000	0.003	0.000	0.000	0.001	0.001	-0.002
Panel C: DV is a (0,1) "good performance" indicator from public feedback scores (feedback score greater than 4.5/5)								
(0,1) indicator that worker is in India	-0.012 (0.017)	-0.009 (0.016)	-0.012 (0.020)	-0.003 (0.031)	-0.005 (0.016)	0.003 (0.019)	0.006 (0.018)	-0.020 (0.020)
Observations	5,935	5,935	3,642	1,245	5,935	3,347	2,883	4,838
Mean of DV	0.623	0.623	0.592	0.660	0.623	0.679	0.679	0.553
Relative effect	-0.019	-0.014	-0.020	-0.005	-0.008	0.004	0.009	-0.036
Panel D: DV is a (0,1) "good performance" indicator from private post-job survey								
(0,1) indicator that worker is in India	-0.032* (0.018)	-0.032* (0.018)	-0.015 (0.021)	-0.054* (0.029)	-0.036 (0.023)	0.003 (0.019)	0.014 (0.020)	-0.045** (0.020)
Observations	5,900	5,900	3,619	1,244	5,900	3,338	2,879	4,803
Mean of DV	0.677	0.677	0.665	0.700	0.677	0.700	0.700	0.641
Relative effect	-0.047	-0.047	-0.023	-0.077	-0.053	0.004	0.020	-0.070

Notes: Contract-level regressions estimate wage and performance effects from ethnicity-based contracts using variation among ethnic Indian company contacts located outside of India. Regressions are unweighted, include fixed effects for year x job type x country of company contact, and report standard errors that are two-way clustered by originating company and worker. Fixed effect regressions bootstrap standard errors. Performance observation counts are lower due to ongoing jobs (99% of cases) or missing values. Worker controls are those listed in Table 7. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Analysis of bundled contract attributes at company level

	DV is log average wage rate paid on oDesk	DV is cumulative percentage differential between contracts and median proposals	DV is average "good performance" ratings over contracts from feedback	DV is average "good performance" ratings over contracts from private success survey	DV is number of workers hired divided by total number of contracts
	(1)	(2)	(3)	(4)	(5)
Each observation is a unique company contact located outside of India Estimates include fixed effects for company's first year x modal job type x country of company contact					
Share of contracts that are formed with workers in India	-0.135*** (0.008)	-0.075*** (0.005)	-0.070*** (0.007)	-0.071*** (0.007)	0.021*** (0.002)
Share x ethnic Indian company contact	0.016 (0.034)	0.021 (0.015)	0.000 (0.031)	0.014 (0.030)	-0.002 (0.009)
Ethnic Indian company contact	-0.041* (0.023)	-0.025*** (0.010)	-0.001 (0.016)	-0.002 (0.015)	0.007 (0.005)
Observations	35,863	35,862	30,097	29,889	35,863
Mean of dependent variable	2.088	0.026	0.510	0.637	0.935

Notes: Company contact-level regressions estimate wage and performance effects from ethnicity-based contracts using variation among company contacts located outside of India. Regressions are unweighted, include fixed effects for first year x modal job type x country of company contact, and report robust standard errors. Performance observation counts are lower due to ongoing jobs (99% of cases) or missing values. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Estimations of contract volumes formed on oDesk with workers in India

	Dependent variable is share of oDesk contracts formed with workers in India							DV is India's share of dollar value of contracts for country	DV is share of company contacts with Indian ethnic name
	Base estimation	Including distance covariates only	Weighting by log population	Unweighted estimation	Adding worldwide oDesk contracts	Adding trade with India control	Excluding UAE outlier firm		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Indian diaspora share of country population	1.090*** (0.197)	0.728*** (0.156)	0.969*** (0.364)	0.850* (0.429)	1.135*** (0.218)	1.004*** (0.236)	0.531** (0.204)	0.694* (0.360)	2.577*** (0.188)
Indicator for geographical distance to India of 5,000-10,000 kilometers	0.071** (0.030)	0.041 (0.026)	0.090** (0.043)	0.087** (0.044)	0.069** (0.031)	0.077** (0.033)	0.059* (0.030)	-0.033 (0.056)	0.004 (0.058)
Indicator for geographical distance to India of >10,000 kilometers	0.095*** (0.029)	0.088*** (0.030)	0.100** (0.039)	0.092** (0.041)	0.119*** (0.027)	0.102*** (0.033)	0.087*** (0.028)	0.058 (0.063)	-0.074 (0.047)
Log population	-0.009 (0.007)		-0.016* (0.009)	-0.017* (0.010)	0.010 (0.008)	-0.009 (0.007)	-0.010 (0.006)	0.011 (0.013)	0.000 (0.007)
Log GDP per capita	-0.042** (0.022)		-0.051* (0.027)	-0.045 (0.029)	-0.008 (0.025)	-0.041* (0.023)	-0.034 (0.022)	0.010 (0.039)	-0.078** (0.035)
Log telephone lines per capita	0.004 (0.034)		0.002 (0.039)	-0.004 (0.038)	0.005 (0.030)	0.004 (0.034)	-0.005 (0.034)	-0.056 (0.055)	0.052 (0.041)
Overall fit of project profile with India's worker profile	0.078** (0.039)		0.070 (0.047)	0.054 (0.054)	0.085** (0.039)	0.076* (0.040)	0.074* (0.039)	0.015 (0.057)	-0.032 (0.083)
Log count of oDesk contracts worldwide					-0.027*** (0.009)				
Trade with India as share of GDP						0.660 (1.046)			
Observations	92	92	92	92	92	92	92	92	92
Mean of DV	0.341	0.341	0.341	0.341	0.341	0.341	0.338	0.372	0.096
Relative effect (1% diaspora share)	0.032	0.021	0.028	0.025	0.033	0.029	0.016	0.019	0.268

Notes: Country-level regressions estimate traits associated with a larger share of work being contracted to India. Regressions weight by log number of worldwide contracts formed on oDesk, unless otherwise noted, and report robust standard errors.

App. Table 1a: Largest US companies hiring workers in India

N	Number of contracts with worker in India	India's share of total contracts originating from company	Company contact has ethnic Indian name	US State
(1)	(2)	(3)	(4)	(5)
1	118	1.00	No	Virginia
2	94	0.98	No	California
3	73	0.26	No	Florida
4	62	0.93	No	Virginia
5	53	1.00	No	Connecticut
6	51	0.98	No	Wisconsin
7	46	0.38	No	Florida
8	45	0.68	Yes	New York
9	44	0.39	No	California
10	42	0.36	No	Nevada
11	40	0.56	No	Arizona
12	40	0.63	No	California

App. Table 1b: Largest non-US companies hiring workers in India

N	Number of contracts with worker in India	India's share of total contracts originating from company	Company contact has ethnic Indian name	Primary country
(1)	(2)	(3)	(4)	(5)
1	906	0.58	Yes	United Arab Emirates
2	68	0.36	No	United Kingdom
3	58	0.53	No	United Kingdom
4	46	0.84	No	Italy
5	45	0.34	No	Australia
6	44	1.00	No	Netherlands
7	42	0.14	No	Spain
8	40	0.38	No	Australia
9	39	0.87	No	United Kingdom
10	29	0.31	No	Australia
11	29	0.32	No	United Kingdom
12	29	0.63	No	Denmark

App. Table 2: Distribution of oDesk job types and wage rates paid

Job category	Companies in United States					Companies outside of the United States, excluding India		
	Total	Ethnic Indians who are hiring abroad	Non-ethnic Indians who are hiring abroad	Ethnic Indians who are hiring in India	Non-ethnic Indians who are hiring in India	Total	Ethnic Indians who are hiring in India	Non-ethnic Indians who are hiring in India
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Observation counts								
Total count	102,819	3,333	85,151	1,296	28,394	55,122	1,590	14,155
Panel B. Distribution of job types (ordered by median wage as shown in Panel C)								
Networking & inform. systems	2%	2%	2%	2%	1%	2%	1%	2%
Software development	7%	9%	7%	8%	8%	8%	37%	7%
Web development	40%	42%	42%	57%	63%	38%	41%	62%
Design & multimedia	9%	8%	9%	6%	6%	10%	4%	7%
Writing & translation	10%	9%	8%	6%	3%	11%	2%	4%
Business services	2%	1%	2%	1%	1%	2%	2%	1%
Customer service	1%	1%	1%	0%	0%	1%	3%	0%
Sales & marketing	10%	11%	10%	9%	7%	10%	4%	8%
Administrative support	20%	16%	20%	10%	10%	18%	6%	9%
Panel C. Median hourly wage paid to worker								
Total	8.6	8.6	8.4	9.3	9.6	8.7	9.7	9.5
Networking & inform. systems	16.7	13.9	16.7	11.1	12.2	16.7	10.6	12.4
Software development	15.0	15.6	15.0	12.2	13.4	15.0	10.5	13.3
Web development	12.2	11.1	12.0	11.1	11.1	12.0	11.0	11.1
Design & multimedia	11.1	10.0	10.0	11.1	11.0	11.0	10.0	10.0
Writing & translation	5.6	5.6	4.4	5.3	5.0	5.6	4.4	4.4
Business services	5.0	3.5	3.3	5.5	4.4	5.6	6.0	5.6
Customer service	3.3	2.2	3.3	3.3	4.4	5.6	10.0	3.5
Sales & marketing	3.3	4.0	3.3	4.5	4.4	3.9	3.9	4.4
Administrative support	2.2	2.2	2.2	2.2	2.2	2.2	2.8	2.2

Notes: Wage rates are calculated as the median wage paid to workers and are expressed in dollars. Sample includes contracts with ethnic name matches and identified job category classifications. Sample splits in columns 3-6 and 8-9 exclude company contacts for which a partial Indian ethnicity assignment is made.

App. Table 3: Separate analyses of Table 7 by split samples

	Initial contracts	Initial restricted to repeat users	Subsequent contracts	2008 and prior	2009 and later	High-end contracts	Low-end contracts	Excluding employer searches	Only employer searches	Workers with good English skills	Workers with poor English skills
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The sample is contracts formed with workers in India											
Estimates include fixed effects for year x job type x country of company contact											
Panel A: DV is log hourly wage paid to worker											
Probability that contract is ethnicity-based	-0.040** (0.020)	-0.045* (0.028)	-0.029 (0.024)	-0.027 (0.027)	-0.031 (0.023)	-0.039* (0.021)	-0.0105 (0.037)	-0.019 (0.020)	-0.049 (0.030)	-0.026 (0.019)	-0.054 (0.055)
Observations	11,489	6,656	34,166	14,099	31,557	32,628	13,028	26,681	18,975	38,462	4,526
Mean of DV	2.218	2.185	2.086	2.375	2.005	2.392	1.438	2.010	2.274	2.145	2.038
Relative effect	-0.018	-0.021	-0.014	-0.011	-0.015	-0.016	-0.007	-0.009	-0.022	-0.012	-0.026
Panel B: DV is percentage differential between accepted contract and median proposal											
Probability that contract is ethnicity-based	-0.014 (0.009)	-0.022* (0.012)	-0.011 (0.008)	-0.011 (0.008)	-0.014* (0.008)	-0.019*** (0.007)	-0.001 (0.013)	-0.028*** (0.007)	0.004 (0.010)	-0.012* (0.007)	-0.019 (0.015)
Observations	11,488	6,656	34,166	14,099	31,555	32,626	13,028	26,681	18,973	38,462	4,526
Mean of DV	-0.018	-0.024	-0.009	-0.006	-0.014	-0.009	-0.017	-0.023	0.005	-0.009	-0.024
Panel C: DV is a (0,1) "good performance" indicator from public feedback scores (feedback score greater than 4.5/5)											
Probability that contract is ethnicity-based	-0.005 (0.024)	0.009 (0.031)	-0.003 (0.021)	-0.032 (0.033)	0.007 (0.019)	-0.000 (0.020)	-0.016 (0.029)	-0.009 (0.021)	-0.002 (0.024)	-0.003 (0.018)	0.016 (0.045)
Observations	9,181	5,727	26,879	12,956	23,084	25,672	10,368	20,971	15,069	30,844	3,474
Mean of DV	0.466	0.511	0.566	0.425	0.605	0.532	0.562	0.516	0.574	0.546	0.482
Relative effect	-0.011	0.018	-0.005	-0.075	0.012	0.000	-0.028	-0.017	-0.003	-0.005	0.033
Panel D: DV is a (0,1) "good performance" indicator from private post-job survey											
Probability that contract is ethnicity-based	0.008 (0.024)	0.017 (0.031)	-0.002 (0.021)	-0.014 (0.029)	0.010 (0.020)	0.007 (0.022)	-0.006 (0.025)	-0.000 (0.021)	0.002 (0.022)	0.004 (0.017)	0.049 (0.049)
Observations	9,091	5,692	26,699	12,862	22,928	25,483	10,307	20,842	14,948	30,644	3,438
Mean of DV	0.596	0.604	0.628	0.582	0.640	0.616	0.628	0.589	0.662	0.623	0.600
Relative effect	0.013	0.028	-0.003	-0.024	0.016	0.011	-0.010	0.000	0.003	0.006	0.082

Notes: See Table 7.

App. Table 4: Table 7's analysis with additional outcome variables

	All hourly contracts				Worker's first hourly contract			
	DV is indicator variable for wage rate increase on current oDesk contract	DV is indicator variable for worker being hired again on oDesk	DV is indicator variable for worker being rehired by company	DV is log wage of worker's NEXT oDesk contract	DV is indicator variable for wage rate increase on current oDesk contract	DV is indicator variable for worker being hired again on oDesk	DV is indicator variable for worker being rehired by company	DV is log wage of worker's NEXT oDesk contract
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The sample is contracts formed with workers in India								
Estimates include fixed effects for year x job type x country of company contact								
Probability that contract is ethnicity-based	-0.003 (0.003)	-0.002 (0.010)	0.004 (0.005)	-0.035* (0.018)	-0.002 (0.008)	-0.015 (0.027)	-0.000 (0.011)	0.028 (0.038)
Observations	45,656	45,656	45,656	36,339	9,311	9,311	9,311	5,811
Mean of DV	0.022	0.796	0.039	2.156	0.035	0.624	0.062	2.051
Relative effect	-0.136	-0.003	0.103	-0.016	-0.057	-0.024	0.000	0.014

Notes: See Table 7.

App. Table 5: Separate analyses of Table 8 by split samples

	Initial contracts	Initial restricted to repeat users	Subsequent contracts	2008 and prior	2009 and later	High-end contracts	Low-end contracts	Excluding employer searches	Only employer searches	Workers with good English skills	Workers with poor English skills
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The sample is contracts formed with ethnic Indian company contacts Estimates include fixed effects for year x job type x country of company contact											
Panel A: DV is log hourly wage paid to worker											
(0,1) indicator that worker is in India	-0.132*** (0.037)	-0.137** (0.055)	-0.158*** (0.050)	-0.098** (0.039)	-0.166*** (0.047)	-0.181*** (0.047)	-0.103** (0.047)	-0.132*** (0.039)	-0.191*** (0.059)	-0.112*** (0.028)	-0.182*** (0.060)
Observations	1,687	957	5,953	1,447	6,193	4,180	3,460	4,463	3,177	5,642	1,321
Mean of DV	2.103	2.019	1.990	2.200	1.970	2.444	1.492	1.903	2.167	1.989	1.995
Relative effect	-0.063	-0.068	-0.079	-0.045	-0.084	-0.074	-0.069	-0.069	-0.088	-0.056	-0.091
Panel B: DV is percentage differential between accepted contract and median proposal											
(0,1) indicator that worker is in India	-0.046*** (0.016)	-0.032* (0.019)	-0.014 (0.010)	-0.038*** (0.014)	-0.021** (0.011)	-0.030** (0.012)	-0.016 (0.015)	-0.046*** (0.012)	0.009 (0.012)	-0.024** (0.012)	-0.034* (0.017)
Observations	1,687	957	5,953	1,447	6,193	4,180	3,460	4,463	3,178	5,642	1,321
Mean of DV	-0.004	-0.027	0.000	0.006	-0.020	-0.006	0.007	-0.010	0.013	0.003	-0.012
Panel C: DV is a (0,1) "good performance" indicator from public feedback scores (feedback score greater than 4.5/5)											
(0,1) indicator that worker is in India	-0.048 (0.034)	-0.053 (0.044)	-0.003 (0.018)	-0.070* (0.037)	0.006 (0.017)	-0.022 (0.023)	0.005 (0.026)	-0.030 (0.022)	0.010 (0.023)	0.001 (0.019)	-0.067 (0.042)
Observations	1,344	816	4,591	1,350	4,585	3,247	2,688	3,379	2,556	4,463	1,021
Mean of DV	0.529	0.576	0.651	0.442	0.677	0.657	0.583	0.601	0.653	0.612	0.593
Relative effect	-0.091	-0.092	-0.005	-0.158	0.009	-0.033	0.009	-0.050	0.015	0.002	-0.113
Panel D: DV is a (0,1) "good performance" indicator from private post-job survey											
(0,1) indicator that worker is in India	-0.066*** (0.033)	-0.073* (0.043)	-0.019 (0.019)	-0.059 (0.037)	-0.024 (0.019)	-0.040* (0.023)	-0.018 (0.026)	-0.053** (0.021)	-0.011 (0.023)	-0.020 (0.018)	-0.063 (0.044)
Observations	1,326	810	4,576	1,333	4,567	3,229	2,671	3,362	2,538	4,432	1,016
Mean of DV	0.655	0.671	0.683	0.617	0.694	0.699	0.651	0.658	0.703	0.667	0.674
Relative effect	-0.101	-0.109	-0.028	-0.096	-0.035	-0.057	-0.028	-0.081	-0.016	-0.030	-0.093

Notes: See Table 8.