

DISCUSSION PAPER SERIES

IZA DP No. 11061

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ABSTRACT

Testing for Repugnance in Economic Transactions: Evidence from Guest Work in the Gulf*

Despite the large individual benefits of guest work by the poor in rich countries, agencies charged with global poverty reduction do little to facilitate guest work. This may be because guest work is viewed as a repugnant transaction – one whose harmful side-effects might cause third parties to discourage it. This paper sets out six criteria for a transaction to be repugnant in consequentialist terms, and conducts uncommon tests for repugnance: It uses these criteria to formulate several empirical tests for the repugnance of guest work by Indian construction workers in the United Arab Emirates. It separates the effects of guest work from the correlates of guest work using a natural experiment that quasi-exogenously allocated guest work among a group of several thousand job applicants. The effects offer little evidence that guest work in this setting is typically the cause of repugnant consequences.

JEL Classification: F22, J6, O12, O16, O19

Keywords: migration, guestwork, temporary, Gulf, Dubai, UAE, rights, abuse, exploitation, migrant, immigrant, labor, mobility, scheme, visa, construction, seasonal, repugnant, externality, regret, behavioral

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* This research would have been impossible without the ideas and support of Jean Fares of the World Bank. I thank Tejaswi Velayudhan, Zubair Naqvi, and Nabil Hashmi for excellent research assistance with the survey. I am grateful for the collaboration of the India survey team under A.V. Surya at SRI/IMRB. I received helpful comments from Eric Posner and an anonymous referee, and benefited from conversations with Yousuf Abdulla Abdulghani, Karthik Muralidharan, David McKenzie, Suresh Naidu, Arvind Nair, Yaw Nyarko, Çağlar Özden, Yao Pan, Lant Pritchett, Irudaya Rajan, Rebecca Thornton, Erwin Tiongson, Eric Verhoogen, Shing-Yi Wang, Glen Weyl, Dean Yang, Alex Zalami, and participants in seminars at the Columbia University Dept. of Economics, Harvard Kennedy School, the Midwest International Economic Development Conference and the Migration & Development Conference. Hannah Postel provided additional research assistance. Research and analysis were generously supported by the John D. and Catherine T. MacArthur Foundation and by the Open Philanthropy Project. The collection of data by the India survey team was supported by the International Organization for Migration in cooperation with the UAE Ministry of Labor. All viewpoints and any errors are the sole responsibility of the authors and do not represent CGD or IZA, or their boards or funders.

People from poor countries typically raise their economic productivity and real earnings by hundreds of percent when they move to work in rich countries (Clemens et al. 2017). Guest work—temporary, employment-based migration—offers in principle a way for many of the poor to raise their productivity abroad without the high political barriers against permanent migration (Djajić 2014). Guest work programs common in the Gulf countries do more to reduce global economic inequality than the migration regimes of high-income Western nations (Weyl 2017), and the world has seen over 580 bilateral agreements for guest work since 1945 (Chilton and Posner 2017). But many social scientists, philosophers, and jurists object to guest work as a *repugnant* transaction: an economic transaction that third parties should intervene to discourage or eliminate.¹ Policy makers charged with reducing global poverty have done little to create new opportunities for guest work.

This paper tests a set of sufficient conditions for guest work to be considered repugnant, by estimating some of the effects of temporary construction work in the United Arab Emirates (UAE) on a set of Indian workers and their families. It identifies thousands of successful Indian applicants to UAE construction jobs from 2008–2009, reports a survey of their households in India in 2011, and links them to administrative data on those working in the UAE. Because the UAE construction sector experienced a sudden crisis in late 2008, the probability of any given applicant arriving in the UAE was primarily determined by the timing of the crisis—a force beyond his control. This exogenous determinant of guest work allows me to estimate the pure effects of UAE work on that worker and his family in India, apart from any other differences that might exist between migrant and non-migrant households. I can then compare those effects to several effects that might be observed if guest work in the Gulf were repugnant under various consequentialist theories of repugnance.

The first contribution of this work is to unify separate strands of the literature to create and execute tests for many sufficient conditions for repugnance. While economists have urged market design to account more seriously for repugnance (Roth 2007), this requires an assessment of which transactions are in fact repugnant, and it is rare to empirically test objective criteria for repugnance in any type of transaction. It thus addresses the growing social science of repugnance in general (Becker and Elías 2007; Lacetera 2016; Ambuehl 2017). The second contribution is to

¹See especially Lenard and Straehle (2012) and the literature summarized below in section 2.

offer evidence from a natural quasi-experiment, addressing the separation of correlation from causation, about whether guest work in the Gulf systematically causes repugnant outcomes. It thus addresses the labor economics literature on repugnant contracts in general (Naidu 2010; Acemoglu and Wolitzky 2011; Naidu and Yuchtman 2013) and the literature on the effects of temporary labor migration in particular—which “has often been ignored in the economic literature on migration” (Dustmann and Görlach 2016). Few studies have been able to establish a credible counterfactual (Gibson and McKenzie 2014b; Dinkelman and Mariotti 2016; Clemens and Tiongson 2017). The UAE, with 98 percent of its private-sector labor force temporary foreign workers, is an ideal natural laboratory.

I find that the typical effects of guest work in UAE construction on Indian households do not exhibit strong evidence of meeting several empirically observable criteria for repugnance. I test for evidence of several such criteria: coercion, regret, externalities, low-level equilibria, and inequity—all defined in Section 1. The presence of systematic coercion is incompatible with the finding that guest work by one household member causes guest work by other household members. The presence of regret is incompatible with the effects of guest work experience on guest work applicants’ knowledge about working and living in the UAE, and on effect of guest work on indebtedness. The presence of negative externalities on household economic productivity is incompatible with the effects of guest work by one household member on work by other household members in India. The presence of low-level equilibria of ‘remittance dependency’ is incompatible with a positive effect of guest work on new business investment in India. The presence of quasi-coercion through highly skewed bargaining power is verified in the data, but does not arise from guest work itself because the disparity would remain in the absence of guest work.

Section 1 below draws on the literature to identify a set of separate, empirically testable necessary conditions for a transaction to be repugnant in consequentialist terms, and Section 2 reviews literature ascribing consequentialist repugnance of various types to guest work. Section 3 then describes the empirical setting of Indian temporary construction workers in the UAE, the natural experiment that quasi-exogenously sorts the sampling universe into migrants and non-migrants, and the survey. Section 4 then offers tests for observable signs of repugnance in the estimated effects of guest work, and Section 5 discusses what can and cannot be learned from this inquiry.

1 Consequentialist theories of repugnant transactions

The literature offers a clear definition of a repugnant transaction: It is one that “some people would like to engage in and that others would like to prevent” (Niederle and Roth 2014, 132).² This might include slavery, gambling, bribery, prostitution, or the sales of human organs.

This definition allows multiple theories of what produces repugnance, because there are many reasons that third parties might like to prevent a transaction. Some theories of repugnance rest on the view that some transactions directly harm the utility of others through their very existence (e.g. Sen 1970; Kass 1997; Chen and Schonger 2016). This is the deontological view that some transactions are wrong by definition, justifying regulations such as bans and “sin taxes” independently from their empirically observable consequences (e.g. Zamir and Medina 2008; Lockwood and Taubinsky 2017). An alternative, consequentialist view of repugnance describes it in terms of observable effects. Social scientists, philosophers, and jurists have advanced several possible sufficient conditions for a transaction to be repugnant in consequentialist terms, conditions that in principle are empirically testable:

1. *Coercion*: The transaction is forced.
2. *Regret*: Either party does not understand the transaction’s effects, through naïveté or fraud.
3. *Externality*: The transaction harms agents not involved in it, other than by changing prices.
4. *Equilibrium*: The option to make the transaction prevents better options from arising.
5. *Inequity*: The transaction has unequal benefits due to highly unequal bargaining power.
6. *Degradation*: The transaction degrades the preferences or character of those involved.

Coercion, *inequity*, *regret*, *externality*, and *degradation* are discussed by Cullenberg and Pattanaik (2004), Roth (2007), Becker and Elías (2007), von Lilienfeld-Toal and Mookherjee (2010, 45), Sandel (2013), Guzmán and Munger (2014, 41), and Lacetera (2016).³ *Equilibrium* effects are a focus of

²In broad terms, the literature equivalently calls such transactions *noxious* (Satz 2010), *contested* (Radin 1996), *taboo* (Fiske and Tetlock 1997), or simply *unjust* (Munger 2011)—though precise definitions vary.

³*Fraud* is distinguished from *regret* by Guzmán and Munger (2014): A transaction could be considered repugnant even if the agent who proceeded with the transaction based on fraudulent information would have proceeded anyway had they possessed correct information (a loan shark lying that the interest rate was 5% instead of the true 30% could remain repugnant even if the customer would have knowingly paid 30%). And a transaction by two misinformed agents who regret it could be considered repugnant even if neither were defrauding the other (two ten-year-olds make a deal involving their future retirement savings). This analysis considers it sufficient for either party to be ill-informed about what they are agreeing to, which comprises both scenarios.

[Genicot \(2002\)](#), [Basu \(2007\)](#), [Satz \(2008\)](#), and [von Lilienfeld-Toal and Mookherjee \(2010\)](#): For example, the existence of the option to place oneself into indentured servitude could inhibit the development of markets for loans that would, if they existed, be preferred those now voluntarily choosing indenture. [Brekke et al. \(2003\)](#), [Ambuehl et al. \(2015\)](#) and [Ambuehl \(2017\)](#) model *degradation* with mechanisms by which seemingly intrinsic preferences to engage in a transaction can be endogenous to the strength of extrinsic incentives.

All of these are independent reasons why a transaction cannot be judged Pareto optimal simply because it occurs. Unlike deontological views of repugnance, the above consequentialist conditions for repugnance are in principle testable with objective evidence. They rest on objective effects rather than exclusively on subjective preferences. For example, whether the purchase of a dog is repugnant because the purpose of the transaction is to eat the dog depends on subjective preferences that differ across communities of people (a deontological view); but whether the purchase of a dog is repugnant because the seller misrepresented the dog's breed is in principle testable with objective observed facts (a consequentialist view).

Until recently, economists have shown little interest in characterizing or addressing repugnance. “[W]hen confronted with repugnance toward a market transaction, economists often respond as if a sufficiently clear argument focused on the welfare gains due to trade will overcome that repugnance” ([Roth 2007](#), 49). But this is changing. A small but dynamic literature has taken repugnance seriously. This includes testing empirically for necessary conditions of consequentialist repugnance, such as testing whether easy-access, high-interest ‘payday’ loans systematically lead to outcomes that borrowers regret ([Melzer 2011](#); [Bhutta et al. 2015](#)).

2 Repugnance ascribed to guest work

Despite the general lack of economic research on temporary migration ([Dustmann and Görlach 2016](#)), a long research literature beyond economics has analyzed guest work contracts. [Lenard and Straehle \(2012\)](#), for example, find that guest work is categorically unjust and recommend policy barriers against it. Parts of that literature find that guest work typically exhibits each of the above consequentialist conditions sufficient for repugnance. The following list is illustrative

rather than comprehensive.⁴

1. *Coercion*: Many researchers equate guest work to forced labor or slavery (Smith 2007; Bauer and Stewart 2013), in part because most workers cannot freely change employers or access legal remedies for violations of labor law. Guest work in the Gulf, in particular, is described generally as a form of slavery (Keane and McGeehan 2008) or bondage (Sönmez et al. 2011). Of the academic journal articles in the JSTOR digital library that mention “guest workers”, 431 also contain the term “slavery”, “bondage”, or “indentured servitude”.⁵ Economists typically use labor coercion to mean deliberate removal of outside options for the coerced worker by another agent (Naidu 2010; Acemoglu and Wolitzky 2011; Naidu and Yuchtman 2013).
2. *Regret*: Zachariah and Rajan (2009) find that large fractions of earnings by Indian migrants to the Gulf are spent on debts incurred to travel, and Rahman (2011) finds that many Bangladeshi migrants to Saudi Arabia do not earn enough to pay back debts that they incurred to travel there, suggesting either naïveté or fraud. Johnston (2010, 1121) finds that U.S. guest workers “frequently fail to earn enough money to cover their basic needs while in the United States or to repay the debts they incurred in order to travel to the United States.” Zachariah et al. (2003) find that “nearly one-fifth of the Indian migrants [in the UAE] have not received the same job, wages, and non-wage benefits as stipulated in their work contracts,” and Owens et al. (2014) find that guest workers in the United States are frequently cheated with illegal fees presented to them as legal, and (Smith 2016) finds fraud commonplace.
3. *Externality*: Several studies have found an association between overseas guest work and poor outcomes for migrants’ children or elderly dependents, including family break up (Hugo 2002; Antman 2011, 2012; Cortes 2015), though carefully-identified studies have shown long-term positive effects on children’s education (Dinkelman and Mariotti 2016). It is frequently argued that remittances from temporary migrants could reduce the productivity of their households, such as by inducing labor-force withdrawal (Chami et al. 2005; Zachariah and Rajan 2009; Adams 2011; Antman 2013; De and Ratha 2012; Abdulloev et

⁴For example, Lenard and Straehle (2012) argue that guest work is necessarily unjust (repugnant), while Hidalgo (2010) argues that wealthy nations have a moral obligation to admit guest workers.

⁵Search conducted January 23, 2017.

al. 2014).

4. *Equilibrium*: McKenzie and Rapoport (2011) find that Mexican youth's option to earn high wages with temporary work in the United States causes them to invest less in education. By reducing the human capital stock at home, the migration option could thus in principle lead to fewer local job opportunities, opportunities that could be preferred by some migrants.
5. *Inequity*: Guest-work contracts have been described as inherently exploitative because many workers' alternative is dire poverty (Walzer 1983, 58–60; Mayer 2002, 345–6). Thus even a contract freely chosen could be repugnant if the agent's best alternative is sufficiently painful. Munger (2011) calls such a choice voluntary but not 'euvoluntary'. Alternatives to departure are often strictly limited by tying workers to a single employer in the destination country (e.g. Holley 2001; Cortes 2006; Renkiewicz 2016; Casella and Cox 2017).
6. *Degradation*: Lee (2017) and many others describe the jobs performed by guest workers, beyond being difficult, as fundamentally "degrading" to workers. Guest work in the Gulf is described as costing workers "their basic human dignity" (Auwal 2010, 89). This raises the concern that participating in guest work could transform workers' preferences in ways that they would not want *ex ante*, but may not be able to regret *ex post*.

Some of this research accords with views widely held by advocates, journalists, and the general public, particularly regarding South Asian guest workers in Gulf countries. For example, Sherry (2004, 1) describes the working conditions of guest workers in Saudi Arabia as "slavery-like". Human Rights Watch (2006) characterizes guest workers in the UAE as generally subject to "wage exploitation, indebtedness to unscrupulous recruiters, and working conditions that are hazardous to the point of being deadly." They are described as "lured into a life of squalor and exploitation" (Abdul-Ahad 2008) and "toiling in a form of modern bondage" (Freedland 2009). Buckley (2009) describes Indian workers in Dubai who have not earned enough to pay the debts they incurred to travel there.

These conclusions suggest a partial explanation for why agencies charged with reducing global poverty invest little in promoting guest work, despite its large effects on workers' incomes. For

example, the World Bank assisted in the design of New Zealand's Recognized Seasonal Employer scheme, an agricultural guest work program for nationals of poor South Pacific island countries (Luthria and Malaulau 2013). This program raised the household incomes of poor families in Tonga typically by a factor of ten, far exceeding the effects of any other general class of international antipoverty policies. Research at the World Bank's Research Department thus assessed the program as "among the most effective development policies evaluated to date" (Gibson and McKenzie 2010, 2014a), one that moreover benefited New Zealand's economy (Winters 2016). But the World Bank has done little to expand that model to other countries. Similarly, an impact evaluation of U.S. agricultural guest work visas for Haiti finds that they raise the current value of Haitian farmers' labor by a factor of 15, an effect well beyond the reach of typical international antipoverty policy in Haiti (Clemens and Postel 2017). But U.S. development and relief agencies with the stated goal of poverty reduction have avoided investing in guest work programs in Haiti or elsewhere.

If consequentialist theories of repugnance are to be a useful guide to guest work policy, systematic and rigorous empirical evidence matters. First, consequentialist theories of repugnance depend on consequences that are in principle observable, and can be tested with objective evidence. Second, evidence must show that those effects are in some sense systematic. For example, suppose that many poor homeowners took mortgages they could not pay. Even numerous anecdotes of such an outcome are unlikely to convey repugnance on the act of offering mortgages to the poor unless the effect were systematic rather than anecdotal. Third, establishing causality is essential. A high rate of bankruptcy among poor mortgage-holders is insufficient to show that the mortgage was the cause of the bankruptcy, since the poor are likely to go bankrupt for other reasons. Fourth, consequentialist theories of repugnance require the transaction to be sufficient for the repugnant outcome, not just necessary. For example, deceptive mortgages can be repugnant without mortgages in general being repugnant, because a mortgage contract is necessary but not sufficient for the existence of a *deceptive* mortgage contract.

3 A natural quasi-experiment in the UAE

This study focuses on an empirical setting in which guest work is frequently considered repugnant on consequentialist terms: Indian guest work contracts in the Gulf. It utilizes a natural quasi-experiment to distinguish the systematic effects of guest work from the correlates of guest work, in order to test whether various consequentialist theories of repugnance apply to the case. This section describes the setting, the natural experiment, and the process of gathering data on Indian workers and their families.

3.1 Empirical setting: Temporary foreign workers in the UAE

Since the early 1980s, the UAE began an economic expansion driven by its oil sector and complemented by growth in other sectors as economic diversification took hold. Real GDP growth has been impressive over this period and progress in economic development was registered through better infrastructure, improved institutions, and human capital formation among UAE nationals.

Much of this progress, particularly in physical infrastructure and the construction of mega projects was supported by a fast rise in employment. Because of its limited number of human resources, the UAE had to rely on large inflow of foreign temporary workers to meet its employment needs. Employment growth accelerated in the years following 2000, creating job opportunities for workers from low-income sending countries such as India and Pakistan. Employment grew from 288,051 in 1975 (with 42,762 UAE nationals) to about 4 million in 2010 (with about 211,000 UAE nationals). Employment has roughly doubled each decade. Employment growth reached 21 percent in 2007 and 31 percent in 2008.

While most sectors during this period grew quickly, employment in the construction grew fastest. Between 2007 and 2008, construction employment increased by more than half a million workers, rising from 1.347 to 1.938 million. In 2008, the construction sector comprised almost half of all UAE employment, compared to 19 percent for the trade sector and 11 percent for manufacturing. More than half of all employment growth from 2007 to 2008 came from construction.

This growth was composed almost entirely of temporary foreign workers. Most of these were

migrant workers from India, Pakistan and Bangladesh. In 2007 about 433,000 new work permits were issued to workers coming from India, and about 585,000 in 2008. In parts of India, the UAE is a major migrant destination; it is the number-one destination of overseas workers from Kerala, India, for example (Zachariah and Rajan 2009, 35). Many were low-skill workers performing hard physical labor, and international concern for their well-being has been common. For policy makers in the UAE and other important destinations, this has created many challenges—how to manage these large flows of workers and insure the proper functioning of labor supply while insuring that workers are protected.

3.2 Quasi-exogenous allocation of guest work

I wish to ensure that when I compare households with and without migrant workers, those households be essentially identical in all other ways, observable and unobservable. Hypothetically, this could be accomplished by a designed experiment in which randomly selected groups of Indian workers are encouraged to take a job in the UAE. In the absence of such an approach, this study takes two approaches to approximate it.

First, I analyze a highly homogeneous group. The sampling universe comprises only a group of Indian workers who applied for and were selected for construction jobs in the UAE through one multinational construction firm in 2008 and 2009. Every household in the universe has a member who was willing to apply for a construction job in UAE, was able to express that desire by applying for the job in one of four recruitment centers in India, and was selected to receive a job offer in the UAE. All workers and households sampled have the observable and unobservable traits that led such a job to be demanded by them and supplied to them.

Second, within that group, the actual arrival of each worker in the UAE was determined largely by a *force majeure* that is unlikely to correlate with any observable or unobservable difference among households that pre-dates migration. During the period of job offers I analyze, the UAE construction sector experienced a sudden, major, and unexpected negative shock.

At the end of August 2008, the UAE faced a rapid and severe slowdown in economic activity due to the international financial crisis and the bursting of a speculative bubble in the Dubai property

market. This led to the freezing or cancelation of large numbers of UAE construction projects, particularly in Dubai. Debt service quickly became difficult for the highly leveraged construction sector. International finance dried up amidst the wave of instability (the same wave that would destroy the American investment bank Lehman Brothers two weeks later), and domestic finance dried up as the price of the UAE's chief export—petroleum—plummeted 60 percent in two months. Hundreds of construction projects halted, some for months and others for years.

As a result, many UAE construction firms canceled orders for new construction hires from India and elsewhere, including hires already in process for a UAE visa. Employment quickly responded by a large drop in growth following years of double digit increases. Employment losses at first were concentrated in the construction sector, the sector mostly exposed to the shock, but became widespread after.

It thus happened that small differences in the date that an Indian worker applied for the UAE job he was offered are associated with large differences in the probability that he successfully arrived in the UAE. But small differences in the date that he applied for his job are unlikely to be associated with large differences in the observable or unobservable traits of that worker and his family. Together, these two methods allow us to observe Indian workers and their families in a setting where work in the UAE has been as-good-as-randomly allocated among them.

This research design has the advantage of keeping to a minimum any expected observable or unobservable differences between these workers and families other than the fact of having worked temporarily in the UAE. This allows unusually confident identification of the true effects of UAE work. The natural experimental approach has the advantage of using naturally occurring events rather than a scenario contrived by researchers, alleviating concerns that research subjects are reacting to an artificial setting. It is also much less expensive than a designed experiment. The approach of limiting the analysis to job applicants through one firm has the advantage of more reliably measuring the effects of UAE work on this population, but it has the disadvantage that its conclusions cannot uncritically be extended to other populations.

3.3 Data: A purpose-built survey matched to administrative records

The data for this study come from three matched sources: Indian hiring records of a major UAE construction firm, a purpose-built survey conducted in nine states of India, and administrative records of the UAE Ministry of Labor. I individually matched hiring data on successful Indian applicants to UAE construction jobs from 2008–2009, survey data on those workers' families collected in 2011, and the UAE work history of each job applicant in all years.

First, a major UAE construction firm provided the basic characteristics and contact information of all workers recruited and selected for a job in the UAE at different recruitment centers in India over the course of a year. This comprises all workers recruited and selected at centers in Northern India at Delhi and Mumbai between June 1, 2008 and May 31, 2009; and all workers recruited and selected in Southern India at Chennai and Ramnad between March 1, 2008 and April 30, 2009. For these 7,571 workers I have age, occupation, skill level, name (frequently a reliable indicator of whether or not the applicant's family is Muslim), and a contact address in India. The locations of these households are shown at the district level in [Figure 1](#).

Second, I hired survey teams to attempt to visit the contact address for all 7,571 workers between August 25 and November 4, 2011.⁶ Many of the addresses, which each applicant had written as he chose on the job application form and which were never previously checked, were incomplete and did not provide sufficient information to locate the dwelling. The survey teams successfully located 4,425 addresses (58.4% of all addresses) in nine different states of Northern and Southern India. These visits resulted in 2,727 complete, hour-long interviews (61.6% of the good addresses) with a knowledgeable adult respondent present at the time of the visit.

Third, I match the passport number of each Indian job applicant to administrative records of the UAE Ministry of Labor. This indicates whether or not the person holding each passport listed on the initial job application had ever worked in the UAE, either on that job or any other, and the terms of the employment contract including occupation, wage, and dates. A worker must be physically present in the UAE to receive one of these three-year work permits ("labor cards"), so these records are good indicators of presence in the UAE.⁷

⁶With the exception of four pilot interviews, conducted July 30 to August 4, 2011, in Delhi and Chennai.

⁷They are not perfect indicators of presence in the UAE, however, for two reasons. First, limited numbers of

Finally, I require a proxy measure of overall economic conditions in the UAE that captures immediate changes in economic expectations that might affect hiring behavior. This has the potential to serve as a strong and valid instrumental variable for job-applicants' migration. Here I choose the price of Dubai Fateh crude oil, the most important indicator of revenue to the UAE national government. I made this selection before the empirical analysis and did not subsequently alter it. [Figure 2](#) shows that this is a strong instrument for individual-level migration by the job applicant in each household. [Figure 2a](#) shows, in the data for the survey sample, how the probability that the applicant had ever traveled to the UAE by the time of the survey (in 2011) varies with the date of application. That probability closely tracks the oil price on those dates (in gray). [Figure 2b](#) shows, in administrative data for the sampling *universe*, the probability that a UAE labor card (visa) was ever issued to the applicant, by date of application. This likewise tracks the oil price. The similarity of the migration probabilities from the survey sample and the sampling universe suggest that survey nonresponse was not highly correlated with the migration treatment.⁸

4 Tests for repugnance

The availability of a strong and plausibly valid instrumental variable for migration allows several tests of the household-level effects of having a household member travel from India to the Gulf for guest work in construction. In a strictly observational setting we would be concerned that any positive or negative outcomes associated with migrant households could act more as determinants of self-selection into migration than as effects of migration. In the present setting,

workers might choose to depart the UAE before their work contracts end. This is uncommon, as both employers and employees incur fixed initial costs and it is in the interests of both to have workers complete the contract. Second, limited numbers of workers may have come to the UAE on a different passport than the one listed in their job application (if it was lost, stolen, or expired), so that I could not match their UAE employment records to the job application. This is also uncommon; Indian passports for adults are valid for 10 years.

⁸The validity of the oil price as an instrumental variable for applicants' migration behavior is further explored in the Online Appendix. It tests for correlation between the observed predetermined traits of the UAE job applicants and the value of the instrumental variable (the oil price index) at the time of their application. Such correlation would imply that assignment of the migration treatment was not as-good-as-random, and would imply that migrant self-selection varied with the instrument. It also tests for correlation, in the sampling universe, between survey response and the instrumental variable. Any such correlation would imply that treated individuals were either more or less likely to respond to the survey than the non-treated. But in neither case are substantial correlations of this kind observed. A separate threat to the validity of the instrument would arise if an employment crisis had occurred in India simultaneously with the UAE crisis, but there was no substantial rise in India's unemployment rate in late 2008. A third threat to instrument validity would arise in principle if the very act of applying to UAE work harmed a worker's employment prospects in India, such as by taking up time and energy that could have been used for domestic search, but there is no clear evidence of such an effect in this setting.

the sampling universe contains only workers who have both self-selected into migration and have been selected by the employer to travel. Moreover, whether or not a worker traveled was largely determined by a *force majeure* at the destination largely unrelated to workers' characteristics other than their application date. This allows testing for objective effects of migration that might be sufficient to satisfy a consequentialist criterion of repugnance.

This section discusses whether data on the effects of guest work in this setting support several sufficient conditions for repugnance from [Section 1](#). Those conditions are not singly or jointly *necessary* for repugnance; for example they do not address deontological theories of repugnance. Thus the following tests are informative but not dispositive regarding the repugnance of guest work in this setting.

4.1 Coercion

While there are few allegations that Indian guest workers in the Gulf are recruited by force, there have been serious concerns about workers being held in the destination country by employers against their will, such as by a lengthy confiscation of their passports (e.g. [Human Rights Watch 2012](#)). Direct information on cases of this kind is difficult to gather, for example because workers might fear retribution for reporting such incidents.

One way to seek observable signs of coercion is to test for behavior that is unlikely under coercion. For example, a worker forced to work in the Gulf against his will might mention his condition to family and friends, as communication with India has become inexpensive and instantaneous for most workers, and Gulf workers are typically in close touch with their households in India (e.g. [Seshan and Yang 2014](#)). He would be plausibly likely to discourage them from following in his footsteps, and even more plausibly unlikely to actively encourage or facilitate their entry into a condition that he himself wished to leave. This suggests that one effective proxy test for coercion would be to observe the effect of migration to the Gulf by one household member on migration by other household members.

[Table 1](#) tests whether migration by the job applicant causes migration by other people in the same family. It uses a simple linear probability model to regress an indicator variable for migration

by working-age household members other than the original job applicant on migration by the original job applicant. Here the treatment variable and the outcome variable indicate current presence in the UAE, at the time of the 2011 survey, three years after the UAE construction crash. The first two columns are Ordinary Least Squares regressions, with and without controls for baseline traits of the applicant and household.⁹ The next two columns are two-stage least squares (2SLS) regressions, with the applicant's migration instrumented by the oil price on the date of his application. Standard errors are clustered by household to allow for arbitrary correlation of the error term between household members. The Cragg-Donald F statistic suggests reasonably strong instrumentation. This basic set of regression specifications will be repeated several times below.

The coefficient on applicant's migration in the 2SLS regressions is positive, statistically distinguishable from zero only around the 10 percent level. This suggests that migration to the UAE for construction guest work by one household member raises the probability of migration to the UAE by other working-age members of the same household by around eight percentage points. In column 4, we can statistically rule out any effect below -2 percentage points at the 5 percent level. If a typical or even common experience of these guest workers was to be forced into guest work or forced to remain in guest work even though they preferred to be in India, we might not expect workers to facilitate their own family's entry into a similar predicament.¹⁰

4.2 Regret

Do workers regret their decisions, due to having been misinformed (by naïveté) or disinformed (by fraud) about what they were signing up for? Cases of Gulf migrants receiving lower pay or fewer benefits than they retrospectively report having expected are commonly reported [Zachariah et al. \(2003\)](#). But there is little rigorous evidence. [McKenzie et al. \(2013\)](#) find that permanent migrants from Tonga to New Zealand substantially underestimate their actual earnings at the des-

⁹“Controls” means that the regression includes the following baseline variables from the job application in 2008–2009: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh).

¹⁰The other family members in question are workers. The employer does not bring workers' spouses or children to the UAE for purposes of companionship, and the workers' housing and cost of maintaining a family would be prohibitive.

mination, using a unique research design of randomized visa allocation that minimizes concerns that migration would be affected by impressions regarding earnings. Shrestha (2017) finds that temporary migrants from Nepal to Malaysia and the Gulf with no prior migration experience substantially overestimate the true risk of death at the destination, as well as overestimating true earnings.

Information: One way to assess the information set acted on by non-migrants prior to their first migration is to compare migrants with experience to otherwise identical non-migrants. The quasi-exogenous allocation of migration in the present setting allows an approximation of this comparison. If Indian workers applying to UAE guest work for the first time are typically ill-informed about working and living conditions in the UAE, we would expect substantial effects of UAE migration on their information set.

In the survey, each respondent in India was asked about typical wages in the UAE, about working conditions in the UAE (“apart from his earnings ... such as safety, enjoyment of the work, difficulty of the work”), and about living conditions in the UAE (“such as housing and food”). Working and living conditions were measured on a 1 to 5 scale of increasing quality relative to conditions in India.¹¹ If any member of the household was in UAE at the time, the respondent was asked about that person’s wage, working, and living conditions. If no member of the household was in UAE, the respondent was asked about what those conditions would be if “a man from this household might have the opportunity to work in the UAE.”

Table 2 reports regressions in which the outcome is respondents’ answers to these questions, and the key dependent variable is current presence in the UAE. As above, the first two columns show OLS regressions with and without controls, and the last two columns show 2SLS regressions with and without controls. Again, the instrumental variable is the oil price on the date that the household’s applicant made his application. The OLS regressions show that respondents from households whose applicant is not currently in the UAE believe that earnings there are 20 percent higher, working conditions are a quarter-point better (on a 1–5 scale), and living conditions are 0.3 points better (on a 1–5 scale).

¹¹1 = Much worse than India; 2 = Worse than India; 3 = Similar to India; 4 = Better than India; 5 = Much better than India.

The effect of migration on household respondents' beliefs, however, differs from the correlation between household-level migration and beliefs. The 2SLS coefficients are unstable and statistically indistinguishable from zero. The coefficient on the fourth column of the earnings regressions implies that migration by a household member causes an increase in household member's impression of typical UAE earnings by 94 percent (that is, $e^{0.662} = 1.94$). This corroborates evidence that Indian workers in the UAE often have opportunities for informal, off-the-books overtime work beyond that promised by their formal contracts, sometimes desired by workers seeking to earn as much as possible in a short period but disallowed by maximum-hours laws (Joseph et al. 2017).¹² But this estimate comes with a large standard error. Further 2SLS estimates in the table imply that UAE migration by a household member causes household members to raise their impression of working conditions in the UAE by about one point (on a 1–5 scale), and to reduce their impression of living conditions by roughly a quarter of a point (on a 1–5 scale). None of these estimates are statistically precise at the five percent level. But they do not reveal strong evidence that direct experience of UAE work causes potential migrants to revise sharply downward their understanding of typical earnings, working conditions, and living conditions there. The Cragg-Donald F statistics in the table suggest that instrumentation is generally strong enough to give the second-stage regressions power to detect large negative effects of that kind.

The difference between the OLS and 2SLS results must arise from migrant selection on unobserved traits. One plausible explanation is positive selection of return migrants: many temporary labor migrants migrate to meet earnings/savings targets (Djajić and Vinogradova 2015), implying that those able to earn more would return earlier. Those present in India in 2011 to answer the survey would include such migrants and their family members. This would tend to generate a positive correlation between impressions of UAE working and living conditions and presence in India, but need not fully explain the negative OLS coefficients in the table. Another mechanism for the simple negative correlation between direct exposure to UAE work and negative ideas about working and living conditions in the UAE could be due to migrant selection into departure: people with better prospects in general (both in India and abroad) could be less likely

¹²It also accords with the evidence of McKenzie et al. (2013) that Tongan migrants to New Zealand earn 85 percent more than they initially believed they could. In that setting, the authors explain the disparity in part because past migrants not wishing to be asked for frequent cash gifts tend to underreport their earnings to friends and family back home.

to go to the UAE and remain there.¹³

Do households know how much migrants are actually earning? Table 3 investigates this question. The first two columns of the table report mean answers to the question about how much a male from that household could earn in the UAE, for households without members in the UAE. The first column shows the answer when the survey respondent is the original job applicant from 2–3 years earlier (who is not now in the UAE), and the second column shows the answer given by respondents who are not the applicant. These are similar. Column 3 shows the answer given by households with a member currently in the UAE; as mentioned above, it is about 20% less than for households without a migrant. Column 4 gives the actual mean contract wage of the workers currently in the UAE. The households of those workers believe, on average, that those workers earn about 40% more than they earn.

This does not necessarily mean, however, that households receive false information from migrants. First, the households' responses may include in-kind compensation. The exact question asked of migrants' households was, "Approximately how much do you think he earns per month for his work in the UAE?" It is plausible that most households interpreted that question to include full compensation received by the worker, which for most workers includes a monetized housing allowance and for some also includes a monetized food allowance. This might account for some or all of the difference.

Second, the person for whom households answered hypothetical earnings may not have been the person who would actually have been sent abroad if the opportunity were offered. Households without a migrant were asked about hypothetical UAE earnings for "a man from this household"—not necessarily the UAE job applicant in my records. Households may have borne in mind the primary breadwinner for the household, that is, the person with the best earnings prospects in India and in the UAE among all household members. As we have seen, when households have the opportunity to send a worker to the UAE they tend to send members with some-

¹³The 2SLS coefficients are more positive than the OLS coefficients for the impressions of UAE wages and non-wage working conditions. This may appear counterintuitive as it implies higher migration rates by those with lower expectations. But note that workers with greater overall ability might be both 1) better informed about conditions in the UAE and 2) able to access better earnings opportunities in India, and thus somewhat less likely to migrate. If better information correlates with better understanding of, for example, the opportunity for informal overtime pay in the UAE, this would generate negative self-selection of migrants on UAE earnings expectations.

what lesser work prospects in India. If those people earn less in the UAE than would someone from the same household with better work prospects in India, this could also tend to explain the difference between the UAE earnings estimates of migrant households and non-migrant households, but without informational asymmetry.

Debt: Another possible sign of poor information among new migrants would be that migration frequently causes an increase in household debt. This could signify that migrants went into debt in order to migrate and did not earn enough to quickly pay it off, or that migrants held debt before migrating—perhaps the reason for entering guest work—but could not earn enough to service or eliminate it, and the debt grew. Either of these could be a sign that migrants had poor information about how much they would earn (e.g. [Zachariah and Rajan 2009](#); [Rahman 2011](#)).

[Table 4](#) explores the effect of migration on household debt. In the top panel, the dependent variable is an indicator for whether or not the household has taken out any substantial loan in the last three years. The OLS results in the first two columns show that households with a migrant in the UAE are about 8–15 percentage points more likely to have borrowed. The 2SLS coefficients are of the same rough magnitude, but are not statistically significant. In the middle panel of the table, the dependent variable is an indicator for households that borrowed and stated that “overseas travel” was one of the principal purposes of the loan. Households with a member in the UAE are 17–25 percentage points more likely to have borrowed for overseas travel than other households. The 2SLS coefficients are smaller and are not statistically significant, despite strong instrumentation according to the Cragg-Donald F statistics. This suggests that some of the correlation between borrowing and having a household member in the UAE may reflect reverse causation (having a migrant might make households more creditworthy) or simultaneous causation by omitted variables (households that send migrants and those with access to credit share underlying similarities).

In the bottom panel of [Table 4](#), the dependent variable is an indicator for whether the household still owes any money on the above borrowing at the time of the household survey. In the OLS results, households with migrants are not more likely to be carrying debt; they are slightly less likely. The 2SLS coefficients suggest a negative effect of having a household member in the UAE and carrying debt. The coefficient is only significant at the 10% level in one of the columns, but

the magnitudes are similar, suggesting a 20–25 percentage point decline in the chance of owing money on borrowing in the past three years, caused by having a household member in the UAE. There is no sign of any positive effect of working in the UAE on indebtedness over the timescale considered here (three years after initial migration).

4.3 Externality

Does Gulf migration exert negative economic effects on others, such as the economic productivity of the migrants' household members in India and thus the broader community? Economists since John Stuart Mill have argued that such externalities could justify third parties' restriction of a transaction (reviewed in [von Lilienfeld-Toal and Mookherjee 2010](#), 45). One mechanism by which this could arise is that the income effect of remittances induce labor force withdrawal among the migrant's family. It is frequently observed that labor force participation rates in migrant households are lower than in non-migrant households (e.g. [Zachariah and Rajan 2009](#), 128). But this correlation could arise by means other than the effect of one household member's migration on other household members' labor supply. For example, people from geographic areas, ethnic groups, or social networks with fewer local labor market opportunities might have a greater tendency to self-select into seeking work opportunities abroad. This would generate an association between migration and lower labor force participation at the household level, caused by unobserved confounders.

Table [Table 5](#) considers the effect of the applicant's work in the UAE on the labor force participation in India of the other members of his household. Again, the sample is restricted to working-age non-applicants, the key regressor indicates whether or not another member of the household is in the UAE, and all standard errors are clustered by household. As before, the Cragg-Donald F statistics show that oil prices provide a strong instrument in all 2SLS regressions.

This table shows no evidence that a UAE job for one household member alters the labor force participation or earnings of other working-age household members. There is a small positive association between living with a UAE worker and employment in the OLS and 2SLS regressions, but these are not statistically significant at the 5% level. There is a small positive association between living in a UAE worker's household and wages conditional on employment, in

the regressions with controls; this relationship is significant in the OLS regression, and of similar magnitude but statistically insignificant in the 2SLS regression. The relationship to overall monthly income of each worker is positive and statistically significant in the OLS regression with controls, negative and statistically insignificant in the 2SLS regression with controls.

In sum, there is suggestive evidence that other workers in the households of UAE workers earn slightly more, but no evidence that the UAE job caused the difference; there is no sign at all that UAE jobs cause other household members to withdraw from the labor force or earn less.

It is possible in principle that negative economic externalities on UAE nationals could arise from Indian guest workers. In the United States context, [Ilias et al. \(2008\)](#) find that natives' principal opposition to guest workers, across the political spectrum, arises from the perception of a negative externality on native workers' employment. But in the UAE, where 98 percent of the private-sector workforce consists of foreign workers on temporary visas, this is a difficult concern to sustain. The economic lives of Emiratis would clearly be radically different in the absence of foreign guest workers, and there is no evidence to suggest that they would be substantially improved.

4.4 Equilibrium

It is possible in principle that migration to the UAE reduces the incentives for local investment in India that, if it were carried out, would tend in the long run to generate jobs in India that migrants might prefer to UAE jobs. [McKenzie and Rapoport \(2011\)](#) find that temporary labor migration from Mexico to the United States reduces human capital investment by Mexican youths, investment that in the long run might have tended to create more job opportunities in Mexico. In the present setting, the opportunity to migrate for high wages in the Gulf might reduce the incentives to invest in business formation within India, which in turn might tend to limit job opportunities in India, a self-reinforcing low-level equilibrium. An important strand of literature has argued that such effects would be sufficient to make guest work repugnant, even if participants have perfect information and foresight, and exert no negative externalities on others ([Genicot 2002](#); [von Lilienfeld-Toal and Mookherjee 2010](#), e.g).

Does migration by the applicant encourage or discourage household-level investment? [Table 6](#) tests the effects of migration to the UAE on the extent of entrepreneurial activity in migrants' households. In the top panel, the dependent variable is an indicator for whether or not the household receives any income from a home-based business. In the OLS coefficients, there is a very small negative correlation with migration to the UAE. But the causal relationship measured in the 2SLS coefficients is very different. Having a household member in the UAE causes the household to be 31 percentage points more likely to be receiving any income from a home-based business.

In the lower panel, the sample is restricted to households for which the applicant is *not* currently in the UAE, and the independent variable indicates whether or not the applicant—who is in India—previously worked in the UAE. Here the comparison is observational rather than quasi-experimental, because previous migrants who have chosen to return to India could differ in entrepreneurial capacity from those who do not choose to return. There is a small positive correlation in the OLS coefficients, and the first 2SLS coefficient suggests an even larger effect than for households where the applicant is currently in the UAE, significant at the 10 percent level. This suggests that both the financial capital and the human capital of the migrant may have separate and positive roles to play in causing business formation. In the rightmost column of the lower panel, weak instrumentation is indicated the low F statistic, and this regression is not informative.

This evidence does not rule out depressing effects on investment from short-term exposure to migration or long-term, repeated migration. But there is no evidence that migration reduces investment on the time scale of three years considered here, and some evidence that it raises investment. The evidence in this setting is not compatible with theories that guest work typically traps communities in a low-level equilibrium sometimes referred to as remittance-dependency.

4.5 Inequity

As discussed above, many theorists posit that decisions to engage in guest work migration from a very poor country to a rich country should not be considered fully voluntary, because the large international inequity means that bargaining power is highly skewed against the guest worker.

Even if he can freely choose not to engage in guest work or to depart at any time from guest work, the freedom to choose dire poverty is not something that all people would consider a meaningful choice. Because the relative earnings of Indians in the UAE and Emirati citizens in the UAE are suggestive of their relative bargaining power, thus suggests that an assessment of the repugnance of guest work would need to consider, alongside the income gains to guest workers relative to their counterfactual income, also the income of guest workers relative to Emiratis.

Stepping back from the natural experiment considered above, a starting point is to compare the wages of Emiratis in the UAE, Indians in the UAE, and Indians in India in nationally-representative survey data. Consider a [Mincer \(1958\)](#) wage regression with nationally-representative microdata on wage-workers, gathered separately in India and in the UAE, stacked into a single dataset. Making minimal assumptions on functional form, regress log wage on dummy variables for different levels of observable traits: age (dummies t^a), schooling (t^s), gender (t^f), and urban/rural (t^r). Include interaction terms between all of these dummies (plus the constant) and each of a set of dummies for three types of worker: Indians in India (dummy t_i), Indians in UAE (t_u), and Emiratis in UAE (t_e). This allows separate estimation, for each type of worker, of the conditional wages associated with each level of each trait.¹⁴

The sprawling regression equation that results is compactly expressed with Hadamard and tensor products as

$$\ln w = \alpha' \boldsymbol{t}_w + \sum_k \mathbb{1}'_{W+1} \left(\boldsymbol{\beta}_k \circ (\boldsymbol{t}_w \otimes \boldsymbol{t}_k) \right) \mathbb{1}_K + \varepsilon, \quad (1)$$

where \boldsymbol{t}_w is a $(W + 1) \times 1$ vector of worker-type dummies $[1 \ t_i \ t_u \ t_e]'$, here with $W = 3$; \boldsymbol{t}_k is a $K \times 1$ vector of dummies for levels of trait k : $[t_1^k \ t_2^k \ \dots \ t_K^k]'$ where $k \in \{a, s, f, r\}$ and K is the number of categories in trait k ; α is a $(W + 1) \times 1$ vector and $\boldsymbol{\beta}_k$ is a $(W + 1) \times K$ matrix of coefficients to be estimated; $\mathbb{1}_c$ is a $c \times 1$ vector of ones; and ε is an error term.¹⁵

¹⁴The age dummies t^a are for the set of ten quinquennial ranges: 15–19, 20–24, 25–29, ..., 60–64, with below 15 and above 64 omitted from the sample. Thus, for example, dummy $t_3^a = 1$ iff the worker's age is 25–29. The schooling dummies t^s are for the set of eight categories of education completion: "Illiterate", "Read & Write" (but no schooling), "Primary", "Preparatory" (some secondary but no secondary degree), "Secondary", "Above secondary", "University", and "Above University". For female $t^f = 1$, for urban $t^r = 1$. The vast majority of Indian workers in the UAE, by standards meaningful in India, work in 'urban' settings.

¹⁵Rupee wages w are measured at exchange rates. The analysis includes wage income only, and omits workers

The coefficients from regression (1) yield estimates of conditional mean wages for Indians in India (w_i) versus Indians in the UAE (w_u). Table 7 reports these estimates and their ratios. Column 1 shows the results without controlling for any observable traits other than nationality and location (that is, with $\beta_k \equiv 0 \forall j$). Column 2 runs the full regression (1) on the entire sample from both countries, and estimates conditional mean wages in each country for a male 30–34 year-old worker with some secondary education—comparing workers in the UAE to urban workers in India. Column 3 does the same, but compares workers in the UAE to *rural* workers in India. Columns 4–5 repeat columns 2–3 with the sample restricted to workers in occupations plausibly related to the construction sector.¹⁶

Observably identical Indian workers earn roughly five times the rupee wages in the UAE that they earn doing similar work in India. This ratio is slightly less for workers in urban areas of India, slightly more for workers in rural areas of India, and highly statistically significant. There is strong positive selection on observable correlates of wages for Indian migrants to the UAE: the ratio of *unconditional* mean wages in the UAE to those in India $E[w_u/w_i] = 15.9$ in column 1, but the ratio of *conditional* means $E[w_u/w_i|X] = 4.9$ in column 2. This is because Indians in the UAE are, among other things, much more educated than their counterparts in India. For example, 35.7% (std.err. 0.2%) of Indian adult males in India are “illiterate” compared to just 3.9% (std.err. 0.3%) of Indian adult males in the UAE.

The bottom of the table adjusts these and all other wage ratios to purchasing power parity (PPP). This does not imply considering the relevant price level for Indian guest workers’ earnings to be UAE prices; guest workers often receive housing and some food in kind, and either send or carry home approximately 85 percent of their earnings (Joseph et al. 2017). These PPP wage ratios are thus calculated assuming that the relevant price level for Emiratis in the UAE is the UAE price level, for Indians in India it is the Indian price level, and for Indians in the UAE it is a weighted average: the India price level with a weight of 0.85 and the UAE price level with a weight of 0.15.

with zero wage income. It thus compares *employed* wage-workers between countries. It omits non-wage benefits, the most important of which in this setting is housing provided by UAE employers.

¹⁶The Appendix lists the occupations considered ‘construction related’ in the two datasets merged for this analysis: India’s National Sample Survey and the UAE Labor Force Survey.

The results show that real earnings for observably identical Indians in the UAE are several times greater than in India: 5–8 times for workers in general, and 4–5 times for construction workers in particular. But an Emirati earns over 9 times in real terms what an observably identical Indian earns in the UAE. These results are compatible with very low bargaining power among Indian workers, who capture through guestwork only a small fraction of the massive real earnings differential (a factor of 45) between an Emirati and an urban Indian worker who are otherwise observably identical. One mechanism for retaining this disparate bargaining power is the traditional system of tying Gulf guest workers to a single employer. Thus this evidence is compatible with the findings of [Naidu et al. \(2016\)](#) that a UAE reform somewhat relaxing restrictions on guest workers’ mobility between employers caused the earnings of guest workers to rise.¹⁷

These empirical disparities suggest that guestwork in the Gulf could have the character of a repugnant transaction through the consequentialist channel of arising from very large disparities in bargaining power. To a reader for whom large inequalities in outcomes were sufficient to make a transaction repugnant, this evidence would strongly imply that Indian guest work in the Gulf indeed possesses aspects of a repugnant transaction. Two considerations, however, limit the force of this argument.

The first is that, as [Munger \(2011\)](#) points out, the fact that a bargaining outcome is skewed does not mean it is not beneficial to both parties. In his terminology, even a transaction that is not ‘evolutionary’ due to skewed bargaining power can still benefit both parties.¹⁸ In the present setting, the fact that guestwork raises Indians’ earnings by a factor of four makes it highly beneficial to them by any meaningful standard, regardless of the fact that Emiratis in the UAE earn nine times what they do.

¹⁷[Appendix Table 2](#) checks to ensure that the observational wage gains for guest workers discussed above indeed reflect the effect of guestwork on earnings. Using the same regression setup as several tables before, the sample is now the set of job applicants, and the key regressor is an indicator variable for the applicant’s current present in the UAE. Migration in 2008–2009 causes a 30–40 percentage point rise in the probability that the applicant is employed in 2011, and conditional on employment, a 94 percent increase in wage (exponentiating the 2SLS coefficient). This implies large earnings gains caused by migration for observably and unobservably identical individuals, thought of a magnitude somewhat lower than the observational estimates above in nationally-representative data.

¹⁸The closely related ‘non-worseness claim’ of [Zwolinski \(2008, 357\)](#) is that “in cases where *A* has a right not to transact with *B*, and where transacting with *B* is not worse for *B* than not transacting with *B* at all, then it cannot be seriously wrong for *A* to engage in this transaction, even if its terms are judged to be unfair by some external standard”.

A second consideration is the tradeoff between migrants' rights and their numbers, posited by [Ruhs and Martin \(2008\)](#) and quantitatively observed by [McKenzie et al. \(2014\)](#). If UAE regulations required Indian guest workers' wages to equal Emiratis' wages, for example, obviously UAE demand for Indian guest worker would fall precipitously. How much is unclear, but [McKenzie et al. \(2014\)](#) cannot rule out a unit elasticity of destination-country demand for guest workers to GDP growth. If this is approximately correct in the UAE, a doubling of guest workers' wages might roughly halve the demand for them. After such a reform, Indians in the UAE would earn roughly eight times what observably identical Indians in India would, and Emiratis would earn roughly 4.5 times what observably identical Indians in the UAE would. Thus major disparities would remain. But only half as many Indians would benefit, and the rest would earn in India. Which is better?

An ethical problem arises in deciding between these options. Certainly fairness of outcomes is an important constraint on people's beliefs that transactions are just ([Kahneman et al. 1986](#); [Gneezy and Rustichini 2000](#)). But norms of this kind are typically formed within communities of people who simultaneously come to some agreement about what is just and agree to be bound by restrictions on unjust acts. In the case of Indian guest workers, the question of whether or not guest work visas should exist is never—to my knowledge—posed as a question of whether or not Indians should form a community that agrees to restrict each other's access to guest work. Rather, the restriction is contemplated by people outside that community, almost invariably people vastly richer than the guest workers in question. And the restriction of guest work does not imply that guest workers will thus acquire the bargaining power to achieve Emirati levels of earnings: the numbers-rights tradeoff implies that the result of such restrictions is that large numbers of potential guest workers are directly coerced to not become guest workers.

But coercion of poor workers by the rich is certainly problematic in theory. Experimental evidence shows that people form perceptions of a 'fair' price depending on the level of prices they have been exposed to in the past ([Herz and Taubinsky 2017](#)). Thus Indians' notions of a 'fair' wage, reflecting bargaining power that is sufficient in their own view, could be quite different from Americans' or Emiratis' notions of a 'fair' wage. When restrictions or moral sanctions are placed on guest work by people with different concepts of fairness than those they are restricting, it becomes unclear how to even assess whether the restrictions enhance the welfare of the

people they are meant to help. Put differently, suppose the following two options were put to a vote among 100 Indians: A) three of you can be admitted to the UAE to earn 45 times what your compatriots in India earn, but the rest of you are obliged to earn at Indian levels, or B) all of you can be admitted to earn 4 times what your compatriots earn, but work alongside people who earn nine times what you do. Low-income Indians under severe financial pressure would seem likely to vote in their large majority for option B. Forcing them to be subject to A would enhance the bargaining power of three of them, but coercively eliminate the choice for 97 of them. It is not clear why the *inequity* repugnance of B should necessarily weigh more heavily than the *coercion* repugnance of A.

5 Conclusions

This paper estimates several effects of guest work in the UAE on Indian laborers, in a rare natural-experimental setting in which the effects of guest work can be plausibly separated from the correlates of guest work. It uses those estimated effects to test empirically for traits that could make guest work repugnant on consequentialist terms. On balance, the findings offer weak if any evidence to support five sufficient conditions for Indian guest work in the UAE to satisfy consequentialist criteria for repugnance: coercion, regret, externality, equilibrium effects, and inequity.

The data do not allow a test of the sixth consequentialist sufficient condition for repugnance: degradation. But collectively, the above empirical results on the effects of guest work call into question the view that guest work in this setting causes a degradation of preferences or character. The counterfactual to allowing guest work is not to *allow* guest work. This means coercing Indian workers not to engage in guest work. The results above suggest that guest work in this setting typically causes Indian construction workers to earn multiple times what they otherwise could, be much more likely to hold a job at all, pay off their debts, start new businesses, and help their family members to access some of these same opportunities. If the work performed by guest workers is viewed as degrading, and thus guest work itself is viewed as degrading, a consequentialist view would suggest comparison to the degradation of the removal of the guest work option: sharply reduced earnings, greater unemployment, reduced ability to pay off debt,

less entrepreneurship, and less ability to assist one's family.

In short, if we are to believe guest work causes degradation, we must believe that the absence of guest work reduces degradation. But the greater poverty that would arise from the removal of guest work options, as the above evidence suggests, could be degrading in many ways. The poor might be led to repugnant acts by the pressing financial needs of a health emergency or an unpayable wedding debt. [Christian and Roth \(2016\)](#) find that negative income shocks raise the incidence of suicides among the poor in Indonesia, while randomized cash transfers reduce suicides. A successful consequentialist case that guest work is typically degrading would need to assess how degrading life can be when the option of the poor to earn greater incomes through guest work is removed. That comparison could come out either way, but the beneficial effects of guest work recorded here suggest that it is much less than obvious which way such a balance might fall.

All of the evidence presented here certainly does not establish that guest work in general, or even Indian guest work in the UAE, is not repugnant. The findings are limited in several ways. First, the theories of repugnance tested offer sufficient conditions for repugnance rather than necessary conditions. Failing to meet these criteria even in theory does not 'show' that a transaction cannot be repugnant. Second, the empirical tests for each theory are likewise (plausibly) necessary conditions for repugnance, not sufficient conditions. Thus the finding that potential migrants are typically not poorly informed about working and living conditions in the UAE is informative about whether or not they regret the transaction later, but does not prove that they do not regret the transaction later. Third, these findings relate to Indian workers at one construction firm in the UAE. It is an informative setting, because the firm is a very major construction firm in the UAE, and the Indian workers come from all over India. But the results should not be automatically and uncritically to other destination countries, even in the Gulf; to other construction firms in the UAE; to other sectors, outside construction; or to countries of origin beyond India. The paper rests its contribution on providing a very rare type of evidence to begin an inquiry, and does not claim to settle it.

One lesson that is fully transferable from this study to other settings is that the true effects of migration on a worker or household can be very different from those assessed simply by

observing the correlates of migration. Because people in difficult circumstances are often those who take the extraordinary step of migrating, looking only at the correlates of migration can systematically understate its benefits and overstate its costs relative to the true effects.

Finally, the findings do not suggest that the conditions under which guest work sometimes occurs are not repugnant, even in the setting considered in this paper. To return to an earlier example, the fact that fraudulent mortgages are repugnant does not make all mortgages categorically repugnant, but does suggest that the terms under which some mortgages occur can be fraudulent. A policy intervention to reduce repugnance in that case might fight fraud in mortgage lending, rather than acting to reduce mortgage lending in general. Even the finding that *typical* guestworkers do not show signs of a repugnant transaction does not mean that anecdotes of guest work under repugnant conditions are incorrect. But it does suggest that the burden of proof to show that guest work in the Gulf is categorically repugnant on consequentialist terms has not been met. A constructive avenue for future research would consider the details of design of guest work programs to reduce fraud, misinformation, regret, and other conditions affecting certain numbers of guestworkers (e.g. [Djajić 2013](#); [Silverman and Hari 2016](#)).

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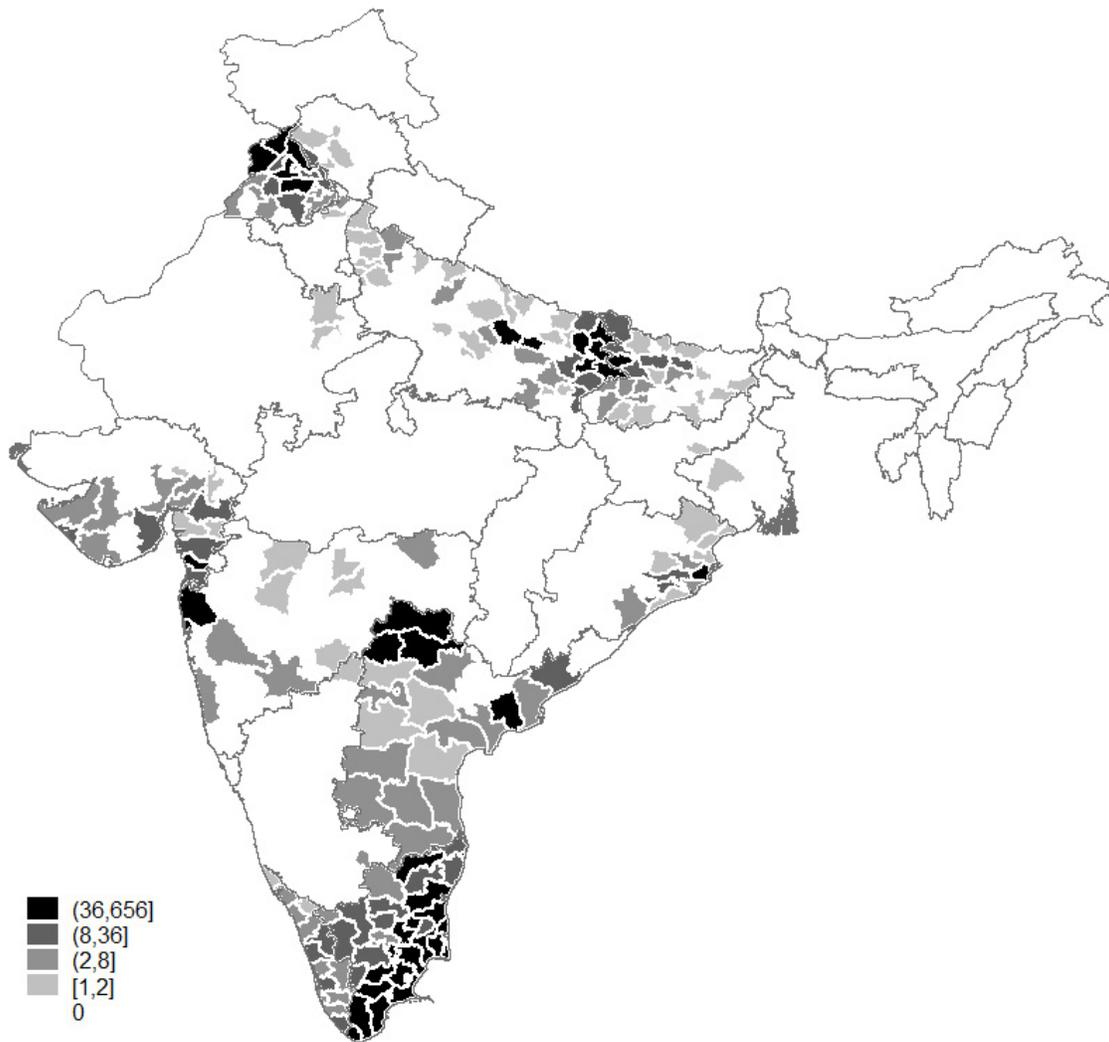
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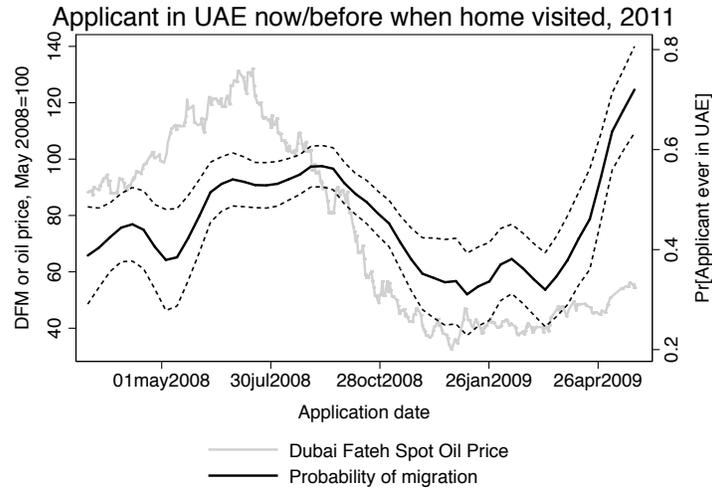
Figure 1: Location of the household sampling universe in India



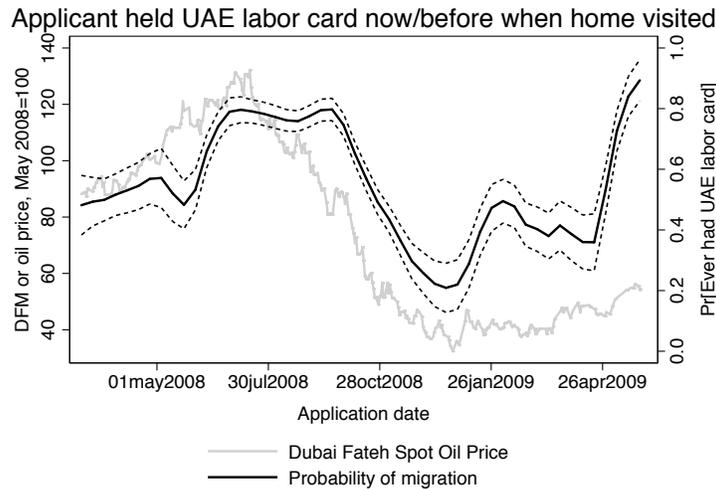
Density map shows number of households in the sampling universe within each district of India whose addresses were sufficiently complete to locate the dwellings.

Figure 2: Initial and lasting effects of the financial crisis on migration

(a) Migration rate in survey sample



(b) Migration rate in sampling universe



Dashed lines show 95% confidence bands on local regression, triangular kernel, bandwidth 30, degree 0. Dubai Fateh Spot Oil price is the price per barrel for light sour crude oil extracted from Dubai, scaled to an index such that the value on May 1, 2008 = 100.

Table 1: Effect of applicant’s migration on non-applicants’ migration, same household

<i>Estimator</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Controls?</i>				
<i>Dependent variable</i>	1 if in UAE, 0 otherwise			
<i>Sample</i>	Non-applicant household members			
Applicant in UAE	0.004 (0.003)	0.004 (0.004)	0.113* (0.064)	0.081 (0.054)
Number of obs.	8,548	8,542	8,548	8,542
Cragg-Donald <i>F</i> stat	—	—	7.80	9.99

Sample is working-age (18–65) members of the household of the worker who applied to a job in the UAE, *excluding* the applicant himself. The dependent variable is an indicator that takes the value 1 if the household member is in the UAE at the time the household is interviewed, and 0 otherwise. All standard errors clustered by household. OLS is ordinary least squares, 2SLS is two-stage least squares, with “Applicant in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh).

Table 2: Effects of migration on information about working and living conditions

<i>Estimator</i> <i>Controls?</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Dependent variable</i>	Guess ln(wage) in UAE			
Any household member in UAE	-0.248*** (0.042)	-0.214*** (0.038)	-0.231 (0.540)	0.662 (0.738)
Number of obs.	2,171	2,170	2,171	2,170
Cragg Donald <i>F</i> stat	—	—	12.31	6.71
<i>Dependent variable</i>	Guess UAE working conditions (1–5 scale)			
Any household member in UAE	-0.242*** (0.050)	-0.256*** (0.050)	1.279* (0.717)	0.999 (0.886)
Number of obs.	2,385	2,384	2,385	2,384
Cragg Donald <i>F</i> stat	—	—	19.19	11.15
<i>Dependent variable</i>	Guess UAE living conditions (1–5 scale)			
Any household member in UAE	-0.322*** (0.051)	-0.310*** (0.050)	-0.821 (0.654)	-0.229 (0.811)
Number of obs.	2,385	2,384	2,385	2,384
Cragg Donald <i>F</i> stat	—	—	19.19	11.15

If household has a member in UAE, respondent asked to guess monthly wage, working conditions relative to India, and living conditions (outside of work) relative to India. If household has no member in UAE, respondent asked to guess what the same quantities would be if someone from that household were to work in UAE. Working conditions and living conditions measured on a 1–5 scale of increasing relative quality, with 3 = same as India. OLS is ordinary least squares, 2SLS is two-stage least squares, with “Any household member in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh).

Table 3: Evidence on intrahousehold information flow

	No	No	Yes	Yes
Applicant in UAE?	No	No	Yes	Yes
Respondent is applicant?	Yes	No	No	No
Guess or true wage?	Guess	Guess	Guess	True
mean ln(UAE wage)	9.921	9.829	9.611	9.198
std. err. of mean	(0.033)	(0.021)	(0.041)	(0.014)
Number of obs.	466	1,281	381	620

If household has a member in UAE, respondent asked to guess monthly wage of that person. If household has no member in UAE, respondent asked to guess what the wage would be if someone from that household were to work in UAE. True wage is the wage given for the worker in UAE Ministry of Labor administrative records. Wages in ln(rupees per month).

Table 4: Effects of migration on extent of household borrowing and debt

<i>Estimator</i> <i>Controls?</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Dependent variable:</i>	Any borrowing in last 3 years			
Applicant in UAE	0.152*** (0.020)	0.079*** (0.022)	0.102 (0.274)	0.196 (0.317)
Constant	0.534*** (0.012)	0.787*** (0.072)	0.549*** (0.083)	0.741*** (0.144)
Number of obs.	2,650	2,649	2,650	2,649
Cragg-Donald <i>F</i> stat	—	—	15.32	11.85
<i>Dependent variable:</i>	Any current outstanding debt			
Applicant in UAE	-0.026** (0.012)	-0.005 (0.012)	-0.259* (0.146)	-0.197 (0.181)
Constant	0.940*** (0.006)	0.819*** (0.037)	1.009*** (0.043)	0.893*** (0.081)
Number of obs.	2,500	2,499	2,500	2,499
Cragg-Donald <i>F</i> stat	—	—	16.91	11.67

OLS is ordinary least squares, 2SLS is two-stage least squares, with “Applicant in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh).

Table 5: Economic effects of applicant’s UAE job on non-applicants

<i>Estimator</i> <i>Controls?</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Dependent variable:</i>	Employed			
Household’s applicant in UAE	0.005 (0.010)	0.020* (0.010)	0.063 (0.128)	0.039 (0.131)
Number of obs.	8,548	8,542	8,548	8,542
Cragg-Donald <i>F</i> stat	—	—	13.39	13.15
<i>Dependent variable:</i>	ln(wage)			
Household’s applicant in UAE	-0.054 (0.062)	0.134** (0.063)	-0.058 (0.397)	0.123 (0.477)
Number of obs.	2,189	2,187	2,189	2,187
Cragg-Donald <i>F</i> stat	—	—	28.27	19.82

Sample is working-age (18–65) non-applicants only. All standard errors clustered by household. Earnings have been defined such that an unemployed person has zero earnings, and the mean is normalized to unity so that coefficients may be interpreted roughly comparably with ln(wage) coefficients. OLS is ordinary least squares, 2SLS is two-stage least squares, with “Household’s applicant in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh). Earnings and wage regressions omit those working in home-based family farm/business.

Table 6: Effects of migration on extent of entrepreneurial activity

<i>Estimator</i> <i>Controls?</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Dependent variable:</i> <i>Sample:</i>	Any income from a home business All applicants			
Applicant in UAE	0.011 (0.012)	-0.021** (0.010)	0.467** (0.197)	0.313* (0.184)
Constant	0.085*** (0.006)	0.029 (0.035)	-0.052 (0.059)	-0.103 (0.084)
Number of obs.	2,650	2,649	2,650	2,649
Cragg-Donald <i>F</i> stat	—	—	15.32	11.84
<i>Dependent variable:</i> <i>Sample:</i>	Any income from a home business Applicants not currently in UAE			
Applicant previously in UAE	0.070*** (0.017)	0.017 (0.013)	0.767* (0.440)	2.125 (3.549)
Constant	0.065*** (0.007)	0.017 (0.040)	-0.126 (0.121)	-0.626 (1.096)
Number of obs.	1,856	1,855	1,856	1,855
Cragg-Donald <i>F</i> stat	—	—	4.50	0.37

OLS is ordinary least squares, 2SLS is two-stage least squares, with “Applicant in UAE” or “Applicant previously in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh).

Table 7: Earnings of Emiratis vs. Indians, 2008

Occupations in sample:	Traits X:	Male age 30–34, some secondary educ.			
	Any	All		Construction-related	
<i>India region:</i>	<i>All</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>
Conditional mean wages, rupees per month					
Emiratis in UAE	159321 (1807)	167576 (5070)	167576 (5070)	107923 (24327)	107923 (24327)
Indians in UAE	34169 (490)	18021 (455)	18021 (455)	16788 (874)	16788 (874)
Indians in India	2154 (10)	3710 (51)	2279 (30)	3704 (89)	2994 (69)
Wage ratios in exchange-rate rupees					
Emiratis in UAE vs. Indians in India	73.95 (0.91)	45.17 (1.50)	73.53 (2.42)	29.14 (6.61)	36.05 (8.17)
Indians in UAE vs. Indians in India	15.86 (0.24)	4.86 (0.14)	7.91 (0.23)	4.53 (0.26)	5.61 (0.32)
Emiratis in UAE vs. Indians in UAE	4.66 (0.09)	9.30 (0.37)	9.30 (0.37)	6.43 (1.49)	6.43 (1.49)
Wage ratios at PPP, with 85% of Indian migrants' expenditure in India					
Emiratis in UAE vs. Indians in India	31.1	19.0	30.9	12.2	15.1
Indians in UAE vs. Indians in India	14.5	4.4	7.2	4.1	5.1
Emiratis in UAE vs. Indians in UAE	2.4	4.7	4.7	3.3	3.3
<i>N</i> (Emiratis in UAE)	4871	4871	4871	131	131
<i>N</i> (Indians in UAE)	5811	5811	5811	1190	1190
<i>N</i> (Indians in India)	92709	92709	92709	18513	18513
... of which rural	35047	35047	35047	8235	8235

India data from 2008–2009 India National Sample Survey (NSS), UAE data from 2008 UAE Labor Force Survey (LFS). Dirhams converted to rupees at average exchange rate prevailing during the NSS data collection period (July 2007–June 2008, 10.99 rupees/dirham). Regressions weighted by relative sampling weights. Standard errors (in parentheses) are reported in each case for the Wald test that the exponentiated linear combination of coefficient estimates yielding each conditional mean (or ratio of means) is unity. Columns 2–5 show predicted wages based on coefficient estimates from the regression in equation (1) for 30–34 year-old male with less than secondary education completed (“preparatory”, no secondary degree); values *N* show number of observations in the underlying regression. “Construction-related” occupations are defined and background on the datasets given in [Appendix subsections A2.1 and A2.2](#). PPP ratios are estimated assuming that ~85% of earnings by Indian workers in UAE are spent in India, at Indian prices ([Joseph et al. 2017](#)). Price levels in Delhi are 0.42 times the price level in Dubai according to UBS *Prices and Earnings 2012*. Price levels in India were 0.42 times price level in UAE according to Penn World Table.

Online Appendix: “Testing for repugnance in economic transactions: Evidence from guest work in the Gulf”

Michael A. Clemens, September 2017

A1 Validity of the instrumental variable

[Appendix Table 1](#) tests for relationships between economic conditions in the UAE at the time of application and variables that should not have been affected by migration. The first two columns use the sampling universe to test whether or not the probability of survey completion in 2011 is associated with oil price or the DFM index at the time of job application in 2008–2009. There is no statistically significant relationship, suggesting that survey completion is as-good-as-random with respect to the experimental treatment driving migration behavior.

It is nevertheless possible that different types of people began applying to UAE jobs after the crisis hit, or that the criteria for being selected changed after the crisis hit. Columns 3 and 4 of [Appendix Table 1](#) tests the relationship—in the whole sampling universe—between economic conditions in the UAE at the time of application and worker traits listed on the original job application. There is no statistically significant relationship with the worker’s age and skill level, or whether the worker lives outside a large city. There is a statistically significant but very small relationship with the worker’s religion and state of residence; Muslim workers and workers living in Tamil Nadu state (which contains the plurality of the sample) typically applied at a time when the oil prices and the DFM index were about 2% higher with respect to their May 1, 2008 values than non-Muslim workers or workers outside Tamil Nadu. There is a statistically significant and substantial relationship between oil prices and the DFM index at the time of application and the recruiting office through which the job application was made: workers recruited at centers in Chennai and Ramnad were typically offered a UAE job at a time when oil prices were about 11% lower and the DFM index was about 5% lower than their May 1, 2008 values, relative to workers recruited via the centers at Delhi and Mumbai. This is to be expected, since (as noted above) the range of application dates covered by the data from different offices of the firm are somewhat different.

But even if the crisis had not affected the overall response rate, and it had not affected the pattern of who was applying for and being selected for UAE jobs, it still might have affected the composition of who was responding to the 2011 survey. Columns 5 and 6 of [Appendix Table 1](#) test—in the sample of completed surveys—whether economic conditions in the UAE at the time of application are associated with applicant traits that could not have been affected by migration. All of these relationships are similar to those seen in the sampling universe in columns 3 and 4, with the exception of worker skill. Skilled workers in the sample applied to their jobs at a time when oil prices were about 4% lower and the DFM index was about 2.5% lower, with respect to their May 1, 2008 values, than non-skilled workers.

Overall, [Appendix Table 1](#) suggests that the natural experiment is generally valid. Economic conditions in the UAE at the time of the job application are not associated with survey nonresponse. There is evidence of a few minor changes in the recruitment and selection of workers and in the composition of survey respondents as the crisis proceeded. But where these exist almost all are small, in the range of 1 to 4 percentage point-differences in economic indices that fell 70–80% in the crisis. The one exception is the indicator for the office through which the worker was recruited, which can be explained by the fact that the recruiting firm provided data on a somewhat different range of application dates for each office. It is nevertheless possible, however, that the firm responded to the crisis by shifting its recruitment and selection of workers towards its southern recruiting offices (Chennai and Ramnad) and away from its northern offices (Delhi and Mumbai). For this reason I check the robustness of all findings to controlling for the baseline traits in [Appendix Table 1](#), especially the office through which each worker was recruited.

Appendix Table 1: Testing the validity of the natural experiment

<i>Dependent variable</i>	<i>Universe</i>			<i>Sample</i>		
	Oil price	DFM index	Oil price	DFM index	Oil price	DFM index
Completed survey	1.088 (0.716)	0.359 (0.737)				
Age			0.048 (0.057)	0.060 (0.059)	0.094 (0.096)	0.088 (0.099)
Skilled			-0.002 (0.707)	0.807 (0.737)	-3.888*** (1.173)	-2.454** (1.205)
Muslim			2.362*** (0.733)	2.079*** (0.764)	2.511* (1.311)	2.942** (1.348)
Applied Chennai office			-10.741*** (0.725)	-4.789*** (0.755)	-16.224*** (2.325)	-11.220*** (2.390)
Located in Tamil Nadu			1.828*** (0.704)	1.940*** (0.734)	4.014* (2.389)	4.719* (2.456)
Rural ^a			1.080 (0.986)	1.225 (1.028)	-1.395 (1.375)	-1.201 (1.413)
Constant	80.651*** (0.432)	63.684*** (0.445)	83.188*** (2.071)	61.700*** (2.159)	87.383*** (3.279)	66.086*** (3.371)
Number of obs.	7,479	7,479	7,477	7,477	2,722	2,722
R ²	0.000	0.000	0.032	0.008	0.043	0.015

OLS regressions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Both oil price and the DFM index are scaled so that the value of each on May 1, 2008 = 100. Thus all coefficients can be interpreted as a % difference in the instrument with respect to its May 1, 2008 value. Dubai Fateh Spot Oil price is the price per barrel for light sour crude oil extracted from Dubai. The Dubai Financial Markets (DFM) Real Estate and Construction Index measures average of stock values for firms such as Emaar, Arabtec Holding, and Union Properties. ^a In the universe, "rural" means a household located outside one of the 27 districts in the universe found within major metropolitan areas. In the sample, "rural" is defined according to the survey enumerator's assessment upon visiting the household.

A2 Nationally-representative data

A2.1 India National Sample Survey (NSS) 2008

Education levels are defined according to cases of *l4educationgen*: “Illiterate” = 1; “Read & Write” = 2–6; “Primary” = 7; “Preparatory” = 8; “Secondary” = 10; “Above Secondary” = 11–12; “University” = 13; “Above University” = 14.

‘Relevant’ occupations are defined for the India NSS data, according to India’s National Classification of Occupations 2004, as: 712 “Building Frame and Related Trades Workers”; 713 “Building Finishers and Related Trades Workers”; 714 “Painters, Building Structure Cleaners and Related Trades Workers”; 721 “Metal Moulders, Welders, Sheet Metal Workers, Structural Metal Preparers and Related Trades Workers”; 724 “Electrical and Electronic Equipment Mechanics and Fitters”; 742 “Wood Treaters, Cabinet Makers and Related Trades Workers”; 821 “Metal and Mineral Products Machine Operators”; 831 “Locomotive Engine Drivers and Related Workers”; 832 “Motor Vehicle Drivers”; 931 “Mining and Construction Labourers”; 516 “Protective Services Workers”.

Because the India NSS uses sampling (probability) weights and the UAE LFS uses relative weights, the NSS weights are adjusted to relative weights when the datasets are stacked together. That is, the NSS sampling weights are multiplied by the ratio of sample size to the sum of the sampling weights—converting them to relative weights.

A2.2 UAE Labor Force Survey (LFS) 2008

Education levels are defined according to cases of *Q108_C*: “Illiterate” = 1; “Read & Write” = 2; “Primary” = 3; “Preparatory” = 4; “Secondary” = 5; “Above Secondary” = 6; “University” = 7; “Above University” = 8–10. Wage is calculated as total of wage in cash and in kind. The wage reported in dirhams is converted to rupees at the exchange rate of 10.99 rupees/dirham, which was the average exchange rate during the period that the NSS data was collected (July 2007–June 2008). Nationals of countries other than UAE and India are dropped.

‘Construction-related’ occupations are defined as follows:

In the India NSS data: 516 “Protective Services Workers”; 712 “Building Frame and Related Trades Workers”; 713 “Building Finishers and Related Trades Workers”; 714 “Painters, Building Structure Cleaners and Related Trades Workers”; 721 “Metal Moulders, Welders, Sheet Metal Workers, Structural Metal Preparers and Related Trades Workers”; 724 “Electrical and Electronic Equipment Mechanics and Fitters”; 742 “Wood Treaters, Cabinet Makers and Related Trades Workers”; 821 “Metal and Mineral Products Machine Operators”; 831 “Locomotive Engine Drivers and Related Workers”; 832 “Motor Vehicle Drivers”; 931 “Mining and Construction Labourers”;

In the UAE LFS data: 7136 “Workers of electrical wiring in buildings”; 9313 “Building construction workers”; 3113 “Assistant electrical engineer”; 7221 “Blacksmiths and workers hammers and pistons”; 2145 “Mechanical Engineer”; 2142 “Civil Engineer”; 7122 “Construction workers with bricks and stones”; 7123 “Workers Pour Concrete”; 8333 “Operators of cranes and equipment to transport materials”; 7242 “Electrical repair and service equipment and electronic equipment”; 3112 “Assistant Civil Engineer”; 2143 “Electrical Engineer”; 7124 “Njaro construction and fixtures”; 7135 “Plumbers”; 7143 “Workers installing tiles and wooden flooring Mbtaiw”; 7121 “Builders traditional materials”; 7212 “Welders and flame-cutting”; 7245 “Workers install and repair electrical lines and cables”; 1223 “Business managers and production activity in construction”; 9312 “Construction workers and maintenance of roads, dams, etc.”; 7144 “Building structure cleaners”; 7125 “Other makers of building structures”; 7133 “Workers put insulation”; 9331 “Drivers and vehicles driven by hand or towed Softswitch”; 9141 “Building Service Workers”; 7136 “Workers of electrical wiring in buildings”; 9313 “Building construction workers”; 7122 “Construction workers

with bricks and stones”; 7123 “Workers Pour Concrete”; 7124 “Njaro construction and fixtures”; 7135 “Plumbers”; 7121 “Builders traditional materials”; 7245 “Workers install and repair electrical lines and cables”; 1223 “Business managers and production activity in construction”; 9312 “Construction workers and maintenance of roads, dams, etc.”; 7144 “Building structure cleaners”; 7125 “Other makers of building structures”; 7133 “Workers put insulation”; 3115 “Assistant Mechanical Engineer”; 7239 “Mechanical installation and repair of machinery”; 9141 “Building Service Workers”; 9132 “Cleaners in offices, hotels and institutions”; 8322 “Drivers of small cars, pick-ups”.

Appendix Table 2: Economic effects of UAE jobs on applicants

<i>Estimator</i> <i>Controls?</i>	OLS		2SLS	
	No	Yes	No	Yes
<i>Dependent variable</i>	Employed			
In UAE	0.178*** (0.009)	0.190*** (0.011)	0.295 (0.181)	0.446** (0.227)
Number of obs.	2,650	2,649	2,650	2,649
Cragg-Donald <i>F</i> stat	—	—	15.32	11.85
<i>Dependent variable</i>	ln(wage)			
In UAE	0.508*** (0.031)	0.803*** (0.040)	0.298 (0.236)	0.664** (0.284)
Number of obs.	1,684	1,683	1,684	1,683
Cragg-Donald <i>F</i> stat	—	—	45.49	31.65

Sample is job applicants only. Earnings have been defined such that an unemployed person has zero earnings, and the mean is normalized to unity so that coefficients may be interpreted roughly comparably with ln(wage) coefficients. OLS is ordinary least squares with robust standard errors. 2SLS is two-stage least squares, with “in UAE” instrumented by the Dubai Fateh oil price index on the day of job application. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include constant. “Controls” means that the regression includes the following baseline variables from the job application: applicant age, indicator variables for “skilled” and “semi-skilled” (base group “unskilled”), Muslim indicator, rural indicator, recruiting office indicators for Chennai/Ramnad and Delhi (base group Mumbai), and state indicators for Bihar, Orissa, Andhra Pradesh, Punjab, Tamil Nadu, Maharashtra, Kerala, and Gujarat (base group Uttar Pradesh). Earnings and wage regressions omit those working in home-based family farm/business.