Limiting The Mobility of Migrant Workers in The Saudi Labor Market

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ABSTRACT

We address the question of how visa-related policies restricting the inter employer mobility right of temporary migrant workers (TMWs) affect the labor market outcomes of competing natives in Saudi Arabia. The migrant impact literature has not sufficiently accounted for visa-related policy restrictions, an omission that might help explain the contradictory results of this literature. Using Choice-Based Conjoint analysis as well as an ordered logistic regression model, we find that the perverse effect of increasing the desirability of TMWs to employers, leading to labor market segmentation and a downwards shift in the labor demand curve for natives, depressing both equilibrium wage and employment. Our findings suggest the importance of accounting for inter-employer mobility rights when defining analytical labor markets for the purpose of empirical impact investigations.

JEL Classification: J21, J23, J42, J61, J68

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INTRODUCTION

International labor migration has become a major, albeit poorly governed, force in the world economy. In the absence of internationally agreed upon and effectively propagated norms, policy responses by individual governments have varied widely, balancing a tension between a practical need for labor and a fear of local political and economic backlash. Policy makers often assume that the interaction between employers, native workers, and migrants is a zero-sum game in which native workers (a large fraction of policy makers' constituencies) are the losers. Some economists hold this intuition to be essentially correct (e.g., Borjas, 2014, Chapter 7, para. 1), including Paul Samuelson who stated in 1964 that "[b]y keeping labor supply down, immigration policy tends to keep wages high" (cited in Borjas, 2003, p. 2).

However, empirical studies have returned contradictory conclusions concerning the impact of migrant influx upon local labor markets;[1] this has only complicated the task of policy development and governance and delayed the formulation of any international consensus regarding optimal temporary labor migration policy. One likely source of the contradictory results is a methodological failure to properly define the labor market for the purpose of the analysis. Traditionally, literature has focused on individuals who have been admitted into a country (organized in age and skill categories) or locations in which the influx of workers has occurred (spatial boundaries). The question of how countries admit migrant workers has not been sufficiently examined when defining the boundaries of labor markets. This failure has left much heterogeneity within the data, perhaps leading to the observed divergence in results.

Nevertheless, policy makers are faced with the inevitable practical question of how to admit migrant workers (i.e., under what visa regime and conditions). In order to address the tension described above and given the relative ease of manipulating visa conditions, policy makers often resort to restricting the economic rights of foreign workers, albeit in diverse ways. This diversity of policy manifestations is a source of the analytically problematic heterogeneity in studies that fail to account for visa status when defining the labor market for study. The underlying assumption that restricting migrants' rights is a form of protectionism to the benefit of native workers is likely to be flawed; indeed, domestic restrictions on immigrants should be distinguished from restrictions on entry at the border, as the prior might result in perverse consequences for the local workforce.

This research aims to address the suspicion, articulated above, that accounting for how countries admit migrant workers might shed light on apparent contradictions in the literature. If true, this would suggest methodological changes so as to account for visa conditions when defining the labor markets to be studied.

For the purposes of the present paper, we focus on the restrictions that target migrants' *economic rights* as defined by Martin Ruhs (2013, p. 44).[2] This is because restricting economic rights is theoretically more disruptive to the functioning of a labor market (involving more spillover effects) than restricting other rights. It is for this reason that Milton Friedman favored a policy of complete freedom from economic restrictions for migrants, coupled with exclusion from state welfare benefits (cited in LibertyPen, 2009).

More specifically and within Ruhs' (2013) "right to free choice of employment" (p. 174), we limit the scope of this project to examining restrictions placed on the inter-employer mobility of migrant workers, i.e., the migrant's right to freely choose a specific employer vs. occupation. This is because, first, these types of restrictions are some of the most commonly observed among limitations of economic rights. Second, the right to inter-employer mobility is particularly consequential; as Milton Friedman has convincingly argued, the mere existence of alternative employers among whom workers are free to move is the best guarantor of workers' rights (BasicEconomics, 2012).

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[1] Two milestone papers shaped subsequent research. These are: i) David Card's (1990) study of the 1980 Mariel Boatlift which used the mass emigration of Cubans to Miami as a natural experiment to gauge the impact of a large migrant influx on a spatially defined labor market and found no effect; and ii) George Borjas' 2003 paper which applied an aggregate time series method and subdivided the labor market into education and experience / skill categories at the national level. Borjas observed a negative impact from immigration on native workers. Despite difference in methods, the authors have not conceded that this is the only source of divergence in their results. Card and Giovanni Peri (2016) have called Borjas' views Malthusian, embracing a "fixed slots paradigm" (p. 21); this paradigm assumes a purely substitutive effect of immigrants upon local workers while overall resources are kept fixed. Card has also argued that capital investment will expand to absorb new entrants, mitigating any negative effects (Uthink The Student Think Tank interview, 2016).

[2] Economic rights, as defined by Ruhs, cover specific rights at work, including rights to the following: free choice of employment, which is of interest in this paper; equal pay; equal conditions; joining unions; and redress in case of employer violations of contract (Ruhs, 2013, pp. 221-222).

In sum, we attempt to address the following question: how do restrictions that governments of receiving countries impose on the inter-employer mobility of temporary migrant workers affect competing native workers within the same aggregate labor market? We tackle this question indirectly by proposing a theoretical mechanism and testing its hypotheses. For this, we use a specific country, namely Saudi Arabia, and its migrant worker visa regime as a case study.

Temporary migration programs (TMPs) vary widely in the nature and severity of restrictions they place on migrants. We focus on the inter-employer mobility rights of migrant workers and, for these, Saudi Arabia imposes particularly severe restrictions. Under the Saudi *kafala* sponsorship system, an employee may change employers only when he or she has received a documented approval of the current employer (the sponsor or *kafeel*). The approval must be expressed in the form of a release or no-objections letter. Even when a foreign worker wishes to leave the country, an exit visa is required. This implies that a foreign worker cannot unilaterally leave an employer.

Further, Saudi Arabia's demand-driven temporary worker program allows no periods of unemployment, and there is no legal status for foreign workers decoupled from their employers. Part-time work for an employer other than the *kafeel* is not allowed. Legally transferring from one sponsor to another involves high costs (fees to the government) and the final approval is highly uncertain.

LITERATURE BACKGROUND

Our study lies at the intersection of two major bodies of literature: i) the research on the economic impact of immigration on the wages and unemployment rate of native workers, and ii) the work on human rights of immigrants, especially regarding their economic rights. We review below the relevant aspects of literature and comment on the intersection of the two areas.

The Impact of Migrants on Native Workers

This literature is notable for its lack of definitive answers to the central question: does migration imply a positive, negative, or neutral effect on the native workers? While significant contributions have been made, the "empirical literature is full of contradictory results" (Borjas, 2014, Chapter 3, para. 1). This has fueled partisan political battles with respect to proper policy responses to immigration.

There are two premises that have been accepted on both sides of the impact debate, but from which opposite conclusions have been obtained. First, it is accepted that the impact of migrants (both in the short and long run) arises from their substitutability with native workers, which may lead to substitutability or complementarity between the two worker groups. Second, the impact if immigration is taken to depend crucially on the adjustment mechanisms in the receiving labor market (especially in the long run). Despite the agreement on these premises, differences in research methods and specific assumptions have led to divergent results; researchers on both sides of the debate agree that "different approaches lead to radically different results" (Borjas, 2014, "Conclusion", para. 4). According to Card and Peri (2016, p. 15), "[t]he 'evidence' depends entirely on how one chooses to model immigration flows".

We observe that one specific source of differences in findings, which affects the implications of the two premises described above, may be the failure to account for visa migrant regimes. This oversight can result in a high degree of heterogeneity in the target labor market. Since there has been no consensus concerning the optimal way of defining the local labor markets, various approaches have been advocated.

Grossman (1982) published the pioneering study in this area. She compared wages in various metropolitan labor markets that were affected differently by immigration. By focusing on geographically defined local labor markets she was the first to apply the spatial approach. While her approach was structural, implied by a theoretical model, studies that followed in the 1990s tended to be purely empirical, utilizing a data-mining approach based on little theorizing. These studies "simply regressed native wages in a locality (or the change in the wages) on the relative quantity of immigrants in that locality (or the change in the relative number)" (Borjas, 2014, Chapter 4, "Spatial Correlations", para. 3).

Two important articles shaped the subsequent research in the migrant impact literature. First, David Card's (1990) study of the 1980 Mariel Boatlift used a natural experiment to gauge the impact of a large influx of migrants upon a spatially defined labor market. In contrast, Borjas (2003) promoted the aggregate time series method at the national level rather than in smaller geographic regions.

Contemporary literature provides contrasting evidence on the effect of migration on native workers. Beine and Coulombe (2018) investigates the influence of temporary foreign workers on interprovincial mobility in Canada. The paper reports that inflow of temporary foreign workers reduces interprovincial mobility. After reviewing the existing literature on the impact of migration on labor market, Edo (2019) argues that the overall effect of immigration on native workers' compensations is somewhat positive. However, this result is depended upon the skill composition of the immigrant workers. If migrant workers share skills which complement the skills of the native laborers, this leads to increase in overall salaries of all the workers in the economy. In contrast, influx of migrant workers with expertise as native workers results in reduction in wages.

Becker et al. (2020) documents that migrant workers are more willing to receive higher education in order to advance their skill sets compared to workers who are natives to that particular region. While exploring the level of education of Polish workers who migrated from eastern to western territories after World War II, the authors find that descendants of the migrant workers are more likely to invest in higher education.

Tabellini (2018) demonstrates that positive influence of migration in a native economy is understated due to presence of political dissimilarity. Using Immigration Acts of 1920s and European migration to U.S. cities, the paper documents positive impact of immigration of European workers. Between 1910 and 1930, U.S. economy provided ample employment opportunities to native workers. However, cultural differences between migrants and native workers resulted in political oppression to immigration.

Aksu et al. (2018) analyze the impact of immigration of 2.5 million Syrian in Turkey by the end of 2015. The study reports no adverse effect of migration on wages or employment opportunities of Turkish natives. Cengiz and Tekguç (2021) substantiate previous findings and show that migration of Syrians in Turkish labor force did not reduce average salaries or number of jobs available to native-born Turkish laborers.

Edo (2020) examines the dynamics of salary adjustment in France due to influx of repatriates created by Algerian independence. The empirical evidence reveals a negative relationship between immigration and average compensation of French workers. In addition, migration of educated repatriates resulted in wage inequality in French labor market. Caruso et al. (2021) investigate the impact of Venezuelan migrants on Colombian labor market. The findings indicate that increase in Venezuelan labors in Colombian market resulted in a decline in salaries. Hu (2020) analyzes the native-migrant inequalities in UK during COVID-19 pandemic and shows that immigrants experience greater unemployment compared to UK-born British workers. Furthermore, probability of reduction in income is lower for UK-born laborers compared to migrants.

Immigrants' Rights

The second body of literature that is relevant in the present context discusses the human and economic rights of migrants. Social, policy, and advocacy perspectives have been applied in this area. The issues involved have been much debated in international organizations, including among others the International Labor Organization (ILO), the Migration Observatory at the University of Oxford, and numerous rights advocacy groups.[3]

Despite international interest and some positive steps, the progress on migrants' rights has been slow due to the fears addressed so inconclusively by the migrant impact literature. For example, the Report of the United Nations Global Commission on International Migration (2005) "fell short of recommending establishment of a new, WTO-like, international organization within the UN system with responsibility for international migration". The report recommends, instead, "steps to be taken toward an Inter-agency Global Migration Facility" (Report of the Global Commission, 2005, pp. 787-788).

Among researchers on migrants' rights, Martin Ruhs (former Director of Oxford University's Migration Observatory) has come closest to bridging the gap between the literatures on migrants' rights and their local impact. Of specific interest to us is his set of migrant economic rights and, among these, the first of

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[3] See, e.g., Martin Ruhs: "Openness, Skills and Rights: An Empirical Analysis of Labour Immigration Programmes in 46 High- and Middle-Income Countries," Working Paper No. 88, Centre on Migration, Policy, and Society (COMPAS), Oxford University, 2011. Sources of data on migrants' rights and policy approaches include the Migrant Integration Policy Index (MIPEX) and The Global Knowledge Partnership on Migration and Development (KNOMAD).

his indicators, *free choice of employment* (Ruhs, 2013, p. 221) which is concerned with restrictions that may have been imposed on migrant workers' right to choose their employment and a particular employer.

Existing literature on economic rights of migrant workers documents violation of rights, restricted access to rights, dilemma between global and domestic justice and suggests transnational cooperation in order to ensure fairness in migrant labor agreements between countries. Boucher (2018) measures migrant worker rights violation in Australia during temporary work visa program from 1996 to 2016. After examining the court cases on migrant workers' abuse, the paper reports that legal representation of migrant workers is essential to ensure successful outcomes. This finding highlights the importance of access to rights for migrant workers.

Baubock and Ruhs (2021) claims that temporary labor migration programmes (TLMPs) are controversial because they are unable to solve the dilemma between domestic and global justice. The host countries which hire workers through TLMPs violate equality of they provide restricted rights to these immigrant workers. Hence, TLMPs raises questions regarding the extent of economic rights of migrant workers in these countries. As Adamson and Tsourapas (2019) points out, these temporary labor migration programs are essentially designed as medium of exchange, poorer country provides workers to high income countries and in return the low-income countries receive financial assistance in the form of remittance.

Ruhs (2021) states that the bargaining power rests in the hands of host countries (high-income countries) in the bilateral labor migration agreements. Therefore, it is crucial to address this inequality that exists in economic rights of migrant workers as well as to come up with viable solutions. The author suggests that transnational cooperation will play a vital role in establishing a 'fair' cross-border policy to solve this dilemma of global and domestic justice.

Migrant Rights and the Local Labor Market Impact

The intersection of the above-mentioned areas of research is not well understood. The migrant impact studies have not accounted for the level of rights afforded to migrant workers. Only rarely and in passing are migrants' rights mentioned. However, in his book The Price of Rights, Ruhs (2013) explicitly recognized that "[r]ights not only have intrinsic value, as emphasized by the human rights approach to migration, but they also play an important instrumental part in shaping the effects of migration" (p. 19). Ruhs further explains that "some employment-related rights can create costs for employers. Therefore, all else being equal, migrant workers who can be employed under restricted rights will be preferred by employers to resident workers with full employment rights" (p. 61). He also identified the gap in the literature that our study targets, pointing out that "... the dearth of scrutiny about the consequences of specific migrant rights for receiving countries... suggests that this is an important gap in analysis and debates that needs to be urgently addressed" (p. 22).

Existing literature examining the influence of immigration on local labor market assumes that laws imposed in labor market of destination countries are exogenous to immigration. Levai and Turati (2021) claims that this assumption is not always valid. Authors create a new workers' protection index in order to analyze migrant workers' protection in destination countries. The empirical evidence indicate that workers' protections adopted by labor market of destination countries is depended on workers' protections in origin countries of the migrants. Therefore, migrant rights in local labor markets are contingent on the labor market rules and regulations in the countries from which these workers migrate.

Furthermore, the COVID-19 pandemic is changing the public attitudes towards migrant workers (Drazanova, 2020). COVID-19 helped local labor markets to realize the importance of low-skilled migrant workers. The pandemic highlighted the necessity of 'essential' jobs, many of which are performed by low-skilled migrant workers. Hence, Ruhs (2021) contends that rights of immigrants in local labor markets will be revised because of the increase in demand of migrant workers. This can lead to a profound effect on access to migrant rights, labor market regulations and change in attitude of public in destination countries towards immigration.

THEORY AND HYPOTHESES

In order to address our research problem, we propose a theoretical mechanism with observable implications. This mechanism hinges on policy-induced labor market segmentation and creates perverse outcomes that disadvantage native workers (the very population the policy is assumed to protect). The argument is as follows.

Restrictions on the inter-employer mobility of immigrant workers lead to labor market segmentation which separates native workers whose mobility is not restricted from migrant workers who cannot be mobile. The immobility of migrant workers weakens their bargaining power in relation to their employers. Consequently, because immigrant workers enter the market at a low initial visa wage, compensation of immigrant workers exhibits rigidity that limits their ability to fully capture their marginal revenue product. There is a policy-induced rent that is captured by the employers. Furthermore, since migrant workers must commit to their employers, employers benefit from additional savings due to reduced turnover.

Taken together, the two effects increase the expected rent accruing to employers (via savings on wages and transaction costs) and, as a consequence, employers prefer to hire migrant workers. Demand for the competing local workers declines, depressing both their equilibrium wage and their employment opportunities. This theoretical mechanism is summarized in Figure 1.

In what follows we empirically examine the validity of the following two hypotheses:

1. *Employers value worker commitment when making employment decisions.*

2. *Within a temporary migration program (TMP) that limits inter-employer mobility, an employer who values worker commitment will have a higher preference for foreign workers.*

Further Background

Given the hypotheses, current studies on employee retention and turnover and the some literature on signaling become relevant. For employee retention and turnover, the recent survey of Hom et al. (2017) is comprehensive. A representative recent estimate of the costs of employee turnover to an employer is by Allen et al. (2010) and ranges between 90 and 200 percent of a worker's annual salary. These estimates "include separation costs, replacement costs, training costs, and an estimate of lost productivity" (Hinkin and Tracey, 2000, p. 17). Hom et al. (2017) also describe predictive work on worker turnover, which examines determinants of high turnover at the level of individual worker profiles, with potential screening implications for recruitment.

Much of the work on signaling in the labor market focuses on signaling worker quality (e.g. competence and productivity, as is the case for educational achievement), but there is also work on signaling intent (often as related to ethical behavior) (Connelly et al., 2011, p. 42). A reference to the immigrant status as a signal for loyalty appears in Bonoli and Liechti (2014) p. 6, but the immigrants' motivations to remain loyal are not related to visa policy as is the case in the present context.
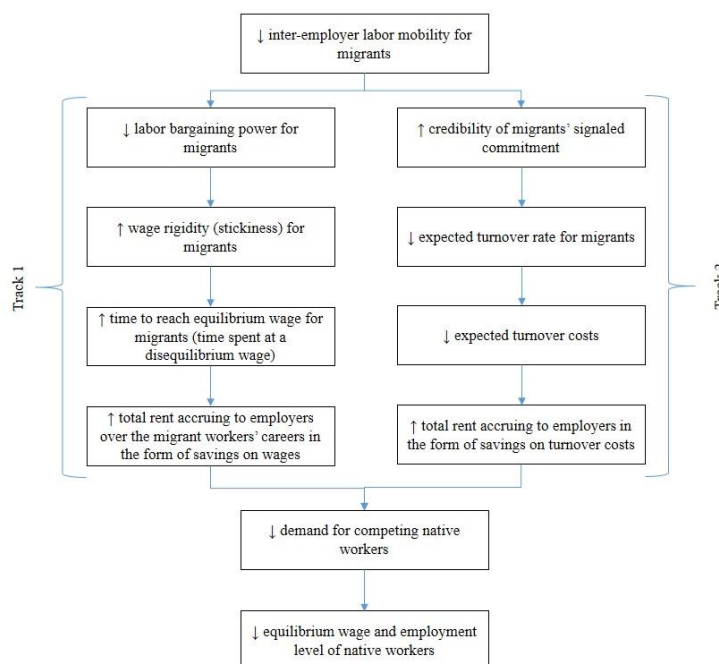

Figure 1 Mechanism for the Impact of Limiting Inter-Employer Mobility

METHODOLOGY

We implement our study using a choice-based conjoint (CBC) experiment that targets employment decision makers (e.g., HR professionals, business owners, etc.) in Saudi Arabia; the study was conducted via fielding a survey. The survey was structured using a CBC design and presented the participants with a series of choices among candidate employees. The goal of the conjoint design was to examine employer preferences by measuring the importance of a candidate's time commitment (contract length) vs. wage in determining employment decisions. The survey also collected demographic information on the employer as well as asking for a straightforward ranking of the likelihood of choosing a foreign worker over a native.

The survey was intended to check the core ideas of our theoretical framework. We attempted to measure the strength of the employers' preference for long-term employment as it is this preference that induces the labor market segmentation; we also gauge the likelihood of choosing a foreign worker. The purpose of the conjoint design is to simulate a real decision-making environment and so reveal true and unbiased preferences.

Sampling and Participants

The sampling procedure was a targeted snowball sampling via social media. We began by targeting the known-to-us network of contacts in the HR and business communities within Saudi Arabia, asking the targeted individuals to complete the survey and forward it to their own contacts. This way, we attempted to reach a large number of decision makers who have made employment decisions in the Saudi labor market.

We joined two relevant WhatsApp groups that include a large number of HR professionals in the Kingdom. (WhatsApp is a social media and instant messaging platform with unrivaled popularity in Saudi Arabia.) This method was very effective in generating a large number of responses from experienced individuals. We also utilized our contacts in the Kingdom to source responses from the business community.

Online platforms for professional networks also provided a useful tool for sampling the target population of employment decision makers. Primarily, we joined the Human Resource Management (SHRM) society's MENA chapter and utilized their online platform to direct-message other members who were based in Saudi Arabia via SHRM Connect. We applied the snowball sampling method because it allowed us to reach a large number of potential participants within strict time and budgetary constraints. To mitigate any biases introduced by snowball sampling, we collected extensive demographic information on the respondents to frame and contextualize any interpretation of the results.

No compensation was offered to the participants. We did indicate that an ultimate outcome of the project may include recommendations toward reducing the high unemployment rate among Saudi workers. This was a societal benefit that many participants valued, and it likely motivated some of the participation.

Actual Sample and Demographics

We collected a total of 152 completed surveys. We used a simple formula in Orme (2010) p. 64, to calculate the target sample size, which suggested a minimum threshold of 83 respondents (roughly half of the actual sample size). The survey was conducted during the months of April and May, 2018. Given the nature of snowball sampling, in which the number of persons receiving invitations to participate cannot be accurately determined, we cannot calculate the participation rate. The 152 completed surveys were distributed over a broad spectrum of industries. Some demographic information of the sample is presented in Table 1. For more detailed information about the specifics of the survey, see the Appendix.

Measures and Statistical Analysis

Two important measures that are obtained from the CBC analysis are the *utility* and *importance values*. Utility values, also known as part-worths, describe the relative desirability of various levels of a certain attribute (Estimating Utilities, n.d.). They are closely related to the relative count/tally of the number of times an attribute was selected during the conjoint experiment. Utility values of an attribute cannot be interpreted or compared to the value of utilities of other attributes in absolute terms; they should only be interpreted and compared as intervals between utility values within a single attribute. The individual-level utility values are calculated using an empirical Bayes estimation (Discover-CBC, 2018).

Using the utility values, individual-level importance values can be calculated for each attribute in the survey. Importance values indicate the weight (or importance) that a decision maker places on a certain attribute in making his or her decision. (Discover obtains the importance values by first finding the range (spread) of utility scores for an attribute and then calculating the proportion of an attribute's range over the sum of all ranges of attributes.) The importance values always sum to 100, and they are highly dependent on the choice of levels of the attribute. The latter fact must be considered when interpreting importance values; importance values are always specific to the attribute levels in the study.

Table 1 Summary of Survey Sample Demographics

Trait	Subgroup	Proportion of Sample (Percent)
Gender*	Male	77.0
	Female	20.4
Nationality	Saudi	85.5
Profession*	Business owner	15.1
	Executive/Director/Manager	35.5
	HR Professional	26.3
Employment Decision	Has made an employment decision	81.6
Experience	≤ 5 years	27.6
	6-20 years	53.3
	≥ 21 years	19.1
Country of Most Experience	Saudi Arabia	96.1
Industry*	Manufacturing	9.9
	Management of Companies and Enterprises	10.5
	Retail Trade	11.2
Business Size of Most Experience	Micro and small (≤ 49 employees)	19.8
	Medium (50-249 employees)	15.1
	Large (≥ 250 employees)	65.1

Note: *The remaining proportion out of 100 percent is "Other," "Undisclosed," or "Self-described."

The Model

We used the importance values of attributes in order to test Hypothesis 1; they also served as the critical independent variable in tests of Hypothesis 2.

A comparison of the average importance values for the attributes time commitment and wage level helped us determine the degree to which employers value commitment when making employment decisions (Hypothesis 1). Next, we combined the importance variable with the ranking of the likelihood of choosing a foreign worker (the final survey question) to test Hypothesis 2. Data obtained from responses to other survey questions were used as control variables. As collected, these include BusSize (number of employees), Nationality of the decision maker, Gender, Profession, EmpDecision (whether the respondent has made an employment decisions), Experience (in years); Country (of most experience); and Industry. We later manipulated these initial variables (deriving dummy variables) and vetted them for inclusion in our model; for simplicity and relevance, we derived and/or utilized the following final control variables: BusSize, Saudi, and DecMaker.[4]

We ran a number of ordered logistic regression (OLR) models with the ranked likelihood of choosing a foreign worker as the dependent variable and the importance value of commitment as the independent variable (in addition to the control variables). We also plotted the data to observe the relationship between the likelihood of choosing a foreign worker and the importance of time commitment. We used Microsoft Excel for data preparation and manipulation and Stata for the statistical analysis.

The ordered logistic regressions (OLR) were of the following form:

$$\ln\left(\frac{prob(rank \leq j)}{1 - prob(rank \leq j)}\right) = \alpha_j - \beta_1 X_1 - \beta_2 X_2 - \cdots - \beta_k X_k \tag{1}$$

Here, j ranges from 1 to the number of importance value ranks minus 1. The coefficients take a negative sign to maintain intuitive readability (larger coefficients are associated with increases in rank). Parameter α_j is a threshold value, analogous to the intercept in a linear regression. Parameter α_j takes a different value for each rank, whereas the

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[4] *Saudi* = 1 if *Nationality* = 1 and 0 otherwise; *DecMaker* = 1 if *EmpDecision* = 1 and 0 otherwise, where *EmpDecision* (as captured) = Whether has made an employment decision (1=Yes; 2=No); *BusSize* = Business size of most experience (1 = micro, < 10 employees; 2 = small, 10-49 employees; 3 = medium, 50-249 employees; 4 = large, ≥ 250 employees) (Enterprises by business size, n.d.).

β coefficients remain constant across all ranks. This is the *proportional odds assumption*;[5] checked using the Brant Test (Brant, 1990). Variables X_i included the importance value of commitment and the relevant control variables.

Using the regressions (13), the cumulative probability and the individual probability of any given rank j can be obtained using the equations:

$$prob(rank \leq j) = 1/(1 + e^{\alpha_j - \beta_1 X_1 - \beta_2 X_2 - \cdots - \beta_k X_k}) \tag{2}$$
$$prob(rank = j) = prob(rank \leq j) - prob(rank \leq j - 1) \tag{3}$$

EMPIRICAL RESULTS

Overall, our results support both Hypotheses 1 and 2. First, the average importance value that employers placed on time commitment (from the CBC Analysis portion of the survey) was high (71.1 percent) (see Table 2). Since the range of both the commitment and wage values were realistic, time commitment appears to be an important factor in employment decisions (Hypothesis 1). Further, both descriptive and statistical analyses (which relate the importance of time commitment (*TimeCommitment_Importance*) to the ranked likelihood of choosing a foreign worker over a native (*NationalVsForeigner_r1*)) suggest that employers who value time commitment are more likely to prefer foreign employees (Hypothesis 2).

Choice-Based Conjoint (CBC) Analysis

The core of the survey comprised the set of CBC questions that aimed to address Hypothesis 1. Summary statistics for the relative importance values of time commitment and wage are presented in Table 2. Clearly, for the identified levels of these two attributes, employers' decisions were more heavily influenced by the time commitment component. But, this result was contingent upon the specific levels defined for each attribute.

Table 2 Summary Statistics for the Relative Importance Values of Wage and Time Commitment

	Wage_Importance	TimeCommitment_Importance
Mean	0.289	0.711
Standard Error	0.025	0.025
Median	0.196	0.804
Mode	0.5	0.5
Standard Deviation	0.302	0.302
Sample Variance	0.0913	0.0913
Kurtosis	-0.120	-0.120
Skewness	0.950	-0.950
Range	0.980	0.980
Minimum	0.00666	0.0136
Maximum	0.986	0.993
Count	152	152
Confidence Level (95.0%)	0.0484	0.0484

As an intermediate output, the calculation of the relative importance values produced the set of utility values of the various levels of time commitment and wage levels. These utility values are shown in Figures 2 and 3; they have been rescaled to sum to zero for each attribute. Although both of these attributes showed the expected general trend of increased utility for higher time commitment and lower wage levels, respectively, there were differences in how much utility increased from one level to the next for each of the two attributes. For time commitment (Figure 2), there is a distinct jump in utility when moving from 1 to 2 years and from 3 to 4 years. On the other hand, the utility of wage cut (Figure 3) appears to increase only slightly at the beginning but increases exponentially by the time a 20-percent wage cut is reached. Again, these utilities are highly sensitive to the specific levels of attributes used.

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[5] The OLR model is an extension of the logistic regression (logit) model that allows the inclusion of a larger number of rankings (i.e. ordered categories). It is based on the assumption that the categories represent a discretization of an underlying, unobserved continuous variable. It uses the cumulative probability of all values up to a certain level instead of the probability of a given event. A foundational assumption to the model is that the β values are constant across the categories/ranks/logits. "That means that the effect of the independent variable is the same for different logit functions… [and is] the reason the model is also called the proportional odds model" (Norusis, 2005).

Variable Transformation, Selection and Descriptive Statistics

We examined the relative importance of the time commitment variable (*TimeCommitment_Importance*) in relation to the likelihood of selecting a foreign employee (*NationalVsForeigner_r1*). The results of the preliminary check were broadly supportive of Hypothesis 2, as employers with a strong preference for foreign workers also tended to value time commitment the most.

Given the sample size (152 survey responses), we retained only the most relevant control variables for the final analysis. We defined the following dummy variables (simplified versions of the categorical variables collected):

- *Saudi* = 1 if *Nationality* = 1 and 0 otherwise
- *SaudiExp* = 1 if *Country* = 1 and 0 otherwise
- *DecMaker* = 1 if *EmpDecision* = 1 and 0 otherwise
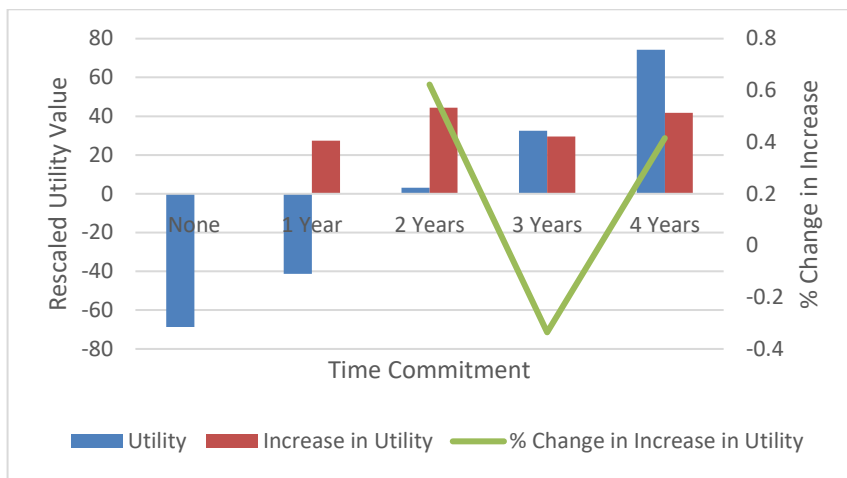- *Owner* = 1 if *Profession* = 1 and 0 otherwise

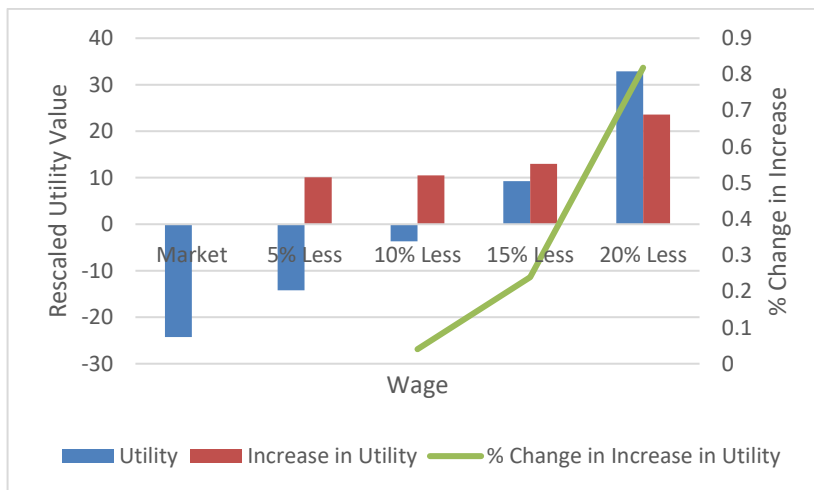Figure 2 Utility Values for Time Commitment Levels

Figure 3 Utility Values for Wage Levels

Further, we transformed the dependent variable by including fewer categories than in the survey (3 categories in the regressions vs. 11 in the survey). This reduction in the number of categories was done to accommodate the sample size. The three final categories are:

NvF = 1 for *NationalVsForeigner_r1* values = 1-3; 2 for values = 4-7; and 3 for values = 8-11

Figure 4 shows the distribution of the likelihood of choosing a foreign worker in the survey data (*NationalVsForeigner_r1*) whereas the distribution of the adjusted *NvF* variable is given in Figure 5. Different divisions of the initial rankings into the *NvF* categories were examined; these are discussed in Sensitivity Analysis below. Summary statistics for all final variables are given in Table 3.
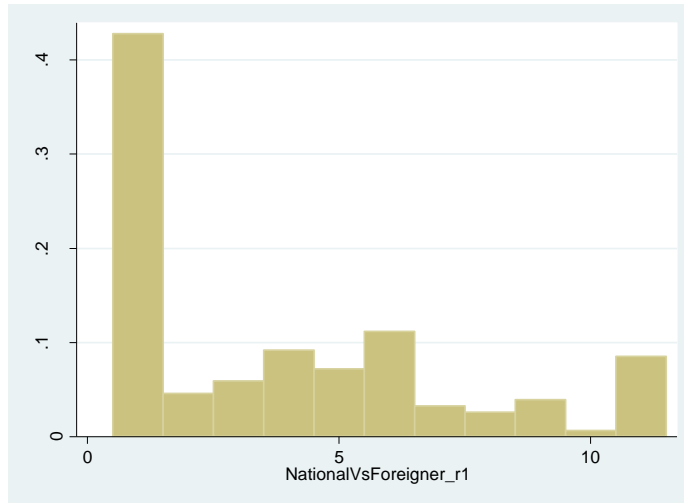

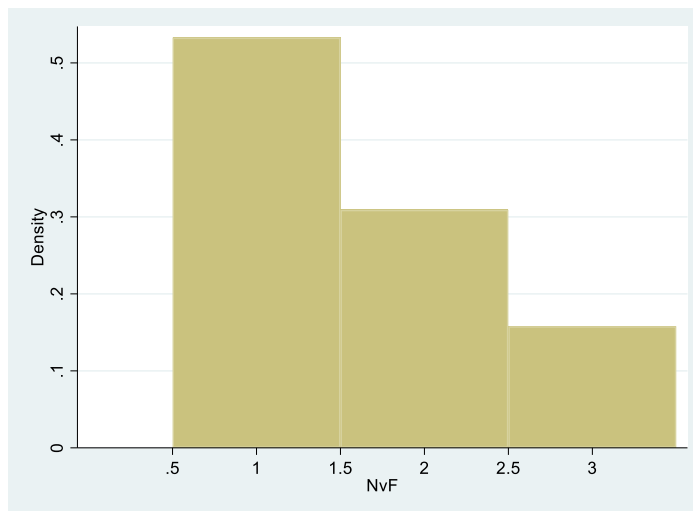Figure 4 *NationalVsForeigner_r1* Variable Distribution

Figure 5 *NvF* Variable Distribution

Due to the multi-dimensional relationships and discrete (categorical and ordinal) nature of the variables, only relatively complex visualizations yielded meaningful results. We generated contour plots to account for three variables at a time (i.e. the dependent, independent and one control variable). Figures 5 and 6 show two contour plots, both of which include the same two main variables, *NationalVsForeigner_r1* and *TimeCommitment_Importance*, in addition to one control variable. The two predictor variables are on the x- and y-axes (the control variable and *TimeCommitment_Importance,* respectively), whereas the predicted (dependent) variable of interest (*NationalVsForeigner_r1*) is on the z-axis, with the height of this dimension coded in color.

Table 3 Summary Statistics for All Final Variables

Stats	NvF	TimeCommit-ment_Importance	Saudi	Owner	DecMaker	SaudiExp	Experience	BusSize
Mean	1.63	0.711	0.855	0.151	0.816	0.961	2.69	3.39
N	152	152	152	152	152	152	152	152
Max	3	0.993	1	1	1	1	5	4
Min	1	0.014	0	0	0	0	1	1
SD	0.744	0.3020	0.353	0.360	0.389	0.195	1.47	0.949
P50	1	0.804	1	0	1	1	2	4
IQR	1	0.460	0	0	0	0	3	1

In both Figure 6 and Figure 7, a notable concentration of red color, indicating high likelihood of choosing a foreign worker, is located in the upper-left corner of the plot. This is the area with a high level of importance placed on time commitment as well as smaller business size (Figure 6) and non-Saudi employers (Figure 7). These plots generally support Hypothesis 2. They further suggest that business size and nationality do influence the likelihood of selecting a foreign worker over a Saudi citizen. (The contour plot including *DecMaker* as the control did not reveal clear information.)
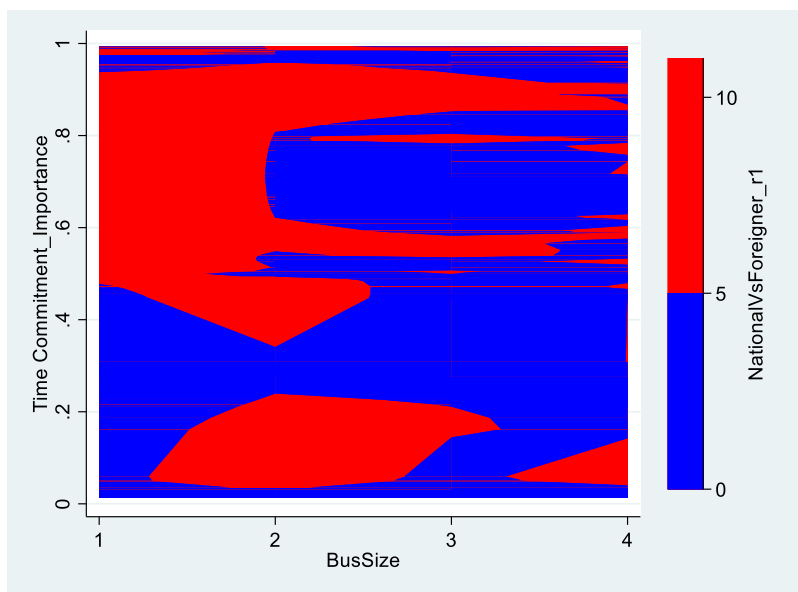

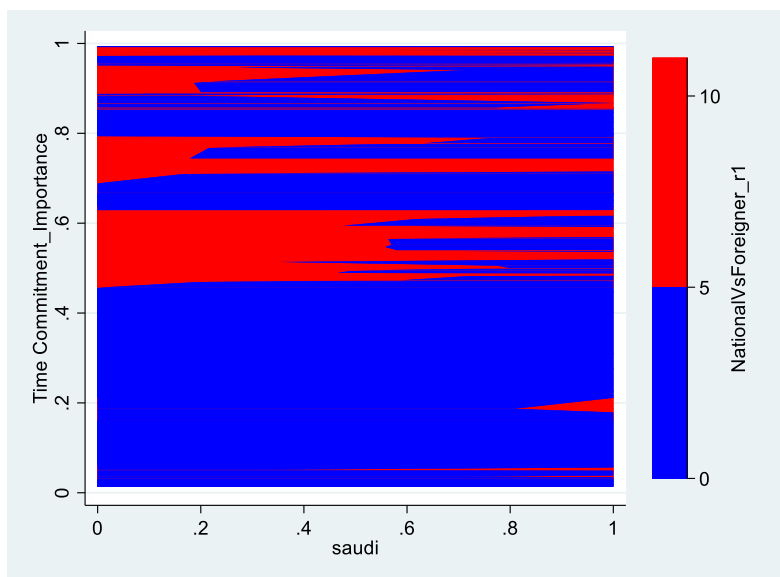Figure 6 Contour Plot including *BusSize* as the Control

Figure 7 Contour Plot with *Saudi* as the Control

Statistical Analysis

We estimated a number of ordered logistic regression (OLR) models which all included the dependent variable, *NvF* (which takes the values 1, 2 or 3, depending on the ranked likelihood of choosing a foreign worker), one main independent variable (*TimeCommitment_Importance*), and a maximum of three control variables. Given relevance of business size, it is included in Model 2 (see Table 4). The results of all estimations are presented in Table 4; Table 4 gives odds ratios (ORs) rather than simple coefficients.

Table 4 Results of the OLR Models

	Model 1: NvF	Model 2: NvF	Model 3: NvF	Model 4: NvF
TimeCommitment_Importance	2.29	2.68+	2.38	2.29
	(1.24)	(1.48)	(1.36)	(1.32)
BusSize	-	0.676*	0.675**	0.700*
		(0.112)	(0.115)	(0.122)
Saudi	-	-	0.182***	0.187***
			(0.080)	(0.082)
DecMaker	-	-	-	0.614
				(0.262)
/cut1	.723	-.499	-2.05	-2.34
/cut2	2.28	1.11	-.278	-0.555
Prob > chi2	0.121	0.0191*	0.0000***	0.0001***

Note: Odds ratios (ORs); standard errors (SEs) in parentheses; n=152; + $p<0.1$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table 4 indicates that the significance of various independent variables depends on the specific model, but the odds ratios remain relatively constant. Specifically, the main independent variable of interest, *TimeCommitment_Importance*, becomes significant (at the 90-percent confidence level) only in Model 2, where *BusSize* is the only control variable. Nevertheless, its associated OR value is very similar across all models (all OR values are greater than 2), and this supports the expectation that an increase in the importance placed on time commitment by an employer increases the odds of being in a higher level of *NvF* (i.e. of being more likely to choose a foreign worker).

In particular, an employer with a time commitment importance of 100 percent has more than twice (e.g. 2.68 times in Model 2) the odds of being in a higher category of preference for foreigners than an employer with a time commitment importance value of 0 percent, holding the control variable (*BusSize*) constant. This supports Hypothesis 2. Furthermore, as the Brant test (in Table 5) shows, this odds ratio holds constant across all of the ordinal levels of the dependent variable (an assumption of the OLR model). All four models pass the Brant test (since no test statistic is significant in Table 5, there is no evidence that the proportional odds (parallel regression) assumption has been violated.)

Table 5 Results of the Brant test of the Proportional Odds Assumption of OLR (for Model 2)

	Chi2	p>Chi2	df
All	0.95	0.621	2
TimeCommitment_Importance	0.02	0.892	1
BusSize	0.95	0.329	1

Sensitivity Analysis: The degree to which results are sensitive to changes in the definition of the ordinal categories of the dependent variable (*NvF*) is a concern. We observed, however, that shifting the allotment of ranks to different categories did not have a large impact on the magnitude or direction of the odds ratios in Table 4.

The significance of *TimeCommitment_Importance* in Model 2 was reduced when the 11 original rankings captured in the *NationalVsForeigner* indicator were sorted differently into the three rankings of *NvF*. Tables 6 and 7 present two alternative to the standard definition/sorting of *NvF* rankings utilized for the results in Table 4.

Table 6 Results of Sensitivity Analysis Using *NvF* = 1 for *NationalVsForeigner_r1* values = 1-4; 2 for values = 5-8; and 3 for values = 9-11

	Model 1: NvF	Model 2: NvF	Model 3: NvF	Model 4: NvF
TimeCommitment_Importance	1.95	2.17	2.01	1.89
	(1.11)	(1.24)	(1.19)	(1.12)
BusSize	-	0.746+	0.752+	0.789
		(0.126)	(0.129)	(0.138)
Saudi	-	-	0.267***	0.271**
			(0.116)	(0.118)
DecMaker	-	-	-	0.565
				(0.241)
Prob > chi2	0.234	0.113	0.0036***	0.0041**

Note: Odds ratios (ORs); standard errors (SEs) in parenthases; n=152; + p<0.1, * p<0.05, ** p<0.01, *** p<0.001.

Table 7 Results of Sensitivity Analysis Using *NvF* = 1 for *NationalVsForeigner_r1* values = 1-4; 2 for values = 5-7; and 3 for values = 8-11

	Model 1: NvF	Model 2: NvF	Model 3: NvF	Model 4: NvF
TimeCommitment_Importance	2.02	2.17	2.06	1.97
	(1.15)	(1.24)	(1.22)	(1.18)
BusSize	-	0.723+	0.727+	0.762
		(0.124)	(0.127)	(0.136)
Saudi	-	-	0.243***	0.249**
			(0.107)	(0.110)
DecMaker				0.537
				(0.231)
Prob > chi2	0.208	0.0775+	0.0015**	0.0016**

Note: Odds ratios (ORs); standard errors (SEs) in parenthases; n=152; + p<0.1, * p<0.05, ** p<0.01, *** p<0.001.

DISCUSSION

First, of the alternatives of time commitment and wage reductions offered in our survey, time commitment appears to dominate employer decision making. As shown in Table 3, commitment to an employer captures a relative importance value of over 70 percent. This supports Hypothesis 1, that employers value work commitment when making hiring decisions. This is also consistent with findings in the employee retention and turnover literature regarding the non-trivial magnitude of turnover costs to employers.[6] In this regard, our CBC methodology offers a novel empirical method to measure employers' preference for time commitment.

Empirical tools such as CBC analysis that were originally developed for market research may offer insight into policy design issues (Hainmueller et al., 2014, p. 3). Ruhs (2002) has observed that workers are commodified by restrictions on their rights (p. 49); if this is the case, then market research methods that deal with product substitution may be useful in understanding policies that suit employers. Whether policy ought to address mainly, or only, the interests of domestic employers instead of also the wellbeing of immigrant workers is not an issue addressed here.

The utility values attached to the specific levels of time commitment and wage, which are used to calculate the importance values, reveal potentially interesting trends, which may be relevant to design of temporary worker visa policy. For example, the large increases in the utility of time commitment at 2- and 4-year thresholds (Figure 3) indicate that inter-employer mobility restrictions on migrant workers should perhaps be limited to 1 or 3 years; this could reduce any strong preference for migrant employees, thus assisting local workers. Similarly, the large increase in utility for wage reductions of 20 percent (compared to 15 percent, in Figure 4) indicates that a government program that subsidizes local worker wages by 20 percent should have significantly more impact on employers' willingness to hire native workers than one subsidizing their wages at 15 percent.

Second, regarding the relationship of time commitment and preference for foreign workers, Table 5 reveals that, in the surveyed population of employers, there is a positive relationship between these variables (the sensitivity analysis supports this conclusion). The odds of being in a higher likelihood category for choosing foreign workers are 2.68 times greater (in Model 2) for those employers that reveal 100 percent importance of time commitment when compared to employers that place no (zero) importance on

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[6] As mentioned previously, a recent estimate of the costs of employee turnover to an employer by Allen et al. (2010) estimated it at between 90 and 200 percent of a worker's annual salary.

commitment. This relationship is also clear in the contour plots (Figures 5 and 6), in which regions of high likelihood of choosing a foreign workers (in red) concentrate in areas of high importance for worker commitment.

It should be added that the connection of time commitment and the likelihood of choosing a foreign employee was statistically significant only at the 90 percent confidence level and only in the baseline Model 2 (see Table 5), but the relationship was nevertheless robust in both magnitude and direction. We appeal to Neumayer and Plumper's (2017. P. 47) definition of statistical robustness which refers to stability of estimated effect sizes and effect strengths.

Our survey was conducted in Saudi Arabia where the vast majority of foreign individuals are subject to a TMP visa regime. Our findings broadly support Hypothesis 2 (that limitations of inter-employer mobility result in a higher preference for immigrant workers among those employers that most value time commitment). This connection is fundamental for the theoretical mechanism that we proposed since it is this preference for foreign workers that leads to the segmentation of the labor market and the resulting imperfect substitution between native employees and immigrants. In other words, the strength of employers' preference for foreign workers (itself a result of the importance of time commitment coupled with the mobility restrictions under the visa program) ultimately determines the effects that these migrant workers have on the labor market outcomes of competing locals.

Of the three control variables that were used in the statistical models (in Table 5), two are significant. These are the business size (*BusSize*) and the nationality of the employer (*Saudi*). As shown in Table 5 and the contour plots (Figures 5 and 6), these controls play an important role in determining the likelihood of choosing a foreign employee over a native worker. These findings are consistent with intuitive and observational expectations even if previous research has not sufficiently addressed them.

The empirical methodology used in this project could potentially help extend work in employee turnover literature. Furthermore, since the nationality of employers appears to be a robust factor in employment decisions, this is an aspect that merits further research. Interestingly, the third control variable, experience in making employment decisions (*DecMaker*), was not significant in any of the statistical models; this suggests that the preference for foreign employees is not a function of special expertise or past experience.

CONCLUSIONS

We have examined the role Temporary Migrant Worker visa programs in determining the impact of these workers in the local economy. We focused on the effects of restrictions on the inter-employer mobility of workers as these are a particularly important subset of limitations on immigrant worker rights. To obtain relevant data, we fielded a CBC survey among Saudi employers (Saudi Arabia places especially stringent restrictions on inter-employer mobility of workers). Among the sampled decision makers, we observed a high level of importance placed on workers' time commitment. This preference for time commitment is positively related to the likelihood of choosing a TMW-visa worker over a Saudi employee.

These findings carry implications for migrant impact research. They suggest that policy restrictions on migrant workers' rights (via various visa types) are an important determinant of the effects that an influx of foreign workers creates in the local labor market. These findings also suggest that accounting for visa categories could help reconcile divergent results obtained in the migrant impact literature.

Future research is needed to address limitations of the present work. For one, our survey consisted of only 152 respondents. This meant that some response categories included few observations. Furthermore, the sample may not be representative of the entire population of employment decision makers in Saudi Arabia; rather, it is biased towards Saudi HR professionals in large businesses and is ultimately the result of snowball sampling. In the interest of validity, future research should more closely mimic the underlying population of employers. This could be accomplished, e.g., through targeted snowball sampling (Dusek et al., 2015).

In the CBC portion of our study, we did not account for variable interactions which may be important in this context. Future research could also expand the levels of attributes (wage and time commitment) and introduce new attributes (e.g., years of experience). Further, the portion of the survey that requested a ranking of the likelihood of choosing a foreign worker could be formulated as an additional CBC module. Where ranking questions are asked, care should be taken in defining the grouping of rankings.

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APPENDIX

Implementation of the Survey

The online survey consisted of multiple parts presented to each participant. The first component of the survey included demographic questions as well as two preliminary questions concerning country-of-work and employment-decision-making experience.

The second component of the survey included ten slides which used a Choice-Based Conjoint (CBC) experimental design. CBC is a discrete choice method traditionally used by market researchers to identify the utility values consumers place on various levels of product attributes (features), as well as the relative importance of these features to consumers' ultimate purchasing decisions. For this study, in simulating choices faced by employers among various employees, CBC provided an aspect of enhanced realism. Perhaps more importantly, however, it "limit[ed] concerns about social desirability" (Hainmueller, Hopkins and Yamamoto, 2014, p. 3), by shielding respondents from obvious statements of bias for or against immigrants, thereby relieving them to some extent from the need to factor into their choices what they perceive as the socially desirable attitude. CBC achieved this through allowing them the chance to provide multiple justifications for any specific choice.

We used an Academic Grant version of the Discover online platform produced by Sawtooth Software, an industry leader in CBC, to setup the survey. The respondents were presented with the following case:

Key Information

You are an employer. You need to choose among 3 equally qualified candidates for 1 job position. Each is willing to sign a different contract, varying in 2 dimensions: wage and time commitment.
You will be presented with a series of 10 different combinations of employees and the contracts they have agreed to sign. Please choose your most likely pick from each combination.

Further Details

Assume that the employment contract has the following properties:

- It is perfectly enforceable.
- It is binding only for the employee; you can terminate it at any time without providing notice, a reason, or compensation.
- The termination penalty for the employee is very high, so the employee will never choose to terminate.

The participants were then presented with ten screens, each including three candidate employees to select from. The employees were described by two attributes, each involving five potential levels (wages ranging from market wage to 20 percent below, and contractual commitment from "none" to 4 years).

An example of these choice screens is in Figure 1A. Finally, each survey participant was presented with one more simple case where he/she was asked to rank the likelihood of choosing a foreign employee over an equally qualified native worker.

Figure 1A Example of CBC Choice Task/Screen

Sawtooth Software's Discover platform uses "a near-orthogonal" CBC design that "avoid[s] dominated concepts" with "high relative D-efficiency" (Sawtooth Software, 2018). We adopted the suggested number of tasks (CBC questions) generated by Discover of 10 but used a smaller number of concepts per task than suggested (3 vs. the suggested 4) in the interest of simplicity and in order to focus the respondent. Also in the interest of simplicity, we used the "main-effects" design (Huber, 2005).