Why do firms hire migrant workers? *

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Job Market Paper

November 11, 2026

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Abstract

Large spatial wage gaps create incentives for workers to migrate. Whether workers migrate and the gains they realize from migrating depend in part on why destination firms value migrant labor. We study firms' preference for migrants over locals, and its consequences for workers, through a series of field experiments in India: an incentivized hiring experiment with 234 firms, real job offers to potential migrants, and real placements matching these firms and workers. Firms have a higher WTP for migrants, demand them 79% more at the same wage, and screen on migrant status. We combine experimental variation in reliability guarantees and the option of on-site housing with incentivized beliefs of firms about workers' on-the-job actions to decompose the migrant WTP premium into three margins of labor input: reliability, unpaid hours, and per-hour productivity. Unpaid labor beyond the agreed workday accounts for approximately 27% of this premium and reflects the exercise of employer power, whereas the other two margins may reflect both worker characteristics and employer power. Firms that perceive migrants as having less institutional recourse than locals report larger premiums. Potential migrants expect less unpaid work and greater recourse than firms anticipate, and in real job offers requiring migration, they forgo substantial wages for protections against on-the-job vulnerabilities. Implemented job placements show that migrants complete more contract days, supply more unpaid labor, and have higher per-hour productivity than locals, validating the beliefs that drive firm preferences. These findings suggest that greater monopsony power over migrants can increase their value to firms while reducing workers' net gains from moving, which may deter migration.

Keywords: Migration, Monopsony, Unemployment, Incomplete Contracts

JEL Classification: O12, O17, D22, J23, J41, J46, J47, J61, J64

*We are grateful to Emily Breza, Arun Chandrasekhar, Eliana La Ferrara, Michael Kremer and James Robinson for their support and guidance throughout the project. We thank David Atkin, Jie Bai, Abhijit Banerjee, Marianne Bertrand, Laura Boudreau, Christina Brown, Gaurav Chiplunkar, Rob Garlick, Rema Hanna, Maulik Jagnani, Yasir Khan, Gabriel Kreindler, Erin Kelly, Melanie Morten, Suresh Naidu, Benjamin Schoefer, Nick Swanson, Eric Verhoogen and seminar audiences at Azim Premji University, Bank of Italy-CEPR workshop on Labor Market Policies and Institutions, CEPR-BREAD Annual Symposium in Development (Zurich), Firms Trade and Development (Yale), SITE (Stanford) and Tufts for helpful comments and feedback. Jay Prasad and Mithlesh Verma provided excellent research assistance. We are deeply indebted to the field team in Patna led by Gufran Ahmad. This work would not have been possible without helpful discussions with Gufran Ahmad, Niraj Kumar, Randhir Kumar, Rakesh Kumar, and Manoj Yadav. The project was funded by the Centre for the Study of the Indian Economy and the Weiss Fund. The IRB approval for this project was provided by Harvard University and Azim Premji University. The experiment was registered at AEA RCT registry (AEARCTR-0017613).

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1 Introduction

Large spatial wage gaps and the prospect of accessing more productive employment create incentives for workers to migrate (Bryan et al., 2014). Whether workers capture these potential gains depends not only on how much more they earn at the destination than at the origin, but also on why destination firms value migrant workers. Firms may prefer migrants to local workers because migrants possess skills that are scarce locally (Kerr and Lincoln, 2010) or differ in other productive characteristics (Manacorda et al., 2012), or because firms can exercise greater monopsony power over them (Amior and Manning, 2026). Such power may stem from migrants' worse outside employment opportunities (Albert, 2021), but it may also arise from institutional disadvantages, including a less reliable social safety net, limited recourse to state institutions, and barriers to accessing dispute-resolution mechanisms and worker unions. These disadvantages make it harder for migrants to contest employers' claims, particularly in the absence of written contracts, and firms may value this disadvantage.[1] [2]

This paper examines whether and why firms prefer migrant workers to local workers, and the consequences of this preference, using three connected real field experiments with firms and workers in the construction sector in India. In the experiment with firms, we measure firms' willingness to pay (WTP) and thereby the demand for migrant and local workers, and ask whether migrant status serves as a screening criterion, with firms willing to hire migrants while refusing locals for the same job. In our experiment, WTP for migrants is 13.9% higher, demand for migrants at the market wage is 79% higher, and 29.5% of firms screen on migrant status. We hypothesize that firms' WTP premium reflects the labor input obtained from workers along three margins: reliability, defined as lower absenteeism and reneging; unpaid hours, defined as uncompensated labor beyond the orally agreed eight-hour workday; and per-hour productivity, including effort.[3] Thus, firms' preference for migrants may manifest in greater labor input for a given wage rather than wage markdowns for a fixed amount of work. Reliability and per-hour productivity may reflect worker characteristics (Bryan and Morten, 2019) as well as employers' power to induce workers to comply with their demands (Shapiro and Stiglitz, 1984; Caldwell et al., 2026), whereas unpaid hours is likely to capture the exercise of monopsony power. To investigate the institutional source of this power, we ask whether firms' preference for migrants is associated with perceived differences in migrant and local workers' access to recourse, beyond differences in their outside employment opportunities. What drives the premium matters for how the gains from migration are divided between workers and firms. If firms value migrants partly for the unpaid labor they can obtain under limited recourse, spatial wage gaps may overstate workers' net gains from mi-

[1] Written contracts are often absent both in informal labor markets in low-income countries and in the employment of undocumented migrants in high-income countries (European Union Agency for Fundamental Rights, 2011; Dustmann et al., 2017a; Elias et al., 2025).

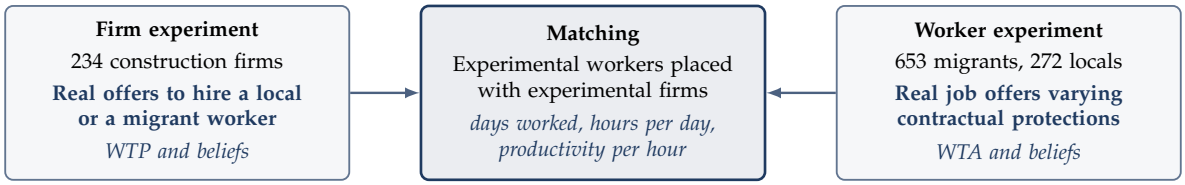
[2] The institutional differences between migrants and locals may arise because migrants are less embedded in destination labor markets, even in the absence of formal restrictions on mobility (Naidu et al., 2016).

[3] Previous work shows that worker reneging rates are high in labor markets of low- and middle-income countries (Varun, 2026; Goraya et al., 2025) and unpaid hours are an important concern for workers (Varun, 2026; Boudreau et al., 2024).

gration, and the risk of such unpaid labor could deter migration, with broader consequences for structural transformation and growth (Gollin et al., 2014).

In the worker experiment, we first examine whether potential migrants anticipate the vulnerabilities that may contribute to firms' preference for migrant labor, and how much they value contractual protections against them. In particular, we test whether workers expect migrants to face greater exposure to unpaid work and less ability to contest employer demands than locals, and how much migrants would forgo in wages for protection against these vulnerabilities. Finally, we move beyond the beliefs of firms and workers to assess whether migrant and local workers actually differ along the margins of labor input highlighted above.

Figure 1: Study Design



Notes: The figure illustrates the experiments that we conduct in the construction sector.

Observational hiring patterns do not identify employer preferences, because hiring is dynamic and the existing distribution of workers may reflect sorting and selection across firms and wages. We therefore conduct a field experiment with 234 construction firms in Patna, India, to measure firms' WTP for migrants relative to locals and the mechanisms behind it. Each firm evaluates several worker–contract bundles for the same standardized 15-day job, with the possibility of extension. Worker type and residence vary across three contracts: (i) a local worker, who is connected to the Patna labor market; (ii) a migrant worker under a *flexible* residence arrangement, which gives the firm the option to house the worker on-site or have the worker commute from within the city, capturing the status quo contract for migrants; and (iii) a migrant worker under an *off-site* arrangement, under which the worker must commute.[4] For each contract, the firm first indicates whether it would consider hiring the worker and then reports the maximum daily wage it would pay. WTP is elicited through a BDM mechanism: one contract is randomly selected and implemented at a drawn wage, making truthful reporting a weakly dominant strategy. Because both migrant contracts draw workers from the same pool, comparing them identifies how residence contributes to firms' valuation of migrants, holding worker characteristics fixed. Worker residence is a central feature of migrant employment worldwide (Goodburn and Mishra, 2024; Adhvaryu et al., 2023). On-site housing may improve reliability by reducing commuting disruptions, but it may also increase firms' ability to obtain unpaid work by making workers more available and dependent on them for accommodation (Pun and Smith, 2007).

We first compare the local and migrant-flexible contracts. At the prevailing market wage of

[4]Throughout, *migrant* refers to workers from other districts of Bihar without established ties to the Patna labor market; *local* includes established residents and regular commuters with such ties.

INR 550 per day, 50.4% of firms are willing to hire a migrant under the flexible arrangement, compared with 28.2% for a local—a 78.8% increase in demand ($p < 0.001$). Firms' average WTP is 531 INR per day for the migrant-flexible contract and 466 INR for the local contract, a premium of 65 INR (13.9%, $p < 0.001$). Moreover, 29.5% of firms are willing to hire a migrant but refuse a local worker for the same job, whereas only 2.1% exhibit the reverse preference ($p < 0.001$). This asymmetry suggests that migrant status serves as a screening criterion, in addition to affecting firms' wage valuations. Removing the option of on-site housing reduces the share of firms willing to hire a migrant at INR 550 per day from 50.4% to 44% ($p = 0.001$) and lowers WTP by 14 INR per day ($p < 0.001$). Value of on-site residence therefore accounts for part of firms' WTP premium for migrants.

We next measure how much of the migrant WTP premium reflects greater reliability. Each worker–residence contract is offered with and without a guarantee that compensates firms for lateness, absence, or reneging, thereby mitigating disruption costs. The guarantee raises hiring of locals by 15 ppt and flexible migrants by 9 ppt, narrowing the hiring gap by 6 ppt ($p = 0.038$). The smaller response for migrants is consistent with firms expecting them to be more reliable. Comparing the corresponding changes in WTP attributes 39.2% of the migrant–local premium to reliability. This reliability difference may be due to migrant worker's fewer social obligations and local network ties at the destination that compete with work (Goraya et al., 2025), as well as firms' monopsony power over migrants (Manning, 2003).

To separate the remaining migrant WTP premium into unpaid hours and per-hour productivity, we combine the contract comparisons with firms' beliefs about the labor they expect to obtain. In the incentivized belief survey firms report their expectations about local, off-site migrant, and on-site migrant workers along the three labor-input margins—reliability, unpaid hours, and per-hour productivity—and separately about outside employment opportunities, worker voice, and recourse. Firms expect on-site migrants to be the most reliable, work the longest hours, be the most likely to provide unpaid overtime, exert the most effort, and have the weakest outside employment opportunities and recourse. Off-site migrants generally fall between on-site migrants and locals.

To identify the residence-based component of unpaid hours, we compare flexible and off-site migrant contracts within the guarantee arm. The two contracts draw from the same worker pool, specify the same job, daily wage, and eight-hour workday, and provide the same protection against absenteeism and reneging. They differ only in the firm's option to house the worker on-site. The WTP difference therefore isolates firms' valuation of additional unpaid hours associated with on-site residence. Across firms, a larger expected hours gap between on-site and off-site migrants is associated with a larger WTP difference between the corresponding contracts. We use this relationship to estimate how much an additional expected hour of work per day adds to firms' WTP.

Firms also expect off-site migrants to work longer than locals. We value these additional hours using the estimated hourly value and add this amount to the residence-related component. To-

gether, these two sources of unpaid work account for 27.7% of the migrant–local WTP premium. As unpaid hours are obtained from post-contractual violations, these are likely to be driven by greater institutional monopsony power over migrants which prevents them from contesting these claims. The residual premium of 33.1% represents expected differences in productivity per hour. Supporting this interpretation, firms with a larger residual premium also report a larger migrant advantage in effort and productivity per hour in the belief survey.

We test whether less institutional recourse for migrants helps explain firms' migrant WTP premia. Firms that expect migrants to have weaker recourse in the belief survey report larger premia after controlling for perceived differences in outside employment opportunities and ability.

A model of wage-dependent retention and labor discipline rationalizes these patterns (Shapiro and Stiglitz, 1984; Caldwell et al., 2026). In the model, the firm can demand unpaid work after agreeing to an eight-hour workday. Migrants with fewer competing obligations are less likely to leave, which raises the firm's return from retaining them, so the firm pays them a higher wage while demanding more unpaid overtime. Migrants with weaker voice face a greater risk of dismissal if they refuse unpaid overtime; the firm then demands more unpaid work and pays a higher daily wage to preserve the more profitable relationship. This wage response also raises retention, so greater reliability can reflect employer power as well as worker characteristics. Worse outside employment opportunities further raise retention and unpaid work but have an ambiguous effect on the wage, so competing obligations and dismissal risk generate the wage premium even when outside employment opportunities are equal.

To assess whether these findings extend beyond the informal sector, we surveyed hiring managers at one of India's largest staffing companies. Managers report that clients prefer migrants among otherwise comparable hires and expect migrants to be more reliable and more willing to work additional unpaid hours. The largest perceived differences concern collective action: managers expect migrants to be substantially less likely to strike or join a union. They also report that clients screen on migrant status and restrict recruitment of locals. Together, these responses suggest that firms prefer migrants partly because migrants are less likely to organize and therefore have less collective bargaining power over wages and working conditions (Derenoncourt et al., 2025; Lagos, 2026).

Turning to workers, we examine whether potential migrants anticipate the employment conditions that may help explain firms' preference for migrant labor. In an incentivized belief experiment, potential migrants to Patna in four districts of Bihar and workers local to Patna assess the expected incidence of wage theft, unpaid overtime, worker reneging, and workers' ability to contest employer actions for three worker profiles—locals, off-site migrants, and on-site migrants—while holding the job and wage fixed. The elicitation therefore captures beliefs about how otherwise identical employment agreements are implemented across worker types. Both groups expect migrants, particularly those housed on-site, to face more wage theft and unpaid overtime, to be less likely to renege, and to have less ability to contest employer actions than locals. Compared with firms' beliefs, however, potential migrants expect fewer migrants to accept unpaid work and more

to quit or seek outside recourse. They also perceive smaller migrant–local gaps on these outcomes. This disagreement suggests workers may underestimate destination costs and overstate migration returns (Jäger et al., 2024).

Importantly, the contractual benchmark is common across worker types: the oral agreement specifies a daily wage for an eight-hour workday and a defined set of tasks. Unpaid hours therefore represent labor obtained beyond the terms agreed ex ante, rather than a difference in the contracted labor bundle. Workers' expectations of more frequent departures from these terms for migrants, particularly those housed on-site, are consistent with migrants' weaker bargaining position within the employment relationship.

Because destination jobs carry risks of unpaid work, wage theft, and limited recourse, spatial wage gaps overstate the returns to migration. Workers' expected returns lie in between: below the wage gap, because they anticipate some unpaid hours, but above the return implied by firms' beliefs, because they anticipate fewer unpaid hours than firms do. Migration is therefore lower than it would be if destination jobs carried no such risk, but is higher than it would be if workers' beliefs matched firms'.

We next quantify how much migrants value protections against these vulnerabilities. Each migrant participant in the job-offer experiment receives two real 15-day offers in Patna: a standard contract and a contract in which the research organization either guarantees payment of wages owed, mediates disputes with the employer, or guarantees another job on comparable terms if the worker quits. Residence is randomly assigned across workers, with both offers to each worker specifying the same arrangement. Workers accept or reject offers across a menu of wages, with one wage–contract combination randomly selected for implementation; the within-worker difference in minimum acceptable wages identifies the value of the protection. Migrants are willing to forgo substantial wages for these protections: up to 29 INR per day (4.9%) for insurance against wage theft, 19 INR (3.2%) for dispute mediation, and 19 INR (3.1%) for an outside-option guarantee. The point estimates for insurance and mediation are larger for jobs with on-site housing, consistent with lower worker bargaining power when the employer also controls accommodation, although the residence interactions are not statistically significant. Workers' willingness to forgo wages for mediation and alternative employment establishes that both institutional recourse and outside employment options affect their valuation of destination jobs. These findings complement the firm-side evidence linking migrant WTP premia to perceived differences in worker voice.

Finally, we examine whether the migrant–local differences in the three margins of labor input that drive firms' WTP premium appear in realized employment relationships. We connect the two experiments by implementing the randomly selected firm and worker offers as real jobs. These placements give firms' WTP and workers' WTA decisions real stakes, and their outcomes record realized behavior rather than stated choices. Across 138 placements of 76 migrant and 49 local workers at 98 firms, migrants complete 1.7 more days on the job than locals ($p < 0.01$), work 0.17 more hours per day ($p < 0.05$), and work 0.10 more unpaid hours beyond the agreed eight ($p < 0.05$). Migrants' per-hour productivity is 0.413 standard deviations higher ($p = 0.081$). In a

complementary observational survey of workers already employed by these firms, migrants work 0.55–0.98 more hours per day than locals—a larger difference than in the placement sample—and on-site workers work longer than off-site workers.

Together, these results show how conditions that make migrants attractive to firms can also reduce workers' gains from migration. Greater reliability and productivity raise firms' valuations, while limited worker recourse may give firms greater scope to obtain unpaid labor. Workers' willingness to forgo wages for contractual protections shows that these conditions also affect their valuation of destination jobs. Higher employer valuations can therefore coexist with vulnerabilities that reduce workers' net returns, which daily wage comparisons alone may fail to capture.

Literature and Contributions. Our analysis connects the literatures on employer monopsony power and migrant labor demand, coercive labor-market institutions and the returns to migration and spatial reallocation in low-income settings.

Migrants' limited outside employment opportunities and restrictions on job mobility can give employers greater monopsony power (Manning, 2003; Hirsch and Jahn, 2015; Wang, 2021; Naidu et al., 2016). Studies of regularization and immigration under imperfect competition examine how this power affects wages and the distribution of migration gains (Borjas and Edo, 2023; Amior and Manning, 2026). We extend this literature by examining limited voice in the workplace and recourse for disputes as potential institutional sources of employer power among internal migrants. We relate these disadvantages to firms' demand for migrant labor while accounting for perceived differences in other sources of monopsony power including outside employment options.

Research on firms' demand for migrant labor links firms' preference for migrants to lower wage costs arising from weaker outside options (Chassamboulli and Peri, 2015; Albert, 2021). Kuhn and Shen (2015) document a migrant preference in Chinese callback data and discuss productive characteristics and efficiency-wage mechanisms as possible explanations. We extend this literature by measuring firms' relative valuations of migrant and local workers for standardized jobs using incentivized hiring decisions and experimental variation in employment arrangements. Comparing demand at a common daily wage establishes whether firms' preference for migrants extends beyond lower labor costs. Experimental contract comparisons then help identify the attributes of the employment relationship underlying this preference.

Research on the exercise of monopsony power has primarily examined wage-setting conduct and wage markdowns (Roussille and Scuderi, 2025; Marshall, 2025). We contribute by quantifying the value firms attach to other margins through which they exercise monopsony power. Firms do this through three margins of labor input: reliability, unpaid hours, and per-hour productivity. While reliability and per-hour productivity may reflect differences in both worker characteristics and employer power, unpaid hours are likely to be driven by the exercise of monopsony power. Our framework shows how greater employer power can coexist with a migrant wage premium: firms may pay more to retain workers from whom they can obtain more unpaid labor. We combine firms' beliefs and experimental hiring valuations with data from placed and incumbent workers

to examine whether the labor-input differences firms value also appear in realized employment relationships.

We also contribute to the literature on how employers use observable characteristics to screen applicants (Phelps, 1972; Aigner and Cain, 1977; Altonji and Pierret, 2001; Kroft et al., 2013). Firms in our experiment use migrant status to decide whom to hire: many are willing to hire a migrant but refuse a local for the same job. Their beliefs link this choice to expected differences in reliability, unpaid hours, and per-hour productivity. The pattern is consistent with models of monopsony and labor discipline in which employers select applicants on characteristics that predict work behavior (Shapiro and Stiglitz, 1984; Caldwell et al., 2026), and it identifies a source of unemployment of local workers in labor markets (Varun, 2026; Dustmann et al., 2017b). Our results imply that local workers may remain unemployed even if their reservation wages were similar to migrant workers (Caldwell et al., 2026).

Acemoglu and Wolitzky (2011) analyze how outside options and labor-market conditions shape employers' incentives to coerce workers. We examine whether migrants' limited ability to contest employer demands and obtain institutional recourse provides an additional source of employer power. We link firms' demand for workers with these vulnerabilities to potential migrants' willingness to forgo wages for protections in real job offers. Comparing firms' and workers' beliefs about unpaid work, contractual violations, and recourse also allows us to assess whether potential migrants anticipate the vulnerabilities that make them attractive to employers.

Employer-provided housing can turn control over accommodation into leverage over labor (Pun and Smith, 2007; Goodburn and Mishra, 2024), connecting our setting to the literature on hold-ups under incomplete contracts (Grossman and Hart, 1986). Related work examines the consequences of migrant accommodation for worker well-being and turnover (Adhvaryu et al., 2023). We contribute by measuring employers' valuation of the option to house workers on-site and separating its reliability-related value from the value associated with additional unpaid hours. This connects contemporary employment–housing arrangements to labor tying (Bardhan, 1983): accommodation can secure dependable labor while increasing workers' dependence on employers and their exposure to demands for unpaid work.

Finally, research on migration and spatial reallocation documents gains to migrants and origin communities (Lagakos et al., 2023; Bryan et al., 2014; Khanna et al., 2026) and evaluates interventions that relax migration barriers, including seasonal subsidies and infrastructure investments (Bryan et al., 2014; Morten and Oliveira, 2024). Recent work also emphasizes destination-market risk: Miner (2026) finds that conditional unemployment insurance more than triples migration. We complement this literature by measuring how payment risk and limited recourse enter workers' valuation of destination jobs. Unpaid work and contractual risk may reduce the gains from moving even when destination wages are higher. The terms and enforceability of employment therefore matter for assessing migration returns and barriers to spatial reallocation and structural transformation (Gollin et al., 2014; Bryan and Morten, 2019).

The remainder of the paper proceeds as follows. Section 2 provides a conceptual frame-

work and Section 3 describes our context. Section 4 describes the experimental design. Section 5 presents the results from the firm experiment. Section 6 reports the results from the worker experiment. Section 7 presents the matching experiment. Section 8 concludes with implications for migration, labor-market institutions, and policy.

2 Conceptual Framework

We develop a model of wage setting and labor discipline to understand how differences in worker characteristics as well as monopsony power over migrants and locals can shape the wages set by firms. The firm values both continuity of employment (reliability) and unpaid work beyond the agreed hours. Worker characteristics and institutional protection affect these margins, and a more valuable employment relationship can give the firm an incentive to pay more to retain the worker.

2.1 Environment

A firm with a vacancy posts a daily wage $w \geq \underline{w}$ for an eight-hour workday and subsequently demands $x \geq 0$ unpaid additional hours. Labor supply is sufficient to fill the vacancy at the wages considered.[5] The wage floor $\underline{w}$ captures customary or institutional restrictions on base pay. A completed contractual workday generates revenue y; additional hours generate revenue $f(x)$, which is increasing and strictly concave.

Workers differ along three dimensions: their outside employment opportunities at the destination, the value of competing activities, and their protection against dismissal. A worker of type $s \in \{M, L\}$, denoting migrants and locals respectively, has outside employment opportunities at the destination with value b_s: the value of employment outside the current job at the destination. In each period, the worker also draws a value χ_s for competing activities, such as leisure, health needs, and social obligations, independently from a uniform distribution on $[0, \tau_s]$, with $\tau_s > 0$.[6] A higher τ_s makes these activities more valuable on average. Quitting or dismissal therefore yields utility $b_s + \chi_s$. Migrants and locals may be different in this value. Utility is quasilinear in pay, each additional hour has disutility one, and the common utility cost of the contractual workday is incorporated into b_s.

Finally, a worker who refuses unpaid overtime is dismissed with probability $q_s \in (0, 1)$ and otherwise completes the contractual workday. The firm takes q_s as given. We interpret a higher q_s as weaker worker voice within the firm and a source of monopsony power. This captures lack of collective representation from informal unions, or of access to state institutions which can protect workers against dismissal following refusal. This is distinct from a lower value of b which is a different source of monopsony power for the firm and so migrants may face greater dismissal risk even when their outside employment opportunities are the same as locals'.

[5] This assumption is consistent with evidence of unemployment and labor rationing in low-income labor markets (Breza et al., 2021; Varun, 2026).

[6] Competing activities contribute to absenteeism in low-income labor markets (Goraya et al., 2025; Varun, 2026).

We hold productivity per hour equal across worker types and abstract from housing to isolate the retention and unpaid-work mechanisms. The empirical analysis examines productivity and residence arrangements separately. Appendix D.1 gives the technical assumptions and describes how productivity differences can be incorporated.

2.2 Worker behavior

The firm posts the wage at the start of the relationship and keeps it fixed. In each period, including the first, it chooses an overtime requirement without observing the worker's shock. The worker then observes the requirement and the shock and chooses whether to comply, refuse, or quit. Quits and dismissals occur before production and payment. Otherwise, the worker completes the contractual workday, receives w, and the relationship continues; compliance additionally requires x unpaid hours.

The firm demands these hours after migration and agreement to an eight-hour day, creating scope for post-contractual appropriation (Klein et al., 1978; Hart and Moore, 1988). Workers may anticipate extra work but learn the actual requirement only after arriving. The analysis conditions on migration and entry into employment: anticipated demands can still be departures from the agreed contract.

Workers maximize current-period utility by comparing three payoffs:

$$\begin{aligned} &\text{Comply:} && w - x, \\ &\text{Refuse:} && (1 - q_s)w + q_s(b_s + \chi_s), \\ &\text{Quit:} && b_s + \chi_s. \end{aligned} \tag{2.1}$$

Compliance is optimal when

$$x \leq q_s(w - b_s - \chi_s). \tag{2.2}$$

At a given wage and overtime requirement, weaker protection against dismissal or less valuable outside employment opportunities make compliance more attractive.

Let $C_s(w, x)$ denote the probability of compliance and $S_s(w, x)$ the probability of completing the workday. These are distinct: a worker who refuses overtime may still remain employed. We measure reliability by S_s and unpaid work by expected additional hours per completed workday, denoted h_s. Empirically, reliability also includes absenteeism, reneging, and lateness. Appendix D.1 derives the probabilities and the hours measure.

2.3 The firm's problem

The firm chooses wages and overtime to maximize expected cumulative profits from a continuing employment relationship. Separation interrupts production and ends the relationship; we abstract from replacement. Under a stationary policy, with no discounting and $0 < S_s < 1$, the firm's value

is

$$J_s(w,x) = \underbrace{\left[y - w + f(x)\frac{C_s(w,x)}{S_s(w,x)}\right]}_{\text{profit per completed workday}} \underbrace{\frac{S_s(w,x)}{1-S_s(w,x)}}_{\text{expected completed workdays}}. \tag{2.3}$$

A higher wage increases payments on completed workdays but can also raise compliance and extend the relationship. Firms may therefore pay more to retain valuable workers even when applicants are plentiful. Let (w_s^*, x_s^*) denote the optimal wage and overtime requirement, and S_s^* and h_s^* the resulting retention and expected unpaid hours. Appendix D.2 derives the solution and Appendix D.3 gives conditions for a finite, unique optimum. We use the optimal contract wage as the model's counterpart to firms' WTP in the experiment. Appendix D.1 states this interpretation.

2.4 Predictions

We use the worker's compliance condition in (2.2) and the firm's value in (2.3) to explain why firms may value migrants more than locals. We first isolate differences in competing activities (τ_s), dismissal protection (q_s), and outside employment opportunities at the destination (b_s), holding the other worker parameters and productivity equal across the two groups. Each comparison allows the firm to adjust both wages and overtime. We then combine the mechanisms to characterize the migrant–local wage and labor-input differences. The conditions under which these predictions hold true are stated in Appendix D.1.

Competing activities. Suppose competing activities are less valuable on average for migrants than for locals ($\tau_M < \tau_L$). This could be because migrants have fewer obligations to their social network such as spending time with family, attending to their health shocks or participating in socializing activities (Goraya et al., 2025; Varun, 2026). At the same wage w and overtime requirement x, fewer migrants draw a shock χ_s high enough to induce refusal or quitting. Migrants therefore have higher compliance C_M and retention S_M than locals. Higher retention increases the expected number of completed workdays, $S_s/(1-S_s)$, in (2.3), making the migrant relationship more durable and increasing the return to extending it through higher pay. When the firm adjusts its contract, it pays migrants more ($w_M^* > w_L^*$), retains them longer ($S_M^* > S_L^*$), and requires more overtime ($x_M^* > x_L^*$); expected unpaid hours are also higher ($h_M^* > h_L^*$). The migrant wage premium remains when overtime is prohibited ($x = 0$), showing that greater migrant reliability can generate a premium independently of unpaid work.

Worker recourse. Suppose migrants have weaker protection against dismissal than locals ($q_M > q_L$), reflecting more limited access to collective representation or institutions that help contest employer demands. At the same wage and overtime requirement, migrants face a greater risk of losing the payoff advantage of employment, $w - b_s - \chi_s$, if they refuse unpaid work. From (2.2), this makes migrants more likely than locals to comply. The firm consequently obtains the additional revenue $f(x)$ more often from migrants, making their employment relationship more profitable

and increasing the incentive to retain them through higher pay. When wages and overtime adjust, migrants receive a higher wage, face a larger overtime requirement, and supply more expected unpaid hours than locals ($w_M^* > w_L^*$, $x_M^* > x_L^*$, and $h_M^* > h_L^*$). Their retention is also higher ($S_M^* > S_L^*$). This retention difference arises from the firm's contract choices; at a common wage and overtime requirement, retention is equal across the two groups under the maintained uniform specification. Because the firm raises the migrant wage to keep a relationship that weaker voice makes more profitable, greater observed migrant reliability can reflect employer power as well as worker characteristics such as fewer competing activities. When $x = 0$, there is no overtime refusal to discipline, so a difference in q_s alone generates no migrant premium.

If workers faced no risk of dismissal for refusing ($q_s = 0$), none would accept unpaid hours. Without this institutional source of monopsony power, unpaid work would be zero.

Outside employment opportunities. Suppose migrants have worse outside employment opportunities at the destination than locals ($b_M < b_L$), for example because they have fewer contacts through which to find another job. At the same wage, migrants have a larger wage advantage from remaining employed, $w - b_M > w - b_L$, making them more likely to comply and remain with the firm. The wage implication is ambiguous, however. Holding overtime fixed, the firm can pay migrants less than locals by the difference in the value of these opportunities while preserving the same worker responses. This creates an incentive to lower migrant pay. The resulting higher profit margin per completed workday also increases the return to retaining migrants, creating an incentive to raise their pay. These opposing incentives exist even without overtime; allowing x to adjust adds scope to obtain more unpaid work from migrants. When the firm adjusts its contract, migrants have higher retention, a larger overtime requirement, and more expected unpaid hours than locals ($S_M^* > S_L^*$, $x_M^* > x_L^*$, and $h_M^* > h_L^*$), but may receive either a higher or a lower wage. Appendix D.6 gives a sufficient condition under which the retention incentive dominates and $w_M^* > w_L^*$.

The migrant–local comparison. The competing-activities and worker-voice mechanisms reinforce one another when $\tau_M \leq \tau_L$ and $q_M \geq q_L$, with at least one strict difference. At equal outside employment opportunities ($b_M = b_L$), they generate a higher migrant wage together with greater retention, a larger overtime requirement, and more expected unpaid hours. If migrants also have worse outside employment opportunities ($b_M < b_L$), the retention and unpaid-work differences are reinforced, while the wage difference depends on the balance of the opposing incentives described above. The sufficient condition in Appendix D.6 identifies a case in which all three mechanisms reinforce the migrant wage premium; Appendix D.7 gives the formal comparison. Thus the firm can pay migrants more per day while obtaining a longer workday and more unpaid labor from them than from locals, even at identical productivity per hour.

Screening on migrant status. The firm observes whether an applicant is a migrant or a local before hiring, while future realizations of χ_s are unknown. Migrant status can therefore signal fewer competing activities ($\tau_M < \tau_L$), weaker dismissal protection ($q_M > q_L$), or worse outside employment opportunities at the destination ($b_M < b_L$). These differences can make a migrant relationship more profitable than a local relationship at the same offered wage, even when productivity per hour is identical. With sufficient applicants, a firm may therefore use migrant status to select between workers rather than simply offer different wages to them. This gives a rationale for a higher demand for a migrant than a local applicant at the same wage.

2.5 Reliability guarantee and migration decisions

The preceding predictions explain why firms may pay more for migrants while obtaining more reliable attendance and more unpaid work from them than from locals. We next examine whether the reliability guarantee reduces the migrant–local valuation difference and how the same vulnerabilities affect workers' willingness to migrate.

The reliability guarantee. We model the guarantee's compensation for voluntary departures as a one-time payment $\kappa > 0$ to the firm if the worker quits. We assume that overtime is fixed at each worker type's ordinary-contract requirement x_s^* so that the guarantee cannot induce additional work demands. The payment goes to the firm and leaves the worker parameters b_s, τ_s, and q_s unchanged.

The guarantee is available only through the experiment, so the firm's alternative is its ordinary contract with wage w_s^* and overtime x_s^*. We value the guaranteed contract by the highest daily wage ω_s^G the firm would pay while preserving the profits from that alternative. Compensation for a covered departure allows the firm to absorb some of the profit loss from paying above w_s^*, generating an acceptable wage increase $\delta_s = \omega_s^G - w_s^* > 0$. Appendix D.8 derives this acceptance threshold and explains its interpretation for the experimental valuations.

To understand the difference across worker types, recall that a worker quits when $\chi_s > w - b_s$. At the ordinary wage, $\ell_s = \tau_s - (w_s^* - b_s)$ is the width of the range of shocks that induces quitting. Raising the wage reduces this range and the prospect of a departure, while also changing ordinary-contract profits. The appendix shows that a larger ℓ_s supports a larger acceptable wage increase δ_s for a common payment κ.

At equal outside employment opportunities, the ordinary migrant wage premium ($w_M^* > w_L^*$) and competing activities that are no more valuable for migrants ($\tau_M \leq \tau_L$) imply $\ell_L > \ell_M$. The guarantee therefore raises the acceptable wage more for locals ($\delta_L > \delta_M$), reducing the migrant–local valuation difference.

Workers' migration decisions. The firm-side comparison also matters for workers' willingness to migrate. Unlike locals who already live or regularly work at the destination, potential migrants must compare the offered job with opportunities at origin and incur the costs of moving. Under

the parameter differences above, they also anticipate greater unpaid-work demands and less ability to contest them than locals. A higher daily wage for migrants therefore need not translate into a correspondingly larger net gain from employment.

For a potential migrant, a lower anticipated overtime requirement x_M, stronger protection against dismissal for refusal (a lower q_M), or better outside employment opportunities at the destination (a higher b_M) improve the available payoffs at a given wage in (2.1). Protection in disputes (decline in q_M) and access to an alternative job (increase in b_M) can therefore address the disadvantages relative to locals. Such protections make migration more attractive and lower the wage required to accept the destination job, holding the worker's origin opportunities and migration costs fixed.

3 Context and Setting

We study firms and workers in Patna, the capital of the state of Bihar, India. Bihar is one of India's poorest states with per capita gross state domestic product (GSDP) of approximately US$800 (Government of Bihar, Finance Department, 2025) which is significantly lower than the national average of around US$2,700 (World Bank, 2025) and comparable to income levels in several Sub-Saharan African countries.

3.1 Internal Migration in India

According to the 2011 Census, India had approximately 449.9 million internal migrants, of whom 87.9% moved within their state; 41.4 million reported work or employment as their primary reason for moving (Census of India, 2011). Bihar is one of India's largest migrant-sending states, with work or employment accounting for 55.0% of male out-migration (Appendix Table A-1). Patna, as Bihar's capital and largest city, is a major destination for workers from rural districts within the state, particularly in construction. Our study focuses on this within-state flow. The migrant workers in our experiment originate from districts outside Patna but within Bihar, and travel to Patna for construction work.

Our focus on within-state migration allows us to examine institutional sources of monopsony power in the absence of formal restrictions on workers' mobility. Migrants may share language and cultural norms with locals yet remain less connected to destination networks and institutions. These weaker connections may limit their ability to contest employer demands and obtain recourse, independently of their access to alternative employment.

3.2 The Construction Labor Market in Patna

Construction is a large and economically important sector. Nationally, it employs around 57.7 million workers and contributes about 8% to India's GDP (Baijal and Awasthi, 2023). Construction in Patna is well suited for studying firm demand for migrant labor. The sector relies heavily on

manual laborers hired on short-term, informal arrangements negotiated at labor stands or through contractor networks. Workers typically gather at informal hiring points each morning, where contractors or firm owners recruit them for daily or short-term assignments. Longer engagements are often arranged through intermediary networks. On-site residence is a common feature of migrant employment in construction where workers are often housed at the worksite for the duration of a project, creating a direct link between the employment relationship and living arrangements.

Who is a Migrant? We classify workers according to their ties to the Patna labor market. A *local worker* meets at least one of three criteria: the worker has a house in Patna and resides there, has lived in rented accommodation in Patna for at least one year, or commutes from a neighboring district to Patna labor stands. A *migrant worker* is a resident of a district in Bihar outside Patna who is not tied to the Patna labor market.

The prevailing daily wage for manual construction labor in Patna's spot market was approximately INR 550 at the time of the experiment. The employment agreements studied in this paper specify a daily wage for an eight-hour workday and a defined set of tasks, agreed orally. Enforcing these agreements can require support beyond the workplace. In Patna, workers facing wage non-payment may approach the police or the labor commissioner, but often have difficulty getting their complaints heard (Varun, 2026). Research on migrant construction labor similarly documents reliance on personal negotiations rather than legal enforcement (Upadhya and Surendran, 2025). Employment records and collective representation can be important for pursuing claims, while their absence can obstruct redress (Mezzadri and Sehgal, 2023). Workers' organizations and legal-aid groups can help by mediating with employers and assisting workers in approaching public authorities.[7] However, workers may still face employer threats, difficulties documenting employment, and fear of losing their job or accommodation after complaining.[8] Limited access to effective recourse can therefore weaken workers' ability to contest unpaid work and payment irregularities, providing an institutional source of monopsony power alongside differences in outside employment options.

3.3 Sampling and Characteristics of Firms

Our sampling proceeds in two steps. First, we conduct a listing survey intended to enumerate the universe of construction firms operating in Patna. We compile the sampling frame from two sources: (i) contact lists for firm owners obtained through the local firm union as well as by asking these firms to provide contacts of other firms, and (ii) in-person visits to construction sites across Patna to identify firms currently running projects. We deduplicate these sources to construct a single firm registry. Listing surveys are administered both by phone and in person and collect basic

[7] Paliath (IndiaSpend, republished in *Scroll*, August 4, 2022) describes India Labourline's use of telephone mediation, field visits and legal assistance to recover unpaid wages. The report also discusses migrants' difficulty remaining at the destination to pursue prolonged litigation.

[8] See Arun M., "Exploited... migrants find voice to report pay violations," *The New Indian Express*, February 24, 2024, and Praveen (2024), for reporting from Kerala.

information on firm characteristics, including years of operation, firm size, and prior experience hiring migrant workers.

The listing survey covered 1,019 firms, of which 664 agreed to take part and provided information. Some firms could not be reached or declined to participate, with non-contact and refusal more common among larger firms.[9] In the second step, we draw the study sample from the set of firms we successfully listed. Because small firms are more numerous, we oversample larger firms to ensure adequate representation and power for size-based heterogeneity analysis. Throughout the paper, we report the estimates without sampling weights. In the Appendix, we reweight the data to account for our oversampling of larger firms and show that the main results are similar when we adjust back to the firm distribution in the contacted listing sample.

Table 1 summarizes the characteristics of the firms in our experimental sample.[10] The final experimental sample consists of 234 firms. The average firm has operated for about 15 years, employs roughly 10 permanent workers, and runs around four construction sites at a time.

Table 1: Summary stats of firms in the experiment

	Mean	SD	N
Age of respondent	42.08	10.15	233
Years of education of respondent	6.90	4.68	229
Backward caste	0.82	0.38	234
Scheduled caste/tribe	0.11	0.31	234
Age of Firm	15.58	8.97	233
Firm is registered	0.11	0.31	231
Firm has a manager	0.18	0.38	234
No of Permanent Workers	10.05	12.82	233
No of operational sites	4.24	2.15	233
Hired worker from another district in the past	0.88	0.33	232
Hired worker from another state in the past	0.37	0.48	234
Migrant Worker (Fraction)	0.46	0.42	216
Worker Stay at Site	0.41	0.49	234
Fraction of Migrant Worker who stay at site	0.34	0.46	133
Fraction of Local Worker who stay at site	0.02	0.11	148
Cost of stay at site per day (INR)	2.14	4.80	56
Daily Wage (Local) (INR)	532.40	43.95	229
Daily Wage (Migrant) (INR)	530.79	46.52	216
Loss from Worker being 1 hr late	88.12	70.55	230
Loss from Worker reneging	332.60	272.18	219

Notes: The table reports summary statistics for firms in the experimental sample. The unit of observation is the firm; the survey was administered to the firm owner or head. Firm-level variables (e.g., years of operation, number of active construction sites, hiring history) are recorded at the firm level, while individual-level variables (e.g., respondent age and education) correspond to the respondent who completed the survey. Number of observations may vary across rows due to item non-response.

Several patterns stand out. Migrant hiring is widespread: 88% of firms report having hired

[9] Most of the non-participation was driven by the absence of any firm owner at the construction site when the enumerators made in-person visits.

[10] Appendix Table A-2 reports analogous statistics for firms in the listing survey.

workers from other districts within Bihar, and 37% have hired workers from other states. Across firms, migrants account for about 46% of the permanent workforce. On-site residence is common, but sharply differs by worker type. Overall, 41% of firms report that at least one worker currently lives on site. Conditional on worker type, about 34% of migrant workers reside on site, compared with roughly 2% of local workers. Together, these facts suggest that firms rely heavily on migrants and that on-site residence is an important part of migrant employment relationships, while it is largely absent for local workers. These baseline patterns motivate our experimental variation in residence status. Firms report negligible direct monetary outlays for housing workers on site (around INR 2 per worker-day on average), indicating that the relevant trade-offs are unlikely to be driven by explicit housing costs.

In the status quo, firms pay similar wages to local and migrant workers. Similar wages, however, need not imply that firms value the two worker types equally. In firms employing both types, wage differentiation may create morale and productivity costs when its basis is not readily observable to workers (Breza et al., 2018). Firms may therefore compress wages across worker types even when their willingness to pay differs (Card et al., 2012). Observed wages therefore need not reveal firms' relative willingness to pay for the two worker types.

Worker reliability is economically important in this market. Firms report an average loss of INR 88 when a worker arrives one hour late and INR 333 when a worker leaves before completing the job—roughly one-sixth and three-fifths of a daily wage, respectively. These losses are consistent with evidence that absenteeism disrupts team production (Adhvaryu et al., 2024) and that turnover is common in developing economies (Blattman and Dercon, 2018; Donovan et al., 2023; Varun, 2026; Goraya et al., 2025). Reneging also requires firms to search for replacement workers, a consequential transaction cost in labor markets (Carranza et al., 2022; Fernando et al., 2023). These disruption and replacement costs motivate the reliability guarantee in our experiment.

4 Experimental Design

4.1 Firm Recruitment and Incentive Compatibility

We recruit construction firms in Patna through a two-stage sampling process described in Section 3.3. After the sampling, two trained enumerators visited the firm-owner and presented them with contracts for the same 15-day construction job, with the possibility of extension. All contracts specify a daily wage for an eight-hour workday and a defined set of tasks. Firms evaluate the offers for ordinary staffing needs, such as the start of a new project. For each contract, the firm reports both whether it would hire a worker under that contract and the maximum daily wage it would be willing to pay (WTP). Our WTP elicitation follows the logic of the Becker–DeGroot–Marschak (BDM) mechanism (Becker et al., 1964). One contract is then selected at random and a wage is drawn; if the drawn wage is at or below the firm's stated WTP for the randomly chosen contract, the firm hires a worker at the drawn wage, and if it exceeds the stated WTP, no hire takes place. Under expected-utility maximization, truthful reporting is a weakly dominant strategy as

overstating WTP risks committing the firm to an unprofitably high wage, while understating it may cause the firm to forgo a worker it would have preferred to hire.[11] The contracts are implemented in the matching stage and firms hire real workers under the chosen terms. We provide more details on the matching process in Section 7.

To ensure comprehension in our context, enumerators administered comprehension checks after explaining the mechanism, verifying that firm owners understood that truthfully reporting their maximum willingness to pay was in their best interest and that misreporting could lead to a worse outcome. We also assess internal consistency of the WTP data by checking whether firms' responses satisfy weak monotonicity across contracts (e.g., WTP for a guaranteed contract weakly exceeds WTP for the corresponding non-guaranteed contract). We find that all but one firm satisfy weak monotonicity across all pairwise comparisons, providing reassurance that the mechanism was well understood. Beyond eliciting WTP, firms also rank the contracts included in the experiment, though these rankings are not incentivized. Firms complete a short background survey prior to the experiment and an incentivized belief elicitation exercise is conducted at the close of the session.

4.2 Treatment Arms

The experiment varies three contract dimensions, yielding six contracts presented to each firm:

1. **Worker type.** Firms are offered an opportunity to hire either a local or a migrant worker, using the definitions in the preceding setting section.

2. **Residence**

    - **Flexible.** Under the *flexible* arrangement, the firm retains the option to house the worker on-site or to have the worker commute from within the city, depending on what is operationally feasible at the firm's worksite. This arrangement applies only to migrant workers, for whom on-site housing is a realistic possibility.
    - **Off-Site.** Under the *off-site* arrangement, the migrant worker is required to commute daily from a residence within the city; on-site housing is not available, and the firm is informed that the worker will reside in rented accommodation in the city. Local workers are always assigned this arrangement, as on-site residence is out of equilibrium for local workers in practice (see Table 1) and the firms are informed that local workers will commute from their residence. The residence dimension therefore applies only to migrant contracts, with local worker contracts fixing the off-site condition throughout.

3. **Reliability guarantee.** In the guarantor condition, the firm is compensated if the worker arrives late or fails to complete the job. Specifically, the guarantor provides up to INR 150 in compensation for late arrival and up to INR 400 for reneging or extended absence, and

[11] BDM-based WTP elicitation has been shown to produce reliable valuations in field settings in developing countries, including among populations with limited formal education (Berry et al., 2020; Burchardi et al., 2021).

additionally arranges a replacement worker in the event of job non-completion. In the no-guarantor condition, the firm bears these disruption costs itself. The guarantee reduces the firm's expected disruption costs from worker lateness, absenteeism, and reneging.

Each firm evaluates all six contracts in Table 2. We randomize their presentation order across firms to prevent particular contracts from systematically appearing earlier or later in the session.

A potential concern with the residence variation is that firms may attribute differences between on-site and off-site migrants to worker selection rather than to residence itself, if they believe that workers who end up living on-site are systematically different from those who commute. To address this, we inform firms before the experiment that residence is determined by a lottery conducted after recruitment. All workers will be drawn from the same pool and recruited through the same process, and the lottery determines which worker is allocated to on-site residence and which commutes. This framing ensures that any difference in firms' valuations of the flexible and off-site migrant contracts can be interpreted as the effect of residence on firm demand, rather than as a reflection of perceived compositional differences between the two groups of workers. The belief survey does not include the lottery framing. Firms are asked about their general expectations regarding each worker type, reflecting their priors from experience in the market rather than beliefs about a randomly assigned pool.

Table 2: Experiment Design

Local, No Guarantor	**Local, Guarantor**
Migrant, Flexible, No Guarantor	**Migrant, Flexible, Guarantor**
Migrant, Off-site, No Guarantor	**Migrant, Off-site, Guarantor**

4.3 Experimental Comparisons

We first compare the local and migrant-flexible contracts without a guarantee to establish whether firms prefer migrant workers under the employment arrangements commonly used in this market. The resulting hiring and WTP gaps capture firms' relative valuation of the two worker–contract bundles, including the option of housing migrants on-site. Comparing locals with off-site migrants then allows us to examine whether this preference persists when both groups commute. This comparison also distinguishes a higher wage valuation from screening at recruitment: firms may be willing to hire a migrant while refusing a local for the same job, indicating that migrant status affects access to employment as well as the wage firms would pay.

The comparison between flexible and off-site migrant contracts examines why firms value residence flexibility. Because workers under both contracts are drawn from the same pool, differences in WTP reflect the residence option rather than differences in worker composition. Housing workers on-site may reduce commuting-related lateness and absence, making labor input more reliable. It may also give firms greater control over workers' time, facilitating demands for early starts or

late finishes without additional compensation.[12] Residence flexibility can therefore be valuable both because it reduces disruptions and because it expands the scope for obtaining unpaid hours beyond the agreed workday.

The reliability guarantee helps distinguish these sources of firm value by compensating for lateness, absenteeism, and reneging and providing a replacement worker if the job is not completed. If firms expect locals to be less reliable than migrants, an unguaranteed local contract exposes them to larger expected disruption costs. The guarantee should consequently raise hiring and WTP more for locals, narrowing the migrant–local gap. Under the identifying assumptions stated in Section 5.5, this differential response measures the contribution of reliability to the migrant premium. Reliability may itself reflect worker characteristics, employer power, or both.

We combine these contract comparisons with incentivized beliefs to separate the remaining premium into unpaid hours and per-hour productivity (Section 5.5). Firms' expectations about hours and work performance provide information about the labor input underlying their valuations, while beliefs about outside employment options, worker voice, and recourse address the potential sources of employer power. In particular, we examine whether firms that perceive migrants as having weaker voice and recourse report larger migrant premia after accounting for perceived differences in outside employment opportunities (Section 5.4.1). This connects the valuation of labor input to the introduction's distinction between outside employment opportunities and institutional sources of monopsony power.

5 Firm Experiment: Results

This section presents results from the firm experiment described in Section 4. Each firm receives real offers to hire workers under six contracts that vary worker type (local or migrant), residence arrangement (flexible or off-site, for migrants), and guarantee status. We first document the baseline migrant–local demand gap, the role of residence, and screening on migrant status (Section 5.2). We then report firms' incentivized beliefs (Section 5.3) and use them to interpret the premium (Section 5.4.1). Next, we decompose the premium into reliability, unpaid hours, and per-hour productivity (Section 5.5). Finally, we test external validity by examining evidence from a staffing company and from brick kilns (Section 5.6).

5.1 Empirical Specification

We estimate the effect of contract type on three outcomes: (i) the firm's WTP, measured as the maximum daily wage (in INR) it is willing to pay; (ii) demand at the market wage of INR 550; and (iii) demand across a wage schedule from INR 500 to INR 600 in increments of INR 25. The firm directly reports its WTP for each contract; outcomes (ii) and (iii) are constructed from this response, with demand at wage w defined as $\mathbf{1}\{\text{WTP}_{ij} \geq w\}$. Outcomes (i) and (ii) are estimated

[12] Workplace–residence arrangements have been documented as a form of labor control in Chinese manufacturing and in Indian brick kilns, sugarcane harvesting, and garment production (Goodburn and Mishra, 2024).

using the following specification:

$$Y_{ij} = \alpha + \beta \, Treat_{ij} + \mu_i + \varepsilon_{ij}, \tag{5.1}$$

where Y_{ij} is the outcome for firm i and contract j. $Treat_{ij}$ is a vector of indicators for the contract type, with the local (non-guarantor) contract as the omitted category. Since each firm receives all six contracts, μ_i absorbs firm-level differences and identification comes from within-firm variation across contract types. Each bar in the figures that follow represents the sum of the baseline mean and the relevant regression coefficient. Standard errors are clustered at the firm level. For outcome (iii), we stack observations across wage levels within each firm–contract pair and add wage fixed effects to the specification above.

As described in Section 4.1, firms first report whether they would hire a given worker at all; conditional on hiring, they then report the maximum daily wage they would be willing to pay. Since non-hiring rates differ across worker types, coding refusals as zero would mechanically amplify the measured WTP gap beyond what reflects firms' underlying wage valuations, making it difficult to interpret the WTP difference as a clean measure of relative preference. To address this, we assign a WTP of INR 350 to refusals, 50 INR below the lowest positive WTP of INR 400 reported by any firm for any contract. This retains meaningful variation across firms and contracts while ensuring that non-hirers do not mechanically inflate the migrant–local WTP differential.

5.2 Results

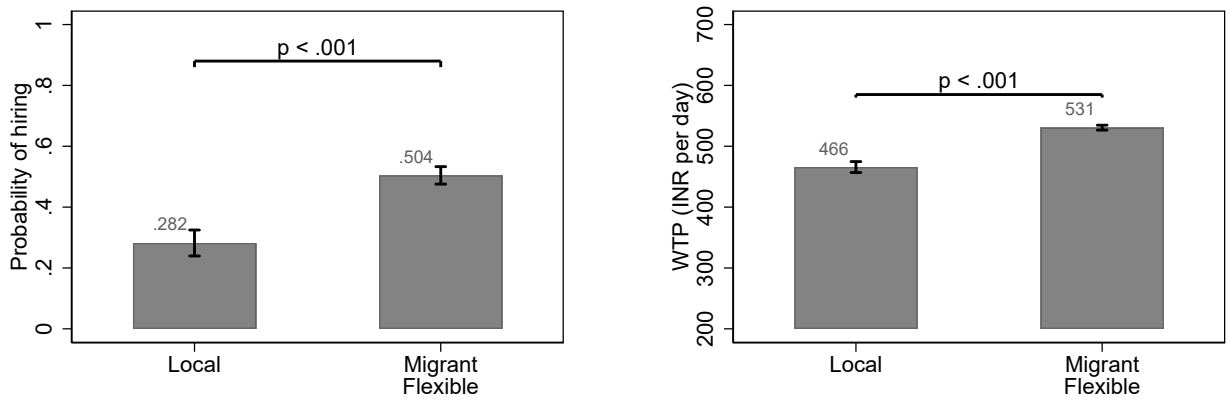
5.2.1 Firms' Demand for Migrant versus Local Workers

Figure 2 presents the hiring rates at the market wage and WTP for local workers against migrant workers under a flexible residence arrangement. Panel (a) shows that at the prevailing market wage of 550 INR per day, firms hire local workers at a rate of 28.2%. Demand for migrant workers under the flexible residence arrangement is substantially higher, with the hiring rate rising to 50.4%—a 22.2 percentage point increase (78.8% higher, $p < 0.001$). At the same wage, roughly one in two firms is willing to hire a migrant, against fewer than one in three for a local. This revealed preference for migrants at identical daily wages is our central finding. It cannot be explained by migrants' willingness to accept a lower daily wage.

Panel (b) shows that average WTP is 466 INR per day for a local worker and 531 INR for a migrant under the flexible arrangement, a premium of 65 INR (13.9%, $p < 0.001$). The WTP gap is economically meaningful and a premium of 65 INR represents a significant additional daily labor cost that firms are willing to incur to secure a migrant over a local worker.

These estimates measure demand for an available marginal worker, rather than the equilibrium migrant share. Migration costs and risks (Bryan et al., 2014; Munshi and Rosenzweig, 2016), recruitment frictions (Carranza et al., 2022; Fernando et al., 2023), and limited accommodation can constrain migrant employment even when firms prefer migrants. These constraints become more binding as firms attempt to expand migrant employment. A migrant WTP premium can therefore

Figure 2: Firms' Hiring and WTP for Local and Migrant Workers



(a) Demand for workers at market wage

(b) WTP for workers

Notes: The figure compares firms' demand for local workers and migrant workers offered under a flexible residence arrangement (the firm may house the worker on-site or off-site at its discretion). Panel (a) shows the probability that a firm hires the worker at the prevailing market wage of INR 550 per day; Panel (b) shows the firm's maximum willingness-to-pay (WTP) for the worker, with refusals set to INR 350. Both outcomes are estimated from Eq. 5.1 with firm fixed effects. The local (no-guarantor) contract is the omitted baseline. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. p-values are shown for different pairs for a two-sided test.

coexist with substantial local employment.

The Role of Residence: Migrant Off-Site Contracts

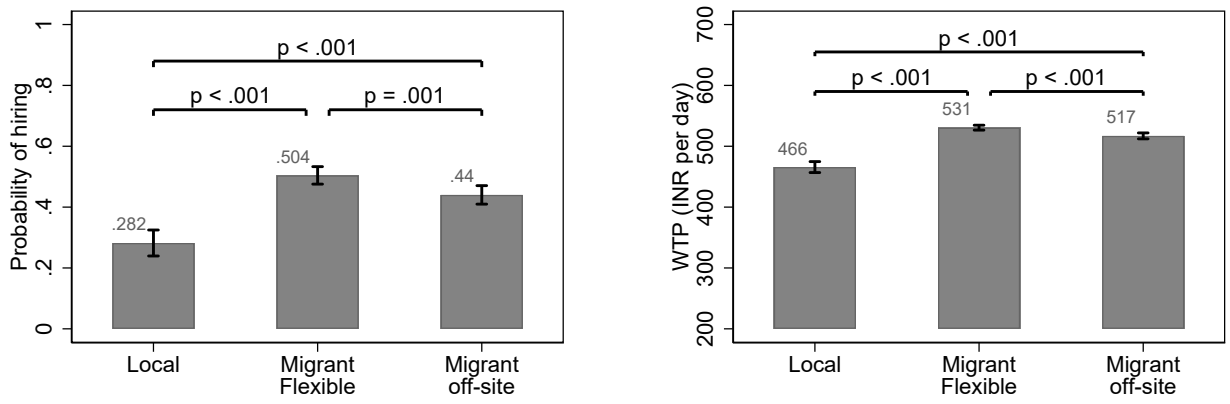
The hiring gap between migrant and local workers established above could reflect several mechanisms. To begin separating them, Figure 3 introduces a third contract in which a migrant worker has an *off-site* residence arrangement.

Panel (a) shows that imposing off-site residence reduces firms' hiring rate for migrant workers from 50.4% under the flexible arrangement to 44%—a decline of 6.4 percentage points (12.7% lower, $p = 0.001$). Panel (b) tells a similar story: WTP falls from 531 INR per day to 517 INR when the worker is restricted to off-site residence, a reduction of 14 INR (2.55% lower, $p < 0.001$). A meaningful share of the migrant premium is therefore tied specifically to the option of on-site housing.

The majority of the migrant premium, however, operates through channels other than residence. Even when migrants must commute, firms hire them at a rate of 44%, still 15.8 percentage points above the local hiring rate of 28.2% ($p < 0.001$), and off-site migrants command a WTP 51 INR higher than locals (11.0% higher, $p < 0.001$).

These patterns are consistent with two mechanisms through which the option of on-site residence may increase firms' valuations. First, housing workers at the worksite can reduce commuting-related lateness and absenteeism, limiting disruptions in a setting where absenteeism and reneging are common (Varun, 2026; Goraya et al., 2025). Second, on-site residence can expand the scope for obtaining unpaid hours beyond the agreed workday by making workers available before and

Figure 3: Hiring and WTP by Residence Arrangement



(a) Demand for workers at market wage

(b) WTP for workers

Notes: The figure extends Figure 2 by introducing a third contract arm: a migrant worker required to commute daily from off-site accommodation (off-site residence). Panel (a) shows the probability that a firm hires the worker at the prevailing market wage of INR 550 per day; Panel (b) shows the firm's maximum WTP, with refusals set to INR 350. Both outcomes are estimated from Eq. 5.1 with firm fixed effects. The local (no-guarantor) contract is the omitted category. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. *p*-values are shown for pairs for a two-sided test.

after normal working hours.

While the prevailing wage at most spot markets is INR 550, there is some spatial variation, and most firms pay workers between INR 500 and INR 600. Appendix Figure A-2 plots firms' hiring probabilities averaged across this wage range for the three baseline contracts, providing a more complete picture of demand across the wages that firms actually offer in the market. Averaged across the schedule, demand for migrant flexible contracts exceeds that for migrant off-site contracts, which in turn exceeds demand for local contracts. Separately, we also ask firms to rank the contracts in order of preference. These rankings are not incentivized but provide an independent check on the demand results. Appendix Figure A-1 shows that the ordering is stark: roughly 87% of firms rank the migrant flexible contract first, while about 76% rank the local contract last.

Heterogeneity across firm types. If reliability and unpaid hours contribute to the migrant premium, the premium may be larger where disruptions are more costly or additional hours are more valuable. We examine whether it varies with two firm characteristics relevant to these benefits: the number of active construction sites and the availability of on-site accommodation.

First, Appendix Figure A-5 splits the sample by the number of active construction sites. Larger firms—those operating five or more sites—manage longer and more complex projects, and plausibly bear higher costs when a worker is absent or reneges because delays at one site can cascade to others. They also tend to have stronger infrastructure for on-site housing and greater ability to extend the workday. Consistent with this, both the local–migrant gap and the migrant flexible–off-site gap widen monotonically with firm size. In hiring rates, the local–flexible gap rises from 12.8 percentage points among firms with two or fewer sites to roughly 20 percentage points among

firms with three or more sites. The WTP results are sharper: the local–flexible gap more than doubles from 27 INR for the smallest firms to 75 INR for larger firms, with the difference-in-differences between the smallest and larger firms statistically significant at 48 INR ($p = 0.002$). The migrant flexible–off-site gap, which captures the premium related to on-site residence, increases from 7 INR for the smallest firms to 19 INR for the largest firms. This is consistent with small firms having less to gain from the control that on-site housing affords and lower costs from worker disruption.

Second, Appendix Figure A-6 splits the sample by whether the firm currently has facility to house workers at the worksite. Among firms with this facility, the flexible–off-site gap is large: 8.1 percentage points in hiring and 18 INR in WTP. Among firms who currently don't have residential facilities, the gap is roughly halved (p-value of DiD $= 0.152$). A small gap remains as there is a non-trivial likelihood that they may have this facility at a future work site when they plan to hire workers. Importantly, however, both groups exhibit a large local–migrant gap, indicating that the migrant premium is not exclusively about housing. Even firms without accommodation facilities hire migrants at substantially higher rates than locals, consistent with the premium also reflecting lower absenteeism risk and higher perceived effort channels.

Robustness to reweighting. To ensure precision of our estimates for larger firms, our experimental sample oversamples larger firms relative to the population of construction firms in Patna. To assess whether this drives our results, we conduct two reweighting exercises (details in Appendix A.3.4 and A.3.5). First, we reweight firms using inverse-probability weights so that the distribution of firm size (number of active construction sites) in the estimation sample matches the population distribution from the listing survey. The migrant–local hiring gap narrows from 22.2 to 17.8 percentage points and the WTP gap from 65 to 53 INR, consistent with the migrant preference being stronger among larger firms. The flexible–off-site gap also attenuates modestly. All pairwise differences remain significant at $p < 0.001$ (Appendix Figures A-12 and A-13). Second, we further weight each firm by its number of permanent workers, so that the estimates reflect demand at a randomly drawn job slot in the market rather than a randomly drawn firm. Under these employment weights, the migrant–local hiring gap is 18.9 percentage points (WTP gap of 58 INR) and the flexible–off-site gap is 6.8 percentage points (15 INR in WTP), with all comparisons significant at $p < 0.001$ (Appendix Figures A-14 and A-15).

Robustness to Recruitment costs. Because the experiment provides both local and migrant workers, the migrant WTP premium may partly reflect the costs firms would otherwise incur to recruit migrants. We examine this possibility using firms' reported costs of recruiting workers from other districts, including travel expenses and intermediary fees. The mean reported cost is INR 2 per day over the 15-day contract, compared with a migrant WTP premium of INR 65 per day. The migrant WTP premium remains substantial among firms reporting no recruitment costs: INR 63 per day, compared with INR 66 among firms reporting positive costs ($p = 0.909$). The premium is also

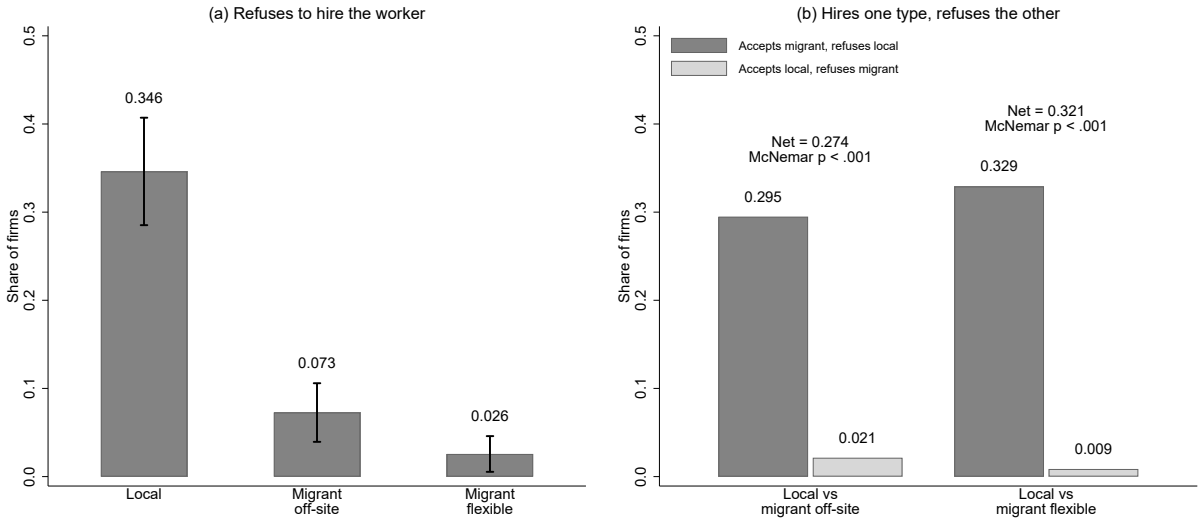
higher among firms that recruit most of their workers from other districts (INR 80) than among those recruiting primarily from the local market (INR 46; $p = 0.009$). These findings suggest that savings on recruitment expenses are unlikely to explain the migrant WTP premium.

5.2.2 Screening on Migrant Status

A higher valuation of migrants need not imply that firms exclude locals from recruitment. We therefore examine whether firms are willing to hire a migrant worker while refusing a local worker for the same job. This captures screening on migrant status at the extensive margin of recruitment. Such selection is relevant to models of labor discipline in which employers screen applicants on characteristics that predict subsequent effort provision (Caldwell et al., 2026).

Figure 4 reports refusal rates and within-firm comparisons across worker types. Panel (a) shows that 34.6% of firms refuse a local worker, compared with 7.3% for an off-site migrant and 2.6% for a migrant under the flexible residence arrangement. Panel (b) establishes that these differences reflect selective recruitment within firms. Holding residence fixed, 29.5% of firms are willing to hire an off-site migrant but refuse a local, whereas only 2.1% exhibit the reverse preference. The net difference is 27.4 percentage points (exact McNemar test, $p < 0.001$). Under the flexible residence arrangement, 32.9% accept a migrant but refuse a local, compared with 0.9% exhibiting the reverse preference, yielding a net difference of 32.1 percentage points ($p < 0.001$).

Figure 4: Screening on Migrant Status



Notes: The figure compares firms' willingness to hire local workers, off-site migrants, and migrants under a flexible residence arrangement. All contracts are without a guarantor and concern the same standardized job. The sample comprises 234 firms, each observed under all three contracts. Panel (a) reports unweighted refusal rates; whiskers show 95% confidence intervals calculated using binomial standard errors. Panel (b) reports the share of all firms willing to hire a migrant but refusing a local, and the share exhibiting the reverse preference. "Net" is the former share minus the latter. Reported p-values are from two-sided exact McNemar tests of equality between the two discordant probabilities.

These results show that migrant status affects whether firms are willing to recruit a worker, in

addition to the wage they are willing to pay. The off-site comparison establishes that this selection persists when residence is held fixed. The pattern is consistent with firms using migrant status to select workers on expected labor input and employment-relationship characteristics. The belief analysis below examines the perceived differences in reliability, unpaid hours, per-hour productivity, and bargaining power that may underpin this selection.

5.3 Beliefs

We elicit firms' beliefs about reliability, unpaid hours, and per-hour productivity to examine the employment characteristics underlying their valuations. Beliefs about outside employment opportunities, voice, and recourse distinguish potential sources of monopsony power. Expected-hours measures also enter the decomposition in Section 5.5.

Implementation

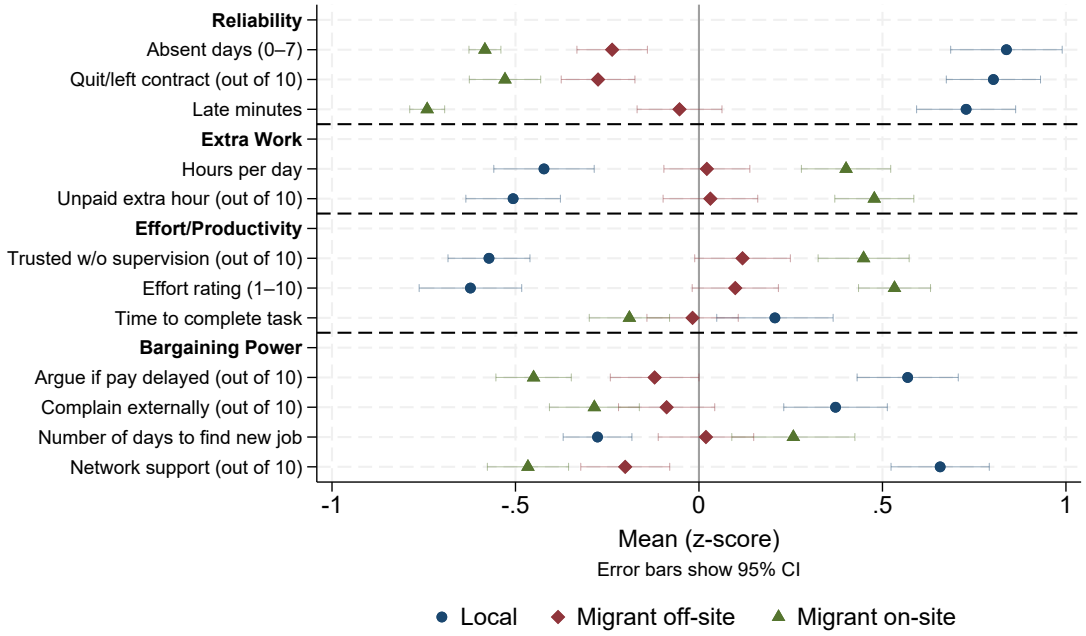
We elicit beliefs for three worker categories separately: (i) local workers from Patna, (ii) migrant workers from outside Patna who reside on or near the worksite, and (iii) migrant workers from outside Patna who live off-site in the city and commute daily. Firms are explicitly told to hold the type of work and contractual conditions constant across categories, so that stated differences reflect perceived worker-type differences rather than confounds from job characteristics.

For each worker category, we elicit beliefs on twelve outcomes, organized around four thematic clusters. The *absenteeism and reneging* cluster covers expected days of absenteeism by different workers over a 7-day window, the number of workers (out of 10) expected to leave before completing a 7-day job, and average minutes late on days the worker does show up. The *extra work* cluster measures the unpaid-hours margin using expected daily hours on a normal workday and the number of workers (out of 10) willing to supply an additional unpaid hour when asked. The *effort* cluster asks for an effort rating (1–10), a productivity measure (output per hour), and the number of workers (out of 10) who can be trusted to work well without supervision. Finally, the *bargaining power* cluster covers workers' expected outside employment opportunities (days to find a new job in Patna if they leave), the number likely to dispute or stop working if payment is delayed by two days, the number likely to seek outside help (e.g., from worker associations or state authorities) in the event of a wage dispute, and the number with family/friends/relatives in Patna who could assist in an emergency. The text of the questions is in Appendix C.1.2.

Responses are incentivized using a binary quadratic scoring rule (Brier, 1950; Gneiting and Raftery, 2007; Hossain and Okui, 2013). Firms are informed that their stated beliefs will be compared against a benchmark computed from responses collected at other real worksites, and that the closer their report is to this benchmark, the higher their probability of earning a bonus of INR 150. At the close of the survey, a random draw selects a subset of questions on which the bonus is paid.[13]

[13]Three questions are chosen randomly and therefore a firm owner can win up to 450 INR (around 5 USD).

Figure 5: Beliefs of Firms



Notes: The figure plots firms' incentivized beliefs about 12 worker outcomes, organized into four thematic clusters: reliability (absenteeism and reneging), extra work, effort, and bargaining power. Each outcome is expressed as a z-score, standardized across the full sample of firm-outcome observations. Beliefs are elicited separately for three worker types: local workers (from Patna), migrant workers residing on or near the construction site (on-site migrants), and migrant workers commuting from off-site accommodation (off-site migrants). Firms are instructed to hold the type of work and payment structure constant across categories. Responses are incentivized using a binary quadratic scoring rule, with bonus payments tied to accuracy relative to a benchmark constructed from responses collected at other real worksites. Error bars show 95% confidence intervals based on standard errors of the mean.

Results

Figure 5 plots firm beliefs for each of the twelve outcomes, expressed as z-scores, separately for local workers, off-site migrants, and on-site migrants. The pattern across the absenteeism and reneging cluster is consistent. Firms expect local workers to be absent more often, more likely to renege before completing a contract, and more likely to arrive late. On-site migrants are perceived as the most reliable, with off-site migrants sitting between the two groups—better than locals on reneging and absence, but somewhat worse than on-site migrants, plausibly reflecting the commuting frictions that off-site residence introduces. The local-migrant gap in beliefs about reneging and absenteeism is among the largest in the figure, consistent with firms' reported high cost of worker non-completion (approximately INR 330; see Table 1). The on-site–off-site gap is larger for minutes late than for absenteeism which is consistent with what one would expect. Lateness is tied to commuting frictions and should therefore exhibit a steep residence gradient, whereas absenteeism reflects a broader set of behavioral margins that are less directly affected by commute distance.

This ranking may appear to conflict with evidence that migration in India is often temporary and circular, with migrants commonly returning to their origins after five to six months (Morten,

2019). The duration of a migration spell, however, is distinct from the duration of the employment relationships formed within it. Developing-country labor markets exhibit high turnover, driven disproportionately by separations early in employment spells (Donovan et al., 2023). Our results concern precisely this short-run margin. Migrants can therefore return home after several months while still being more reliable than locals within the short employment spells that firms must staff.

In the extra work cluster, firms believe that migrants—especially those residing on-site—are substantially more willing to supply unpaid overtime when asked to do so, and that they work more hours on a typical day. The gap between on-site and off-site migrants is notable here. Even holding worker type fixed, on-site residence is associated with meaningfully higher expected hours, which is consistent with the physical availability that on-site residence affords and with firms' inability to extend working hours for workers who must commute home.

Firms also rate migrants higher on effort. Both the effort rating and the trust-without-supervision measure are higher for migrants than for locals, with on-site migrants rated highest. The ordering—on-site migrants $>$ off-site migrants $>$ locals—is consistent across all effort-related outcomes and large in magnitude. Unlike the contract experiment, the belief elicitation asks about migrant workers without the lottery framing that holds worker selection fixed. The gradient between on-site and off-site migrants could be due to two distinct forces. First, firms may believe that workers willing to live on-site are positively selected on motivation or the quality of their outside employment opportunities. Second, physical proximity may give firms greater capacity to monitor and direct workers, making on-site residence a technology of effort extraction rather than simply a signal of worker type. To separate these channels, we present firms with a follow-up vignette that holds selection constant by telling them that the on-site and off-site workers are identical in all observable respects except residence (see Appendix C.1.3). Under this framing, a majority of firms equalize their effort ratings for the two migrant types, suggesting that selection accounts for much of the perceived gap. However, a non-trivial share of firms continue to rate on-site migrants higher even when selection is neutralized. When asked to explain this residual difference, these firms consistently cite the ability to monitor and direct on-site workers, suggesting that on-site residence also functions as a technology of labor control. This is reminiscent of labor-tying arrangements documented in agrarian markets, where interlocking labor, credit, and housing transactions shift bargaining power toward employers (Bardhan, 1983). In our setting, the tied transaction is between employment and residence — firms that provide on-site housing can condition continued accommodation on compliance with demands for additional work, giving them leverage that is absent when workers commute from independent housing.

Firms perceive two disadvantages among migrants. First, migrants have weaker outside employment opportunities, reflected in longer job-finding times and less network support. Second, they are less likely to contest delayed payment or seek external recourse. Both disadvantages are greatest for on-site migrants, with off-site migrants generally between locals and on-site migrants. These beliefs correspond to the outside-employment and institutional sources of monopsony power distinguished in the framework.

A separate belief-elicitation round with finer variation in residence arrangements reinforces the interpretation that residence is a tool of controlling labor input. In that exercise, firms compare on-site migrants with migrants who arrange their own accommodation only 500 meters from the worksite and commute daily. Appendix Table A-4 shows that even this small shift from employer-arranged on-site residence to independent nearby housing changes firms' expectations across all seven control-related outcomes. Relative to migrants living independently 500 meters away, firms expect on-site migrants to be absent less often, to be less likely to quit before completing the contract, to arrive less late, to work longer hours, and to be more willing to supply an unpaid extra hour. Firms also expect on-site migrants to be less likely to argue if wages are delayed and less likely to seek external help in a wage dispute. Because worker origin and broad job terms are held fixed, and because the off-site worker remains within walking distance of the worksite, these differences are unlikely to reflect worker type or commuting distance alone. They instead point to the distinctive role of employer-controlled residence: what firms value is not merely proximity to the site, but the additional control created when housing is bundled with employment.

Together, these beliefs paint the following picture. Firms view on-site migrants as simultaneously more productive and more controllable, with weaker exit options and less recourse to outside arbitration, all of which increase firms' bargaining position and expand the set of labor inputs they can extract at a given contract price. The belief results thus provide a mechanism-level foundation for the WTP premia documented in Section 5.2.

If these beliefs drive firms' hiring decisions, firms with stronger priors about the migrant advantage should exhibit larger demand gaps. Appendix Figures A-7 and A-8 split firms at the median of composite belief indices for reliability (absence and reneging) and extra hours (willingness to work unpaid overtime and daily hours worked), respectively, and plot hiring probabilities and WTP separately for each group. In both cases, firms with above-median belief gaps display a substantially larger migrant–local demand differential than firms with below-median gaps. The difference-in-differences in WTP between the local and migrant flexible contracts across the two belief groups is 63 INR ($p < 0.001$) for the reliability dimension and 35 INR ($p = 0.006$) for the extra-hours dimension, indicating that the belief patterns documented above translate into measurably larger revealed demand for migrant labor.

5.4 Interpreting the Migrant Premium

5.4.1 Worker Voice and Outside Employment Opportunities

Workers' outside employment opportunities and their ability to contest employer demands are distinct sources of monopsony power. We examine whether perceived differences in worker voice help explain firms' migrant preference beyond differences in outside employment opportunities. We focus on off-site migrants and locals, holding the residence arrangement fixed, and relate firms' beliefs about these sources of employer power to both the three margins of labor input and their experimental migrant premium.

We construct an index of migrants' voice from the standardized migrant–local gaps in firms' expectations of arguing when payment is delayed and seeking external help in a wage dispute. A higher index indicates that migrants are perceived as less likely than locals to contest the employer or seek external recourse. We control for perceived differences in days needed to find another job (outside employment opportunities) and in time needed to complete a fixed task (worker ability). Appendix Table A-5 shows that firms perceiving weaker voice among migrants also expect them to be more reliable, more willing to supply unpaid hours, and to exert greater effort. These associations remain positive and statistically significant after accounting for outside employment opportunities and task-completion speed.

The same perceived disadvantage is associated with firms' revealed demand for migrants. Among the standard off-site migrant and local contracts, a one-standard-deviation increase in the index is associated with a 22.5 INR larger migrant WTP premium ($SE = 6.6$) and a 5.0-percentage-point larger migrant–local hiring gap ($SE = 1.8$), conditional on the same belief controls (Appendix Table A-6). Together, these cross-firm associations provide support for institutional sources of employer power operating through limited worker voice and recourse, alongside outside employment options.

5.4.2 Daily WTP versus Hourly WTP

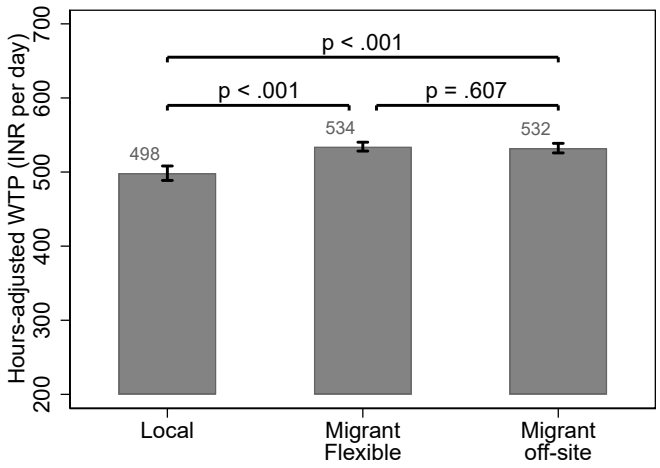
Given the expectation of higher number of working hours from migrant workers, a natural question is whether the migrant WTP premium documented above simply reflects firms purchasing additional hours at the same per-hour rate. We argue that the daily WTP is the economically relevant measure of the premium. Construction labor in this market is contracted on a daily basis, with both firms and workers negotiating a daily wage for a standard workday of approximately 8 hours. Neither side quotes or bargains over an hourly rate, so the daily wage is the price that governs actual hiring decisions. Moreover, the additional hours that firms expect from migrants are not separately compensated. Dividing WTP by expected hours would implicitly treat these unpaid hours as if they were purchased at a market hourly rate, masking the asymmetry between what firms pay for and what they obtain.

Nonetheless, to address the concern directly, Figure 6 presents hours-adjusted WTP for the three baseline (no-guarantor) contracts. For each firm, we divide its stated WTP by the expected regular hours it reports for the relevant worker type—constructed from the incentivized belief elicitation in Section 5.3—and multiply by 8 to express the result as a standardized 8-hour-day equivalent, keeping units comparable to the main WTP figures. For the migrant flexible contract, the denominator uses on-site migrant hours for firms that report on-site accommodation is available, and off-site migrant hours otherwise. Two patterns emerge. First, after the hours adjustment, a substantial migrant premium persists: firms' 8-hour-equivalent WTP is 498 INR for local workers versus 532–534 INR for migrant contract types ($p < 0.001$ in both cases). The raw migrant–local WTP gap of 65 INR per day (Section 5.2) narrows to 36 INR after standardizing hours, but remains economically meaningful and statistically significant, indicating that differ-

ences in regular hours per day cannot by themselves account for the migrant premium. Second, the daily WTP premium for the flexible arrangement over the off-site arrangement—14 INR in the raw comparison—vanishes entirely after the hours adjustment ($p = 0.607$).

Both results should be interpreted with the caveat that dividing by believed regular hours is a crude adjustment. It captures only one margin—hours on a worked day—and does not account for additional margins of on-site availability—such as early morning hours, late evening cleaning, or watchman duties—that may not register in the regular-hours belief. The vanishing flex–off-site gap therefore does not imply that residence operates solely through regular hours, nor does the persistent local–migrant gap cleanly isolate per-hour productivity, since it may still reflect unmeasured hours differences across worker types. Section 5.5 separates reliability, unpaid hours, and per-hour productivity.

Figure 6: Hours-adjusted WTP (8-hour-day equivalent)



Notes: The figure shows firms' hours-adjusted willingness-to-pay (WTP) for local workers, migrant workers under a flexible residence arrangement, and migrant workers under an off-site arrangement, all without a guarantor. For each firm, WTP is divided by the firm's belief-based expected regular hours per day for the relevant worker type, then multiplied by 8 to express as a standardized 8-hour-day equivalent. For the migrant flexible contract, the denominator uses on-site migrant hours for firms that report on-site accommodation is available, and off-site migrant hours otherwise. Refusals are set to INR 350. Estimates are from Eq. 5.1 with firm fixed effects. Standard errors are clustered at the firm level. p-values are shown for pairwise tests.

5.4.3 On-Site Residence: Amenity or Extraction?

An alternative interpretation of the residence premium is that additional work supplied by on-site workers reflects a mutually beneficial exchange for accommodation. Firms can provide housing at a marginal cost of about INR 2 per worker-day (Table 1), while workers save rent and commuting expenses. Firms are willing to pay INR 14 more per day for the option of on-site residence, indicating that the arrangement also generates value for employers. To assess whether this value reflects an agreed exchange of housing for work or greater employer leverage, we examine workers' valuation of the arrangement and their reports of how additional work is obtained.

Workers' valuation suggests that the financial benefits of on-site residence come with substantial offsetting costs. Migrant workers in our sample report paying an average of INR 1,110 per month in rent when working away from home, or approximately INR 37 per day (Section 6), and workers already employed at these firms who live off-site spend a further INR 18.4 per day on commuting (Section 7.3). Yet their WTA for on-site work is only INR 13 per day lower than for off-site work (Figure 13). Although rental and commuting expenditures are only benchmarks for the value of the accommodation provided, this small wage discount suggests that workers perceive costs that offset much of the financial benefit. These costs may include longer hours, poorer housing conditions at work site, or diminished autonomy.

We address the housing-quality explanation by focusing on workers who rate on-site living conditions as at least as good as those in a rented room. Their rent and commuting savings still exceed the wage discount for on-site jobs. Under the accounting assumptions, this gap places an estimated lower bound of INR 24.1 per day on the mean cost of employer control (Appendix Table A-13).

Workers' reports provide more direct evidence of employer leverage. Among migrant workers, 56% prefer to live on-site, primarily to save rent and commuting costs, while 25% consider on-site accommodation to offer better living conditions than renting off-site. More directly, 57% attribute the additional hours associated with on-site residence to employer pressure rather than reciprocity, and 47% believe that firms may deny continued residence to workers who refuse demands for extra work. Overall, 72% report at least one of these two concerns. These responses suggest that access to accommodation can become a means of enforcing demands for additional labor.

Together, these findings support the interpretation that on-site housing can provide financial benefits while also increasing workers' dependence on employers. Threatened loss of accommodation makes refusing additional work more costly, creating a channel through which firms may obtain labor beyond the agreed workday. This mechanism can increase firms' valuation of on-site residence while reducing its net value to workers. The worker-side experiment below examines how protections against contractual violations and limited recourse affect workers' willingness to accept jobs under both residence arrangements.

5.5 Decomposing the Migrant–Local WTP Gap

We combine experimental contract variation and elicited beliefs to decompose the migrant–local WTP premium into reliability (DW_i), unpaid hours (EW_i), and per-hour productivity ($Effort_i$). These are margins of labor input: reliability and per-hour productivity may reflect worker characteristics or monopsony power, while unpaid hours capture labor obtained beyond agreed terms. Section 5.4.1 examines the institutional sources of this power alongside outside employment options.

Decomposition and identifying assumptions. For expositional clarity, let the six WTP bids be

$$\begin{aligned} \omega_{i,L} &\equiv \omega_{i,(L,\varnothing,0)}, & \omega_{i,LG} &\equiv \omega_{i,(L,\varnothing,1)}, \\ \omega_{i,MF} &\equiv \omega_{i,(M,F,0)}, & \omega_{i,MO} &\equiv \omega_{i,(M,O,0)}, \\ \omega_{i,MFG} &\equiv \omega_{i,(M,F,1)}, & \omega_{i,MOG} &\equiv \omega_{i,(M,O,1)}. \end{aligned}$$

Here, L and M denote local and migrant workers, F and O denote flexible and off-site residence arrangements, and the final index indicates whether the contract includes the guarantee.

Define the overall migrant–local WTP gap for the baseline (non-guaranteed) contracts as

$$\Delta_i^{tot} \equiv \omega_{i,MF} - \omega_{i,L}.$$

The six bids identify three primitive wedges:

$$\begin{aligned} EH_i &\equiv \omega_{i,MFG} - \omega_{i,MOG}, \\ PR_i &\equiv \omega_{i,MOG} - \omega_{i,LG}, \\ DW_i &\equiv \big(\omega_{i,LG} - \omega_{i,L}\big) - \big(\omega_{i,MFG} - \omega_{i,MF}\big). \end{aligned}$$

The first wedge, EH_i, is the difference in WTP between flexible and off-site migrant contracts *within the guarantor arm*. We interpret this as the gain from being able to implement on-site residence and it primarily reflects the expanded scope for unpaid extra hours. The key identifying assumption is that the guarantee removes reliability related differences in value of the two contracts. This assumption is supported by the structure of the guarantee, which compensates the firm for *both* late arrival and extended absence or reneging, and additionally promises a replacement worker in the event of job non-completion. Thus the guarantee plausibly equalises the expected cost of disruption across the flexible and off-site contracts within the guarantor arm. In addition, because the experimental protocol informs firms that workers for flexible and off-site migrant contracts are drawn from the same pool and randomized into off-site or on-site housing, the comparison should not be driven by selection across workers.

The second wedge, PR_i, is the migrant–local WTP gap under the off-site guaranteed contracts. As both contracts include the guarantee, this comparison equalizes disruption costs across worker types. However, PR_i does not isolate effort alone: it bundles two distinct margins—differences in expected effective hours per day, since even off-site migrants may work longer than locals, and differences in effort intensity and other per-hour productivity. To separate these margins, we estimate the INR value of one additional expected effective hour per day, β_H, by regressing the flexibility wedge under the guarantee on the believed effective-hours gap between on-site and off-site migrants, focusing on firms that report on-site residence is feasible:

$$EH_i = \beta_H \Big(\tilde{h}_{i,M,N,1} - \tilde{h}_{i,M,O,1}\Big) + \eta_i.$$

Here, $\tilde{h}_{i,M,N,1}$ and $\tilde{h}_{i,M,O,1}$ are firm i's belief-based expected effective hours for on-site (N) and off-site (O) migrants under the guarantee, and $\widehat{\beta}_H$ denotes the OLS estimate. An additional maintained assumption is that the estimated mapping from expected effective hours to willingness to pay also applies when valuing the off-site migrant–local hours difference.

The unpaid-hours component is then defined as

$$EW_i \equiv EH_i + \widehat{\beta}_H\Big(\tilde{h}_{i,M,O,1} - \tilde{h}_{i,L,\varnothing,1}\Big).$$

Here, $\tilde{h}_{i,L,\varnothing,1}$ denotes expected effective hours for locals under the guarantee. The second term converts the effective-hours advantage of off-site migrants over locals into wage units. Together with the residential-flexibility wedge EH_i, it measures the contribution of unpaid hours to the migrant WTP premium.

The effort component is defined by netting out the same hours adjustment from PR_i:

$$Effort_i \equiv PR_i - \widehat{\beta}_H\Big(\tilde{h}_{i,M,O,1} - \tilde{h}_{i,L,\varnothing,1}\Big).$$

This isolates effort intensity, task-completion speed, and other per-hour productivity differences, net of hours differences across worker types.

The final wedge, DW_i, is the local guarantee premium minus the migrant flexible guarantee premium. It is positive when the guarantee is more valuable for local contracts than for migrant flexible contracts—i.e., when locals are perceived as less reliable and firms price in a larger expected disruption cost for them. A positive DW_i therefore indicates that part of the baseline migrant premium reflects migrants' lower perceived disruption risk.

Using these definitions, the baseline migrant–local WTP gap can be written as

$$\Delta_i^{tot} = EH_i + PR_i + DW_i.$$

Allocating the off-site migrant–local hours difference to the unpaid-hours component yields

$$\boxed{\Delta_i^{tot} = EW_i + Effort_i + DW_i.}$$

Estimation. We estimate the decomposition shares reported in Figure 8 by jointly fitting equations for the three WTP wedges using maximum likelihood. We assign a WTP of INR 350 to non-hirers. Confidence intervals are obtained from a firm-level bootstrap, reestimating the joint system in each draw.

Reliability. Appendix Figure A-10 provides cross-sectional support for the interpretation of DW_i. Firms that believe migrants are less likely to be absent than locals exhibit a larger disruption-cost wedge, with an OLS slope of 9.84 INR per additional expected absent day ($SE = 3.59$, $p = 0.007$).

Figure 7c presents the four relevant hiring rates at the market wage. The guarantee raises local hiring from 28.2% to 43.2%, a gain of 15 percentage points ($p < 0.001$), while migrant flexible hiring

rises from 50.4% to 59.4%, a gain of 9 percentage points ($p < 0.001$). The difference-in-differences is 6.0 percentage points ($p = 0.038$), indicating that the guarantee significantly compresses the migrant–local gap—consistent with a portion of the baseline gap being attributable to firms' perception that migrants are less likely to be absent or renege. Using the corresponding WTP comparisons, the MLE-based decomposition in Figure 8 attributes 39.2% of the total migrant–local gap to reliability, making it the single largest component.

This component reflects a difference in migrant-local worker characteristics as well as differential monopsony power. A worker is absent or reneges when competing activities are worth more than the day's wage. Migrants away from home have fewer obligations that compete with work. However, they also have fewer alternative jobs, so the premium may reflect weaker outside employment opportunities as well.

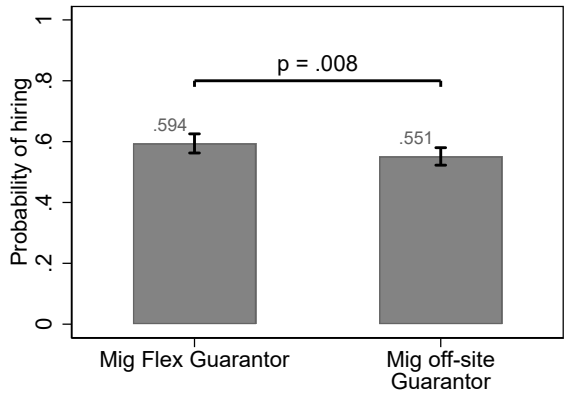
Unpaid hours. Appendix Figure A-9 plots the relationship between the guaranteed flexibility wedge and the believed effective-hours gap using a binscatter: firms that perceive a larger hours gap between on-site and off-site migrants also exhibit a larger WTP wedge between the corresponding guaranteed contracts. The OLS slope yields $\widehat{\beta}_H = 10.32$ INR per additional expected effective hour per day.

As the belief results indicated, on-site residence could in principle also raise effort through tighter monitoring and control, so we test this directly. Augmenting the $\widehat{\beta}_H$ regression of EH_i on the difference in beliefs about hours of work with differences in beliefs about effort and work-rate between on-site and off-site migrants yields coefficients that are small and statistically indistinguishable from zero ($p = 0.226$ and $p = 0.845$, respectively), while the hours coefficient is essentially unchanged at 8.79 ($p = 0.035$). The guaranteed flexibility wedge is therefore likely to be driven by hours, not effort, validating the interpretation of EH_i as the hours-based residential-flexibility term that enters EW_i.

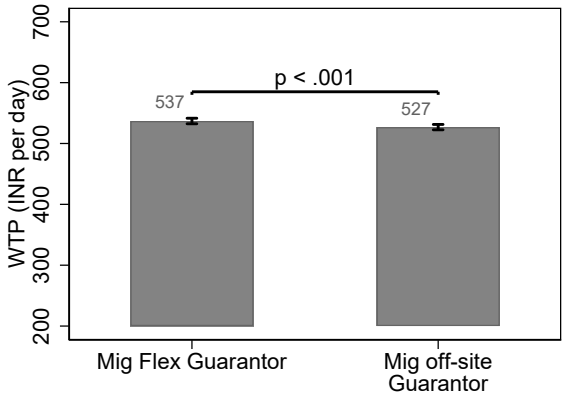
Figure 7a presents the flexible versus off-site comparison using the hiring-rate measure at the market wage. Among guaranteed contracts, firms hire migrant workers at a rate of 59.4% under the flexible arrangement and 55.1% under the off-site arrangement, a statistically significant gap of 4.3 percentage points ($p = 0.008$). This pattern supports the value of residential flexibility net of disruption insurance. The corresponding WTP comparison in Figure 7b measures EH_i in wage units. The MLE-based decomposition in Figure 8 shows that unpaid hours (EW_i) account for 27.7% of the total migrant–local WTP gap of 65 INR per day.

This component most likely reflects greater employer monopsony power rather than differences in migrant-local characteristics. Fewer competing activities make longer days less costly to migrants, but cannot explain why the additional hours go unpaid. A worker free to refuse supplies extra hours only for overtime pay above the agreed contractual wage. In the presence of monopsony power, the likelihood of complying with unpaid hours demand rises with weaker outside employment opportunities and institutional recourse.

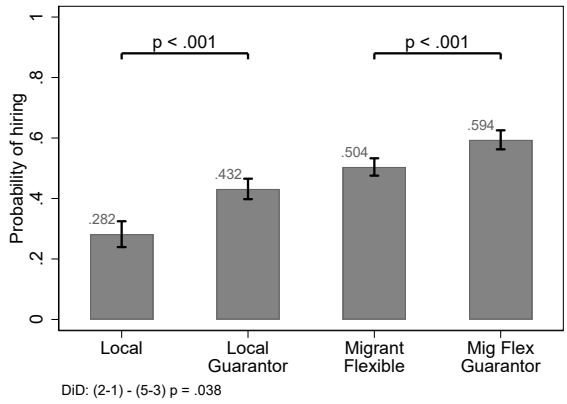
Figure 7: Hiring and WTP under Reliability Guarantees



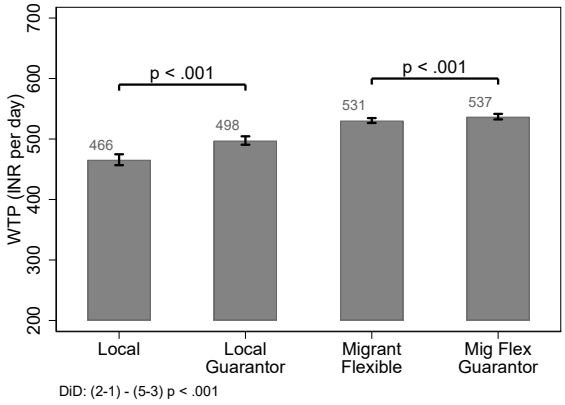
(a) Demand for migrant workers under flexible and off-site



(b) WTP under flexible and off-site



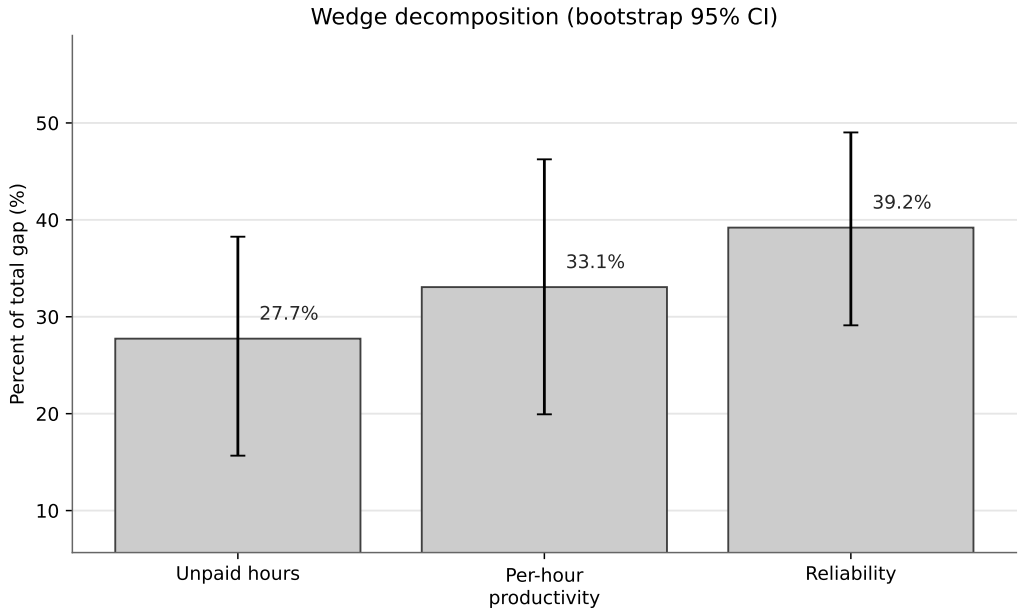
(c) Demand for migrant flexible and local workers with/without guarantee



(d) WTP for migrant flexible and local workers with/without guarantee

Notes: The figure presents results used to identify the residential-flexibility and disruption-cost components of the migrant–local gap. Panels (a) and (b) compare guaranteed migrant flexible and guaranteed migrant off-site contracts: Panel (a) shows hiring rates at the market wage of INR 550; Panel (b) shows WTP, with refusals set to INR 350. The WTP difference between these two guaranteed contracts isolates the value of flexible (on-site) residence net of disruption insurance, denoted EH_i in the accounting framework. Panels (c) and (d) show the four contracts used to identify the disruption-cost wedge via a difference-in-differences design: local (no-guarantor), local (guarantor), migrant flexible (no-guarantor), and migrant flexible (guarantor). Panel (c) shows hiring rates at INR 550; Panel (d) shows WTP. All outcomes are estimated from Eq. 5.1 with firm fixed effects. The local (no-guarantor) contract is the omitted baseline. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. *p*-values are shown for different pairs for a two-sided test.

Figure 8: Decomposition of the migrant–local WTP gap



Notes: The figure decomposes the total migrant–local WTP gap into three components following the accounting framework in Section 5.5. The total gap is the difference in WTP between the migrant flexible (no-guarantor) and local (no-guarantor) contracts. The unpaid-hours component (EW_i) combines two objects: the WTP difference between the migrant flexible guaranteed and migrant off-site guaranteed contracts, which captures the value of on-site residence net of disruption insurance, and the believed effective-hours advantage of off-site migrants relative to locals, scaled by $\widehat{\beta}_H$. The reliability component, the disruption-cost wedge (DW_i), is the local guarantee premium minus the migrant flexible guarantee premium. The per-hour productivity residual is the remaining gap after subtracting the portion of the off-site migrant–local WTP difference attributable to believed effective-hours differences, scaled by $\widehat{\beta}_H$ (the estimated INR value of one additional expected effective hour per day; see Appendix Figure A-9). Bars show each component as a percent of the total gap. The three wedges are estimated jointly by maximum likelihood, with survey-order fixed effects, on firm-level WTP with refusals set to INR 350, and the shares are computed from the estimated wedges. Whiskers are 95% percentile confidence intervals from a firm-level bootstrap.

Per-hour productivity. The belief evidence supports the interpretation of the effort residual: firms rate migrants higher on effort and trust without supervision even under off-site residence. Appendix Figure A-11 provides cross-sectional support for this interpretation: firms that believe off-site migrants are more productive than locals—a composite of beliefs about effort, work pace, and trustworthiness without supervision—exhibit a larger effort wedge $Effort_i$, with an OLS slope of 28.89 INR per one-unit increase in the standardized composite belief gap ($SE = 7.05$, $p < 0.001$). Figure 8 shows that per-hour productivity accounts for 33.1% of the total migrant–local WTP gap of 65 INR per day.

This component combines ability and effort, which have different sources. Ability may reflect selection into migration (Bryan and Morten, 2019). Effort, by contrast, rises with the cost of losing the job (Shapiro and Stiglitz, 1984) and migrants with fewer outside employment opportunities and less recourse have more to lose, so part of this premium may reflect discipline rather than skill.

5.6 External Validity

5.6.1 Evidence from a Formal-Sector Staffing Company

We test whether the mechanisms documented in the informal sector are also applicable in the formal sector. To that end, we surveyed 22 hiring managers at one of India's largest staffing companies that recruits workers for client firms operating primarily in manufacturing, delivery, and retail. Unlike participants in the firm experiment, these managers do not report their own hiring preferences. Instead, they describe the instructions they receive from client firms and their expectations about the workers those firms seek to hire.

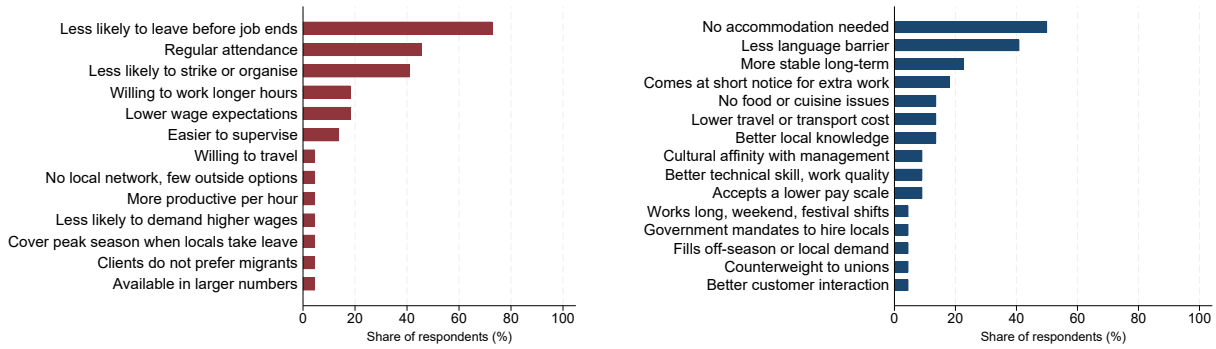
Migrants account for 63% of the workers placed by the company during the previous twelve months. When managers are asked how many of 100 otherwise comparable hires clients would ideally want to be migrants, the average response is 58 ($p = 0.028$). Figure 9 reports managers' explanations for these preferences. The most frequently cited advantage of migrants is a lower probability of leaving before the job is completed (73% of respondents), followed by more regular attendance (45%). These responses closely correspond to the reliability channel, which accounts for the largest component of the migrant premium in our decomposition. Managers also report that clients value migrants because they are less likely to strike or organize (41%) and because they are easier to supervise (14%).

The same considerations appear in clients' explicit restrictions on local recruitment. According to the managers, 20% of clients instruct the staffing company not to recruit workers from nearby areas. Among the 3 managers who have received such instructions, 67% report that clients fear locals may organize other workers, 67% that they may complain to political leaders, unions, or government authorities, and 33% that they may refuse overtime or tasks beyond the original assignment.

Figure 10 reports managers' quantitative expectations about local and migrant workers. They expect 39% of local workers to leave before completing a job, compared with 26% of migrants. They also expect migrants to be approximately twice as likely to accept additional hours without additional compensation (46% versus 26%). The largest differences concern collective action: managers expect local workers to be substantially more likely than migrants to strike (39% versus 15%) or join a union (42% versus 18%). These collective-action differences provide complementary evidence on institutional sources of monopsony power, extending our measures of individual voice and recourse to collective worker representation.

By contrast, managers report no difference in productivity. The matching evidence is mixed on this margin: firms' ratings of placed migrants and locals are statistically indistinguishable, while the on-the-job productivity index shows a marginally significant migrant advantage. Additional results from the staffing-company survey are reported in Appendix Section A.9.

Figure 9: Why clients prefer migrant and local workers

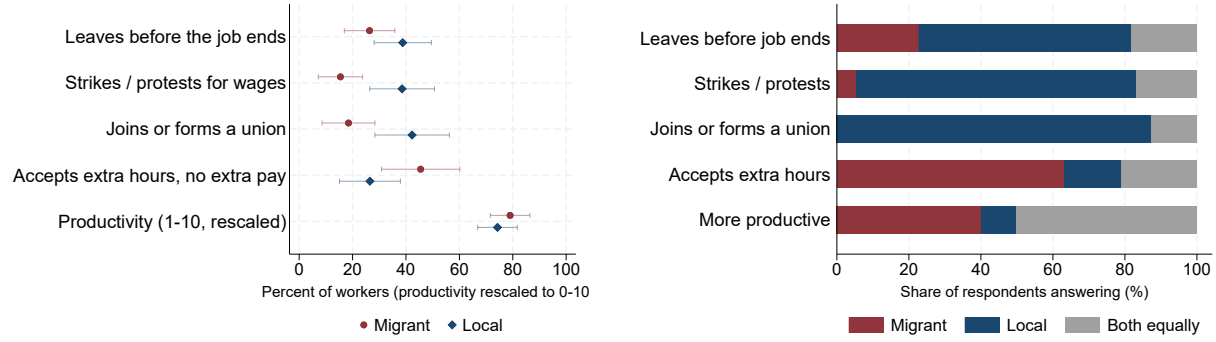


(a) Reasons for preferring migrants

(b) Reasons for preferring locals

Notes: Reasons that hiring managers report their client firms give for preferring migrant workers (Panel a) and local workers (Panel b). Bars show the share of managers citing each reason; respondents could select more than one. Only reasons selected by at least one respondent are shown. Sample: 22 hiring managers at a staffing company placing workers with client firms in manufacturing, delivery, and retail.

Figure 10: Hiring managers' beliefs about migrant and local workers



(a) Expected share of workers

(b) Which type is more likely

Notes: Panel (a) reports the expected percentage of migrant and local workers exhibiting each behaviour, with markers showing means and bars showing 95% confidence intervals; productivity is elicited as a 1–10 rating and rescaled to 0–100 for comparability. Panel (b) reports, for the same items, which worker type managers judge more likely; shares exclude "do not know" responses, which were given by one respondent on the union item. Sample: 22 hiring managers at a staffing company.

5.6.2 Evidence from Brick Kilns

To test whether these patterns extend to another migrant-intensive sector, we conducted a parallel experiment with 34 brick-kiln owners. Each owner indicated whether they would hire a local versus a migrant worker for brick moulding under two piece rates, alongside incentivized beliefs about both groups. As observed in construction, kiln owners strongly prefer migrant workers: 64.7% are willing to hire a migrant compared to 41.2% for a local, representing a 23.5 percentage-point gap ($p = 0.016$). Their beliefs closely mirror the construction sample: migrants are expected to have fewer absences, be less likely to quit mid-cycle, produce higher volumes of bricks, raise fewer objections to wage deductions, and take longer to find alternative work. Appendix A.8

reports the design and results (Figures A-24 and A-25).

5.6.3 Suggestive Evidence from a High-Income Setting

Related evidence from high-income labor markets illustrates the importance of outside employment options and institutional recourse. Migrants switch jobs more and earn more when employer ties are relaxed (Wang, 2021; Depew et al., 2017), while concentrated guest-worker recruitment can increase employer power (Gibbons et al., 2019). Among undocumented farmworkers in Italy, an intervention facilitating reports of exploitation increased prosecutions (Dipoppa, 2025). Public accounts show employers using the tie exactly as the firms in our experiment say they would: workers supply extra hours because refusing risks dismissal and having to leave the country; employers value workers who cannot quit; and the demands stop once the worker is free to move. Appendix A.10 reproduces six such accounts (Table A-16).

6 Experiment with workers

The firm-side results establish that firms prefer migrant workers and are willing to pay a substantial wage premium for them, driven in part by the option to house workers on-site, perceived reliability advantages, and beliefs about greater vulnerability and scope for unpaid hours. A natural question is whether potential migrants themselves recognize the conditions that make them attractive to employers—and, if so, how much they value contract attributes that improve their bargaining power. This section presents worker-side evidence on both margins.

6.1 Recruitment of workers

We recruit male construction workers from two populations. The first consists of migrant workers surveyed in their home districts outside Patna—these are potential migrants who may take up a job in Patna as part of the experiment. Migrant workers were recruited from four districts with the help of labor intermediaries who play an important role in facilitating migration. The second consists of local workers currently active in Patna's construction labor market. Local workers are approached at labor stands (informal hiring spots) in Patna. Migrant workers are approached at their residences or at labor stands in their home districts. After providing informed consent, workers complete a survey and then participate in the belief-elicitation exercise and the contract-variation experiment described below. Due to time constraints not every worker completes both the belief exercise and the experiment.

Table 3 summarizes the characteristics of the 653 migrant workers in our experimental sample. The average worker is about 33 years old, has roughly 4 years of formal education, and has been working for approximately 12 years. The sample is drawn largely from Scheduled Castes and Scheduled Tribes (53%) and Other Backward Classes (42%). Migration experience is widespread: 34% of workers have previously worked in another district within Bihar, and 53% have worked in

another state. Monthly earnings average around INR 13,584, and average family monthly income is approximately INR 20,529. Asset ownership is limited—only 16% own a bike—and 19% report having taken a loan in the past three months. These characteristics are broadly consistent with a population of low-income, low-education informal workers for whom migration is a common livelihood strategy. Appendix Table A-8 compares the migrant workers in our sample with a representative sample of rural construction labourers in Bihar from the 2020–21 Periodic Labour Force Survey, the population from which construction migrants are drawn. Our sample closely resembles this population.

Table 3: Summary stats of Migrant Workers

	Mean	SD	N
Age of Respondent	32.73	9.77	653
Years of education	3.87	3.94	653
Backward caste	0.42	0.49	653
Scheduled caste/tribe	0.53	0.50	653
Years of work	11.87	8.38	653
Worked in another district of Bihar	0.34	0.47	633
Worked in another state	0.53	0.50	652
Monthly Income (INR)	13,584.36	4,517.03	617
Family Monthly Income (INR)	20,528.67	12,821.25	593
Owns a bike	0.16	0.37	653
Loan in last 3 months	0.19	0.39	621
Expected Monthly rent in Patna (INR)	1,109.58	895.30	552

Notes: The table reports summary statistics for migrant workers in the experimental sample (both pure control as well as those who were offered jobs), recruited from home districts outside Patna. The unit of observation is the worker. Number of observations may vary across rows due to non-response.

6.2 Worker Beliefs

We next ask whether workers recognize the same employment-relationship differences that firms appear to value. The firm-side evidence suggests that migrants, especially those residing on-site, are attractive to employers because they are perceived to face weaker recourse, greater exposure to unpaid extra work, and lower likelihood of quitting. We therefore elicit workers' beliefs about how different types of workers are treated in Patna's construction labor market.

The elicitation asks respondents to compare three worker profiles: (i) local workers, (ii) migrant workers who live off-site and commute from their own accommodation, and (iii) migrant workers who reside on or near the worksite. For each profile, respondents estimate how many workers out of ten would experience or exhibit each outcome. They are instructed to hold the type of work and wage fixed across profiles. Differences in responses can therefore be interpreted as beliefs about how treatment varies with migrant status and residence arrangement, rather than with the job itself.

The outcomes are designed to capture the margins highlighted in the firm experiment. We

group them into four clusters. The first, *extra work*, measures whether workers are expected to supply unpaid labor beyond the standard workday, including unpaid extra hours, late evening cleaning work, and early morning curing work. The second, *wage theft*, measures payment irregularities, including delayed payment, underpayment, wage withholding, and unilateral wage reductions. The third, *bargaining power*, measures workers' expected ability to respond to mistreatment, including whether they would dispute the employer, face pressure or threats, lodge an external complaint, or have outside job opportunities. The fourth, *reneging and effort*, measures whether workers are expected to quit before completing the job and whether they can be trusted to work without supervision. Figures 11 and 12 plot these beliefs separately for migrant and local respondents.

Rather than asking respondents about their own expected experiences, we ask them to estimate how common each outcome is among workers of a given type. Responses are incentivized for accuracy. Before the main survey, the research team collected answers to the same questions from a reference group of approximately 20 workers drawn from the same population and computed the average response for each outcome. Respondents are informed that their answers will be compared to these reference averages, and that more accurate responses increase their probability of earning a bonus of up to INR 100 per question. At the end of the survey, a subset of questions is randomly selected for payment, with total bonus earnings capped at INR 300. This scoring rule rewards respondents for reporting their best estimate of the prevalence of each outcome.[14]

6.2.1 Results: Migrant Beliefs

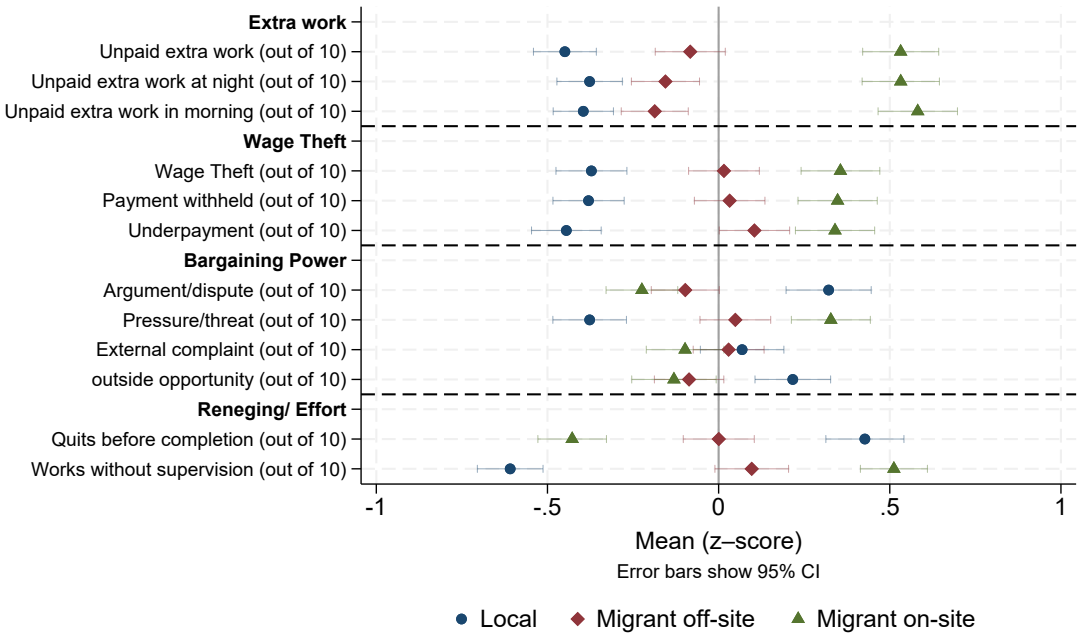
Figure 11 plots migrant workers' beliefs for each of the twelve outcomes, expressed as z-scores, separately for local workers, off-site migrants, and on-site migrants. The pattern across the extra work cluster is striking. Migrant workers believe that on-site migrants are substantially more likely to be made to work unpaid extra hours, to be asked to stay late for cleaning, and to be called in early for curing—compared with both off-site migrants and local workers.

In the wage theft cluster, workers expect that migrants—especially those residing on-site—are more likely to experience payment delays, underpayment, and wage withholding. On-site migrants are perceived as the most vulnerable to wage theft, with off-site migrants sitting between the two groups, plausibly reflecting the greater dependence on the employer that on-site residence entails. These beliefs are consistent with a setting in which workers recognize that weaker outside employment opportunities and closer physical proximity to the employer reduce their bargaining position.

The bargaining power cluster reveals a consistent gradient: workers expect local workers to be most likely to engage in arguments or disputes, lodge external complaints, and have outside opportunities, while on-site migrants are perceived as least likely to exercise these forms of recourse. Off-site migrants occupy an intermediate position. In the reneging and effort cluster, workers believe that on-site migrants are less likely to quit before job completion and can be trusted more to

[14] Workers were informed about the reference group and the bonus structure before the elicitation began.

Figure 11: Beliefs of Migrant Workers



Notes: The figure plots migrant workers' incentivized beliefs about the prevalence of various working conditions for three worker types: local workers, off-site migrants (commuting from own accommodation), and on-site migrants (residing at or near the worksite). Outcomes are organized into four thematic clusters: extra work (unpaid overtime), wage theft (payment delays and underpayment), bargaining power (recourse and outside employment opportunities), and reneging and effort. Each outcome is expressed as a z-score, standardized across the full sample of worker-outcome observations. Error bars show 95% confidence intervals based on standard errors of the mean.

work without supervision, relative to locals.

We examine whether the belief gradient varies by caste status by splitting the sample into SC/ST and non-SC/ST workers (who are mostly OBC). Appendix Figure A-21 shows that the ordering of beliefs across worker types—with on-site migrants perceived as most exposed to extra work, wage theft, and vulnerability—is present in both subgroups, though SC/ST workers report somewhat more pronounced beliefs about the vulnerability of on-site migrants, consistent with caste-based social disadvantage amplifying perceived exposure to exploitative conditions.

We also examine whether beliefs vary with prior migration experience by splitting the sample into workers who have previously migrated out of state and those who have not (Appendix Figure A-22). The overall gradient—on-site migrants most exposed, locals least—is present in both groups. Workers with out-of-state experience report somewhat more pronounced beliefs about the exposure of on-site migrants to unpaid extra work, consistent with personal experience sharpening perceptions of the conditions most directly tied to employer extraction. Beliefs about wage theft, vulnerability, and reneging, by contrast, are broadly similar across the two groups, suggesting that these dimensions are widely recognized in origin communities even without firsthand exposure.

Comparing Firm and Worker Beliefs Workers decide whether to migrate by comparing expected returns at destination with those available in their origin markets. If workers underestimate the costs of unpaid work or overestimate their ability to quit, contest firms' demands, or obtain outside recourse, they may overstate the net returns to moving. For workers near the migration threshold, such incorrect beliefs can induce migration even when remaining at origin would yield higher welfare. Recognizing that migrants are vulnerable does not eliminate this possibility: workers may anticipate these disadvantages without fully accounting for their magnitude.

We examine this possibility by comparing firms' and migrant workers' incentivized beliefs about five outcomes elicited from both groups on the same 0–10 scale: whether workers would accept an unpaid extra hour, work well without supervision, quit before completing the job, argue if payment were delayed, or complain to an outside body. We first compare beliefs about migrants themselves. These level comparisons capture disagreement about the destination conditions that potential migrants may use to evaluate migration opportunities. We then compare perceived migrant–local gaps to assess whether disagreement also concerns migrants' relative position within the destination labor market.

For respondent i, outcome k, and migrant type t, let B_{ikt} denote the belief about an on-site or off-site migrant. We estimate

$$B_{ikt} = \alpha^B_{kt} + \delta^B_{kt}\, Firm_i + \varepsilon^B_{ikt}, \tag{6.1}$$

where $Firm_i$ equals one for firm respondents and zero for migrant workers. The constant α^B_{kt} is the mean belief among workers, while $\alpha^B_{kt} + \delta^B_{kt}$ is the mean among firms. Columns (1) and (2) of Table 4 report these means, and column (3) reports the firm-minus-worker difference, δ^B_{kt}.

For the relative comparison, we define

$$g_{ikt} = B_{ikt} - B_{ikL},$$

where B_{ikL} is the respondent's belief about a local worker at destination. Differencing within respondent removes any additive respondent-specific tendency to report higher or lower values. We estimate

$$g_{ikt} = \alpha^g_{kt} + \delta^g_{kt}\, Firm_i + \varepsilon^g_{ikt}. \tag{6.2}$$

Columns (4) and (5) report the mean gaps perceived by firms and workers, respectively, and column (6) reports their difference, δ^g_{kt}. This comparison concerns migrants and locals at destination; it does not compare migrating with remaining at origin.

Columns (1)–(3) of Table 4 show that workers expect fewer migrants to accept an unpaid extra hour and more migrants to quit or complain to an outside body than firms do. These differences are statistically significant for both residence arrangements. Workers also expect more migrants to argue when payment is delayed. Firms expect more migrants to work well without supervision under both residence arrangements.

Columns (4)–(6) show that firms and workers agree on the direction of all ten migrant–local comparisons. Nevertheless, workers perceive significantly smaller migrant–local gaps in unpaid

Table 4: Firms' and migrant workers' beliefs about migrants: levels and migrant–local gaps

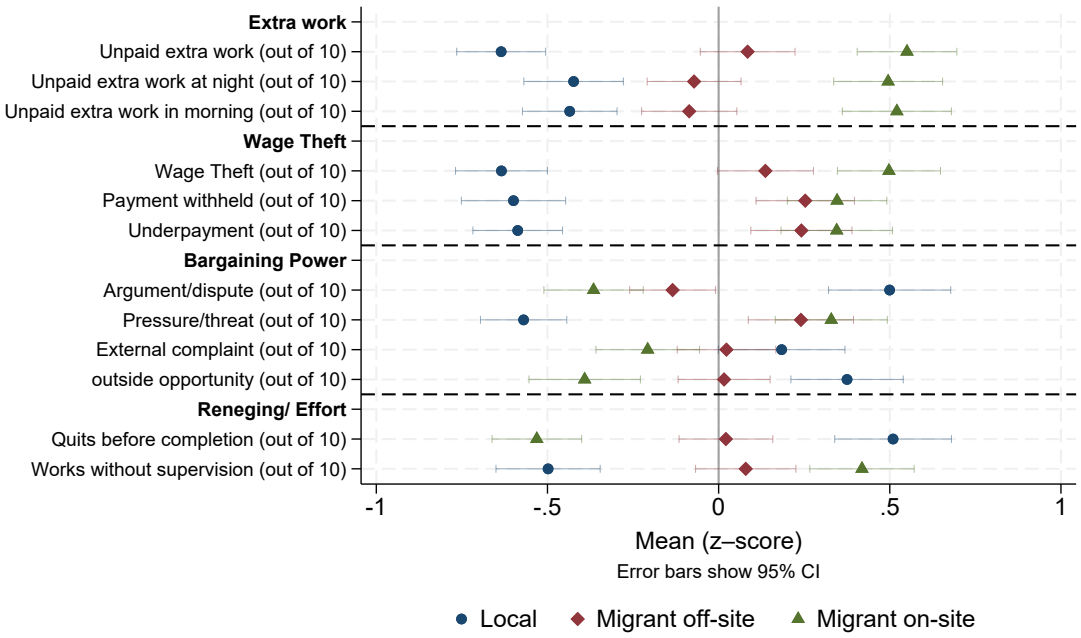
Outcome	Belief about migrants			Believed migrant − local gap		
	Firms (1)	Workers (2)	Firm − worker (3)	Firms (4)	Workers (5)	Firm − worker (6)
Panel A. On-site migrant						
Works well without supervision	7.02	6.00	1.02***	3.18	3.15	0.03
			(0.24)			(0.29)
Accepts an unpaid extra hour	7.88	5.39	2.48***	3.64	2.89	0.76**
			(0.26)			(0.33)
Quits before completing the job	0.84	2.11	-1.27***	-3.25	-2.02	-1.23***
			(0.17)			(0.26)
Argues if pay is delayed	1.97	2.88	-0.91***	-3.47	-1.50	-1.97***
			(0.23)			(0.35)
Complains to an outside body	2.43	3.57	-1.15***	-2.21	-0.51	-1.70***
			(0.27)			(0.36)
Panel B. Off-site migrant						
Works well without supervision	6.00	4.84	1.16***	2.10	1.98	0.12
			(0.26)			(0.29)
Accepts an unpaid extra hour	6.22	3.58	2.64***	2.00	1.08	0.92***
			(0.29)			(0.34)
Quits before completing the job	1.45	3.12	-1.67***	-2.62	-1.01	-1.61***
			(0.18)			(0.25)
Argues if pay is delayed	3.08	3.23	-0.14	-2.36	-1.15	-1.20***
			(0.25)			(0.33)
Complains to an outside body	3.08	3.96	-0.88***	-1.52	-0.12	-1.40***
			(0.27)			(0.33)

Notes. All entries are expected numbers of workers out of 10. Columns (1) and (2) report the mean belief about the migrant type named in the panel, for firms and for migrant workers; column (3) is firm minus worker. Columns (4) and (5) report mean within-respondent gaps (that migrant type minus a local worker) and column (6) their difference. Heteroskedasticity-robust standard errors are in parentheses. Stars use unadjusted p-values. The sample contains 220 firms and 310 workers, with cell sizes varying because of item non-response. The migrant–local gap has the same sign for firms and workers in all ten comparisons. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

work, quitting, arguing, and outside complaints under both residence arrangements. By contrast, the perceived migrant–local gaps in working well without supervision are close and not statistically distinguishable between firms and workers. Disagreement about migrants' relative position is therefore concentrated in outcomes associated with extraction, exit, and recourse.

The potential inefficiency at the migration margin follows from the disagreement about destination conditions in columns (1)–(3). For marginal workers, correcting those expectations could reverse the decision to migrate: perceived net returns can be positive while true expected net returns are negative. The table thus identifies belief differences consistent with a mechanism through which incorrect expectations induce welfare-reducing migration. This role for beliefs in labor-market decisions parallels evidence that information about outside options changes workers' search and wage-negotiation intentions (Jäger et al., 2024). Note that this result implies that the observed rate of migration is higher than if the workers' beliefs were accurate but lower than what the spatial wage gaps would predict in the absence of unpaid hours and other vulnerabili-

Figure 12: Beliefs of Local Workers



Notes: The figure plots local workers' incentivized beliefs about the prevalence of various working conditions for three worker types: local workers, off-site migrants (commuting from own accommodation), and on-site migrants (residing at or near the worksite). Outcomes are organized into four thematic clusters: extra work (unpaid overtime), wage theft (payment delays and underpayment), bargaining power (recourse and outside employment opportunities), and reneging and effort. Each outcome is expressed as a z-score, standardized across the full sample of worker-outcome observations. Workers are asked to report the expected number of workers out of 10 who would experience each condition, holding the type of work and wage constant across worker types. Error bars show 95% confidence intervals based on standard errors of the mean.

ties.

6.2.2 Results: Local Beliefs

Figure 12 presents the analogous belief plot for local workers. The patterns are broadly similar to those reported by migrant workers: local workers also perceive on-site migrants as more exposed to unpaid extra work, wage theft, and vulnerability, and as less likely to quit. This reinforces the conclusion that the vulnerability of on-site migrants is a widely recognized aspect of the labor market.

Together, the worker-belief results suggest that migrants expect to face worse conditions than local workers in destination labor markets, particularly when they reside at the worksite. Relative to firms, however, they expect fewer migrants to accept unpaid work and more to quit or seek outside help. These differences suggest that recognizing vulnerability need not imply fully accounting for its costs when deciding whether to migrate. This raises the question of how workers value contract features that reduce vulnerability—a question we address in the experiment below.

6.3 Worker Experiment Design

The worker experiment is designed to estimate how much potential migrants are willing to forgo in wages in exchange for contracts that reduce vulnerability in destination labor markets. The within-worker comparison holds fixed the opportunity forgone at origin and varies the protections attached to the destination job. Each worker is offered a real job in Patna lasting at least 15 days. Workers report whether they would accept the job under each of several contract conditions, presented at varying daily wages (INR 500, 525, 550, 575, and 600) in increasing order. One contract and wage combination is randomly selected for implementation, making responses incentive compatible. Because the sample has limited formal schooling (4 years on average), enumerators explained the mechanism using a simplified example, and verified comprehension by asking workers to describe in their own words the consequences of accepting or rejecting an offer that was selected for implementation.

The experiment varies two contract dimensions, yielding the treatment cells shown in Table 5:

1. **Residence.** Workers are offered a job under one of two residence arrangements:
    - **On-site.** The worker is provided accommodation at or near the construction site for the duration of the job. Lodging is arranged by the firm.
    - **Off-site.** The worker is not provided any accommodation at the site and must arrange their own place to stay in the city. The research team assists in finding accommodation, but the worker bears the lodging costs.
2. **Offer Type.** Each worker receives a standard (control) contract and a contract that adds one of three protections against vulnerability:
    - **Control.** A standard job offer in which the research team would introduce the worker to the contractor, after which all matters related to work, payment, and the site are between the worker and the contractor. The research team bears no further responsibility.
    - **Insurance (wage-theft/payment-delay protection).** In addition to the standard job, the research team guarantees full payment for work completed. If the firm fails to pay the agreed wage or pays less than the contracted amount, the organization helps recover the payment. If the firm does not pay, the organization pays the worker the outstanding amount. This guarantee is provided in a written contract bearing the organization's signature and stamp, along with a contact card.
    - **Mediation (dispute resolution).** In addition to the standard job, the research organization provides a dispute mediation service. If the worker encounters a dispute with the firm—over wages, working conditions, or other matters—the organization intervenes to mediate the dispute. This service is documented in a written agreement.
    - **Outside option.** In addition to the standard job, the research organization guarantees that if the worker decides to leave the current firm for any reason, the organization will

place the worker into another job of comparable terms in Patna. This fallback-job guarantee improves the worker's alternative employment option at destination, reducing dependence on the initial employer.

- **Pure Control**: A small share of workers are assigned to a pure control group and receive no job offers.

The design yields eight contract conditions. Each worker receives a control offer and one protected offer in random order, both under the same residence arrangement. Their difference in minimum acceptable wages identifies the value of the protection. The job-offer experiment includes 602 migrant workers, roughly evenly allocated across six treatment-by-residence cells; the remaining workers receive no offers. Insurance is offered only to migrants.

Table 5: Worker-side treatment cells

Residence	Offer type	Contract attributes
On-site	Control	Standard job
On-site	Insurance	Standard job + Insurance (wage-theft protection)
On-site	Mediation	Standard job + Mediation (dispute resolution)
On-site	Outside option	Standard job + Outside option (alternative job guarantee)
Off-site	Control	Standard job
Off-site	Insurance	Standard job + Insurance (wage-theft/payment-delay protection)
Off-site	Mediation	Standard job + Mediation (dispute resolution)
Off-site	Outside option	Standard job + Outside option (alternative job guarantee)

Randomization was conducted at the worker level, separately for the treatment type (insurance, mediation, or outside option) and the residence arrangement (on-site or off-site). Appendix Table B-1 compares worker characteristics across the three treatment types; joint F-tests of equality fail to reject balance on any characteristic. Appendix Table B-3, which compares workers who received the control contract first with those who received the treatment contract first, is similarly well balanced. Across the two residence arrangements (Appendix Table B-2), workers are balanced on all baseline characteristics except age, where those assigned to on-site residence are modestly older on average (a difference significant only at the 10% level). Because residence is assigned between rather than within workers, our on-site versus off-site comparison controls for age, education, and SC/ST status and includes enumerator, district, and interview-month fixed effects (Eq. 6.4), absorbing this difference; the within-worker treatment-effect estimates exploit variation holding the worker fixed and are unaffected by it.

Empirical Specification We estimate the effect of contracts on workers' willingness to accept (WTA) wages using the following specification:

$$Y_{ij} \;=\; \alpha \;+\; \beta\, \mathit{Treat}_{ij} \;+\; \mu_i \;+\; \varepsilon_{ij}, \tag{6.3}$$

where Y_{ij} is the WTA (minimum daily wage at which the worker accepts the job) for worker i under offer j.A worker who rejects the job at every offered wage is assigned $w_{\max}+25$, one INR 25 step above the highest offered wage $w_{\max}$. This top-coding implies that the value of protections is underestimated, and we account for this by estimating the value of protections using interval regressions, which model the censored distribution of WTA as being normal. Additionally, as a large fraction of our sample rejects the job at every offered wage, we also use labor supply, whether the worker accepts the job at each offered wage, as an outcome that is unaffected by censoring. $\mathbf{Treat}_{ij}$ is a vector of indicators for the contract type offered to worker i on offer j, with the relevant control contract as the omitted baseline. μ_i absorbs fixed effects for the worker. Standard errors are clustered at the worker level. Each bar in the figures that follow represents the sum of the control mean and the relevant regression coefficient.

6.4 Results

We present the experimental results in two parts. We first compare workers' baseline WTA across the two residence arrangements under the control contract, which establishes the cost–vulnerability trade-off that workers face before any protections are introduced. We then turn to the treatment effects of the three contract protections—insurance, mediation, and outside option—estimated separately by residence arrangement.

Because treatment type and residence are randomized independently across workers, the control-arm WTA can differ across treatment subsamples due to sampling variation in small cells. Our within worker analysis ensures that the treatment effect is identified despite these sampling differences.

WTA: On-Site versus Off-Site Residence

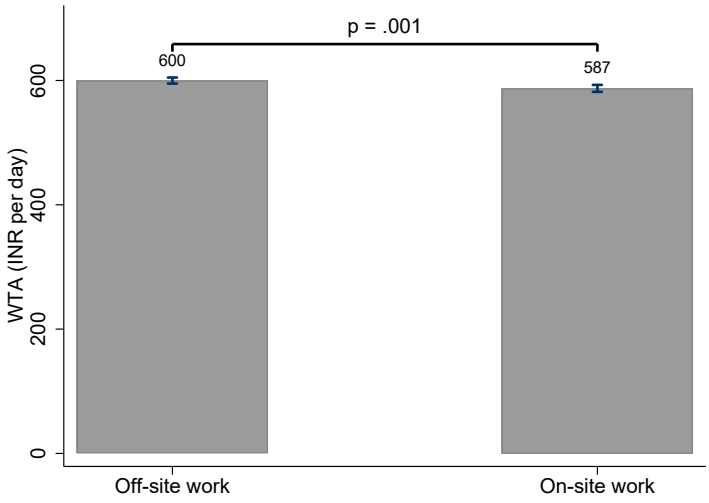
Because residence is assigned between workers rather than within, this comparison cannot exploit worker fixed effects; we instead estimate

$$Y_i \;=\; \alpha \;+\; \beta\, \mathit{OnSite}_i \;+\; \boldsymbol{\gamma}'\mathbf{X}_i \;+\; \boldsymbol{\phi}'\mathbf{F}_i \;+\; \varepsilon_i, \tag{6.4}$$

where Y_i is the WTA of worker i under the control contract, OnSite_i indicates assignment to the on-site residence arrangement, $\mathbf{X}_i$ controls for worker age, education, and SC/ST status, and $\mathbf{F}_i$ collects fixed effects for the enumerator, the worker's district, the month of the interview, the order in which the two offers were presented, and the protection offered alongside the control contract. Standard errors are clustered at the worker level. The sample is restricted to the responses to control contracts which do not offer protection.

Figure 13 shows WTA of 600 INR per day for off-site work and 587 INR for on-site work, a dif-

Figure 13: WTA for staying at site



Notes: The figure shows migrant workers' minimum willingness-to-accept (WTA) daily wage for on-site work (accommodation provided at the construction site) and off-site work (worker arranges own accommodation), both under the standard control contract with no additional protections. The outcome is estimated from Eq. 6.4, controlling for worker age, education, and SC/ST status, with fixed effects for the enumerator, district, interview month, question order, and the protection offered alongside the control contract. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the worker level. The p-value is shown for a two-sided test.

ference of 13 INR ($p = 0.001$). Despite free accommodation, workers require only a slightly lower wage for on-site work. Section 5.4.3 discusses this small net valuation alongside rental savings and workers' reports of pressure for additional work and threatened loss of accommodation.

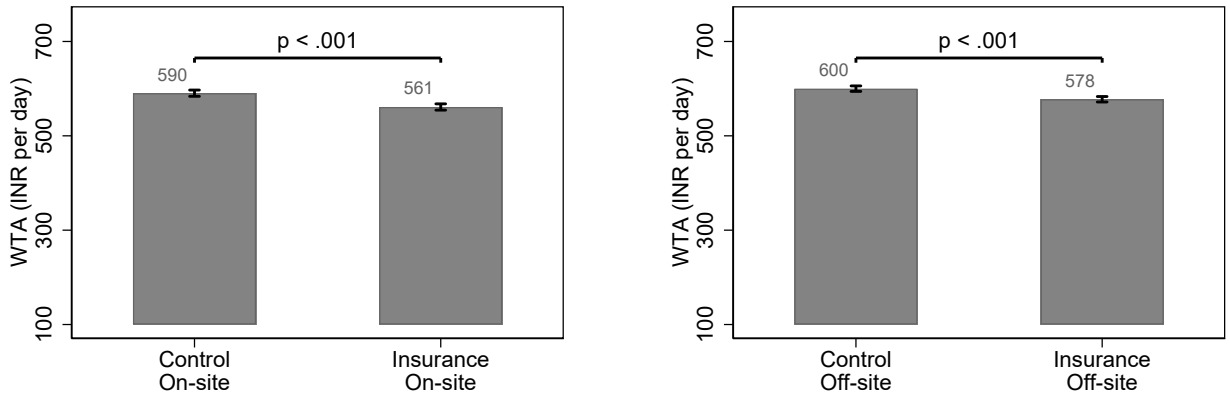
Effect of Wage Insurance on WTA

Figure 14 shows that payment insurance reduces WTA by 29 INR per day under on-site residence (4.9%, $p < 0.001$) and 22 INR under off-site residence (3.7%, $p < 0.001$). Labor supply, measured as whether the worker accepts the job at each offered wage, is not affected by censoring and shows the same response: insurance raises the probability of accepting the job by 23.4 ppt under on-site residence ($p < 0.001$) and by 18.0 ppt under off-site residence ($p < 0.001$; Appendix Figure A-20). Insurance produces the largest estimated reduction in WTA, indicating substantial value attached to secure payment.

Effect of Mediation on WTA

Figure 15 shows that mediation reduces WTA by 19 INR per day under on-site residence (3.2%, $p = 0.002$) and 15 INR under off-site residence (2.5%, $p = 0.006$). Mediation also raises the probability of accepting the job, by 15.3 ppt under on-site residence ($p < 0.001$) and by 12.0 ppt under off-site residence ($p < 0.001$; Appendix Figure A-19). Workers therefore value institutional recourse within the employment relationship.

Figure 14: Effect of Wage Insurance on WTA

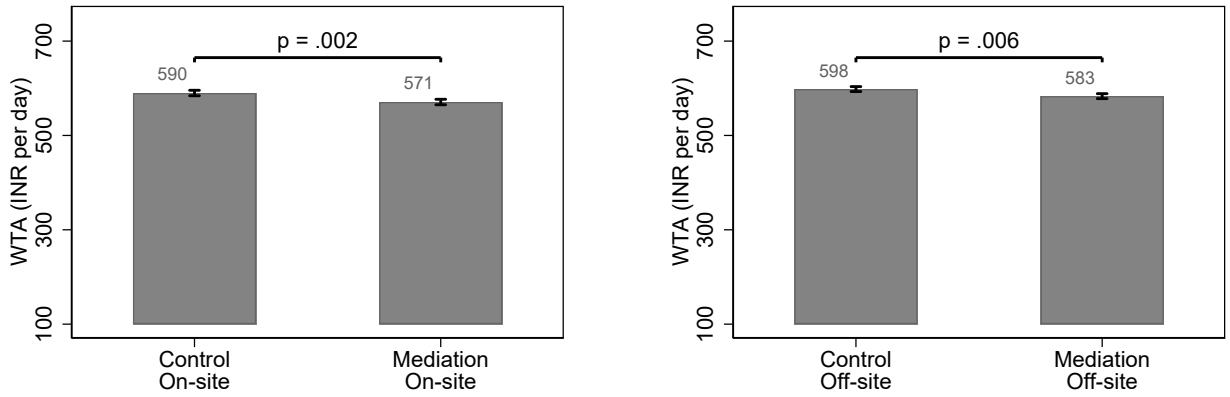


(a) WTA for on-site work

(b) WTA for off-site work

Notes: The figure shows the effect of the wage insurance treatment—which guarantees full payment for work completed and provides recourse against wage theft and payment delays—on migrant workers' minimum WTA daily wage. Panel (a) presents results for on-site work (accommodation provided at the site); Panel (b) presents results for off-site work (worker arranges own accommodation). Each bar is the sum of the control mean and the relevant regression coefficient, estimated from Eq. 6.3. The specification includes worker fixed effects and question-order fixed effects. The baseline in each panel is the WTA under the standard control contract for the same residence arrangement. Standard errors are clustered at the worker level. *p*-values are shown for each treatment–control pair for a two-sided test.

Figure 15: Effect of Mediation on WTA



(a) WTA for on-site work

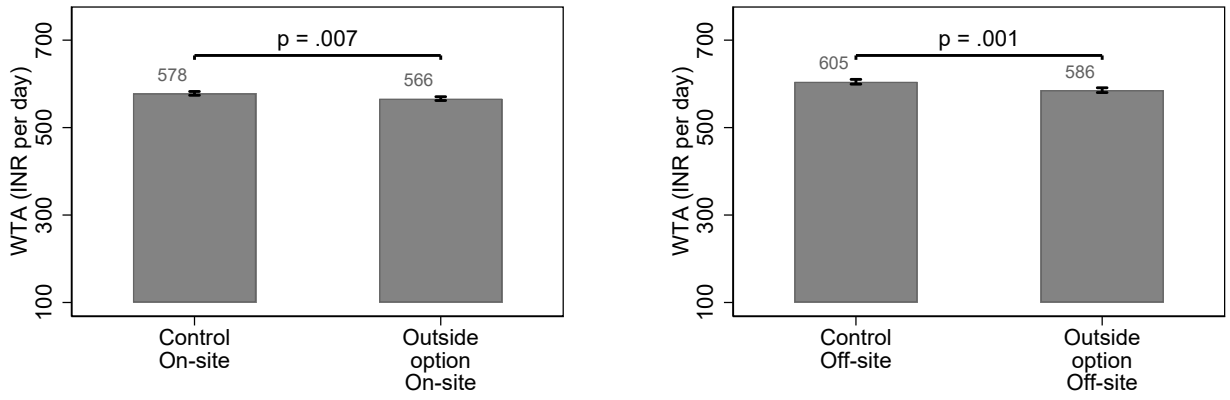
(b) WTA for off-site work

Notes: The figure shows the effect of the mediation treatment—which provides dispute resolution services if the worker encounters a conflict with the contractor—on migrant workers' minimum WTA daily wage. Panel (a) presents results for on-site work (accommodation provided at the site); Panel (b) presents results for off-site work (worker arranges own accommodation). Each bar is the sum of the control mean and the relevant regression coefficient, estimated from Eq. 6.3. The specification includes worker fixed effects and question-order fixed effects. The baseline in each panel is the WTA under the standard control contract for the same residence arrangement. Standard errors are clustered at the worker level. *p*-values are shown for each treatment–control pair for a two-sided test.

Effect of Outside Option on WTA

Figure 16 shows that the fallback-job guarantee reduces WTA by 12 INR per day under on-site residence (2.1%, $p = 0.007$) and 19 INR under off-site residence (3.1%, $p < 0.001$). The guarantee also raises the probability of accepting the job, by 9.1 ppt under on-site residence ($p < 0.001$) and by 15.4 ppt under off-site residence ($p < 0.001$; Appendix Figure A-18). Workers therefore value stronger outside employment options at destination.

Figure 16: Effect of Outside Option on WTA



(a) WTA for on-site work

(b) WTA for off-site work

Notes: The figure shows the effect of the outside-option treatment—which guarantees that the research organization will place the worker into an alternative comparable job in Patna if they leave the current contractor—on migrant workers' minimum WTA daily wage. Panel (a) presents results for on-site work (accommodation provided at the site); Panel (b) presents results for off-site work (worker arranges own accommodation). Each bar is the sum of the control mean and the relevant regression coefficient, estimated from Eq. 6.3. The specification includes worker fixed effects and question-order fixed effects. The baseline in each panel is the WTA under the standard control contract for the same residence arrangement. Standard errors are clustered at the worker level. *p*-values are shown for each treatment–control pair for a two-sided test.

These estimates are robust to relaxing the top-coding assumption that assigns $w_{\max} + 25$ to workers who reject all offered wages. Appendix Table A-12 reports interval regression estimates that treat the WTA as interval-censored: a worker who rejects a wage and accepts the next wage on the menu has a WTA in the INR 25 interval between them; a worker who accepts the lowest wage on the menu, $w_{\min}$, has a WTA in $[w_{\min} - 50,\ w_{\min}]$; and a worker who rejects every wage has a WTA above the top of the menu, with no upper bound. The treatment effects remain negative and statistically significant in every arm and are roughly twice the switching-point estimates, because the interval specification allows the reservation wages of workers who reject every offer to exceed $w_{\max} + 25$. Panel B shows the same pattern for local workers.

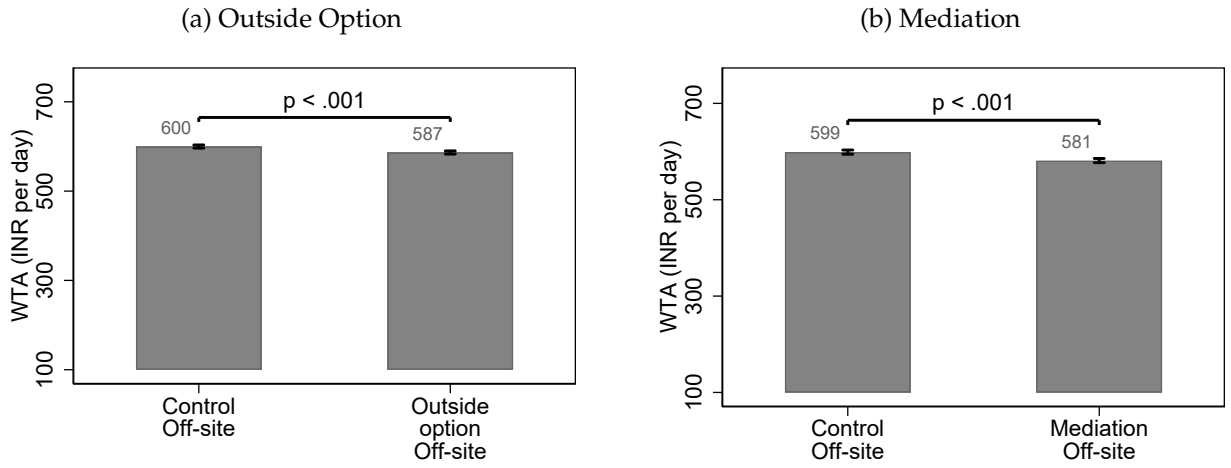
6.5 Response of Local Workers

The migrant-worker results above show that contract protections significantly lower the wages migrants require to accept a job. A natural benchmark is whether local workers—who are not subject to the same residence-based vulnerabilities—also value these protections, and if so, whether

their valuations differ from those of migrants. We examine this using the sample of local construction workers in Patna, who were offered contracts varying the outside option and mediation treatments under off-site work only. Summary statistics for these workers are in Appendix Table A-9. A total of 253 workers were made offers and 272 workers were surveyed.

Figure 17 presents the within-worker estimates for local workers. Panel (a) shows that the outside-option guarantee reduces local workers' WTA from 600 INR to 587 INR, a decline of 13 INR per day ($p < 0.001$). Panel (b) shows that the mediation treatment reduces their WTA from 599 INR to 581 INR, a decline of 18 INR per day ($p < 0.001$). Both effects are highly significant, indicating that local workers also place positive value on protections against employer lock-in and unresolved disputes—even though they are not subject to the housing dependence and displacement risks that characterize migrant employment. The outside-option effect for locals (13 INR) is somewhat smaller than the corresponding off-site estimate for migrant workers (19 INR), suggestive of migrants facing a more severe vulnerability environment in which the guarantee of an alternative job is especially valuable. The mediation estimates are close across the two groups (18 INR for locals versus 15 INR for migrants), and the significant reductions in both groups show that institutional recourse is valued by local as well as migrant workers.

Figure 17: WTA for Local Workers: Outside Option and Mediation



Notes: Each panel plots the mean WTA (willingness to accept) for local workers under the control and treatment arms, estimated from the regression $sw_{ij} = \alpha + \beta\, Treat_{ij} + \mu_i + \varepsilon_{ij}$, where μ_i denotes worker fixed effects. The switching point sw is defined as the lowest wage at which the worker accepts the offer; workers who reject all wages are assigned $w_{\max} + 25$. The sample in each panel is restricted to workers who received both the control arm and the relevant treatment arm. 95% confidence intervals are shown; standard errors are clustered at the worker level. The p-value tests whether the treatment mean differs from the control mean. **Left panel:** treatment arm offers an outside option guarantee (survey firm places the worker in an alternative Patna job at the same wage if the worker quits). **Right panel:** treatment arm offers mediation services (dispute resolution if a conflict arises with the employer). Both treatments are offered for off-site work only. Workers are local construction workers in Patna.

As a large fraction of workers reject the job at every wage on the menu, OLS on the switching point understates the treatment effects for both locals and migrants relative to an interval regres-

sion, which models the WTA of these workers as lying above the top of the menu in a normal distribution (Appendix Table A-12). To compare how locals and migrants respond to treatment, the censored part of the distribution has to be handled correctly. We therefore estimate the difference-in-differences in Table 6 by interval regression, pooling migrant and local workers and restricting migrants to the off-site arm to ensure comparability. The censored share differs between the two groups: under the control contract, 58.7% of migrants and 44.7% of locals reject every wage. How far above the top of the menu these workers' WTA lies is inferred from the assumed normal shape of the distribution, so we allow its standard deviation to differ by migrant status and by treatment arm. The data reject a common standard deviation: under the control contract, it is about 50 percent larger for migrants than for locals (83 versus 56 INR in the outside-option sample).

The outside-option guarantee lowers migrants' WTA by more than it lowers locals' WTA. The DiD estimate is -21.9 INR ($p = 0.026$), so the decline in WTA for migrants is roughly twice that for locals. For mediation, the DiD is small (-4.0 INR) and not statistically significant, and we cannot reject that migrants and locals value mediation equally. One possible explanation for the similar response to mediation is that migrants underestimate their disadvantage.[15] This comparison, however, covers only off-site jobs. Mediation may be worth more to migrants who live on site, where a worker who complains risks losing both the job and the accommodation.

We did not offer insurance to local workers in this experiment. Varun (2026) offers the same payment guarantee to workers at labor stands in Patna. There, the guarantee raises take-up of a seven-day job by 4.0 ppt when the firm pays wages daily, and by 13.0 to 13.5 ppt when the firm withholds part of the wages until the last day. Here, the guarantee raises off-site migrants' take-up by 30.0 ppt at INR 600, the highest wage we offer. Migrants' response exceeds locals' by 26.0 ppt relative to the daily-pay job ($p < 0.001$) and by about 17 ppt relative to the jobs that withhold wages ($p = 0.01$). This suggests that migrants may value protection against wage theft more than local workers do. We treat the comparison as suggestive, because the two experiments differ in contract length and in how they elicit workers' choices.

6.6 Discussion

Taken together, the worker-side results yield two main conclusions. First, potential migrants recognize their vulnerability but expect less unpaid work and greater ability to quit or obtain recourse than firms anticipate. Under the interpretation developed alongside Table 4, these differences suggest that workers may overstate migration returns. Marginal workers could therefore accept destination jobs with negative true expected net returns. The smaller perceived migrant–local gaps provide supporting evidence about relative vulnerability, while the level differences bear directly on expectations relevant to migration decisions.

Second, workers place substantial value on protections that reduce vulnerability. Across all three treatments—insurance, mediation, and outside option—workers are willing to accept mean-

[15] In Table 4, workers perceive a much smaller gap between off-site migrants and locals in seeking outside recourse than firms do, so migrants may value mediation less than they would if their beliefs were accurate.

Table 6: WTA for Contract Attributes: Migrants vs Local Workers

	Outside Option	Mediation
Treatment	-23.29***	-30.28***
	(4.49)	(5.38)
Migrant	30.38**	20.90
	(12.70)	(12.84)
Treatment × *Migrant (DiD)*	-21.90**	-4.01
	(9.85)	(9.53)
Observations	460	458
Right-censored (%)	40.2	39.1
Question order FE	✓	✓
SD by group and arm	✓	✓

Notes: Each column reports interval-regression estimates of $WTA_i^* = \alpha + \beta_1\, \textit{Treat}_i + \beta_2\, \textit{Migrant}_i + \beta_3\, (\textit{Treat}_i \times \textit{Migrant}_i) + \boldsymbol{\gamma}'\textit{Order}_i + \varepsilon_i$, where WTA_i^* is the worker's latent willingness to accept, the lowest daily wage at which the worker would take the job. It is observed only up to the wage interval in which the worker switches from rejecting to accepting the offer. A worker who first accepts at wage w contributes the interval $(w-25,\ w]$; a worker who accepts the lowest wage on the menu, $w_{\min}$, contributes $[w_{\min}-50,\ w_{\min}]$; and a worker who rejects every wage is right-censored at the top of the menu, $w_{\max}$, with no upper bound. The error is normally distributed, with a standard deviation that differs by migrant status and by treatment arm. All regressions control for worker age and years of education. *Treatment* ($\hat{\beta}_1$) is the WTA effect for local workers. *Migrant* ($\hat{\beta}_2$) is the WTA gap between migrant and local workers under the control contract. *Treatment* × *Migrant* ($\hat{\beta}_3$) is the DiD: the difference in the treatment effect between migrant and local workers. Migrant workers are restricted to the off-site arm to ensure comparability with local workers, who are all off-site. The sample in each column is restricted to workers who received both the control arm and the relevant treatment arm. Question order fixed effects control for the order in which the two offers were presented to the worker. Right-censored is the share of offers rejected at every wage. Standard errors are clustered at the worker level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ingfully lower daily wages when the contract includes a protection, with the wage-equivalent value ranging from 12 to 29 INR per day depending on the treatment and residence arrangement. These WTA reductions are economically large: the insurance treatment alone represents a wage sacrifice of up to 4.9%, indicating substantial value attached to secure payment. The mediation and fallback-job results show that workers value both institutional recourse within the employment relationship and alternative employment at destination. These findings complement the firm-side evidence linking migrant WTP premia to perceived differences in worker voice, alongside outside employment options.

7 Matching

7.1 Design

The matching exercise connects firms' experimental hiring decisions and workers' job-acceptance decisions to realized employment relationships. We examine whether the migrant–local differences in reliability, unpaid hours, and per-hour productivity that firms value and workers anticipate also appear in real jobs, complemented by evidence from incumbent workers.

Placements are generated from the incentive-compatible draws in the firm and worker experiments. On the firm side, one contract is randomly selected and a wage is drawn. If the drawn wage is weakly below the firm's stated WTP for that contract, the firm is assigned to hire on those terms. On the worker side, one contract–wage combination is randomly selected from the worker's offer schedule. If the worker accepted that offer during the elicitation, the worker is assigned to take the job. The research team then matches successful firms and successful workers on compatible contract arms and coordinates the placement. In many cases, workers whose random draw didn't result in a job offer were also matched to ensure that we had sufficient sample size. Among workers who accepted the same contract at the same wage, those who migrated were younger, more educated, earned more, and were less likely to have taken a loan than those who did not migrate (Appendix A.7.2, Table A-14). This pattern suggests that placed migrants were less economically vulnerable, which may attenuate the migrant–local differences in reliability, unpaid work, and effort arising from employer power.

Workers migrated from their villages to Patna city. Upon reaching the city, the survey firm helped the workers in finding housing in the city and shared the rent for those whose offer had specified on-site residence. The firm paid the wage of its accepted offer and the worker received the wage of the worker's accepted offer; the research team paid the difference to the worker at the end of the placement, and in no placement did the firm's wage exceed the worker's. The guarantee offered to firms and the protections offered to workers were implemented as accepted, and firms were not told about workers' protections. Placements were offered as fifteen-day jobs, and either side could end them earlier.

During each placement, enumerators collect daily information from both sides of the match. Workers report whether they worked that day, start and end times, total hours worked, whether they were made to work beyond the agreed hours without extra pay, whether they were asked to do other work outside the agreed hours or duties, and whether any payment irregularities occurred. Firms separately report whether the worker turned up, the number of hours worked, and their assessment of the worker's work and behavior. This data was collected either on phone or by making visits to the work site. Surveys were attempted every day, on both sides, until the placement ended, so days worked counts every day the worker worked. These outcomes map directly into the three margins emphasized throughout the paper: days worked and attendance capture reliability; unpaid overtime, early or late work, and additional tasks capture unpaid extra work; and firm ratings together with the productivity module capture effort or productivity.

The final matching sample consists of 138 worker-contracts across 98 firms, including 50 local placements and 88 migrant placements. A few workers were placed twice, at their own request, after their first placement ended. Table 7 traces the path from the survey samples to these placements. Some firms which had accepted a contract but for which the random draw hadn't resulted in an offer were also matched with a worker. For this reason, the total number of matched firms (98) exceeds the number of firms for which the draw resulted in an offer (96). For additional details about the matching exercise, see Appendix C.3. For ethical reasons we match workers only on off-site contracts, and workers who were offered on-site contracts are also matched on off-site contracts.

Table 7: From Survey to Placement

	Surveyed	Offers made	Accepted ≥ 1	Draw $\rightarrow$ offer	Placed
Migrant workers	653	602	415	210	76
Local workers	272	253	201	81	49
Firms	234	234	227	96	98

Notes: Each cell counts individuals. *Surveyed* is the baseline survey sample; for firms the survey and the contract experiment take place in the same visit. *Offers made* counts workers who completed the job-offer experiment (the control contract and one treatment arm) and firms who completed the contract experiment. *Accepted* ≥ 1 counts those who accepted at least one contract–wage cell of the elicitation menu. *Draw* $\rightarrow$ *offer* counts those whose draw landed on an accepted cell, creating a binding offer. *Placed* counts unique workers and firms with at least one realized placement. The 76 migrant and 49 local workers account for 138 worker-contracts, as some workers were placed twice.

7.2 Results

We estimate, separately for each outcome,

$$Y_{i(d)} \;=\; \alpha + \beta\,\text{Migrant}_i + X_i'\gamma + \varepsilon_{i(d)},$$

where $Y_{i(d)}$ is the outcome for worker-contract i (Panel A) or worker-contract-day id (Panel B), Migrant_i is an indicator equal to one if the worker is a migrant, and X_i is a vector of worker-level covariates consisting of age, years of education, and an indicator for SC/ST caste status. The sample pools placements across all realized contract arms.

Table 8 presents the estimates. Standard errors are two-way clustered at the worker and firm level in both panels, capturing serial correlation within a worker's daily rows and correlation across workers placed with the same firm. Covariates are controlled for but not reported.

Panel A reports contract-level outcomes: i) the total number of days the worker turned up at the site; ii) if the worker reports being made, on any day of the contract, to do more than eight hours of work without extra pay; iii) and if the worker reports being asked, on any day, to do other work outside the agreed hours or duties. Panel B reports contract-day outcomes: i) the worker's gross self-reported hours of work on the day; ii) the firm's gross reported hours of work on the day; iii) the number of hours of work beyond eight on the day; iv) the firm's rating of the day's

work on a 1–10 scale where lower is better; and v) the firm's rating of the worker's behavior on a 1–5 scale where lower is better.

Table 8: Matching Outcomes: Migrants vs Local Workers

	(1)	(2)	(3)	(4)	(5)
Panel A: Contract-level outcomes					
	Days worked	Any day >8 hrs	Any extra task		
Migrant	1.681***	0.175**	0.075*		
	(0.446)	(0.084)	(0.044)		
Observations	138	138	138		
Control mean (local)	1.62	0.22	0.02		
Covariates	✓	✓	✓		
Panel B: Contract-day outcomes					
	Daily hours	Daily hours (Firm)	Excess hours	Work rating	Behaviour rating
Migrant	0.169**	0.177**	0.103**	-0.087	-0.086
	(0.076)	(0.079)	(0.042)	(0.399)	(0.140)
Observations	369	361	378	362	361
Control mean (local)	8.05	7.89	0.10	2.92	2.16
Covariates	✓	✓	✓	✓	✓

Notes: The table reports estimates from the regression $Y_{i(d)} = \alpha + \beta\,\text{Migrant}_i + X_i'\gamma + \varepsilon_{i(d)}$, where Migrant_i is an indicator equal to one if the worker is a migrant and zero if a local. Worker-level covariates in X_i are age, years of education, and an indicator for SC/ST caste status (controlled for but not shown). Panel A outcomes are constructed at the worker-contract level (one observation per matching): (1) total days the worker turned up at the site over the contract, where a day with fewer than three hours of work still counts as a turn-up day; (2) an indicator for any day on which the firm made the worker do more than eight hours of work without extra pay, based on worker self-reports; (3) an indicator for any day on which the worker was asked to do other work outside the agreed hours or duties. Panel B outcomes are constructed at the worker-contract-day level: (1) gross hours of work as self-reported by the worker; (2) gross hours of work as reported by the firm; (3) hours of work extracted beyond eight on the day, set to zero on days when the firm did not extract extra work; (4) the firm's rating of the day's work on a 1–10 scale where lower values are better; (5) the firm's rating of the worker's behavior on a 1–5 scale where lower values are better. Standard errors are two-way clustered at the worker and firm level in both panels. Control mean refers to the mean of the outcome for local workers in the estimation sample. Covariates checkmark indicates that age, education, and SC/ST status are included. The sample pools placements across all realized contract arms.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The Panel A estimates indicate that, conditional on covariates, migrant workers turn up for substantially more days of their contracts than local workers: migrants work 1.7 more days than locals (on a local-worker mean of 1.6 days), statistically significant at the 1% level. No place-

ment ran the full fifteen days, and most ended within a few days, mostly because the worker stopped coming. This greater retention is consistent with the framework, in which reliability can reflect worker circumstances and monopsony power arising from outside employment opportunities at the destination and institutional protection. Migrants are also more likely to experience at least one day of the contract on which the firm extracts more than eight hours of work (an 18 percentage-point increase over a local mean of 22%), and more likely to be asked to perform tasks outside the scope of the agreed work (an 8 percentage-point increase on a local mean near zero). The hours-extension effect is significant at the 5% level and the extra-task effect at the 10% level, and both run in the direction predicted by the worker and firm belief evidence.

Panel B reinforces the Panel A story with within-day outcomes. Migrants work 0.17 more hours per day than locals by their own report (on a local mean of 8.0 hours), a gap mirrored in firms' independent reports of daily hours (0.18 more hours). They are also made to work 0.10 additional unpaid hours per day beyond the agreed eight-hour workday (on a local mean of 0.10 hours); the worker-reported daily hours, the firm-reported daily hours, and the excess-hours effects are all statistically significant at the 5% level. Firms' ratings of migrant workers' work and behavior, by contrast, are small and statistically indistinguishable from those given to locals—differences of roughly 0.1 points on the 1–10 work-rating and 1–5 behavior scales (local means of 2.92 and 2.16). The matching data thus provide no evidence that firms judge migrants' output more harshly, even as migrants supply more days and more hours. Read alongside the firm decomposition in Section 5.5, the matching patterns align directionally with all three WTP channels: days completed with the disruption-cost wedge, excess hours with the excess-work wedge, and the productivity results below with the effort residual.

Two caveats are important for interpreting these patterns. First, the matching sample is modest in size. Second, all realized placements are off-site, so the matching exercise does not directly test the on-site residence channel. The matching results therefore provide evidence on whether migrant–local differences appear in realized off-site employment relationships. Within that scope, the patterns in Table 8 are consistent with the three margins emphasized throughout the paper: migrants complete more contract days, are asked to supply more unpaid extra work, and receive firm assessments that are at least as favorable as those of local workers.

7.3 Evidence from Incumbent Workers

We complement the matching exercise with a survey of workers employed at construction sites operated by firms in our main experimental sample. Because we observe rather than assign these ongoing employment relationships, the survey allows us to study worker–firm behavior in a more natural setting and under both residence arrangements. The sample consists of 417 worker-day observations on 62 workers employed by 35 firms. We estimate the migrant–local and on-site–off-site gaps using the same worker-level controls as above and cluster standard errors two-way by worker and firm.

Table 9, Panel A, reports the migrant–local comparison. Migrants work 0.98 more hours per

day than locals, relative to a local mean of 7.90 hours. This gap, equivalent to approximately twelve percent of the local mean, is statistically significant at the one percent level. Because migrants and locals may sort into different firms, columns (3) and (4) restrict the sample to the 9 firms that employ both groups and include firm fixed effects. The estimated gap falls to 0.56 hours but remains statistically significant. Columns (2) and (4) control for compensation paid in addition to the daily wage. The estimated hours gap falls by approximately half in the pooled specification but remains essentially unchanged within firms, indicating that the additional hours supplied by migrants are not merely the counterpart of higher agreed compensation.

Panel B examines differences by residence arrangement. On-site workers supply 0.88 more hours per day than off-site workers, relative to an off-site mean of 8.22 hours. A similar gap appears when the sample is restricted to migrants (column 3), indicating that the association is not driven solely by the disproportionate representation of migrants among on-site workers. On-site workers are also more likely to report that the firm extracted work beyond what had been agreed.

Taken together, these results show that migrant status and on-site residence are both associated with longer working days in ongoing employment relationships. The additional hours worked by migrants are greater among incumbent workers than in our matched sample. We interpret this difference as reflecting the distinct stages of the employment relationship captured by the two samples. Estimates from the matched sample represent the average short-run difference associated with migrant status, whereas estimates for incumbent workers represent the longer-run difference. The latter may capture both selection—because some workers leave early in the employment relationship—and the gradual internalization of workplace norms among those who remain. Some of the difference between the two samples may also arise because workers in the matched sample were placed by our research team rather than by a labor intermediary, which may have made firms less willing to impose unusually long working hours and thereby attenuated the estimated migrant–non-migrant difference.

7.4 Productivity

The decomposition in Section 5 attributes roughly 33.1% of the migrant–local willingness-to-pay gap to per-hour productivity. We use the matching exercise to examine whether realized on-the-job productivity is consistent with this interpretation. For each placed worker, an enumerator conducts an approximately two-hour worksite observation on the first or second day of the placement; workers who left before the visit have no observation, and no worker was observed twice. During this observation, the enumerator records the main productive activities performed by the worker—bricks carried, bricks passed to the mason, bowls of plaster delivered, and sand bags lifted—along with the duration of each activity, the distance associated with each task, and time spent idle, on break, or interrupted. Firms are informed in advance that an observer will be present, so the measure captures behavior under anticipated observation rather than a response to surprise monitoring.

Table 9: Daily Hours and Extra Work Among Incumbent Workers

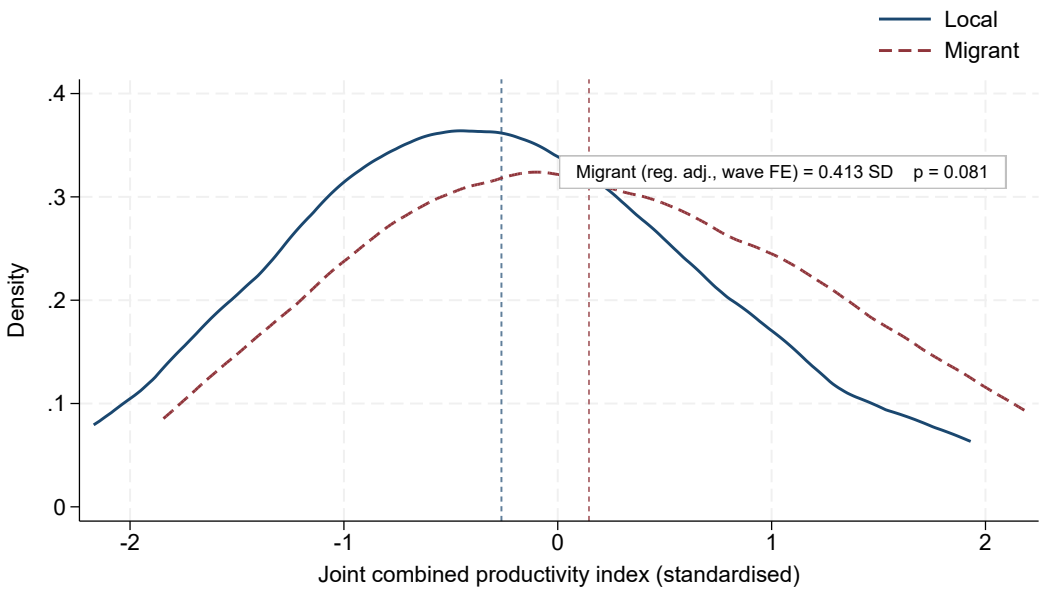
	(1)	(2)	(3)	(4)	(5)
Panel A: Migrant versus local workers					
	Daily hours worked				Extra work
Migrant	0.979***	0.550***	0.559**	0.568**	0.134
	(0.326)	(0.167)	(0.187)	(0.188)	(0.108)
Observations	417	417	125	125	418
Control mean (local)	7.90	7.90	8.19	8.19	0.15
Controls	✓	✓	✓	✓	✓
Extra pay control		✓		✓	
Firm FE			✓	✓	
Panel B: On-site versus off-site workers					
	Daily hours worked				Extra work
On-site	0.882**	0.353*	0.881*	0.315	0.215*
	(0.407)	(0.179)	(0.463)	(0.245)	(0.111)
Observations	417	417	291	291	418
Control mean (off-site)	8.22	8.22	8.47	8.47	0.16
Controls	✓	✓	✓	✓	✓
Extra pay control		✓		✓	
Sample	All	All	Migrant	Migrant	All

Notes: The sample consists of workers already employed at construction sites operated by firms in the main experimental sample. The unit of observation is the worker-day. *Daily hours* are computed from start and end times recorded at the site; *Extra work* is an indicator for the worker reporting that the firm extracted more work than agreed. Panel A reports the coefficient on an indicator for the worker being a migrant, as classified by the firm; Panel B reports the coefficient on an indicator for the worker residing at or near the site. Controls are worker age, years of education, and an indicator for SC/ST status. *Extra pay control* indicates that the amount of additional compensation paid for extra work is included as a regressor. *Firm FE* columns absorb firm fixed effects and are restricted to the 9 firms employing both migrants and locals. In Panel B, *Sample* indicates whether the column is estimated on all workers or on migrants only. Standard errors are two-way clustered at the worker and firm level. The extra-work columns have one more observation than the hours columns because a single worker-day with an implausible start–end record is excluded from the hours measure. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We combine these observations into a single productivity index following Brown and Haroon (2025). The index is the average of two standardised components: a task-quality composite that aggregates per-minute, effort-weighted task rates across the four measured activities, and an engagement measure based on the share of observed time not spent idle, on break, or interrupted. Appendix Section A.7.1 describes the construction in detail, including the effort weights, treatment of dead time, and the imputation procedure for workers with no measured task. Appendix Figure A-23 reports bivariate correlations between the index and its components.

Figure 18 plots the distribution of the combined productivity index by worker type. The migrant distribution is shifted to the right of the local distribution. In a regression of the standardized index on a migrant indicator, controlling for age, years of education, SC/ST status, and survey-wave fixed effects, with standard errors clustered at the firm level, the migrant coefficient is 0.413 standard deviations ($p = 0.081$). The point estimate is positive, directionally consistent with the effort/productivity channel in the firm-side decomposition, and marginally significant at the 10% level. Given the sample size, the productivity evidence should nevertheless be interpreted as suggestive rather than definitive.

Figure 18: Distribution of combined on-the-job productivity index by worker type



Notes: Kernel densities of the standardised combined productivity index for local (solid navy) and migrant (dashed maroon) placed workers. The index is the unweighted mean of two standardised components, pooled across the two survey waves: a task-quality composite built from per-minute effort-weighted rates across four measured tasks (bricks carried, bricks passed, plaster delivered, sand bags lifted), and an engagement share equal to the fraction of observed stage time the worker was not idle, on break, or interrupted. Construction details are in Appendix Section A.7.1. The annotation reports the migrant coefficient and p-value from a regression of the standardised index on a migrant indicator with age, years of education, an SC/ST status indicator, and a survey-wave fixed effect, clustered at the firm level. Sample: 115 placed workers (41 local, 74 migrant) with a productivity observation.

8 Conclusion

This paper investigates firms' preferences for migrant versus local workers and the mechanisms shaping these preferences. We hypothesize that greater monopsony power over migrants, arising from their weaker outside employment opportunities and more limited recourse to state and non-state institutions, can drive these preferences. Alongside differences in worker characteristics, greater monopsony power can allow firms to obtain more labor input along three margins:

reliability, unpaid hours, and productivity per hour. Our conceptual framework shows how these differences in labor input can lead firms to pay migrants a higher daily wage than locals, connecting migrant labor demand to monopsony and labor discipline (Manning, 2003; Caldwell et al., 2026; Shapiro and Stiglitz, 1984).

Using incentive-compatible field experiments with construction firms and workers in Patna, India, we find a strong revealed preference for migrant labor. At the prevailing market wage, firms are about 79% more likely to hire a migrant worker than a local worker, and their average WTP is 13.9% higher for a migrant. The WTP premium is higher when firms have the option to house workers on-site, which may increase worker reliability and expand firms' scope to obtain unpaid hours. This preference also operates through screening at recruitment: firms are substantially more likely to be willing to hire a migrant while refusing to hire a local for the same job at any wage than to exhibit the reverse preference. This suggests that local workers may remain unemployed even if their reservation wages are similar to those of migrants, helping explain why labor shortages and local unemployment may coexist (Caldwell et al., 2026).

We decompose firms' WTP premium for migrants into three sources of firm value. Reliability, defined as lower absenteeism and reneging risk, accounts for 39.2% of the premium (Varun, 2026; Goraya et al., 2025). Unpaid hours, defined as uncompensated labor beyond the agreed workday, account for 27.7%. Per-hour productivity accounts for the remaining 33.1%. Unpaid hours are obtained from ex-post violations of contractual agreement and are due to greater monopsony power over migrants. Reliability and per-hour productivity may reflect both migrants' weaker bargaining position and differences in worker characteristics. Incentivized beliefs support these mechanisms: firms expect migrants to be more reliable, more willing to supply unpaid overtime, and more productive per hour, while having weaker outside employment opportunities, less network support, and more limited recourse in disputes.

Firms that perceive migrants as having weaker recourse report larger migrant WTP premia after accounting for perceived differences in outside employment opportunities and worker ability. These cross-firm associations support a role for institutional sources of monopsony power alongside outside employment opportunities. To examine whether these patterns extend beyond informal construction, we survey hiring managers at a staffing company recruiting for large firms in manufacturing, delivery, and retail. Respondents report a client preference for migrants and expect migrants to be more reliable and more willing to supply unpaid work. The largest perceived differences concern collective action: managers expect migrants to be substantially less likely to join unions or strike, suggesting that weaker collective representation may provide an additional source of employer power.

The worker experiments show how these employment risks enter the valuation of destination jobs. Workers recognize migrants' disadvantages but expect fewer migrants to accept unpaid work and more to quit or seek outside recourse than firms do. These differences suggest a channel through which optimistic expectations may distort marginal migration decisions. In real job offers requiring migration, workers are willing to forgo substantial wages for payment insurance,

dispute mediation, and guaranteed alternative employment. Payment insurance alone is valued at up to 29 INR per day (4.9%). These wage-equivalent valuations show that institutional recourse and outside employment options matter for workers' assessment of destination jobs, complementing the firm-side evidence on the value of employment relationships with limited worker recourse.

Job placements based on offers accepted by both firms and workers link these valuations and expectations to realized employment outcomes. In these placements, migrants complete more contract days and supply more unpaid hours than locals. Migrants also score higher on the measured per-hour productivity index. A complementary observational survey of incumbent workers documents larger migrant–local differences in daily hours worked than those observed in the placements.

These findings connect employer demand for migrant labor to the distribution of migration gains. Employment conditions that increase firms' returns to hiring migrants may reduce the attractiveness of destination jobs to workers. Weak contract enforcement may therefore sustain employer demand while discouraging migration at the margin. Spatial wage differences alone may overstate workers' net returns when destination employment entails unpaid labor, payment risk, and limited recourse. Understanding these conditions is consequently relevant both to the division of surplus within employment relationships and to the spatial allocation of labor.

Policies that reduce migration costs may need to be complemented by protections governing destination employment. Portable public entitlements and access to alternative employment can strengthen workers' outside options, while accessible dispute resolution and enforcement of wage and working-time commitments can strengthen their ability to contest contractual violations. Such protections can make migration more attractive while also changing firms' returns to employing migrants. Their effects on wages, employment, and migration will therefore depend on responses on both sides of the labor market. Establishing the equilibrium incidence of these interventions is an important direction for future research.

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Part I

Appendix

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A Additional Results

A.1 Internal Migration

Table A-1: Internal migration in India and Bihar (Census 2011)

	Total (thousands)	Male (thousands)	Female (thousands)
Panel A: India			
All internal migrants	449,917	143,468	306,450
Within-state	395,653	119,598	276,055
Interstate	54,265	23,870	30,395
Work/employment migrants	41,423	35,017	6,406
Within-state	28,275	23,254	5,021
Interstate	12,553	11,258	1,295
Panel B: Bihar (interstate out-migration)			
Interstate out-migrants	7,454	3,852	3,602
Work/employment	2,265	2,117	148
Panel C: Bihar (within-state)			
Within-state migrants	25,728	3,629	22,099
Work/employment	641	488	153
In-migrants from other states	1,112	164	948
Panel D: Top destinations for Bihar migrants			
Jharkhand	1,336	533	803
NCT of Delhi	1,107	663	443
West Bengal	1,104	578	525
Uttar Pradesh	1,073	293	779
Maharashtra	569	389	179

Notes: The table reports internal migration statistics from the Census of India 2011, Migration Tables D-02 and D-03 (Census of India (2011)). A migrant is defined as a person whose place of last residence differs from the place of enumeration. "Within-state" refers to migrants whose last residence was within the same state; "interstate" refers to those whose last residence was in a different state. Work/employment migrants are those who reported work or employment as their primary reason for migration. Panel B reports Bihar residents enumerated in other states (out-migrants). Panel C reports migrants enumerated within Bihar. Panel D reports the five states where the largest number of Bihar out-migrants were enumerated. All counts are in thousands.

A.2 Firm Sampling

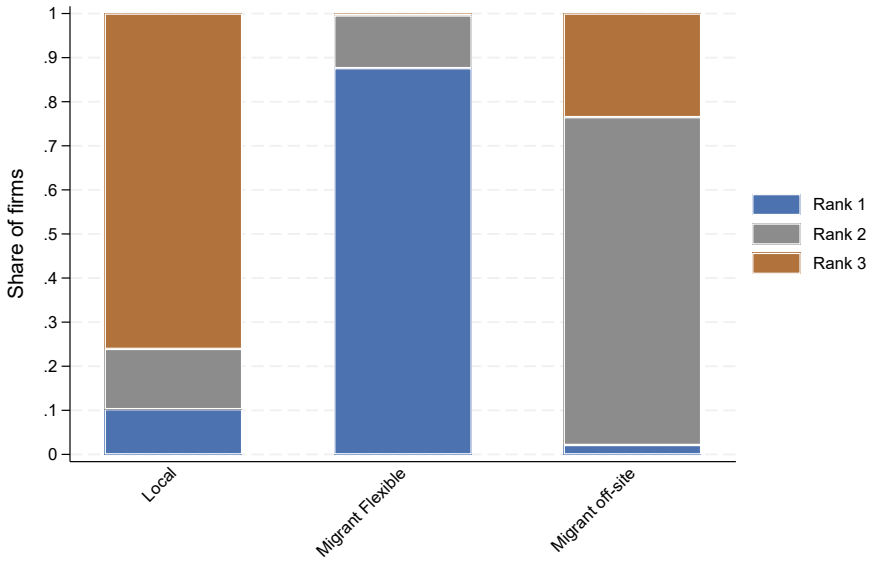
Table A-2: Summary stats of listed firms

	Mean	SD	N
Age of respondent	42.10	10.02	664
Years of education of respondent	7.13	4.41	644
Age of Firm	15.06	9.23	650
Hired worker from another district in the past	0.83	0.38	647
No of operational sites	3.11	2.21	658
No of Permanent Workers	7.63	12.82	637
Daily Wage (Local) (INR)	533.59	60.37	629
Daily Wage (Migrant) (INR)	527.15	70.47	606
Firm is registered	0.13	0.34	633

Notes: The table reports summary statistics for firms reached in the listing survey, conducted prior to the experiment to enumerate the universe of construction firms operating in Patna. The listing survey was administered both by phone and in person and collected basic information on firm characteristics. The experimental sample is drawn from the firms successfully listed here; larger firms are oversampled in the experimental sample. Number of observations may vary across rows due to item non-response.

A.3 Firm Experiment

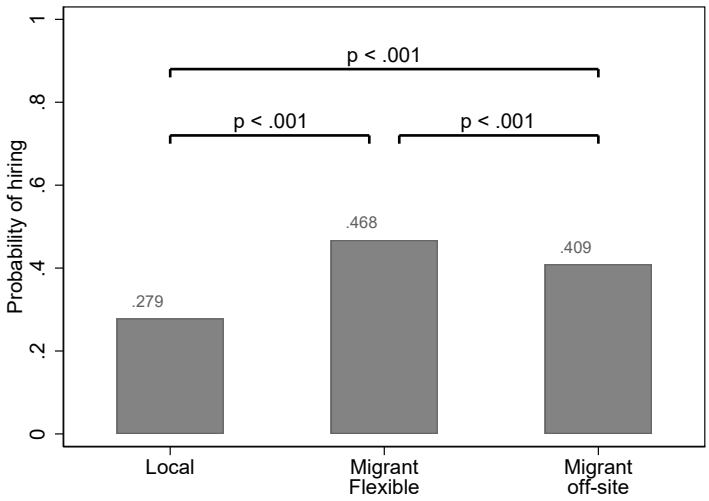
Figure A-1: Preference order for contracts



Notes: The figure shows firms' stated (non-incentivized) preference rankings over the three experimental contracts. For each contract, the bars show the share of firms that ranked it first, second, etc. The three contracts are the non-guaranteed local, migrant flexible, and migrant off-site contracts. Rankings were elicited after the incentivized WTP and hiring decisions.

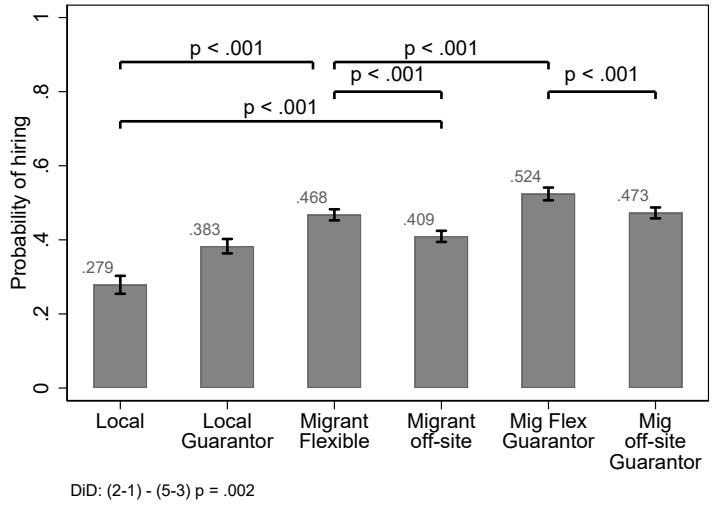
A.3.1 Demand across the wage schedule

Figure A-2: Demand for local versus migrants



Notes: The figure plots firms' demand (probability of hiring) averaged over the five offered wages for three contract types: local (no-guarantor), migrant flexible (no-guarantor), and migrant off-site (no-guarantor). Results are estimated from Eq. 5.1 with firm and wage fixed effects. Each point is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level.

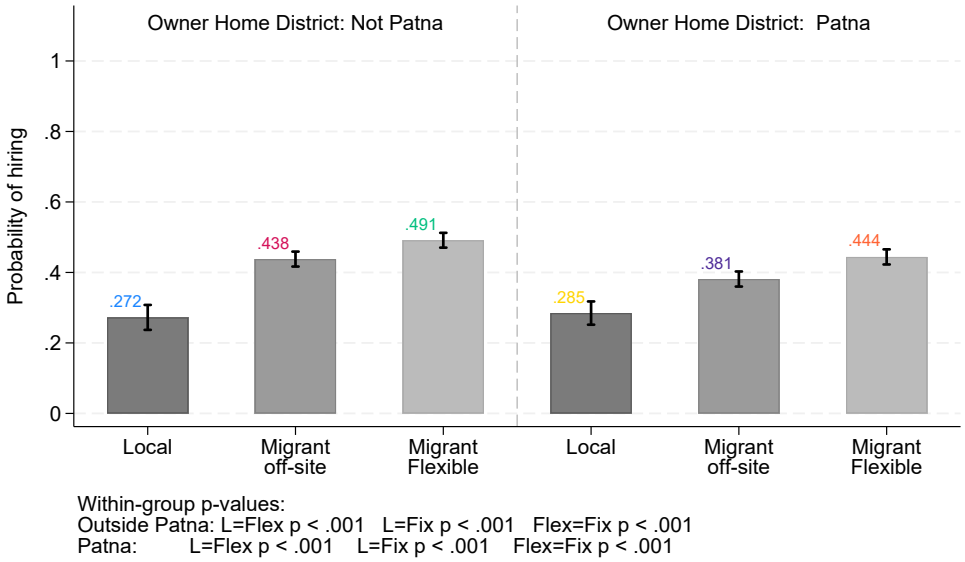
Figure A-3: Demand for all contracts



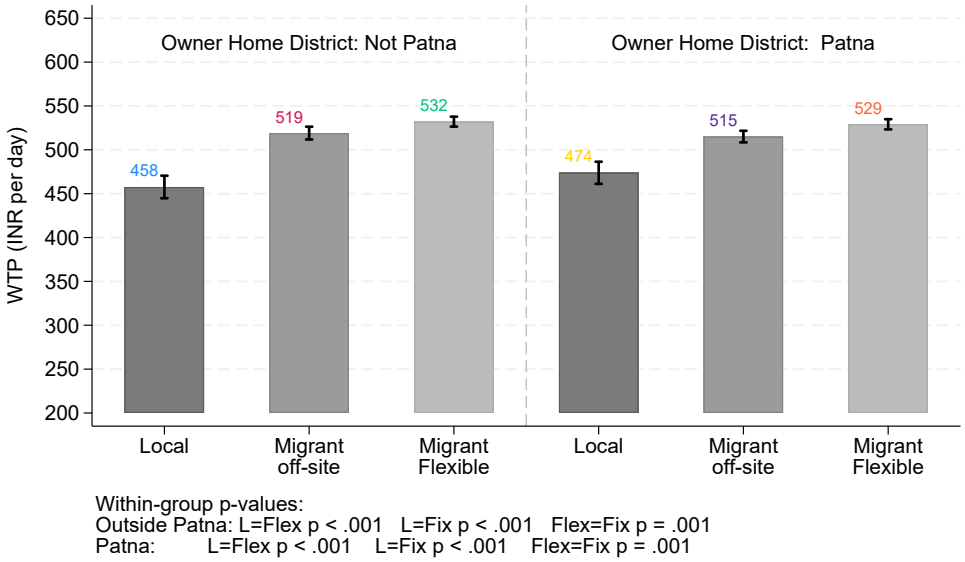
Notes: The figure plots firms' demand (probability of hiring) averaged over the five offered wages for all six experimental contracts: local (no-guarantor), local (guarantor), migrant flexible (no-guarantor), migrant flexible (guarantor), migrant off-site (no-guarantor), and migrant off-site (guarantor). Results are estimated from Eq. 5.1 with firm and wage fixed effects. Each point is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level.

A.3.2 Heterogeneity

Figure A-4: Heterogeneity by Firm owner Origin



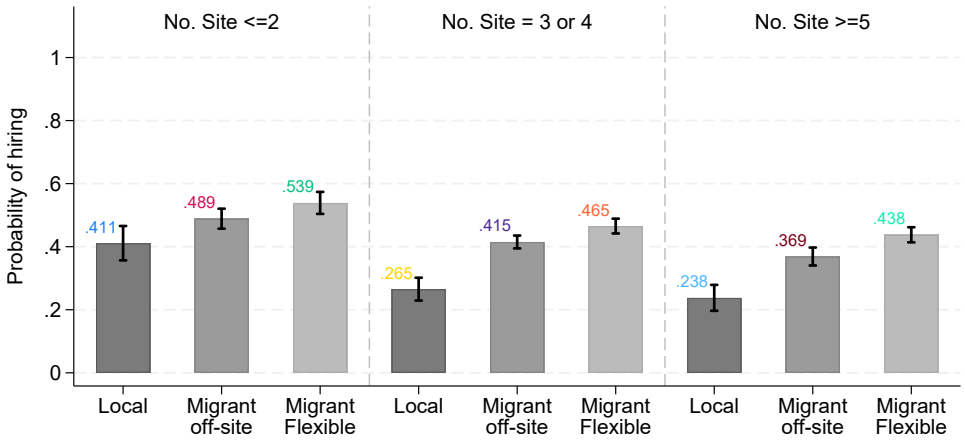
(a) Demand across the wage schedule



(b) WTP

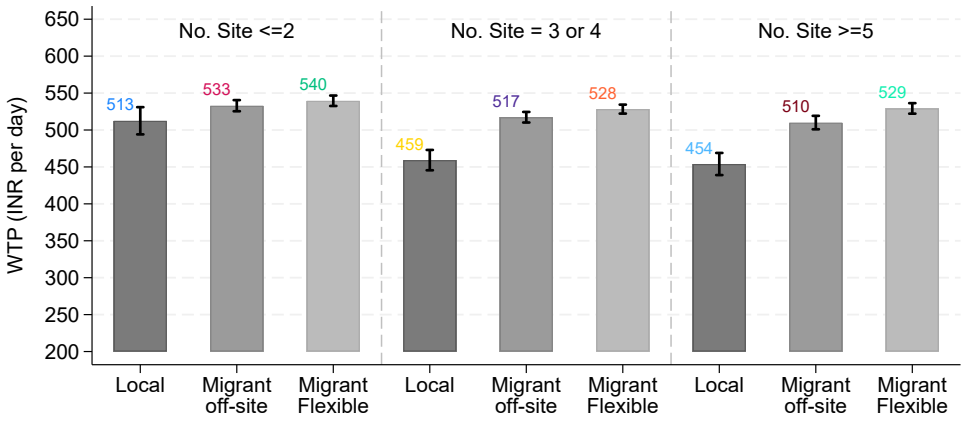
Notes: The figure shows heterogeneity in firms' demand by whether the firm owner's home district is Patna or outside Patna. Panel (a) plots the probability of hiring averaged over the five offered wages; Panel (b) plots the firm's WTP (with refusals set to INR 350). Within each group, three contract arms are shown: local (no-guarantor), migrant off-site (no-guarantor), and migrant flexible (no-guarantor). Results are estimated from Eq. 5.1 separately for each subgroup, with firm, question-order and wage fixed effects. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. Within-group p-values for pairwise comparisons are reported in the figure notes.

Figure A-5: Heterogeneity by Number of Sites



No. Site <=2: L=Fix p = .041 L=Flex p = .002 Fix=Flex p = .02
No. Site = 3 or 4: L=Fix p < .001 L=Flex p < .001 Fix=Flex p < .001
No. Site >=5: L=Fix p < .001 L=Flex p < .001 Fix=Flex p = .001
DiD: Local-Flex (site <=2 vs site 3-4): .072 p = .12
DiD: Local-Flex (site <=2 vs site >=5): .072 p = .125

(a) Demand across the wage schedule

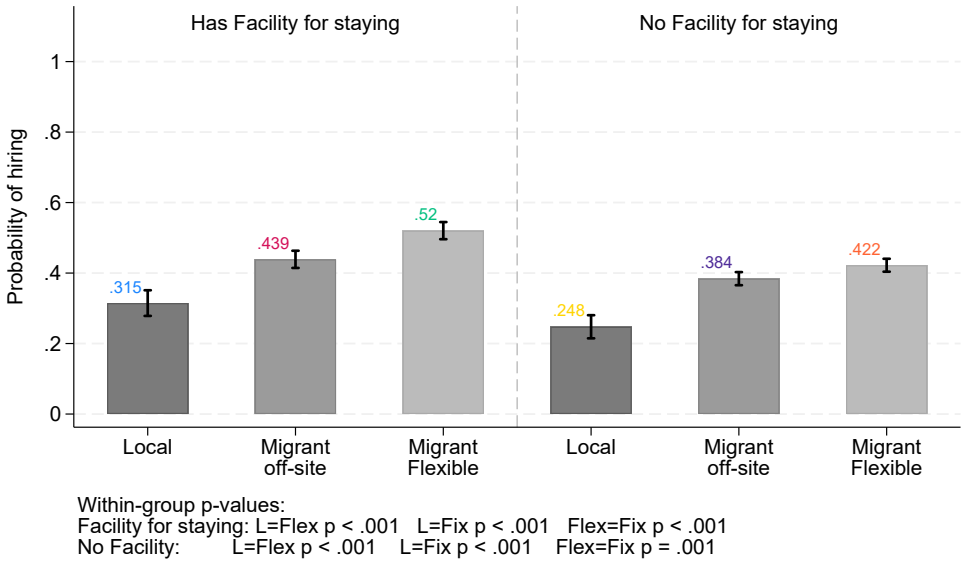


No. Site <=2: L=Fix p = .098 L=Flex p = .029 Fix=Flex p = .033
No. Site = 3 or 4: L=Fix p < .001 L=Flex p < .001 Fix=Flex p = .002
No. Site >=5: L=Fix p < .001 L=Flex p < .001 Fix=Flex p = .001
DiD: Local-Flex (site <=2 vs site 3-4): 41.982 p = .006
DiD: Local-Flex (site <=2 vs site >=5): 48.194 p = .002
DiD: Local-Flex (site 3-4 vs site >=5): 8.185 p = .227

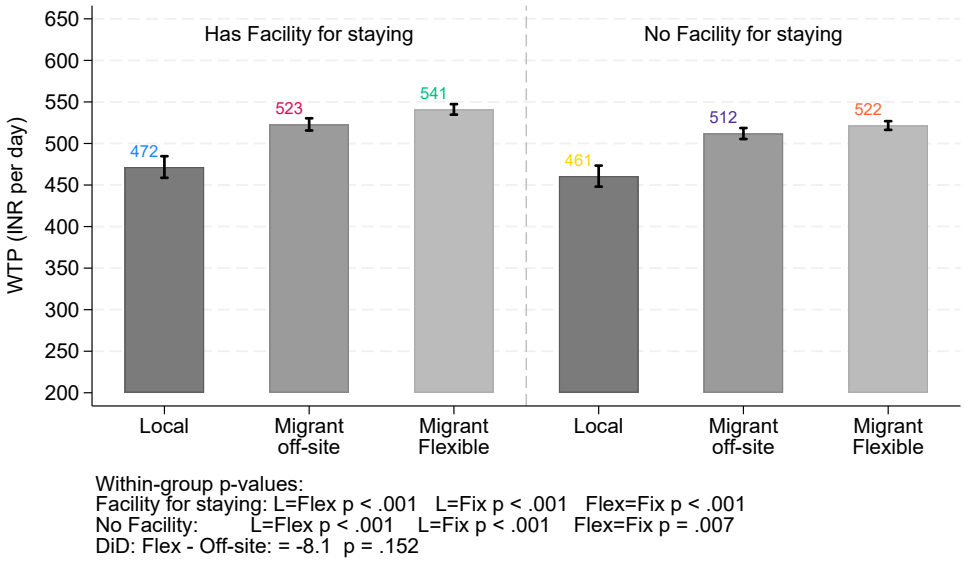
(b) WTP

Notes: The figure shows heterogeneity in firms' demand by the number of active construction sites operated by the firm (site category: 1–2 sites, 3–4 sites, 5 or more sites). Panel (a) plots the probability of hiring averaged over the five offered wages; Panel (b) plots the firm's WTP (with refusals set to INR 350). Within each site-category group, three contract arms are shown: local (no-guarantor), migrant off-site (no-guarantor), and migrant flexible (no-guarantor). Results are estimated from Eq. 5.1 separately for each subgroup, with firm, question-order and wage fixed effects. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. Within-group p-values for pairwise comparisons and difference-in-differences p-values across site categories are reported in the figure notes.

Figure A-6: Heterogeneity: Firm has facility for residence



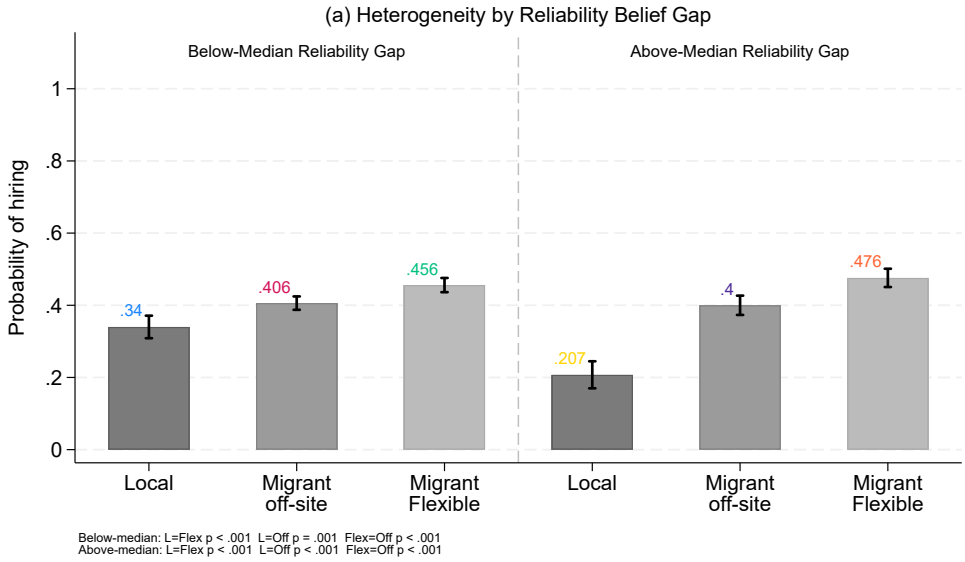
(a) Demand across the wage schedule



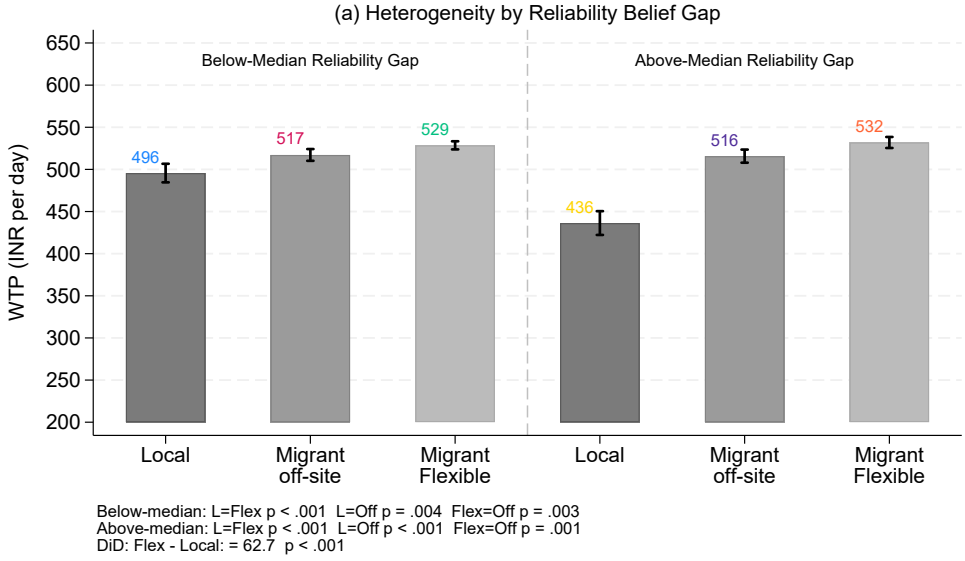
(b) WTP

Notes: The figure shows heterogeneity in firms' demand by whether the firm has a facility to house workers at the construction site. Panel (a) plots the probability of hiring averaged over the five offered wages; Panel (b) plots the firm's WTP (with refusals set to INR 350). Within each group (has facility / no facility), three contract arms are shown: local (no-guarantor), migrant off-site (no-guarantor), and migrant flexible (no-guarantor). Results are estimated from Eq. 5.1 separately for each subgroup, with firm, question-order and wage fixed effects. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. Within-group p-values for pairwise comparisons are reported in the figure notes.

Figure A-7: Heterogeneity in beliefs about reliability



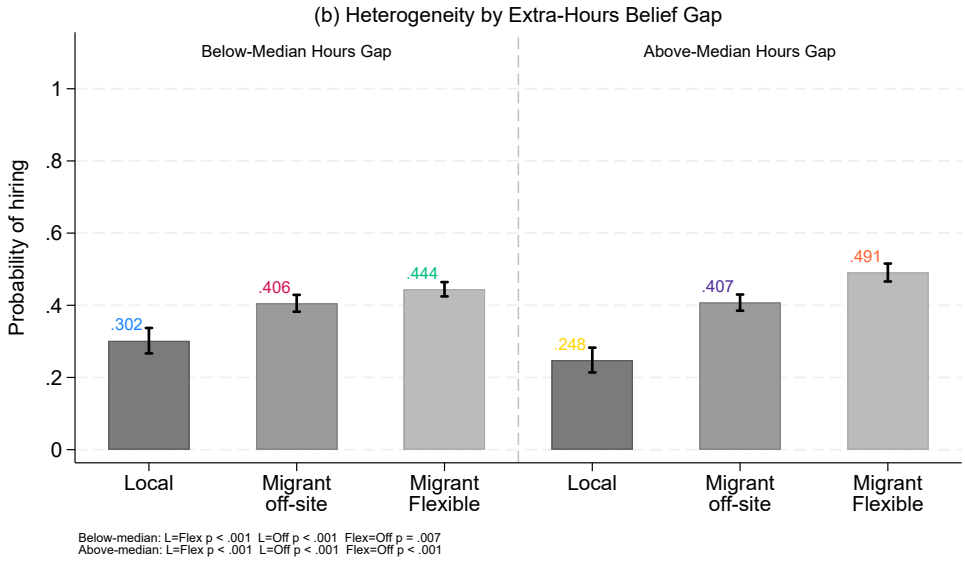
(a) Demand across the wage schedule



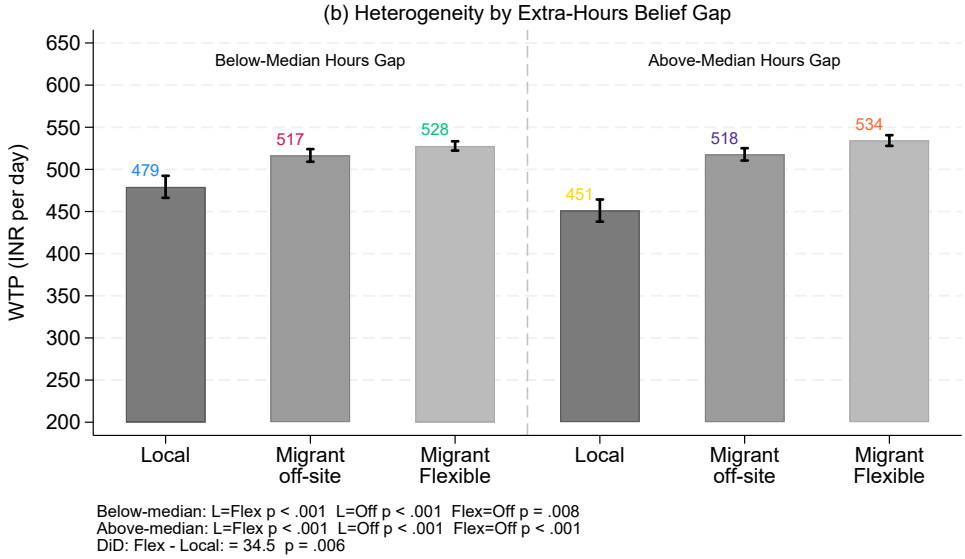
(b) WTP

Notes: The figure shows heterogeneity in firms' demand by the intensity of their beliefs about the reliability advantage of migrant workers over locals. The reliability belief gap is a composite z-score averaging the believed gap in absence days and the believed gap in reneging (number leaving before job completion) between on-site migrants and local workers. Firms are split at the median of this composite. Panel (a) plots the probability of hiring averaged over the five offered wages; Panel (b) plots the firm's WTP (with refusals set to INR 350). Within each group (below-median / above-median reliability gap), three contract arms are shown: local (no-guarantor), migrant off-site (no-guarantor), and migrant flexible (no-guarantor). Results are estimated from Eq. 5.1 separately for each subgroup, with firm, question-order and wage fixed effects. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. Within-group p-values for pairwise comparisons are reported in the figure notes.

Figure A-8: Heterogeneity in beliefs about extra hours



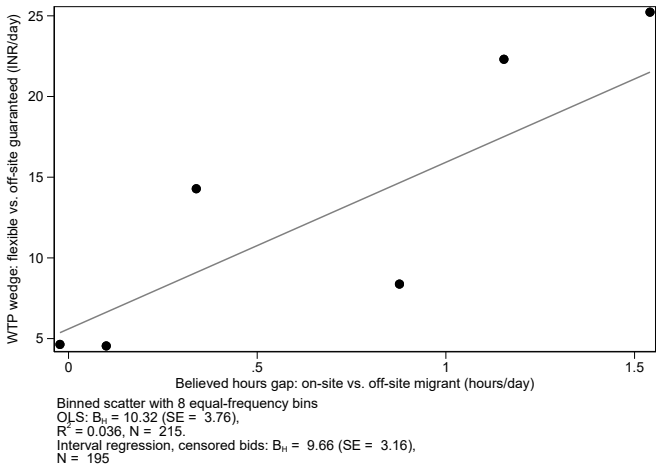
(a) Demand across the wage schedule



(b) WTP

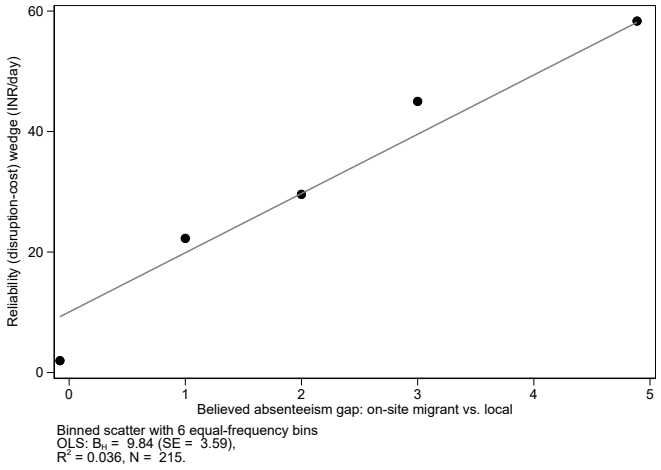
Notes: The figure shows heterogeneity in firms' demand by the intensity of their beliefs about the extra-hours advantage of migrant workers over locals. The extra-hours belief gap is a composite z-score averaging the believed gap in willingness to work an unpaid extra hour and the believed gap in daily hours worked between on-site migrants and local workers. Firms are split at the median of this composite. Panel (a) plots the probability of hiring averaged over the five offered wages; Panel (b) plots the firm's WTP (with refusals set to INR 350). Within each group (below-median / above-median extra-hours gap), three contract arms are shown: local (no-guarantor), migrant off-site (no-guarantor), and migrant flexible (no-guarantor). Results are estimated from Eq. 5.1 separately for each subgroup, with firm, question-order and wage fixed effects. Each bar is the sum of the control mean and the relevant regression coefficient. Standard errors are clustered at the firm level. Within-group p-values for pairwise comparisons are reported in the figure notes.

Figure A-9: Estimating the INR Value of One Additional Expected Hour



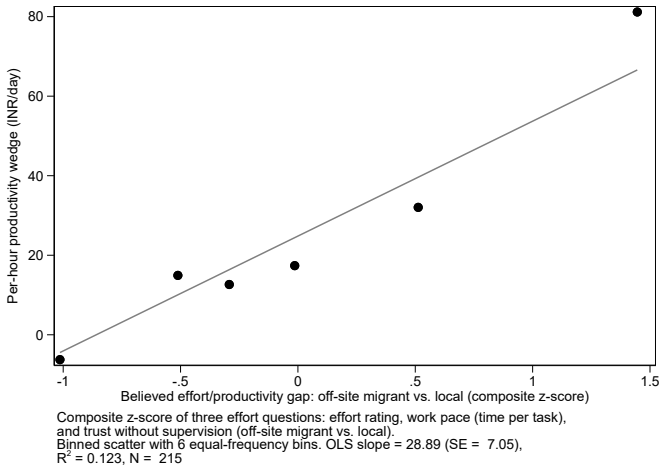
Notes: The figure plots the relationship between the believed hours gap and the WTP wedge used to estimate $\widehat{\beta}_H$. The x-axis measures the firm's believed difference in effective hours per day between on-site and off-site migrant workers. The y-axis measures the firm's WTP wedge between the flexible guaranteed and off-site guaranteed contracts ($EH_i \equiv \omega_{iMFG} - \omega_{iMOG}$), which isolates the value of on-site residence net of disruption insurance. Each point represents the mean of an equal-frequency bin (8 bins). The slope, $\widehat{\beta}_H$, is the estimated INR value of one additional expected effective hour per day. The figure also reports an interval regression of the same wedge on the same belief gap that treats a refused contract as valued below the lowest wage the firm faced (INR 450, or INR 500 on the wage ladder) and a yes at the top of the ladder as a value of INR 600 or more, rather than setting refusals to INR 350; firms whose wedge is then unbounded, because both contracts were refused or both were accepted at the top of the ladder, drop out. Standard errors are robust.

Figure A-10: Relationship between the reliability (disruption-cost) wedge and beliefs about absenteeism



Notes: The figure plots the relationship between the believed absenteeism gap and the disruption-cost wedge DW_i. The x-axis measures the firm's believed difference in absent days (out of 7) between local and migrant on-site workers, with positive values indicating that the firm expects locals to be absent more often. The y-axis measures the firm's disruption-cost wedge $DW_i \equiv (\omega_{iLG} - \omega_{iL}) - (\omega_{iMFG} - \omega_{iMF})$, which captures the extent to which the guarantee compresses the migrant–local hiring gap. A positive DW_i indicates that the guarantee is more valuable for local than for migrant workers, consistent with firms perceiving migrants as more reliable. Each point represents the mean of an equal-frequency bin (6 bins); the regression line is estimated by OLS on the underlying data with robust standard errors.

Figure A-11: Relationship between the Effort wedge and beliefs about effort



Notes: The figure plots the relationship between firms' beliefs about migrant–local effort/productivity differences and the per-hour productivity component of the migrant–local WTP wedge. The y-axis is the firm's per-hour productivity wedge, $\text{Effort}_i \equiv (\omega_{iMOG} - \omega_{iLG}) - \widehat{\beta}_H\,(h_{iMO} - h_{iL})$: the WTP premium for an off-site migrant over a local worker, both under the guarantee (so disruption risk is insured), net of the believed effective-hours difference valued at the estimated hourly price $\widehat{\beta}_H$ (Figure A-9). It isolates the per-hour productivity channel of the WTP decomposition. The x-axis is a composite z-score that averages the believed off-site-migrant-minus-local gap across three effort questions—effort/work-pace rating (1–10), work pace (time to complete a standardized task, where higher means slower, so the gap is reversed), and trustworthiness without supervision (out of 10)—each standardized across firms; positive values indicate that the firm perceives migrants as more productive. Each point represents the mean of an equal-frequency bin (6 bins); the regression line is estimated by OLS on the underlying data with robust standard errors. Because the effort wedge is a constructed residual—it nets the hours channel out of the productivity premium rather than coming from a single contract contrast—the slope is descriptive (validating that the residual labeled "effort" co-moves with firms' stated effort beliefs) rather than a structural price.

Table A-3: Decomposition of the migrant–local WTP gap under alternative weights and censoring

	Unpaid hours (% of gap)	Per-hour productivity (% of gap)	Reliability (% of gap)	Total gap (INR/day)
(1) Main estimate	27.7	33.1	39.2	65
	(5.8)	(7.2)	(5.5)	(5.3)
(2) Sampling-weighted	26.3	41.9	31.8	53
	(5.9)	(8.5)	(6.6)	(6.1)
(3) Employment-weighted	34.3	38.0	27.7	58
	(7.9)	(9.7)	(7.4)	(7.6)
(4) Tobit, censored bids	28.1	30.8	41.1	46
	(5.5)	(6.3)	(5.9)	(5.2)

Notes: The table reports the decomposition of the migrant–local WTP gap in Figure 8 under alternative weights and treatments of refused contracts. The first three columns give each component's share of the total gap, in percent. The last column gives the total gap, the WTP difference between the migrant flexible and local contracts (both without guarantor), in INR per day. Row (1) is the main estimate: the three wedges are estimated jointly by maximum likelihood, with survey-order fixed effects, on firm-level WTP with refusals set to INR 350. Rows (2) and (3) re-estimate the same model by weighted maximum likelihood. Row (2) uses inverse-probability sampling weights, which correct for the oversampling of firms with many active sites (Appendix A.3.4). Row (3) multiplies these weights by each firm's number of permanent workers, so that each job rather than each firm receives equal weight (Appendix A.3.5). Row (4) treats refusals and the top of the wage ladder as censored rather than fixed. A firm that refuses a contract is assumed only to value it below the lowest wage it faced. A firm that accepts the top rung of the ladder, INR 600, is assumed only to value the contract at INR 600 or more. The six bids are modeled jointly as multivariate normal, with the same three wedge equations as row (1); the total gap in row (4) is the gap in latent WTP. Standard errors in parentheses are from a firm-level bootstrap with 100 draws. All rows use 234 firms.

A.3.3 Beliefs by residence distance

In a separate belief-elicitation round, firms were asked the same twelve outcomes as in Section 5.3 (full question text in Appendix C.1.2) for *five* worker types rather than three: local workers from Patna; on-site migrants ("Mig flex," accommodation arranged by the firm at or adjacent to the worksite); and migrant workers who arrange their own accommodation approximately 500 m, 2 km, or 5 km from the worksite and commute daily ("Mig fix 500 m / 2 km / 5 km"). This finer residence variation lets us isolate the effect of physical separation between the worker and the worksite, holding worker origin constant.

Table A-4 reports the within-firm comparison between on-site migrants (Mig flex) and migrants whose own room is only 500 m from the site (Mig fix 500 m). We restrict attention to the seven outcomes that most directly capture firm control over labor: attendance, reneging, lateness, hours per day, willingness to supply unpaid extra hours, and willingness to dispute or seek external recourse over wage delays. Even this minimal change in residence—worker still lives within walking distance of the site, but in independently arranged accommodation—generates statistically meaningful belief gaps across these control outcomes, consistent with the labor-control interpretation of on-site residence advanced in Section 5.3.

Table A-4: Firms' beliefs about on-site vs. 500 m off-site migrant workers

Outcome	On-site	Off-site, 500 m	Diff.	SE	p	N
Absent days (out of 7)	0.17	0.60	-0.43***	0.12	0.001	30
Quit before contract end (out of 10)	0.80	1.63	-0.83***	0.27	0.005	30
Late minutes	2.07	13.10	-10.89***	2.95	0.001	28
Hours worked per day	8.22	7.93	0.28***	0.09	0.004	30
Willing to work unpaid extra hour (out of 10)	7.80	5.67	2.13***	0.59	0.001	30
Argue if pay delayed (out of 10)	0.77	2.30	-1.53***	0.47	0.003	30
Seek external help in wage dispute (out of 10)	1.27	2.13	-0.87***	0.30	0.007	30

Notes: The table reports firms' incentivized beliefs about seven worker outcomes, comparing on-site migrant workers ("Mig flex," accommodation arranged by the firm) with migrant workers who arrange their own room approximately 500 m from the worksite and commute daily ("Mig fix 500 m"). Beliefs were elicited across all twelve outcomes used in Section 5.3—absenteeism and reneging (absent days out of 7, quitting before contract end out of 10, minutes late); extra work (hours per day, willingness to accept an unpaid extra hour out of 10); effort (effort rating 1–10, time to complete a task, trustworthiness without supervision out of 10); and bargaining power (outside employment opportunities, in days to find a new job, willingness to dispute delayed pay out of 10, willingness to seek external help out of 10, network support out of 10)—separately for five worker types: locals, on-site migrants, and migrants with own accommodation 500 m, 2 km, and 5 km from the worksite (see Appendix C.1.2 for question text). The table reports the seven outcomes that most directly capture firms' control over labor. Firms are instructed to hold the type of work and payment structure constant across categories. Reported means are on each outcome's original response scale. The *Diff.* column is the within-firm paired mean difference (on-site − off-site 500 m); standard errors are from a paired t-test (equivalent to a firm fixed-effects regression on the two-group subsample with cluster-robust standard errors). p-values are from two-sided tests. N is the number of firms with non-missing responses for both worker types on that outcome. Responses are incentivized using a binary quadratic scoring rule, with bonus payments tied to accuracy relative to a benchmark constructed from responses collected at other real worksites. $^{*}\,p < 0.10$, $^{**}\,p < 0.05$, $^{***}\,p < 0.01$.

A.3.4 Sampling-weight-corrected estimates

Our experimental sample oversamples larger firms (measured by number of active construction sites) relative to the listing frame in order to ensure adequate statistical power for heterogeneity analysis by firm size. The main-text estimates report unweighted results, in which each firm receives equal weight regardless of its representation in the population. Without correction, the unweighted estimates recover the average treatment effect for the experimental sample, but not necessarily for the population of Patna construction firms. This subsection re-estimates the main demand specifications using inverse-probability weights that adjust for the non-representative sampling.

Weight construction. Let $s \in \{1, 2, 3\}$ index firm-size strata defined by the number of active sites: small (1–2 sites), medium (3–4 sites), and large (5 or more sites). From the listing survey, we compute the population share of firms in each stratum, $\pi_s^{\text{list}} = N_s^{\text{list}}/N^{\text{list}}$. From the experimental sample, we compute the corresponding sample share, $\pi_s^{\text{exp}} = N_s^{\text{exp}}/N^{\text{exp}}$. Each firm i in stratum s receives weight

$$w_i \;=\; \frac{\pi_s^{\text{list}}}{\pi_s^{\text{exp}}},$$

and we estimate the main specifications using these probability weights with standard errors clustered at the firm level.

Identification assumptions. Let $S_i = 1$ denote that firm i is selected into the experimental sample, and let T_i index the (within-firm) treatment assignment. The weighted estimates recover the population average treatment effect under three conditions:

1. *Internal validity.* Treatment assignment is independent of potential outcomes within the experimental sample:
$$\big(Y_i(1),\, Y_i(0)\big) \;\perp\; T_i \;\mid\; S_i = 1.$$
This holds by design, since all six contracts are presented to every firm and the order of presentation is randomized.

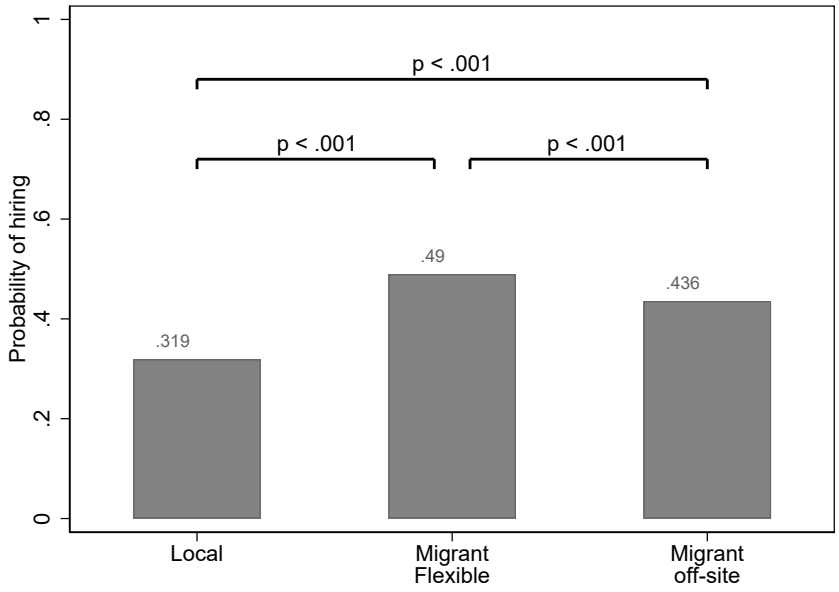
2. *Conditional ignorability of sample selection.* Within each site-count stratum, firms in the experimental sample have the same average treatment effect as firms in the population:
$$\big(Y_i(1) - Y_i(0)\big) \;\perp\; S_i \;\mid\; \text{site_bin}_i.$$
This is the key assumption. It requires that, conditional on the number of active sites, selection into the experiment—through non-contact, refusal, or other attrition from the listing frame—is unrelated to the firm's preference gap between migrant and local workers.

3. *Overlap.* Every population stratum is represented in the experimental sample:
$$0 \;<\; \mathrm{P}(S_i = 1 \mid \text{site_bin}_i)$$
for every stratum s. This holds in our data, as all three size bins contain firms in both the listing and the experimental sample.

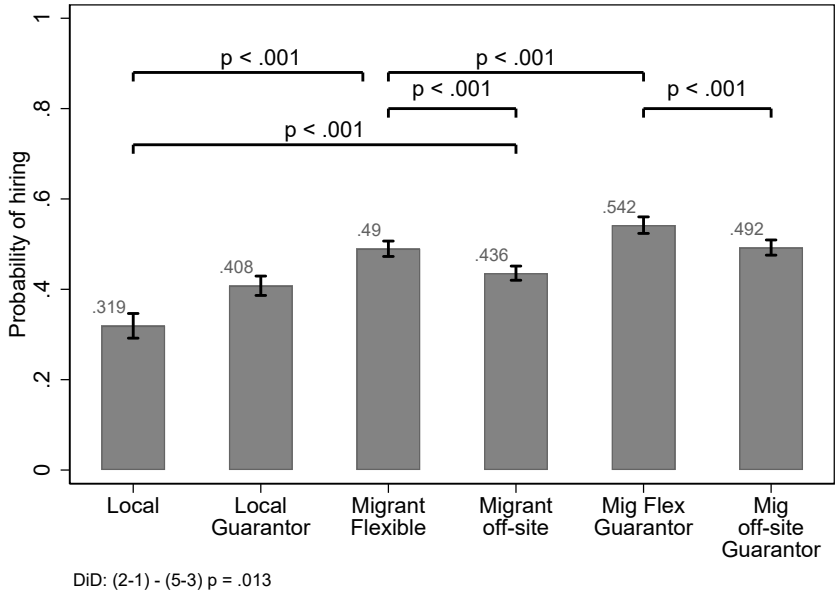
When these conditions hold, the weighted estimator recovers the population ATE for Patna construction firms. However, if firms differ in treatment effects for reasons other than the number of sites—and those reasons also affect selection into the experiment—then the weights do not fully correct for selection and the resulting estimates approximate but do not exactly equal the population ATE.

Results. Figures A-12 and A-13 present the reweighted results. Because the effects documented in the main text are driven disproportionately by larger firms, which are oversampled, the population-weighted point estimates are somewhat attenuated relative to the unweighted estimates. The qualitative patterns, however, are unchanged: firms exhibit a clear preference for migrant workers over locals, and imposing off-site residence reduces firms' willingness to hire migrants.

Figure A-12: Demand across the wage schedule (sampling-weight-corrected)



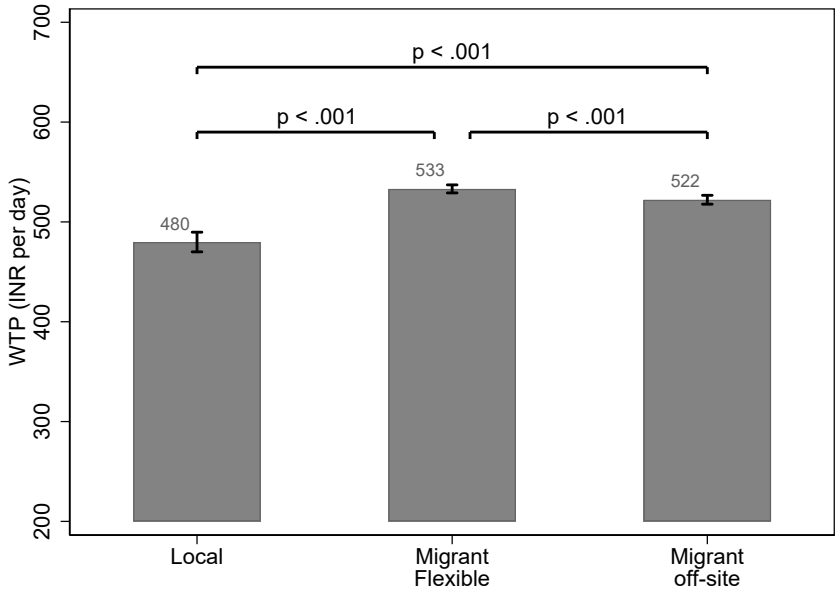
(a) Local vs. Migrant Flexible vs. Migrant Off-site



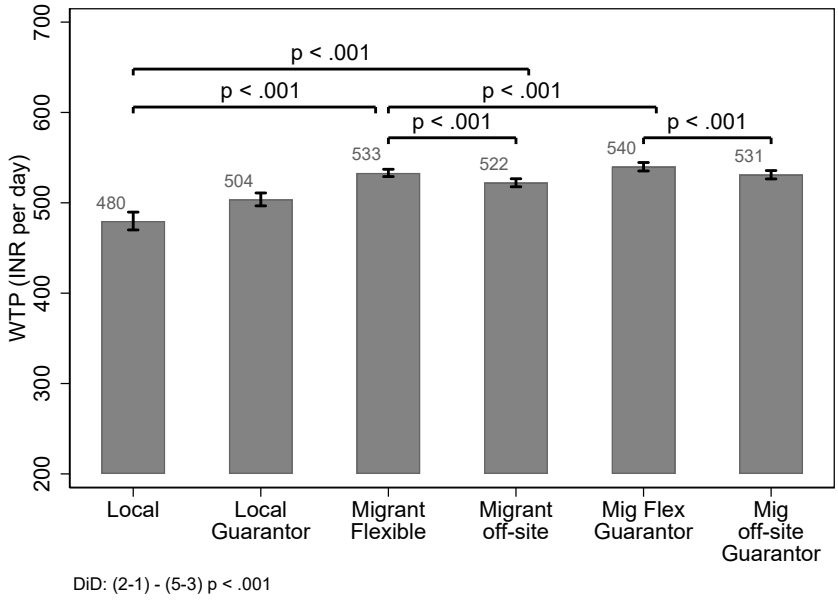
(b) All contracts

Notes: The figure replicates the main demand results using inverse-probability sampling weights that adjust for the oversampling of larger firms in the experimental sample. Weights are constructed as the ratio of each firm-size stratum's share in the listing survey to its share in the experimental sample, where strata are defined by the number of active construction sites (1–2, 3–4, 5+). Panel (a) shows the three main contracts (local, migrant flexible, migrant off-site); Panel (b) includes all six contracts. Bars show predicted hiring probabilities from a linear probability model of acceptance on treatment indicators with firm and wage fixed effects, estimated with probability weights and standard errors clustered at the firm level. Brackets report p-values from pairwise Wald tests of equality across treatment arms.

Figure A-13: WTP for different contracts (sampling-weight-corrected)



(a) Local vs. Migrant Flexible vs. Migrant Off-site



(b) All contracts

Notes: The figure replicates the main WTP results using inverse-probability sampling weights. The outcome is the maximum daily wage (INR) the firm reports for each contract. Panel (a) shows the three main contracts; Panel (b) includes all six. Estimated with firm fixed effects, probability weights, and standard errors clustered at the firm level. See notes to Figure A-12 for details on weight construction.

A.3.5 Employment-weighted estimates: aggregate market demand

The sampling-weight-corrected estimates in Section A.3.4 recover the average treatment effect across firms in the Patna population, weighting each firm equally. However, firms differ substantially in scale: the average firm in our sample employs roughly 10 permanent workers, but the standard deviation is about 13, implying a highly skewed size distribution. When the question of interest is about the composition of *aggregate market demand*—for instance, what share of total hiring in Patna is affected by the migrant preference—the relevant estimand weights each firm not equally but in proportion to the number of job slots it fills. A large firm's contract preferences shape more workers' employment outcomes than those of a small firm.

Estimand. Let a index the treatment arm (contract type), Y_{ia} denote firm i's demand outcome for arm a (e.g., an indicator for hiring at a given wage, or the maximum wage offered), m_i denote a pre-treatment measure of firm i's employment scale (number of permanent workers), and w_i denote the inverse-probability sampling weight from Section A.3.4. The employment-weighted estimand is

$$\mathbb{E}_W[Y_{ia}] \;=\; \frac{\sum_i W_i\, Y_{ia}}{\sum_i W_i}, \qquad W_i \;=\; w_i \times m_i.$$

This object can be interpreted as the expected demand for contract type a associated with a randomly drawn *job slot* in the Patna market, rather than a randomly drawn *firm*. The composite weight W_i serves two purposes simultaneously: w_i corrects for the oversampling of larger firms relative to the population, and m_i re-weights firms in proportion to their economic footprint, so that the resulting estimate reflects aggregate labor demand.

Identification assumptions. The employment-weighted estimand requires the same three conditions stated in Section A.3.4—internal validity of treatment assignment, conditional ignorability of sample selection given site-count strata, and overlap—plus one additional assumption:

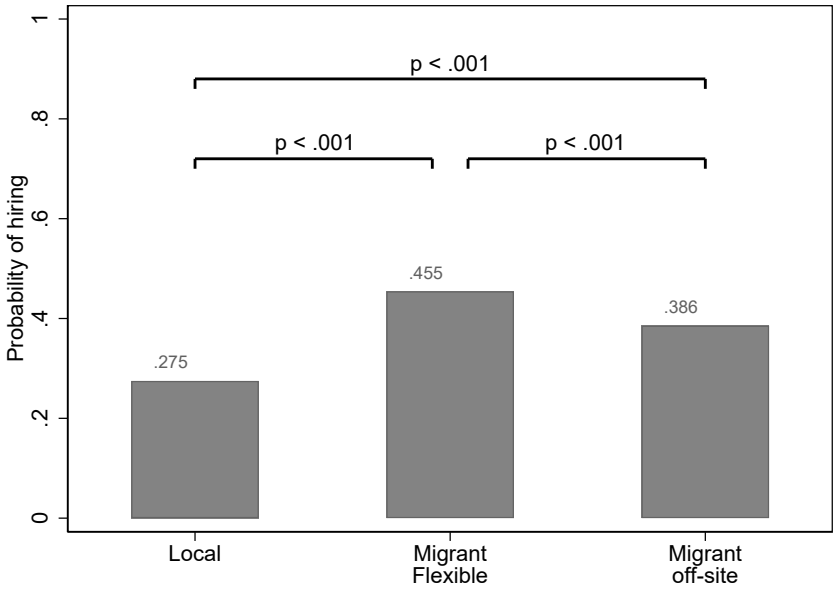
4. *Homogeneity of per-slot preferences.* Each firm's experimentally elicited preference for contract type a (measured for one standardized 15-day hire) is representative of its preference at each of its m_i hiring slots:

   $$Y_{ia} \;=\; Y_{ia}^{(k)} \quad \text{for all } k = 1, \ldots, m_i,$$

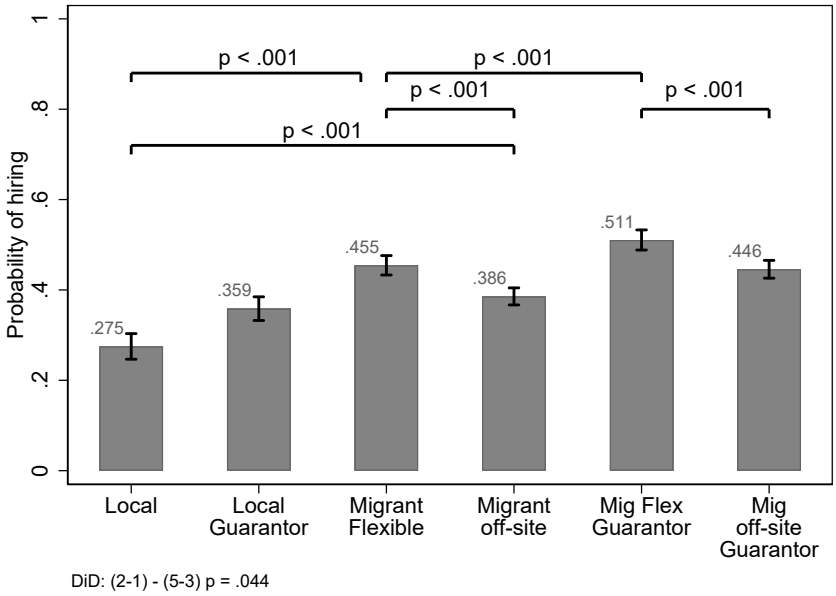
   where $Y_{ia}^{(k)}$ denotes the firm's demand for contract a at its k-th slot. In other words, the treatment effect is constant across a firm's hiring positions. This assumption is plausible in our setting, where the experimental job is a standardized daily-wage task and all slots within a firm require essentially the same skills. It would be violated if firms have decreasing marginal demand for the migrant premium—for example, if they prefer migrants for a core set of positions but are indifferent at the margin for additional hires.

We winsorize m_i at the 99th percentile of the sample distribution to prevent a small number of very large firms from dominating the weighted estimates.

Figure A-14: Demand across the wage schedule (employment-weighted)



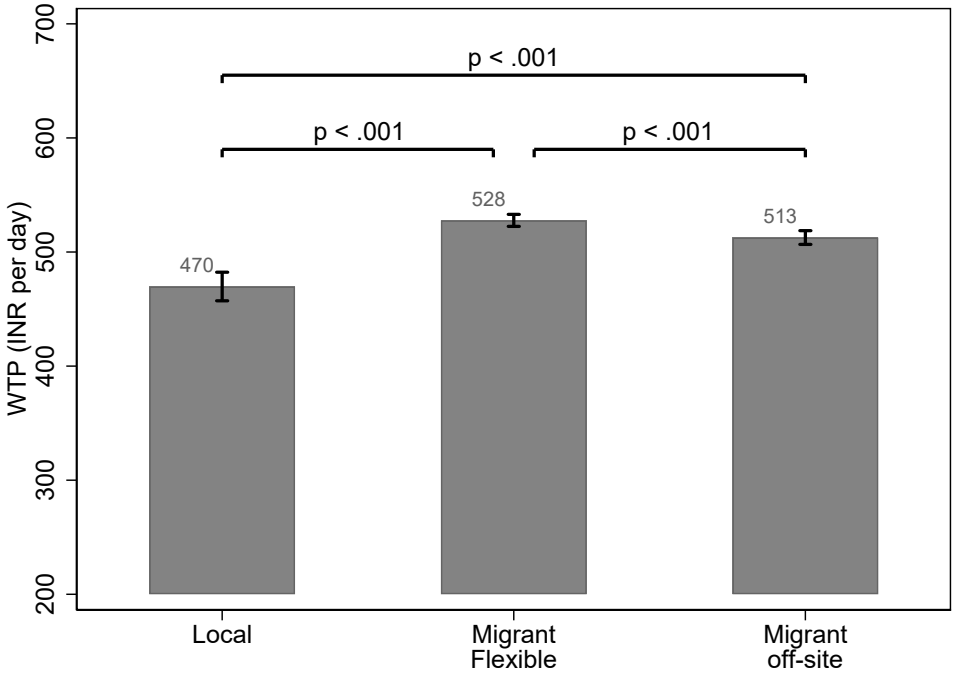
(a) Local vs. Migrant Flexible vs. Migrant Off-site



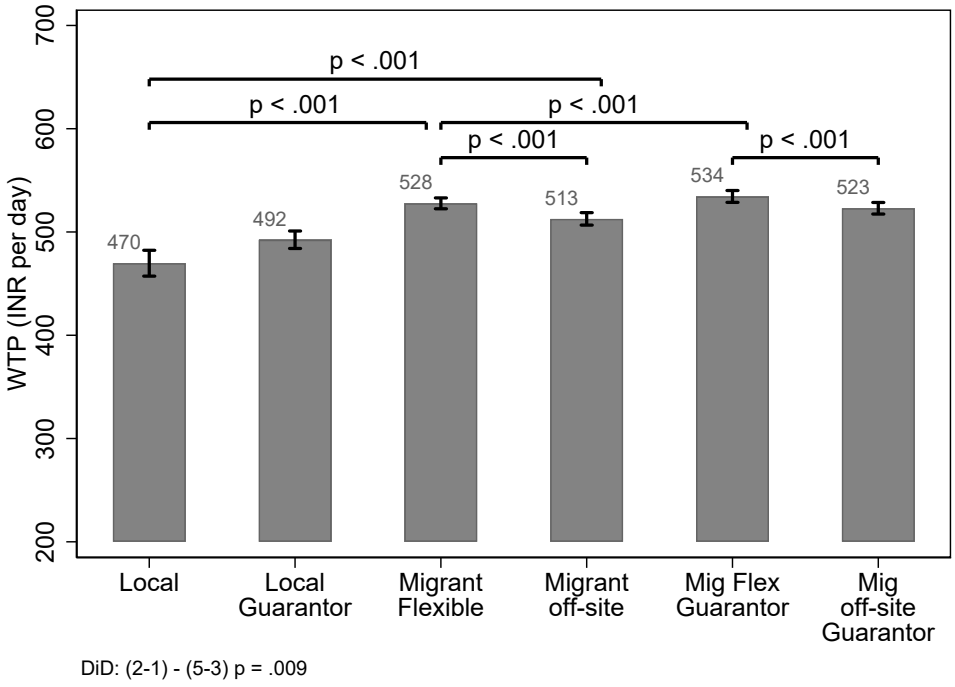
(b) All contracts

Notes: The figure replicates the main demand results using employment-weighted inverse-probability weights $W_i = w_i \times m_i$, where w_i is the sampling weight from Section A.3.4 and m_i is the number of permanent workers (winsorized at the 99th percentile). The resulting estimates reflect the expected demand for each contract type at a randomly drawn job slot in the Patna construction market. Panel (a) shows the three main contracts (local, migrant flexible, migrant off-site); Panel (b) includes all six contracts. Bars show predicted hiring probabilities from a linear probability model of acceptance on treatment indicators with firm and wage fixed effects, estimated with probability weights and standard errors clustered at the firm level.

Figure A-15: WTP for different contracts (employment-weighted)



(a) Local vs. Migrant Flexible vs. Migrant Off-site



(b) All contracts

Notes: The figure replicates the main WTP results using employment-weighted inverse-probability weights. The outcome is the maximum daily wage (INR) the firm reports for each contract. Panel (a) shows the three main contracts; Panel (b) includes all six. Estimated with firm fixed effects, probability weights, and standard errors clustered at the firm level. See notes to Figure A-14 for details on weight construction.

Results. Figures A-14 and A-15 present the employment-weighted results. The qualitative patterns are unchanged relative to both the unweighted and sampling-weight-corrected estimates: firms exhibit a clear preference for migrant workers, and imposing off-site residence reduces demand. As expected, the point estimates are larger than the population-weighted (equal-firm) estimates from Section A.3.4, reflecting the fact that the migrant preference is concentrated among larger firms that account for a disproportionate share of total hiring.

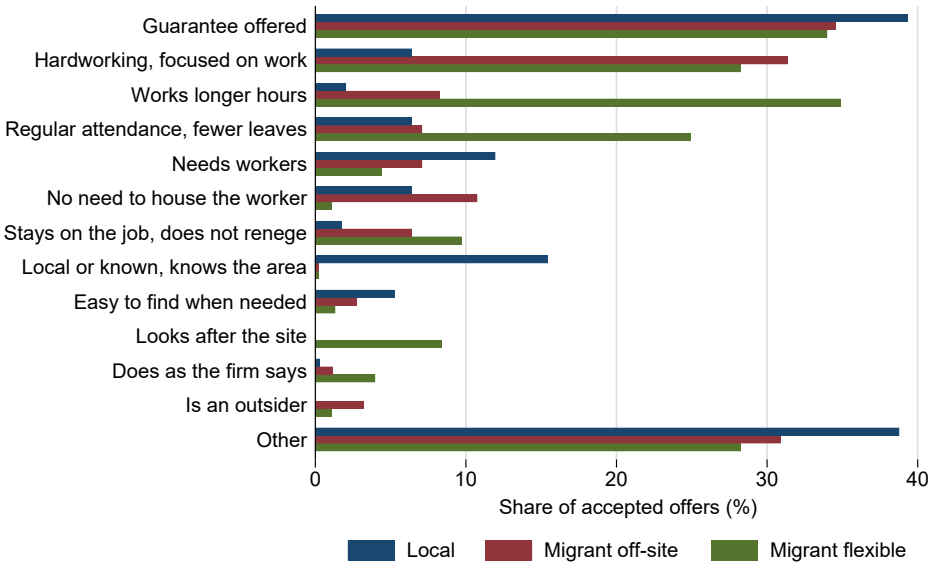
A.4 Firms' Stated Reasons for Accepting and Rejecting Offers

After each hiring decision in the firm experiment, the enumerator asked the firm why it accepted or rejected the offer. Firms chose from a fixed list of reasons and could add reasons in their own words. We code the free-text answers by keyword and combine similar reasons into the groups shown in Figure A-16. Panel (a) reports the share of accepted offers that cite each reason and Panel (b) the share of rejected offers, separately for local, off-site migrant, and flexible migrant offers, pooling the guarantee arms with their counterparts. Firms could give more than one reason, so the shares do not sum to one. Figure A-17 groups the acceptance reasons into the three channels of the decomposition.

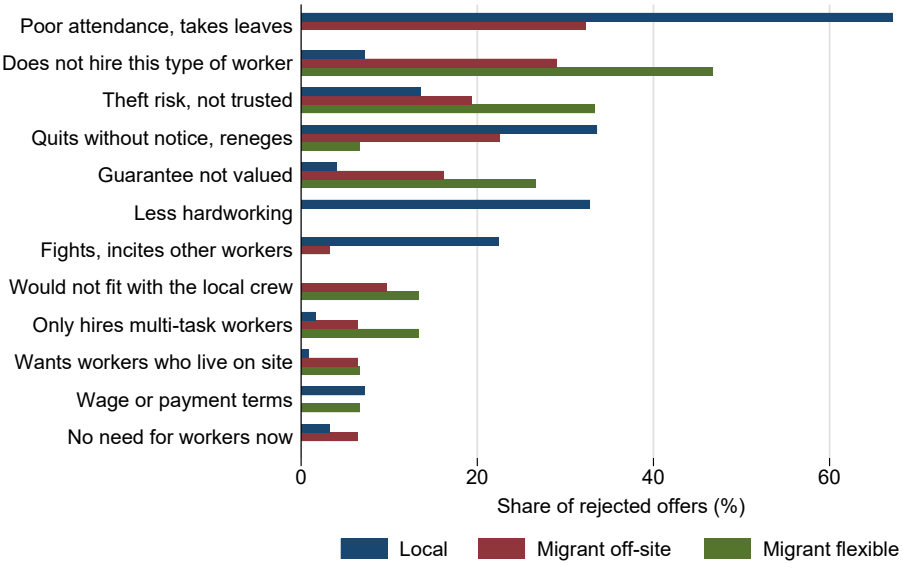
The reasons firms give for accepting migrants line up with the three channels in the decomposition (Section 5.5). Among accepted flexible migrant offers, 34.9% cite longer hours and 24.9% cite regular attendance or fewer days off, against 2.0% and 6.4% for local offers. Effort, meaning that the worker is hardworking and focused on the job, is cited for 31.4% of accepted off-site migrant offers and 28.3% of accepted flexible migrant offers, but for only 6.4% of accepted local offers. Grouped into channels (Figure A-17), reliability is cited for 29.6% of accepted flexible migrant offers, excess work for 34.9%, and effort for 28.3%, against 7.9%, 2.0%, and 6.4% of accepted local offers. The reasons for accepting a local worker are instead about the firm's own situation. The firm needs workers (12.0%), the worker is local or known to the firm (15.5%), or the firm does not have to house the worker (6.4%). The guarantee is the most cited reason for every offer type. The "Other" bar is large mainly because, in the first three versions of the form, the question was asked at each step of a wage ladder and most firms answered that they liked the wage.

Rejections are rare for migrant offers (4.9% of migrant firm-offers) and common for local offers (26.7%). Locals are turned down for their behaviour. Among local rejections, 67.2% cite poor attendance, 33.6% cite quitting without notice, 32.8% cite low effort, and 22.4% cite fights or inciting other workers. Migrants are turned down because of the firm's policy rather than the worker's behaviour. The firm does not hire outsiders or unknown workers (29.0% of off-site and 46.7% of flexible migrant rejections), does not trust them (19.4% and 33.3%), or says that no guarantee will change its mind (16.1% and 26.7%). Poor attendance and low effort, the reasons that dominate local rejections, are almost never given for migrants.

Figure A-16: Reasons Firms Give for Accepting and Rejecting an Offer



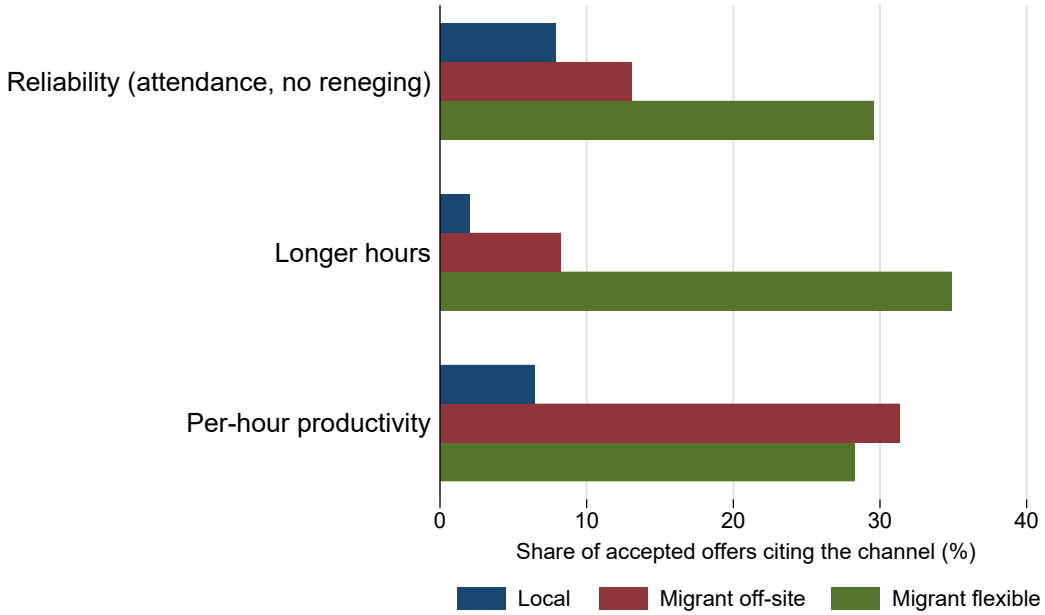
(a) Accepting an offer



(b) Rejecting an offer

Notes: Panel (a) shows the share of accepted offers, and Panel (b) the share of rejected offers, for which the firm cites each reason, by offer type. A rejection means the firm declined the worker on the stated terms at any wage. Guarantee arms are pooled with their non-guarantee counterparts. Firms chose from a fixed list and could add reasons in their own words; free-text answers are coded by keyword, and similar reasons are combined. "Other" in Panel (a) includes "I liked the daily wage", which was mainly given in the first three versions of the form, where the question was asked at each step of a wage ladder. Sample: 234 firms. Panel (a): 343 accepted local offers, 437 accepted off-site migrant offers, and 453 accepted flexible migrant offers. Panel (b): 125, 31, and 15 rejected offers.

Figure A-17: Acceptance Reasons Grouped into the Three Channels



Notes: Share of accepted offers for which the firm cites at least one reason in each channel, by offer type. Reliability: does not leave the job without informing, will not quit if payment is delayed, cannot leave without informing because of living at the site, takes fewer days off or shows up reliably because of living near the site, comes on time, or is available for the whole contract period. Longer hours: stays longer and works more hours, including because of living at or near the site. Per-hour productivity: more hardworking, better work skills, or focused on the work. Guarantee arms are pooled with their non-guarantee counterparts. Sample: 343 accepted local offers, 437 accepted off-site migrant offers, and 453 accepted flexible migrant offers from 234 firms.

A.5 Believed Channel Gaps and Believed Sources of Employer Power

Table A-5 relates, across firms, the gaps firms expect between an off-site migrant and a local worker on the three channels of the decomposition to the gaps they expect in the worker's outside employment opportunities, in the worker's willingness to contest the firm, and in the worker's speed at a fixed task. All variables come from the firm belief survey, with one observation per firm, and are standardized indices. Tables A-6 and A-7 then relate the same three believed gaps to the firm's own migrant premium in the experiment, in hiring and in willingness to pay, for the off-site migrant contract against the local contract.

Table A-5: Believed Channel Gaps and Believed Sources of Employer Power: Indices

	(1)	(2)
Panel A: Reliability index (fewer absent days, fewer quits)		
Outside employment opportunities	-0.108*	-0.053
	(0.058)	(0.060)
Institutional Power	0.414***	0.306***
	(0.061)	(0.071)
Speed		0.310***
		(0.077)
Firms	194	193
Panel B: Unpaid hours index (accept an unpaid extra hour)		
Outside employment opportunities	0.010	0.047
	(0.060)	(0.060)
Institutional Power	0.368***	0.309***
	(0.070)	(0.074)
Speed		0.188**
		(0.075)
Firms	196	195
Panel C: Per-hour productivity index (effort rating)		
Outside employment opportunities	0.014	0.081
	(0.060)	(0.053)
Institutional Power	0.531***	0.391***
	(0.062)	(0.063)
Speed		0.386***
		(0.055)
Firms	189	189

Notes: One observation per firm from the firm belief survey. Every variable is the firm's believed gap between an off-site migrant and a local worker, signed so that a higher value favours the migrant, standardized across firms. Outside employment opportunities are measured by the gap in days needed to find a new job. Institutional Power is the mean of two standardized gaps: fewer workers who argue when pay is two days late, and fewer who complain outside the firm in a pay dispute. Speed is the gap in minutes needed to finish a fixed task. Each regression uses all firms that answered the items it needs. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A-6: Migrant Premium and Believed Sources of Employer Power: Indices

	(1)	(2)
Panel A: Hiring		
Migrant off-site	0.125***	0.126***
	(0.017)	(0.017)
× Outside employment opportunities	-0.007	-0.002
	(0.019)	(0.020)
× Institutional Power	0.060***	0.050***
	(0.017)	(0.018)
× Speed		0.026
		(0.021)
Firms	196	195
Observations	1,960	1,950
Local hiring rate	0.290	0.290
Panel B: Willingness to pay (INR per day)		
Migrant off-site	48.1***	48.7***
	(5.8)	(5.8)
× Outside employment opportunities	-2.1	0.2
	(6.6)	(6.8)
× Institutional Power	27.4***	22.5***
	(6.1)	(6.6)
× Speed		13.4*
		(7.0)
Firms	196	195
Observations	392	390
Local mean (INR)	470.9	470.7

Notes: Firms with a belief survey, local and off-site migrant contracts without a guarantee. Panel A: one observation per firm, contract and wage; the outcome is one if the firm would hire at that wage; firm, wage and presentation-order fixed effects. Panel B: one observation per firm and contract; the outcome is the stated maximum daily wage, with a refusal valued at 350; firm fixed effects. Outside employment opportunities, Institutional Power and speed are the standardized belief gaps defined in Table A-5; their main effects are absorbed by the firm fixed effects. The migrant coefficient is the premium for a firm with average beliefs; each interaction is the change in the premium per standard deviation of the index. Standard errors clustered by firm in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A-7: Migrant Premium and Believed Sources of Employer Power: Survey Units

	(1)	(2)
Panel A: Hiring		
Migrant off-site	0.078***	0.077***
	(0.021)	(0.021)
× Days to find a new job	0.000	0.002
	(0.009)	(0.009)
× Fewer argue if pay is late (of 10)	0.018***	0.017***
	(0.004)	(0.005)
× Fewer complain outside (of 10)	-0.000	-0.001
	(0.004)	(0.005)
× Minutes faster at task		0.001
		(0.001)
Joint p, argue and complain	0.000	0.001
Firms	186	186
Observations	1,860	1,860
Panel B: Willingness to pay (INR per day)		
Migrant off-site	27.4***	26.8***
	(6.6)	(6.6)
× Days to find a new job	0.2	1.0
	(3.1)	(3.2)
× Fewer argue if pay is late (of 10)	7.6***	6.8***
	(1.4)	(1.5)
× Fewer complain outside (of 10)	0.9	0.5
	(1.7)	(1.8)
× Minutes faster at task		0.6
		(0.5)
Joint p, argue and complain	0.000	0.000
Firms	186	186
Observations	372	372

Notes: Same samples and specifications as Table A-6, with the belief gaps entered one item at a time in the units of the survey question. The migrant coefficient is the premium for a firm whose believed gaps are all zero. Standard errors clustered by firm in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.6 Worker Experiment

Table A-8: Migrant workers in the sample and rural construction labourers in Bihar (PLFS 2020–21)

	Migrant sample		PLFS 2020–21	
	Mean	(SD)	Mean	(SD)
Age	32.7	(9.8)	33.6	(8.4)
Years of education	3.9	(3.9)	4.7	(3.9)
Scheduled Caste or Tribe (share)	0.53	(0.50)	0.54	(0.50)
Other Backward Class (share)	0.42	(0.49)	0.42	(0.49)
Monthly earnings (INR, 2026 prices)	13,515	(4,188)	13,139	(2,716)
Observations	653		208	

Notes: The table compares the 653 migrant workers in our experimental sample (Table 3) with rural construction labourers in Bihar in the Periodic Labour Force Survey (PLFS) 2020–21, conducted from July 2020 to June 2021. The PLFS group consists of men aged 18–55 who live in rural Bihar and whose usual principal activity is in construction (National Industrial Classification 2008, divisions 41–43) as a construction labourer (National Classification of Occupations 2004, group 931). We restrict the PLFS group to labourers because we recruited helpers, not masons, and to ages 18–55 because these were the ages eligible for our survey. PLFS means and standard deviations use the PLFS person weights. In both sources, education is years of formal education. Caste is the caste reported by the worker in our survey and the household's social group in PLFS. In our survey, monthly earnings are the worker's reported monthly income, winsorized at the 1st and 99th percentiles. In PLFS, monthly earnings are wage earnings in the survey reference week multiplied by 30/7 for casual labourers (204 of the 208), which assumes work in every week of the month, and earnings in the last 30 days or the last month for the self-employed and regular employees. PLFS earnings are converted to the prices of our survey period with the all-India Consumer Price Index for Rural Labourers published by the Labour Bureau. The July 2020–June 2021 average of the old series (base 1986–87 = 100), 1,048.5, is converted to the new series (base 2019 = 100) with the official linking factor of 9.78, which gives 107.21. The survey-period index, 137.98, averages the monthly indices from January to July 2026, weighted by the number of migrant interviews in each month; the indices for January to April 2026 are interpolated linearly between December 2025 (137.03) and May 2026 (138.37). PLFS earnings are multiplied by the ratio of the two indices, 1.287; in nominal terms, mean PLFS earnings are INR 10,209. We use the all-India index because the linking factor is published only at the all-India level. Earnings are available for 617 migrants and 205 PLFS workers.

Table A-9: Summary stats of Local workers

	Mean	SD	N
Age of Respondent	32.23	9.33	272
Years of education	4.73	4.26	272
Backward caste	0.58	0.49	272
Scheduled caste/tribe	0.27	0.44	272
Years of work	8.85	6.96	271
Worked in another district of Bihar	0.61	0.49	272
Worked in another state	0.23	0.42	272
Monthly Income (INR)	14,297.13	3,988.26	244
Family Monthly Income (INR)	22,586.16	13,325.12	224
Owns a bike	0.17	0.38	272
Loan in last 3 months	0.17	0.37	250

Notes: The table reports summary statistics for local workers in the experimental sample (both pure control as well as those who were offered jobs), recruited from labor stands in Patna. The unit of observation is the worker. Number of observations may vary across rows due to non-response.

Table A-10: Baseline characteristics: migrant and local workers

	Migrant		Local		
	Mean	(SD)	Mean	(SD)	p-value
Age of Respondent	32.73	(9.77)	32.23	(9.33)	0.48
Years of education	3.87	(3.94)	4.73	(4.26)	0.00
Backward caste	0.42	(0.49)	0.58	(0.49)	0.00
Scheduled caste/tribe	0.53	(0.50)	0.27	(0.44)	0.00
Years of work	11.87	(8.38)	8.85	(6.96)	0.00
Migrated for work outside home district	0.65	(0.48)	0.64	(0.48)	0.73
Monthly Income (INR)	13,512.24	(4,195.44)	14,305.33	(3,938.05)	0.01
Owns a bike	0.16	(0.37)	0.17	(0.38)	0.80
Loan in last 3 months	0.19	(0.39)	0.17	(0.37)	0.45

Notes: The table compares baseline characteristics of the 653 migrant workers (Table 3) and the 272 local workers (Table A-9) in the experimental sample. The unit of observation is the worker. The two groups are separate recruitment samples rather than randomly assigned arms, so the table is a check on comparability, not on randomization. *Migrated for work outside home district* equals one if the worker has previously worked in another district of Bihar or in another state, zero only if neither, and is missing otherwise. Monthly income is winsorized at the 1st and 99th percentiles, pooled across both groups so that the two columns face a common trim. The p-value is from a two-sided t-test of equality of means between migrant and local workers. Number of observations varies across rows due to non-response.

Table A-11: WTA for Migrant Workers: On-site vs Off-site

	Outside Option	Mediation	Insurance
Panel A: OLS on the switching point			
Treatment	-19.231***	-14.951***	-22.500***
	(3.888)	(3.759)	(4.142)
On-site	-25.667***	-8.336	-8.875
	(6.927)	(7.252)	(7.418)
Treatment × *On-site (DiD)*	7.231	-4.121	-6.793
	(4.974)	(5.596)	(6.289)
Observations	408	398	398
Control mean (off-site)	604.81	598.28	600.00
Control mean (on-site)	578.25	589.95	590.40
Question order FE	✓	✓	✓
Panel B: Interval regression			
Treatment	-40.664***	-30.566***	-47.670***
	(7.771)	(7.199)	(8.177)
On-site	-44.054***	-14.180	-22.768
	(12.959)	(13.685)	(14.042)
Treatment × *On-site (DiD)*	19.021**	-5.361	-2.065
	(9.207)	(10.296)	(11.371)
Observations	408	398	398
Right-censored (%)	43.6	44.0	41.0
Question order FE	✓	✓	✓

Notes: Panel A reports estimates from the regression $sw_i = \alpha + \beta_1\, \textit{Treat}_i + \beta_2\, \textit{On-site}_i + \beta_3\, (\textit{Treat}_i \times \textit{On-site}_i) + \boldsymbol{\gamma}'\textit{Order}_i + \varepsilon_i$, where sw_i is the worker's switching point (the lowest wage at which the worker accepts the offer). Workers who reject all wages are assigned $w_{\max} + 25$. Panel B reports interval-regression estimates of the same equation with the worker's latent willingness to accept, WTA_i^*, in place of sw_i. WTA_i^* is observed only up to the wage interval in which the worker switches from rejecting to accepting the offer. A worker who first accepts at wage w contributes the interval $(w - 25,\, w]$; a worker who accepts the lowest wage on the menu, $w_{\min}$, contributes $[w_{\min} - 50,\, w_{\min}]$; and a worker who rejects every wage is right-censored at the top of the menu, $w_{\max}$, with no upper bound. The error is normally distributed with a common standard deviation. Right-censored is the share of offers rejected at every wage. All regressions control for worker age and years of education. *Treatment* ($\hat{\beta}_1$) is the WTA effect for off-site workers. *On-site* ($\hat{\beta}_2$) is the WTA gap between on-site and off-site workers in the control group. *Treatment* × *On-site* ($\hat{\beta}_3$) is the DiD: the difference in the treatment effect between on-site and off-site workers. The sample in each column is restricted to workers who received both the control arm and the relevant treatment arm. Question order fixed effects control for the order in which the two offers were presented to the worker. Standard errors are clustered at the worker level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

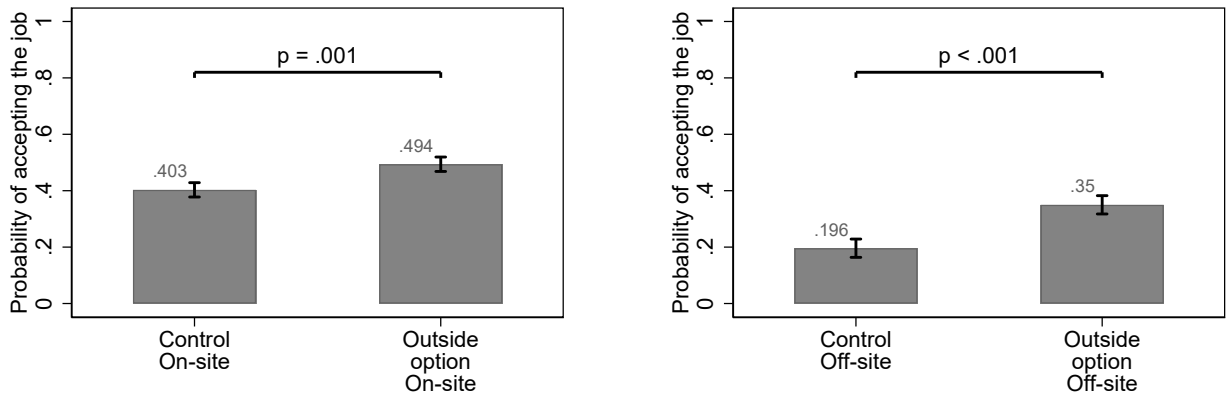
Table A-12: Effect of Contract Protections on Worker WTA: Interval Regression

	Outside Option		Mediation		Insurance	
	Off-site	On-site	Off-site	On-site	Off-site	On-site
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Migrant workers						
Treatment	-40.468***	-22.322***	-31.199***	-35.631***	-51.475***	-48.169***
	(8.066)	(5.432)	(7.489)	(7.671)	(8.915)	(7.984)
Control mean (OLS sw)	604.81	578.25	598.28	589.95	600.00	590.40
Workers	104	100	102	97	100	99
Observations	208	200	204	194	200	198
Left-censored (%)	17.8	35.5	22.5	28.9	26.0	30.8
Right-censored (%)	49.5	37.5	47.1	40.7	49.0	32.8
Panel B: Local workers						
Treatment	-21.628***		-28.662***			
	(4.149)		(5.099)			
Control mean (OLS sw)	599.80		598.82			
Workers	126		127			
Observations	252		254			
Left-censored (%)	10.3		13.4			
Right-censored (%)	32.5		32.7			

Notes: Each column reports interval regression estimates of the effect of a contract protection on workers' willingness-to-accept (WTA) daily wages. Panel A reports migrant workers. Panel B reports local workers, who all work off-site and were offered the outside option or mediation but not insurance. The dependent variable is the WTA interval, constructed as follows: a worker who first accepts at wage w contributes the interval $(w-25,\ w]$; a worker who accepts the lowest wage on the menu, $w_{\min}$, contributes $[w_{\min}-50,\ w_{\min}]$; and a worker who rejects every wage is right-censored at the top of the menu, $w_{\max}$, with no upper bound. The error is normally distributed with a common standard deviation. The sample in each column is restricted to workers who received both the control contract and the relevant treatment contract. Control mean is the mean switching point under the control contract, with workers who reject all wages assigned $w_{\max}+25$. Left-censored is the share of offers accepted at the lowest wage; right-censored is the share rejected at every wage. Standard errors, clustered at the worker level, are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

A.6.1 Worker Labor Supply Across All Wages

Figure A-18: Effect of Outside Option on Worker Acceptance (All Wages)

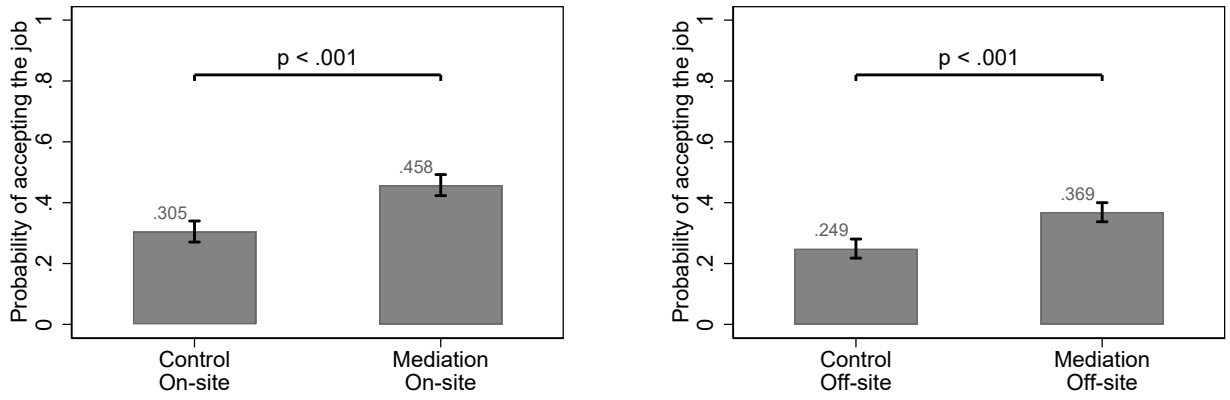


(a) On-site work

(b) Off-site work

Notes: Each panel shows mean acceptance rates from a regression of the accept/reject decision on treatment indicators with worker fixed effects and wage fixed effects, estimated separately by residence arrangement. The sample is restricted to workers who received both a control and an outside-option offer. Each bar plots the predictive margin for the relevant treatment arm. Error bars show 95% confidence intervals. Standard errors are clustered at the worker level. *p*-values are shown for a two-sided test of equality between the control and treatment arms.

Figure A-19: Effect of Mediation on Worker Acceptance (All Wages)

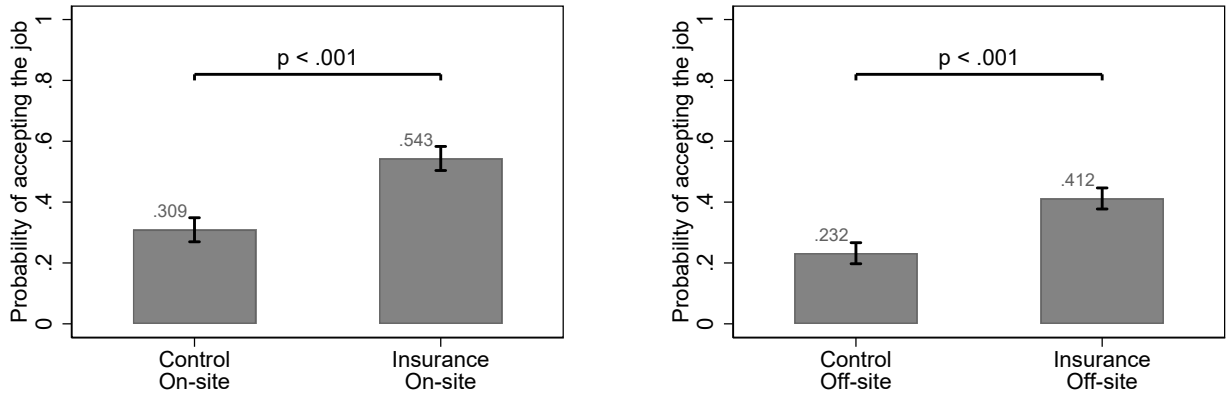


(a) On-site work

(b) Off-site work

Notes: Each panel shows mean acceptance rates from a regression of the accept/reject decision on treatment indicators with worker fixed effects and wage fixed effects, estimated separately by residence arrangement. The sample is restricted to workers who received both a control and a mediation offer. Each bar plots the predictive margin for the relevant treatment arm. Error bars show 95% confidence intervals. Standard errors are clustered at the worker level. *p*-values are shown for a two-sided test of equality between the control and treatment arms.

Figure A-20: Effect of Wage Insurance on Worker Acceptance (All Wages)



(a) On-site work

(b) Off-site work

Notes: Each panel shows mean acceptance rates from a regression of the accept/reject decision on treatment indicators with worker fixed effects and wage fixed effects, estimated separately by residence arrangement. The sample is restricted to workers who received both a control and an insurance (wage-theft/payment-delay protection) offer. Each bar plots the predictive margin for the relevant treatment arm. Error bars show 95% confidence intervals. Standard errors are clustered at the worker level. *p*-values are shown for a two-sided test of equality between the control and treatment arms.

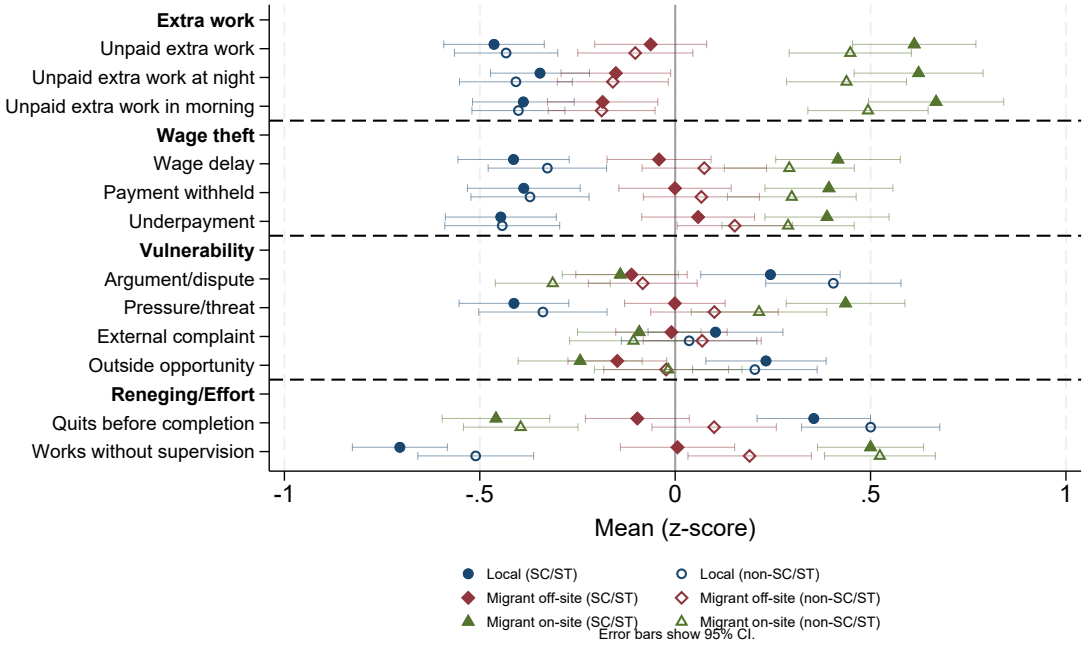
A.6.2 Worker Heterogeneity

Heterogeneity in Worker Beliefs by Caste To assess whether the belief patterns documented in Section 6 vary with workers' social identity, we split the migrant worker sample by Scheduled Caste/Scheduled Tribe (SC/ST) status and reproduce the belief plot separately for each group. SC/ST workers constitute approximately 53% of the sample; the remaining workers are predominantly Other Backward Classes (OBC). All outcomes are standardized using the pooled mean and standard deviation across both groups, so that z-scores are directly comparable.

Figure A-21 presents the results. The core pattern—on-site migrants perceived as most exposed to unpaid extra work, wage theft, and vulnerability, with locals perceived as least exposed—is present among both SC/ST and non-SC/ST workers. SC/ST workers tend to report somewhat larger perceived gaps between on-site migrants and locals, particularly for outcomes in the bargaining power and wage theft clusters. This is consistent with caste-based social disadvantage sharpening workers' awareness of—or exposure to—exploitative conditions in destination labor markets. The broad similarity of the gradient across caste groups reinforces the conclusion that the vulnerability of on-site migrants is a widely recognized feature of the market, not an artifact of the beliefs of any particular social group.

Heterogeneity in Worker Beliefs by Migration Experience To assess whether the belief patterns documented in Section 6 reflect personal exposure to destination labor markets or instead represent common knowledge among workers in origin communities, we split the migrant worker sample by whether the worker has previously migrated out of state for work. Out-of-state migration is common in our sample: 53% of workers report having worked in another state. All

Figure A-21: Heterogeneity in Migrant Worker Beliefs by SC/ST Status

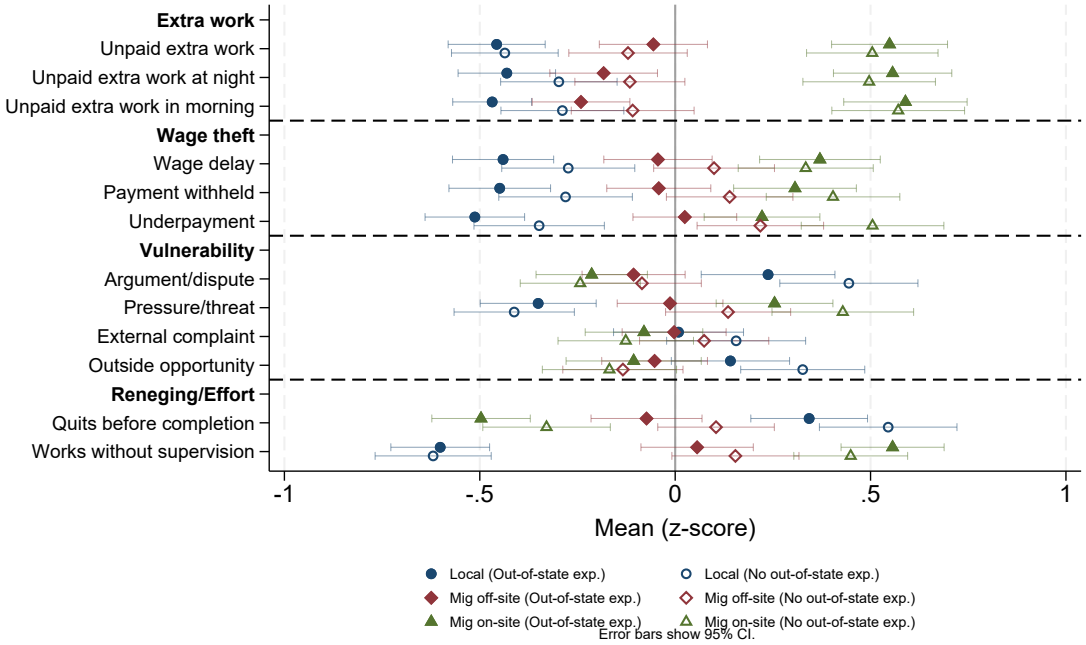


Notes: The figure plots migrant workers' beliefs about the prevalence of various working conditions for three worker types: local workers, off-site migrants, and on-site migrants, separately by SC/ST status. Each outcome is expressed as a z-score, standardized using the pooled (across SC/ST groups) mean and standard deviation so that magnitudes are comparable across subgroups. Filled markers denote SC/ST workers; hollow markers denote non-SC/ST workers (predominantly OBC). Color and shape encode the predicted worker type: navy circles for locals, maroon diamonds for off-site migrants, and green triangles for on-site migrants. SC/ST and non-SC/ST markers are jittered vertically to avoid overlap. Error bars show 95% confidence intervals. The sample consists of 653 migrant workers.

outcomes are standardized using the pooled mean and standard deviation across both groups.

Figure A-22 presents the results. The core gradient—on-site migrants perceived as most exposed, locals least—is present among both groups across all four clusters. The two groups differ mainly in the extra work cluster, where workers with out-of-state experience report somewhat more pronounced beliefs about the exposure of on-site migrants to unpaid extra hours—the perceived gap between on-site migrants and the other two worker types is wider for experienced workers across the three unpaid-overtime items. This is consistent with personal migration experience sharpening perceptions of the conditions most directly tied to employer extraction, which workers are most likely to have encountered firsthand. In the wage theft, bargaining power, and reneging clusters, beliefs are broadly similar across the two groups: both experienced and inexperienced workers perceive on-site migrants as more exposed to payment irregularities and as less likely to dispute, complain, or quit, and these perceptions do not differ appreciably with migration history. This pattern suggests that these dimensions of migrant vulnerability are widely recognized in origin communities even without direct personal exposure, plausibly transmitted through returning migrants or social networks.

Figure A-22: Heterogeneity in Migrant Worker Beliefs by Out-of-State Migration Experience



Notes: The figure plots migrant workers' beliefs about the prevalence of various working conditions for three worker types: local workers, off-site migrants, and on-site migrants, separately by whether the worker has previously migrated out of state for work. Each outcome is expressed as a z-score, standardized using the pooled (across both groups) mean and standard deviation. Filled markers denote workers with prior out-of-state migration experience (53% of the sample); hollow markers denote workers with no out-of-state experience. Color and shape encode the predicted worker type: navy circles for locals, maroon diamonds for off-site migrants, and green triangles for on-site migrants. Markers are jittered vertically to avoid overlap. Error bars show 95% confidence intervals.

A.6.3 Bounding Workers' Costs of On-Site Employer Control

Employer-provided housing saves workers rent and commuting expenses, but may also make it more costly to refuse additional work or leave the employer. A small wage discount for on-site jobs could therefore reflect poorer accommodation, the cost of greater employer control, or both. We use workers' assessments of living conditions to bound the cost of control without assigning a monetary value to housing quality.

In the worker experiment, potential migrants receive real construction-job offers in Patna. Residence is randomly assigned: workers are either offered accommodation at the worksite or must arrange their own accommodation off-site. We use the standard control contract, which provides no additional protections. Let WTA_i^{on} and $\text{WTA}_i^{\text{off}}$ denote worker i's reservation wages under the two arrangements. Their difference is the net value of on-site residence:

$$D_i \equiv \text{WTA}_i^{\text{off}} - \text{WTA}_i^{\text{on}} = R_i + C_i - Q_i - E_i.$$

Here R_i and C_i are rent and commuting savings, Q_i is the daily wage-equivalent cost of differences in living conditions, and E_i is the additional cost of employer control associated with on-site res-

idence. The quality term is signed: $Q_i < 0$ if on-site conditions are preferred. Only one residence arrangement is offered to each worker; random assignment identifies the average wage discount, rather than its individual components.

To separate control costs from poorer housing, we focus on group G: workers who rate on-site living conditions as better than or equal to those in a rented room. We assume that responses reflect respondents' own accommodation-quality rankings and are unaffected by residence assignment. Under these assumptions, $Q_i \leq 0$ in G. Writing D_G, $\bar{R}_G$, and $\bar{C}_G$ for the group's mean wage discount and financial savings gives

$$\mathbb{E}[E_i \mid G] = \bar{R}_G + \bar{C}_G - D_G - \mathbb{E}[Q_i \mid G] \geq \bar{R}_G + \bar{C}_G - D_G.$$

If these workers require wages close to those for off-site jobs despite saving rent, poorer accommodation cannot explain the shortfall. Indeed, any improvement in housing quality raises the implied control cost. This is why the calculation provides a lower bound rather than a point estimate of E.

Table A-13 uses the 150 workers in G with housing-cost reports. We estimate D_G as minus the coefficient on on-site assignment for this group, from a regression on the full sample that interacts on-site assignment with membership of G and controls for age, education, SC/ST status, question order, the protection offered alongside the control contract, and enumerator, district, and interview-month fixed effects. Rent savings equal reported monthly rent for a single worker in Patna, less expected on-site charges, divided by 30. For 4 workers whose reported rent is implausible, we set rent savings to the mean of the other workers in G. Commuting savings are INR 18.4, the mean commuting expenditure of workers from a separate source. Interpreting this calculation as a lower bound requires that the benchmark not exceed mean commuting savings in G.

A bootstrap draws workers with replacement 1,000 times and reestimates the wage discount and rent mean jointly. The subgroup's mean rent savings are INR 30.9 per day, while its estimated wage discount is INR 25.2. With commuting savings, the implied lower bound on mean control costs is INR 24.1 per day (95% interval: 8.7 to 39.4). The exercise supports the interpretation that the wage discount for on-site jobs reflects costs of employer control, rather than poorer accommodation alone.

Table A-13: Conditional Bounds on Workers' Costs of On-Site Employer Control

Panel A: Inputs (INR per day)	
On-site discount, all migrants (D)	12.6
	(3.8)
On-site discount, site rated at least as good to live in (D_G)	25.2
	(7.7)
Rent saved, same group ($\bar{R}_G$)	30.9
	(1.8)
Commuting saved (C)	18.4
Panel B: Conditional lower bound, $\bar{R}_G + C - D_G$ (INR per day)	
Bound	24.1
Bootstrap SE	(7.8)
One-sided 90% lower confidence bound	13.8
95% percentile interval	[8.7, 39.4]
Workers in group G	150
Workers, all (D)	602

Notes: Amounts are INR per day. Group G comprises workers reporting that on-site living conditions are better than or equal to those in a rented room. D and D_G are minus the on-site coefficients in regressions of control-contract WTA on residence, age, education, SC/ST status, question order, the protection offered alongside the control contract, and enumerator, district, and interview-month fixed effects. D_G is estimated from the full sample, with on-site residence interacted with membership of G; $\bar{R}_G$ is the mean over the 150 workers in G with housing-cost data. Rent savings equal reported monthly rent for a single worker in Patna less expected on-site charges, divided by 30. For 4 workers whose reported rent is implausible (below INR 50 or above INR 20,000 per person per month, or a total room rent below INR 1,000), rent savings are set to the mean of the other workers in G. Commuting saved is the mean commuting expenditure of workers in this setting. Parentheses in Panel A report worker-clustered regression standard errors and the standard error of the rent mean. Panel B reports uncertainty from 1,000 worker resamples, jointly reestimating the wage discount and rent mean.

A.7 Matching

A.7.1 Productivity Index

This subsection documents the productivity-index construction referenced in Section 7.4, and reports bivariate correlations between the index and its components. The index is built worker-by-worker from a time-and-motion productivity module attached to the matching exercise. Each placed worker is observed at the worksite for an approximately two-hour window (typically 10 a.m.–noon), subdivided into two to three stages to limit enumerator fatigue. Within that window the enumerator records, for each stage, (i) counts of the main productive activities the worker performed: bricks carried, bricks passed to the mason, bowls of plaster delivered, and sand bags lifted; (ii) the travel distance associated with each brick or plaster trip; (iii) the minutes spent on each task; and (iv) minutes classified as break, idle, or work-interrupted. Minutes on other unmeasured productive activities (cleaning, scaffolding, demolition, helping other workers) are recorded but without a corresponding output count. Firms are told in advance that an observer will be present.

The module was fielded in two survey waves that used slightly different time-and-motion instruments. We pool the waves and include a survey-wave fixed effect that absorbs any level

difference between them. The headline index is an *intersection* composite built from the four productive tasks measured in both waves—bricks carried, bricks passed, plaster delivered (including casting, or *dhalai*, in the second wave), and sand bags lifted—following Brown and Haroon (2025). For each task we compute a per-minute effort-weighted rate: the task count, multiplied by the relevant travel distance raised to the power 0.25 (so that a long-carry site does not receive proportional credit for moving material further), and, for plaster, further multiplied by a bowl-size factor (the hemispherical volume implied by the plaster-bowl circumference). Brick and plaster counts are divided by the number of co-workers on the same task wherever that field is collected, because these throughput measures correlate strongly with team size and partly capture team-level rather than individual output; sand carrying does not exhibit this pattern and is left unadjusted. Counts and times are summed from stage to day and then averaged from day to worker, and the per-minute rate is the effort-weighted count divided by time on task.

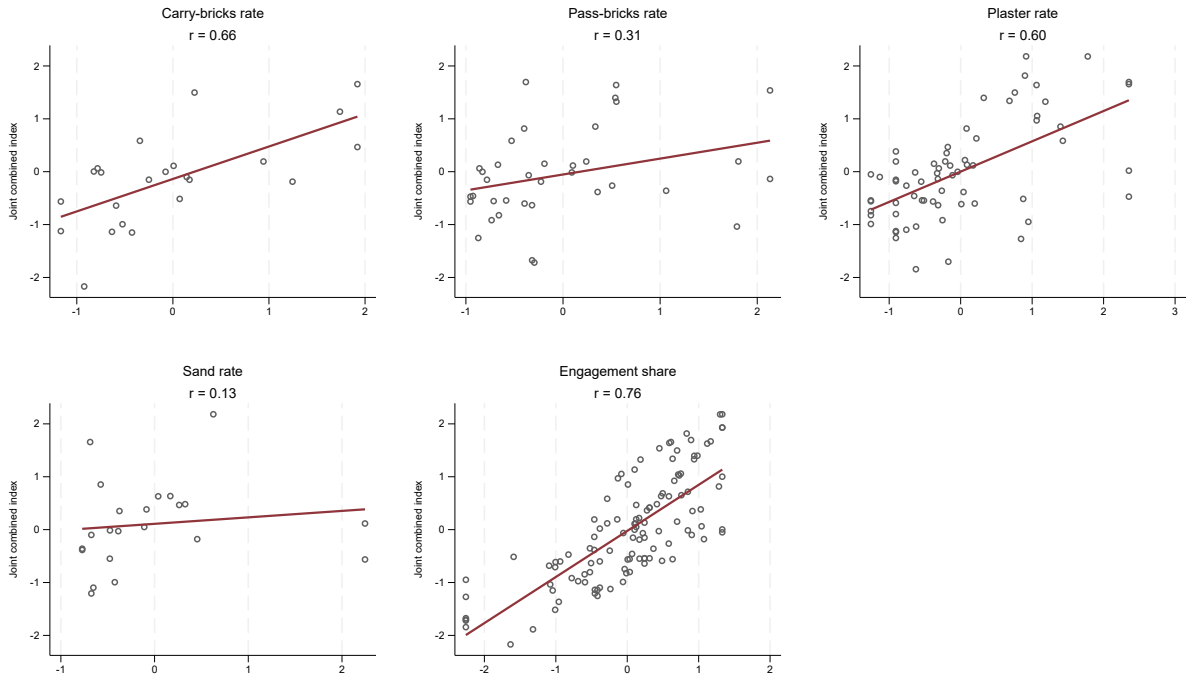
Each rate is standardised to a z-score within the subsample of workers who performed the task, and the extreme z-scores are winsorised at the 5th and 95th percentiles. The worker-level task-quality composite is then the time-weighted mean of these standardised rates,

$$\frac{\sum_k z_k \, t_k}{\sum_k t_k + t_{nonprod}},$$

where t_k is time on task k and $t_{nonprod}$ is non-productive time (break, idle, interrupted). Placing $t_{nonprod}$ in the denominator only, with no contribution to the numerator, dilutes the composite toward zero (the sample mean of a standardised variable) in proportion to the worker's dead time.

For the minority of placements whose observed window contained no measured task, the composite is undefined; for these workers we set the standardised composite equal to their engagement z-score, where engagement is the share of observed stage time that was not idle, break, or interrupted. The headline index plotted in Figure 18 is the unweighted mean of this composite and the standardised engagement share, pooled across the two waves with a survey-wave fixed effect and re-standardised to mean zero and unit variance. Using the task-quality composite alone yields a similar migrant gap (0.315 standard deviations, $p = 0.114$). As a robustness check that exploits the richer second-wave instrument, we also construct an *extended* composite that adds the wave-2-only tasks (soil, *gitti*, bamboo, brick-cleaning, centring, mud-filling, demolition, digging, and load-tying); the migrant gap on this measure is directionally similar, though it is estimated on the small wave-2 subsample alone. Per-worker covariates entering the migrant regression in the main text are age, years of education, and an SC/ST status indicator, with standard errors clustered at the firm level.

Figure A-23: Combined productivity index and its components



Notes: Each panel plots the standardised combined productivity index against one of its inputs: the per-minute effort-weighted z-scores for (top row) bricks carried, bricks passed, plaster delivered, (bottom row) sand bags lifted, and the engagement share. Grey circles are placed workers; the maroon line is an OLS linear fit; the pairwise correlation coefficient r is reported in each subtitle. Rate z-scores are winsorised at the 5th and 95th percentiles and are defined only for workers who performed the task, yielding different panel samples. Engagement is defined for every worker. Sample: 115 placed workers from the productivity module.

A.7.2 Selection into Migration

Table A-14 compares migrant-sample workers who migrated to Patna through the matching exercise with workers who said yes to the same job in the worker survey but did not migrate. A job is a contract, one of the treatment arms (control, outside option, mediation, or insurance) combined with on-site or off-site residence, at one of the five wages at which the contract was offered. The sample consists of the 415 migrant-sample workers who said yes to at least one contract at one or more offered wages; 74 of them migrated; the other 2 placed migrants are excluded because the worker survey does not record them saying yes to any offered contract. Each characteristic is regressed on an indicator for having migrated, with fixed effects for the 56 contract-by-wage groups, so that every comparison is between workers who said yes to the same contract at the same wage. Column (2) adds home-district fixed effects, because placement rates differed across the districts in which workers were recruited.

Within contract-by-wage groups, workers who migrated were 4.8 years younger, had 2.0 more years of education, reported INR 2,299 more in monthly income, and were 13 percentage points less likely to have taken a loan in the previous three months than workers who said yes to the same

job and did not migrate. These differences persist with home-district fixed effects. Differences in caste composition, years of work, and earlier work outside the home district are smaller and not statistically significant at the 5 percent level. The difference in bike ownership is significant within contract-by-wage groups but not with home-district fixed effects.

Table A-14: Workers who migrated and workers who said yes to the same job

	Mean		(1) Contract-by-wage FE		(2) + Home-district FE	
	Did not migrate	Migrated	Difference	p-value	Difference	p-value
Age	33.5	28.2	-4.8	0.002	-5.1	0.010
Years of education	3.5	5.8	2.0	0.001	1.7	0.021
Scheduled Caste or Tribe	0.56	0.47	-0.04	0.611	-0.13	0.076
Other Backward Class	0.40	0.51	0.09	0.258	0.14	0.077
Years of work	12.3	8.6	-2.2	0.084	-2.5	0.099
Worked outside home district	0.71	0.62	-0.03	0.734	0.19	0.055
Monthly income (INR)	13,255	15,209	2,299	0.000	2,758	0.000
Owns a bike	0.14	0.38	0.22	0.003	0.12	0.208
Loan in last 3 months	0.23	0.12	-0.13	0.000	-0.13	0.010

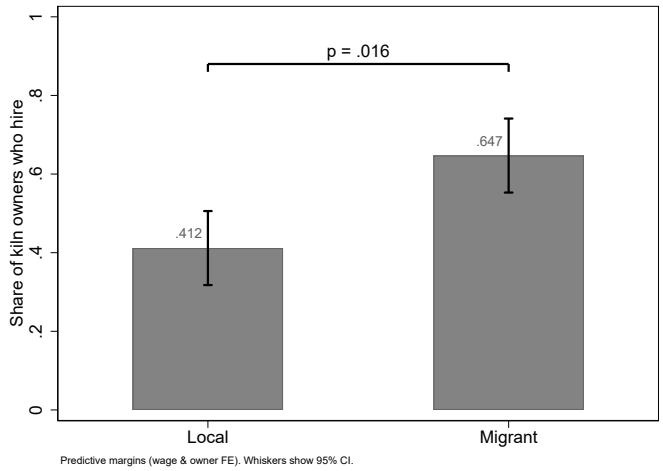
Notes: The sample consists of the 415 migrant-sample workers who said yes, in the worker survey, to at least one contract at one or more offered wages. A contract combines a treatment arm (control, outside option, mediation, or insurance) with on-site or off-site residence; each contract was offered at five wages, from INR 500 to 600. *Migrated* equals one for the 74 workers who were placed with a firm through the matching exercise. Means are computed once per worker. Differences are coefficients on *Migrated* from regressions of each characteristic on *Migrated* with fixed effects for the 56 contract-by-wage groups (column 1) and, in addition, home-district fixed effects (column 2). A worker who said yes to a contract at several wages enters each of the corresponding groups; standard errors are clustered by worker. Characteristics are defined as in Table A-10; monthly income is winsorized at the 1st and 99th percentiles, pooled with local workers. The p-values are from two-sided tests.

A.8 Evidence from a Brick-Kiln Owner Experiment

To test whether the demand patterns documented among construction firms extend to other sectors, we conducted a parallel experiment with brick-kiln owners. Brick kilns are a canonical setting for migrant and bonded labor in South Asia: work is paid by the piece, organized around an advance-and-debt arrangement, and workers are typically housed at the kiln (Breman, 2010). Each owner was offered the chance to hire a worker for brick-moulding and reported (i) whether it would hire a local versus a migrant worker at two piece rates (INR 600 and INR 650 per thousand bricks), and (ii) incentivized beliefs about local and migrant workers along six dimensions: days absent, leaving before completing the two-month work cycle, bricks moulded per day, contesting a wage deduction when bricks break, contesting a short or delayed food allowance, and the number of days a worker would need to find other work if he left the kiln. "Local" workers come from villages within a few kilometres of the kiln; "migrant" workers come from other districts of Bihar.

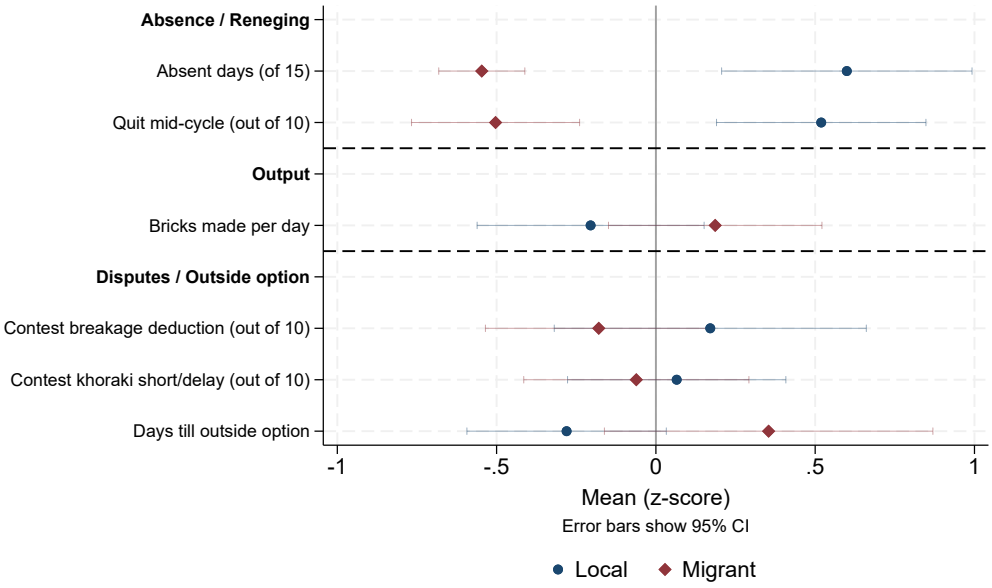
Kiln owners, like construction firms, prefer migrant workers (Figure A-24). Pooling the two piece rates and conditioning on owner and piece-rate fixed effects, 64.7% of owners are willing to hire a migrant versus 41.2% for a local—a 23.5 percentage-point gap, or 57% higher demand ($p = 0.016$).

Figure A-24: Brick-kiln owners' demand for local versus migrant workers



Notes: Share of brick-kiln owners willing to hire a local versus a migrant worker for brick-moulding, pooled across piece rates of INR 600 and INR 650 per thousand bricks. Bars are predictive margins from a linear probability model with owner and piece-rate fixed effects; standard errors clustered by owner ($N = 34$ owners; 136 owner×worker-type×piece-rate observations). Whiskers show 95% confidence intervals; the bracket reports the p-value for the local–migrant difference.

Figure A-25: Brick-kiln owners' beliefs about local versus migrant workers



Notes: Standardized (z-scored) owner beliefs about local (navy circles) and migrant (maroon diamonds) brick-moulding (*paatne*) workers, grouped into reliability, output, and disputes/outside employment opportunities. Points are means across owners; error bars show 95% confidence intervals. Higher values denote more days absent, more workers leaving mid-cycle, more bricks per day, more workers contesting the breakage deduction or food allowance delays, and more days needed to find other work. $N = 34$ owners.

Owners' beliefs reproduce the construction patterns (Figure A-25). Relative to locals, owners expect migrants to be absent on fewer days, to be less likely to leave before completing the two-month cycle, to mould more bricks per day, to be less likely to contest a wage deduction when bricks break, and—were they to leave—to take more days to find other work. Migrants are thus seen as more reliable, more productive, less able to contest unfavorable treatment, and as holding weaker outside employment opportunities. With the caveat of a small sample, these patterns reproduce, in a second and piece-rate sector, the reliability, productivity, and control margins we identify among construction firms.

A.9 Staffing-Company Hiring-Manager Survey

This section reports the remaining results from the survey of 22 hiring managers at a staffing company, discussed in Section 5.6.1. The company recruits workers and places them with client firms, so managers report the hiring instructions their clients give rather than their own preferences. Table A-15 summarises the composition of their placements and the ways in which client preferences over worker type are expressed. Migrants account for 63% of workers placed over the preceding twelve months. Client instructions run in both directions but asymmetrically: 20% of clients ask the company not to hire workers from nearby areas, against 13% who ask it not to hire migrants. Preferences are rarely concealed—68% of managers report that clients state their preference over worker type openly rather than hinting at it—and 64% of managers say their clients prefer migrants even when local workers are available. On-site accommodation is a recurring client requirement, with 41% reporting that clients often or always want workers who will stay at or near the workplace.

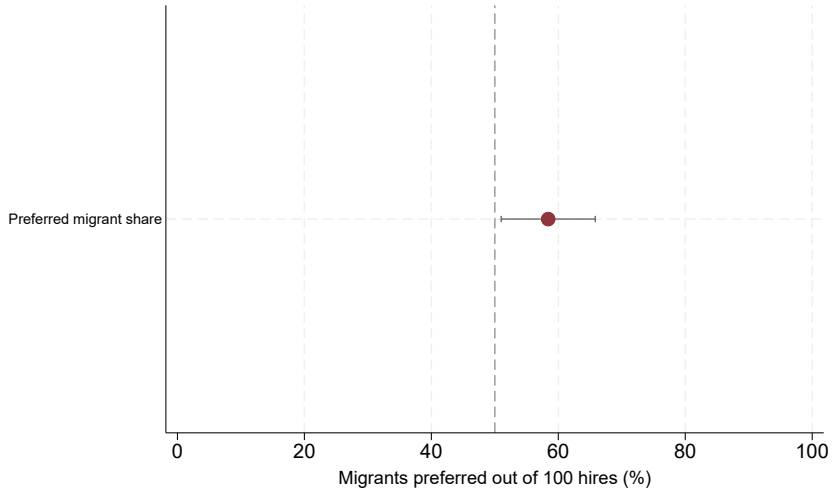
Figure A-26 reports the preferred migrant share of 100 hires. The mean is 58 with a 95% confidence interval of [51, 66] ($p = 0.028$). Alongside the reasons in Figure 9, this result indicates preference of firms in the formal sector follow a pattern similar to our the largely informal firms in our main experiment.

Table A-15: Staffing-company hiring managers: placements and client instructions

	Mean	SE	N
Panel A. Respondent and client mandates			
Primary sector: manufacturing (%)	54.5	(10.9)	22
Primary sector: retail (%)	22.7	(9.1)	22
Primary sector: delivery (%)	22.7	(9.1)	22
Migrant share of workers placed, last 12 months (%)	62.7	(5.9)	22
Client mandates, last 12 months (count)	15.0	(2.7)	22
Panel B. Restrictions and how preferences are expressed			
Clients asking not to hire nearby locals (%)	19.7	(5.4)	22
Reason: may organise other workers (%)	66.7	(33.3)	3
Reason: may complain to leaders, unions, authorities (%)	66.7	(33.3)	3
Reason: may refuse overtime or extra tasks (%)	33.3	(33.3)	3
Clients asking not to hire migrants (%)	12.7	(4.2)	22
Clients often/always want on-site workers (%)	40.9	(10.7)	22
Prefers migrants even when locals available (%)	63.6	(10.5)	22
Clients state migrant/local preference openly (%)	68.2	(10.2)	22

Notes: Responses from 22 hiring managers at a staffing company that places workers with client firms, principally in manufacturing, delivery, and retail. Panel A describes the respondents and the mandates they handle; Panel B describes restrictions clients place on worker type and how those preferences are communicated. Categorical bands are converted to midpoints before averaging, so means should be read as approximations. Standard errors are in parentheses. Items answered only by the subset of managers who receive a given type of client instruction have correspondingly smaller samples, reported in the final column.

Figure A-26: Preferred migrant share of 100 hires



Notes: Mean preferred number of migrants out of 100 hires, with a 95% confidence interval. The dashed vertical line at 50 denotes no preference between migrant and local workers. Sample: 22 hiring managers at a staffing company.

A.10 Evidence from the U.S. H-1B Visa Program

The employer leverage we document is not specific to informal labor markets or to low-income settings. The H-1B program, the principal channel for skilled migration to the United States, ties a worker's visa to a sponsoring employer: a worker who loses his job has sixty days to find a new sponsor or leave the country, and employer-sponsored permanent residency (the "green card") involves a queue that, for Indian nationals, can exceed a decade. Switching employers is legally possible but is widely perceived as risky for the pending application. The employment relationship therefore carries the worker's right to remain at the destination, and both sides know it.

Table A-16 reproduces comments from public discussion threads on Hacker News, a large technology forum on which visa holders, their colleagues, and their employers discuss the program. We collected 498 comments from threads spanning 2008–2026 and select six that speak directly to the paper's mechanisms; the right column states the parallel. The comments are anecdotal and self-selected, and we use them only as illustration. Read together, they describe the same economics as our experiments: firms value tied workers because they stay and comply; the surplus is taken in hours and effort rather than through wage markdowns; and the extraction ends when the worker's outside option improves.

Table A-16: Employer leverage over visa-tied migrant workers: accounts from a U.S. technology forum

Forum comment	Parallel mechanism in this paper
A U.S.-citizen colleague of H-1B workers (2017): "I'm uncomfortable with the kind of leverage my employer has over them. If my boss asked me to work 60 hour weeks or work through the weekends or something, I'm able to say 'no' because if they fire me, it's not really that big of a deal. I'll just go work for someone else. I'm not going to get kicked out of the country. For the H1B holders, it's a different story."	Locals can refuse extra demands because they can find other work—the belief gaps our firms report (Section 5.3).
A former H-1B worker, replying (2017): "I was a H1B worker and this is absolutely exactly how it happens. What are you going to say? No? . . . they'll just put you on a PIP [performance-improvement plan] and push out your green card application a few months or tell you they're re-evaluating things in light of your transgressions. Now what?"	Leverage runs through the terms of the employment relationship, not the wage (Section 5.5).
An employer, answering "Why do you hire H1-B workers instead of natives?" (2016): "H1B workers show up to work hard, show strong understanding that they are being paid to do a job as opposed to being entitled for some lifestyle, and have more respect for the hierarchy of the org. They will tend to stick around for a while too, and not be job hoppers."	Effort, deference, retention: the reasons our firms and staffing-company managers give for preferring migrants (Section 5.6.1).
A commenter on visa reform (2024): "The H1B system also impacts immigrants' job portability. An H1B employee is less likely to leave a bad job for a better job, thus H1B employees are more desirable because of the lock-in."	A worker who cannot leave is worth more at the same wage—our firms' willingness-to-pay premium for migrants (Section 5).
About a colleague on an employer-tied visa (2025): "He was tied to the employer for his visa. . . In 2008/2009. . . he won [the] green card lottery, and immediately all that overtime he was asked to put in stopped. This was after being told his company would sponsor him for a green card if he stayed there 5 years (and then reneged on that—his boss saying 'I never said that')."	Extraction tracks the outside option: when mobility arrives, the unpaid overtime stops (Section 5.5).
A former H-1B worker (2014): "[P]eople are brought here and they can't go anywhere regardless of how bad the system sucks except back home. In most cases the places they are coming from are in an even [worse] state so we stay here instead. . . I was paid significantly less than what I thought I was worth and also well below what US citizens and GC [green-card] holders were paid for a number of years. . . If I moved to any other company my green card process would restart so guess what I was stuck."	The binding outside option is the origin region—weaker for migrants, and priced by firms (Section 5.3).

Notes: Comments from public discussion threads on Hacker News (news.ycombinator.com), posted between 2008 and 2026; years in parentheses are posting dates. Quotes are verbatim except for ellipses and bracketed clarifications. The comment in the fifth row concerns an employer-tied visa other than the H-1B. The accounts are anecdotal and unverified.

B Randomization Balance

Table B-1: Balance on treatment-type assignment

	Insurance		Mediation		Outside option		
	Mean	(SD)	Mean	(SD)	Mean	(SD)	p-value
Age of Respondent	32.42	(10.21)	33.57	(9.66)	32.02	(9.18)	0.25
Years of education	4.06	(3.96)	3.64	(3.90)	3.98	(3.94)	0.52
Backward caste	0.39	(0.49)	0.41	(0.49)	0.45	(0.50)	0.49
Scheduled caste/tribe	0.55	(0.50)	0.52	(0.50)	0.51	(0.50)	0.65
Years of work	12.09	(8.81)	12.28	(8.07)	11.43	(7.97)	0.56
Worked in another district of Bihar	0.33	(0.47)	0.34	(0.47)	0.35	(0.48)	0.93
Worked in another state	0.57	(0.50)	0.51	(0.50)	0.51	(0.50)	0.41
Monthly Income (INR)	13273.70	(4364.85)	14000.00	(4415.88)	13771.79	(4863.65)	0.28
Family Monthly Income (INR)	20310.81	(13235.64)	20219.10	(10714.97)	21793.01	(14779.97)	0.43
Owns a bike	0.18	(0.39)	0.17	(0.38)	0.14	(0.34)	0.41
Has Loan	0.50	(0.50)	0.51	(0.50)	0.53	(0.50)	0.80

Notes: The table reports means and standard deviations of worker baseline characteristics by the treatment type (insurance, mediation, or outside option) the worker was assigned to in the experiment. One observation per worker. The p-value column reports the result of a joint F-test of equality of means across the three treatment types (2 degrees of freedom), testing whether baseline characteristics are balanced across treatment arms.

Table B-2: Balance on residence assignment

	Off-site		On-site		
	Mean	(SD)	Mean	(SD)	p-value
Age of Respondent	31.91	(9.54)	33.42	(9.83)	0.06
Years of education	4.04	(3.96)	3.75	(3.90)	0.36
Backward caste	0.44	(0.50)	0.40	(0.49)	0.37
Scheduled caste/tribe	0.50	(0.50)	0.55	(0.50)	0.19
Years of work	11.77	(8.09)	12.06	(8.50)	0.67
Worked in another district of Bihar	0.34	(0.47)	0.33	(0.47)	0.87
Worked in another state	0.52	(0.50)	0.54	(0.50)	0.61
Monthly Income (INR)	13961.67	(4478.61)	13395.28	(4628.43)	0.14
Family Monthly Income (INR)	20993.54	(13572.86)	20578.24	(12530.34)	0.71
Owns a bike	0.16	(0.37)	0.17	(0.37)	0.83
Has Loan	0.50	(0.50)	0.53	(0.50)	0.55

Notes: The table reports means and standard deviations of worker baseline characteristics by residence assignment (off-site or on-site). One observation per worker. The p-value column reports the result of a two-sided t-test of equality of means across residence groups, testing whether baseline characteristics are balanced between the two residence arrangements.

Table B-3: Balance on offer presentation order

	Control first		Treatment first		
	Mean	(SD)	Mean	(SD)	p-value
Age of Respondent	32.18	(9.53)	33.11	(9.87)	0.24
Years of education	3.84	(3.95)	3.95	(3.92)	0.75
Backward caste	0.44	(0.50)	0.40	(0.49)	0.32
Scheduled caste/tribe	0.51	(0.50)	0.54	(0.50)	0.42
Years of work	11.74	(8.02)	12.08	(8.56)	0.61
Worked in another district of Bihar	0.35	(0.48)	0.32	(0.47)	0.42
Worked in another state	0.54	(0.50)	0.51	(0.50)	0.52
Monthly Income (INR)	13760.66	(4615.50)	13597.56	(4508.26)	0.67
Family Monthly Income (INR)	20696.49	(13592.02)	20867.81	(12512.91)	0.88
Owns a bike	0.16	(0.36)	0.17	(0.38)	0.51
Has Loan	0.54	(0.50)	0.49	(0.50)	0.24

Notes: The table reports means and standard deviations of worker baseline characteristics by the order in which contract offers were presented (control contract first or treatment contract first). One observation per worker. The p-value column reports the result of a two-sided t-test of equality of means across presentation order groups, testing whether baseline characteristics are balanced between the two randomized orderings.

C Survey Implementation

C.1 Firm Experiment

C.1.1 Firm Experiment: Elicitation Script

The following is a translation of the Hindi script read aloud to firm owners by enumerators before the WTP elicitation.

Introduction. We will now ask you some questions in which we will give you the opportunity to hire different types of workers.

We will ask you about a total of 6 different contracts. You will tell us whether or not you would hire a worker under each contract.

For each contract, we will give you some information about the worker: (a) where they are from—whether they are local or from outside Patna, and (b) where they will stay during the work. After that, we will ask whether you would hire the worker, and if so, the maximum daily wage you would be willing to pay. In our 6 contracts, you can hire two types of workers:

1. **Local workers from Patna**—who are residents of Patna city or Patna district, or who have been living continuously in Patna on rent for at least a year. This includes workers who may not live in Patna city but reside in Patna or nearby district and commute daily for work. These workers have prior experience in construction labor.

2. **Workers from other districts of Bihar**. We will bring these workers from villages in districts outside Patna. These workers have prior experience in construction labor.

The residence arrangement for outside workers can be of two types:

1. **Daily commuting:** The worker will rent their own room or house in the city and commute to the site daily. That is, they will not stay at or near the site.
2. **Staying at or near the site:** The worker will reside at the site or nearby.

Description of the six contracts.

1. In one contract, we will provide you with an outside worker whose residence arrangement will be at your discretion. If you wish, the worker will stay at the site; otherwise, they will find their own accommodation and commute to the site.
2. In the second contract, we will also provide an outside worker, but this worker will not stay at the site and will commute daily from their own accommodation.
3. In the third contract, we will provide a local worker.
4. The remaining three contracts will involve the same three worker types, but in addition we will provide you with a guarantee. We will explain this to you later.

For whichever of the 6 contracts you wish to hire the worker, please say "yes," and for those you do not, say "no." The decision to hire is entirely yours.

Important: Each contract is completely independent of the others. Therefore, please think about each contract separately and answer accordingly. Your answer to one contract should not affect your answer to the next. You will be shown a total of 6 contracts. For each contract:

1. If you do not wish to hire the worker: say "no."
2. If you wish to hire the worker: say "yes" and state the maximum daily wage (rupees per day) at which you are willing to hire the worker under that contract. (That is, if the wage were even 1 rupee higher, you would not hire the worker under that contract.)

Allocation mechanism (BDM). After you have answered all 6 contracts, two things will be selected by a lucky draw:

1. One contract out of the 6.
2. A wage amount.

The rules are as follows:

1. If the maximum wage you stated for the contract selected in the lucky draw is equal to or greater than the wage drawn, you will be given a worker under that contract, and the wage will be the one drawn in the lucky draw (not your stated wage).

2. If your stated wage is less than the lucky-draw wage, or you said "no" to that contract, no worker will be provided.

The worker will be provided to you within the next month, or according to your need (when you say), under the same contract and at the same wage.

Illustrative example. Suppose for a certain contract you said you are willing to pay up to 550 per day. If that contract is selected in the lucky draw and the drawn wage is 525, you will receive the worker at a wage of 525. If the drawn wage is 575, no worker will be provided.

Comprehension check. Before proceeding, the enumerator verifies the respondent's understanding using the following questions:

1. "Is each contract separate or are they linked?" *(Correct: Each contract is completely separate.)*
2. "How will it be decided whether you receive a worker or not?" *(Correct: One contract and one wage will be selected by lucky draw.)*
3. "If the contract and wage selected in the lucky draw are ones for which you said 'yes,' and your stated maximum wage is equal to or greater than the lucky-draw wage—what will happen?" *(Correct: You will be given a worker under the selected contract at the lucky-draw wage.)*
4. "If the contract and wage selected in the lucky draw are ones for which you said 'no'—what will happen?" *(Correct: No worker will be provided.)*
5. If the respondent does not understand "random/lucky draw": "Just as you would draw one slip from among 6 slips without looking—the computer will select one contract in the same way."

Features common to all contracts. The following conditions apply to all 6 contracts and do not vary:

1. The duration of work is 15 days. After that, if needed, work may be continued by mutual agreement.
2. Payment may be made weekly or in a lump sum after 15 days, at your convenience. If the worker needs money in between, you may provide an advance at your discretion.
3. When answering for each contract, please assume you are starting a new project. Under those circumstances, would you hire the worker at the stated wage or not?
4. Workers do not choose their own residence arrangement. We recruit all workers in the same manner and from the same pool. After recruitment, due to logistical constraints (such as limited space for on-site accommodation), we use a lottery to determine which worker stays at or near the site and which commutes daily.

We will now ask you about the contracts one by one.

C.1.2 Questions in the Belief Experiment

We elicit beliefs for three worker categories: (i) local workers from Patna, (ii) migrants from districts outside Patna with on-site residence, and (iii) migrants from districts outside Patna who live off-site in the city and commute daily. We ask the following questions for all the workers.

1. **Absence (0–7 days):** Expected number of days absent over the next 7 workdays.
2. **Reneging (out of 10):** Out of 10 hires for a 7-day job, expected number who leave before completing all 7 days.
3. **Delay (minutes):** Average minutes late among those who show up to work.
4. **Outside employment opportunities (days):** If the worker leaves the job, expected number of days to find a new daily-wage job in Patna.
5. **Hours worked (hours/day):** On a normal day (starting on time), expected hours worked.
6. **Unpaid extra hour (out of 10):** If the worker is asked to work 1 hour more on 1–2 days in a week with no extra pay, expected number (out of 10) who will do that work.
7. **Trusted without supervision (out of 10):** Out of 10 workers, expected number who can be trusted to work well without close supervision.
8. **Response to delayed pay (out of 10):** If payment is delayed by 2 days, expected number (out of 10) who would argue, dispute, or stop working.
9. **Effort rating (1–10):** Typical effort/work pace during an 8-hour workday (1 = minimum, 10 = maximum).
10. **Task productivity (per hour):** Time taken to complete a task in construction.
11. **External complaint/help-seeking (out of 10):** If a wage/payment dispute arises, expected number (out of 10) who would go outside to seek help (e.g., leaders, associations, police).
12. **Network support in Patna (out of 10):** Expected number (out of 10) with family/relatives in Patna who can help in a medical emergency.

C.1.3 Follow-up Vignette

There are two workers, both from outside the district. Both have recently arrived in Patna: Neeraj and Manoj. Both workers are the same age, are identical, and there is no difference between them. Both are willing to stay on-site and are also willing to commute to the site daily. If Neeraj gets the opportunity to work while living on-site and Manoj commutes to the site every day, whom would you trust more to do good work without supervision?

C.2 Worker Experiment

C.2.1 Worker Experiment: Elicitation Script

The following is a translation of the Hindi script read aloud to migrant workers by enumerators before the contract-variation experiment. The specific contract terms (work description, residence arrangement, and protections) were presented within each individual offer and are not reproduced here.

Introduction. Now I will ask you about two types of wage-based work (Job 1 and Job 2). For each job, I will tell you three things: (1) what the work is, (2) where the work will be and what the residence arrangement will be, and (3) what the daily wage will be.

After that, you will tell me: "Under those terms, would you want to work—yes or no?"

Please keep in mind that each question is separate; your answer to one question has no bearing on any other question. Please think carefully about the terms of each question and answer accordingly. If you want to work under those terms, say "yes"; if not, say "no." Each set of terms will be asked at five different daily wages. Therefore, there will be 10 questions in total.

After you have answered all the questions, one question will be selected by a lucky draw—just as you would draw one slip from among 10 slips without looking.

If the question selected by the lucky draw is one for which you said "yes," you will be given work under the terms of that question; and if you said "no" to the selected question, you will not be given work.

Comprehension check. Before proceeding, the enumerator verifies the respondent's understanding using the following questions:

1. "How many questions will there be in total?" *(Correct: ten.)*
2. "Is each question separate?" *(Correct: yes, each is separate.)*
3. "What will happen at the end?" *(Correct: a lottery will select one question out of ten.)*
4. "If you said 'yes' to the selected question, then what?" *(Correct: you will be given work under those terms.)*
5. "And if you said 'no'?" *(Correct: you will not be given work.)*

Alright, now I will describe the first question—please listen carefully and then tell me whether you would want to work under those terms or not.

C.2.2 Questions in the Belief Experiment

We ask workers the following questions about (i) local workers in Patna, (ii) off-site migrant workers in Patna, and (iii) on-site migrant workers in Patna.

1. **Unpaid overtime incidence (out of 10):** Expected number made to work 1–2 extra hours on at least one day within 7 days, without extra pay.
2. **Evening cleaning (out of 10):** Expected number asked to stay late in the evening to do cleaning work.
3. **Early-morning curing (out of 10):** Expected number asked to come early in the morning to do curing (pouring water on walls).
4. **Any payment delay (out of 10):** Expected number experiencing at least one delay in receiving wages during 7 days of work.
5. **Withholding at endline (out of 10):** Expected number for whom some amount is withheld after 7 days relative to the agreed entitlement.
6. **Underpayment (out of 10):** Expected number paid a daily wage of 450 instead of the agreed 500 after completing 7 days.
7. **Reneging (out of 10):** Expected number leaving the job before completion of 7 days.
8. **Any dispute/argument (out of 10):** Expected number with at least one argument or dispute with the contractor over wages/hours/work within 7 days.
9. **Any contractor pressure (out of 10):** Expected number for whom the contractor puts pressure at least once within 7 days (scolding/threatening, removal threats, or withholding payment).
10. **Works well without contractor (out of 10):** Expected number who work well even in the absence of the contractor.
11. **External complaint/help-seeking (out of 10):** If a wage/payment dispute arises, expected number who go outside the site to seek complaints/help (e.g., leader, contractor association, police, others).
12. **Re-employment (out of 10):** If they leave the current job, expected number able to find a new daily-wage job within 2 days.

C.3 Matching Exercise

This subsection describes how the placements analyzed in Section 7 were formed. It covers how firms and workers were paired, why many successful draws did not become placements, and how offers that specified on-site residence were implemented.

Pairing firms and workers. The research team formed each placement from a firm and a worker who had both accepted the contract to be implemented in their respective elicitations. Due to demand and supply idiosyncrasies in timing we chose to match firms and workers who had accepted contracts of the same type even if their random draw hadn't resulted in an offer. A firm was eligible for a worker of a given type if it had accepted the offer for that type of worker, under the relevant residence and guarantee terms, at the wage in question, and a worker was eligible for a job if the worker had accepted that job at that wage. The implemented offer was therefore one that both sides had accepted, but it was not always the offer that the computer draw had selected. Firms needed workers on particular dates and at particular sites, and workers were available only at particular times, so the team paired firms and workers as supply and demand allowed, drawing on any offer that the two sides had accepted. A firm whose draw selected a migrant contract could thus be matched with a local worker, but only if it had also accepted the local contract at that wage. Either side was free to decline a proposed placement, and declining carried no penalty.

From successful draws to placements. Table 7 shows that far fewer workers and firms were placed than had a successful draw. On the worker side, many workers with a successful draw could not be reached by phone when a job became available, had found other work in the meantime, or had migrated elsewhere. On the firm side, many firms with a successful draw had already found workers by the time a worker was available, or their labor needs had changed. Because the team could implement any offer that both sides had accepted, firms and workers whose own draw had not produced an offer could still be placed once a compatible counterpart was available. For this reason the placed counts in Table 7 are not a subset of the draw column.

On-site offers implemented as off-site jobs. As noted in Section 7.1, all placements were implemented as off-site jobs. Workers whose accepted contract specified on-site residence were placed in the same job but lived off site. For these workers the research team arranged a place to stay near the site, and the rent was shared between the worker and the research team.

Payments, protections, and support. The firm paid the wage of its accepted offer and the worker received the wage of the worker's accepted offer. The research team paid the difference to the worker as a lump sum when the placement ended. Pairs were formed only where the worker's wage was at or above the firm's, so the firm never paid more than the worker received. The timing of the firm's own payments was left to the firm and the worker. For firms whose accepted offer included the guarantee, the guarantee was in force, and in some placements the team paid the compensation or sent a replacement worker. Workers' protections were in force as accepted and some were used; firms were not told about them. Some workers received travel fare from their village, and cooking gas was provided when gas prices rose during the placement period.

D Proofs and Extensions

D.1 Model definitions and worker responses

This subsection shows the technical assumptions and underlying details of the framework used in Section 2. The model holds per-hour productivity equal across worker types and abstracts from housing.

Technology and worker characteristics. The additional-hours revenue function satisfies

$$f(0) = 0, \qquad f'(x) > 0, \qquad f''(x) < 0, \qquad f'(0) < \infty, \qquad \lim_{x \to \infty} f'(x) = 0. \tag{D.1}$$

The worker's competing-activity shock is drawn independently in each period, with $\tau_s > 0$, and has the distribution

$$\chi_s \sim \text{Uniform}[0, \tau_s], \qquad G_s(a) = \min\{1, \max\{0, a/\tau_s\}\}. \tag{D.2}$$

Since $\mathbb{E}[\chi_s] = \tau_s/2$, $\tau_M < \tau_L$ implies a lower mean value of competing activities for migrants. The value of outside employment opportunities at the destination is b_s, and $q_s \in (0, 1)$ is the institutional probability of dismissal conditional on refusing unpaid work. Utility is quasilinear in pay. The marginal disutility of an additional hour is one, and the common utility cost of the contractual workday is incorporated into b_s.

Productivity differences. Differences in the effective value of labor can be incorporated by scaling revenues. If λ denotes the value of an hour of migrant labor relative to an hour of local labor, migrant revenues become λy and $\lambda f(x)$. Such differences may reflect worker characteristics or employer power. The comparisons in the framework hold this productivity factor fixed. The empirical exercise shows that this difference can drive the preference of firms.

Worker responses. The wage is posted at the start and remains fixed over the relationship. In each period, including the first, the firm chooses overtime before observing the worker's shock. The worker then observes both and chooses among the current-period payoffs in (2.1); continuation utility does not enter these comparisons. Quitting and dismissal precede production and wage payment. Workers who refuse but are not dismissed complete the contractual workday; the relationship continues only when the workday is completed.

The analysis conditions on migration and entry into employment. Actual overtime demands are learned after arrival and are evaluated using outside employment opportunities at the destination and protection against dismissal. The demands need not be unanticipated to constitute departures from the agreed eight-hour contract.

The worker maximizes current-period utility. Let $R_s = w - b_s$. The incentive compatibility condition for compliance is $\chi_s \leq R_s - x/q_s$. Refusal is optimal for $R_s - x/q_s < \chi_s \leq R_s$, and

quitting is optimal for $\chi_s > R_s$. The compliance and retention probabilities are therefore

$$C_s(w,x) = G_s(R_s - x/q_s), \tag{D.3}$$

$$S_s(w,x) = (1-q_s)G_s(R_s) + q_s G_s(R_s - x/q_s). \tag{D.4}$$

The quit probability is $1 - G_s(R_s)$, and the dismissal probability is $q_s[G_s(R_s) - G_s(R_s - x/q_s)]$. Retention and additional labor supplied are distinct margins. A worker who refuses overtime may still complete the workday. We measure reliability by the retention probability S_s and unpaid hours per completed workday by

$$h_s(w,x) = x\frac{C_s(w,x)}{S_s(w,x)}. \tag{D.5}$$

The retention probability S_s represents continuity of production within the employment relationship. Empirically, the reliability margin includes absenteeism, reneging and lateness.

Firm optimization. The firm's expected flow profit is

$$m_s(w,x) = (y-w)S_s(w,x) + f(x)C_s(w,x). \tag{D.6}$$

Separation interrupts production and ends the relationship. The infinite horizon represents a continuing employment relationship. Under a stationary policy and with no discounting, the Bellman equation is $J_s = m_s + S_s J_s$, giving $J_s = m_s/(1-S_s)$ for $S_s < 1$ and the expression in (2.3). Production and wage payments occur only on completed workdays.

The firm solves

$$(w_s^*, x_s^*) \in \underset{w \geq \underline{w},\ x \geq 0}{\arg\max}\ J_s(w,x). \tag{D.7}$$

The wage is posted before overtime is chosen. Under a stationary policy, this sequential problem is equivalent to (D.7), as shown below. Define $S_s^* = S_s(w_s^*, x_s^*)$ and $h_s^* = h_s(w_s^*, x_s^*)$.

Conditions for the comparisons. The comparative statics apply to profitable optima with positive overtime, a nonbinding wage floor, interior worker-response thresholds, and a negative-definite Hessian.[16] Finite comparisons maintain these conditions along the optimizing path between worker types.

Hiring valuations. For the experimental interpretation, we map ordinary-contract hiring valuations to the optimal wage, $\omega_s = w_s^*$. This is a maintained interpretation of the hiring valuations, not an identity between profit-maximizing wages and maximum acceptable wages in general. The guarantee comparison uses a separate acceptance threshold relative to ordinary-contract profits,

[16] The interior thresholds are $0 < w_s^* - b_s - x_s^*/q_s < w_s^* - b_s < \tau_s$. Appendix D.2 states the curvature condition used for differentiable comparative statics, and Appendix D.3 provides sufficient conditions for a unique global optimum satisfying these restrictions.

as defined in Appendix D.8. Interpreting reported valuations as that threshold requires the elicitation interpretation stated there.

D.2 Interior solution

Suppress the worker-type subscript and define

$$d = q^{-1} - 1 > 0, \qquad z = w - b - x, \qquad A = y - b. \tag{D.8}$$

When both response thresholds are interior,

$$z > dx, \qquad z + x < \tau, \tag{D.9}$$

the probabilities in (D.3)–(D.4) reduce to

$$S = \frac{z}{\tau}, \qquad C = \frac{z - dx}{\tau}, \qquad w = b + z + x. \tag{D.10}$$

Hence

$$J(z, x) = \frac{N(z, x)}{\tau - z}, \qquad N = z[A - z - x + f(x)] - dxf(x). \tag{D.11}$$

At a stationary point write

$$p = f'(x), \quad H = \tau - z, \quad K = -f''(x)(z - dx) + 2dp, \quad \Delta = 2K - (p - 1)^2. \tag{D.12}$$

The first-order conditions are

$$N_x = (p - 1)z - d[f(x) + xp] = 0, \tag{D.13}$$

$$N_z + J = A - 2z - x + f(x) + J = 0. \tag{D.14}$$

For $x > 0$, the first condition implies $p > 1$. At a stationary point,

$$\nabla^2 J = \frac{1}{H} \begin{pmatrix} -2 & p - 1 \\ p - 1 & -K \end{pmatrix}. \tag{D.15}$$

The condition $\Delta > 0$ is sufficient for negative definiteness of the Hessian. The affine transformation from (w, x) to (z, x) preserves this property. All derivatives below are evaluated at a positive-profit optimum with a nonbinding wage floor and interior response thresholds satisfying (D.9).

To establish sequential optimality, fix w and let $V(w) = \max_x m(w, x)/(1 - S(w, x))$ over policies with $S < 1$. For every feasible x, $m(w, x) + S(w, x)V(w) \leq V(w)$, with equality at a maximizer. This is the Bellman optimality condition. The solution to the ratio problem is therefore an optimal stationary overtime policy conditional on the posted wage.

At a profitable interior optimum with positive unpaid overtime, the wage satisfies

$$w_s^* = b_s + x_s^* + \tau_s - \sqrt{\tau_s[\tau_s - y + b_s + x_s^* - f(x_s^*)] + \frac{1-q_s}{q_s}\, x_s^* f(x_s^*)}. \tag{D.16}$$

The overtime requirement x_s^* is determined jointly with the wage. The no-overtime wage is derived in (D.18) below.

D.3 Global existence and uniqueness

The following sufficient conditions ensure a unique global optimum with interior response thresholds and a finite value of the employment relationship. Write $p_0 = f'(0)$ and define

$$F_\infty = \sup_{x \geq 0} f(x) < \infty.$$

The bound is common across worker types.

Lemma 1. *In addition to* (D.1)*, suppose*

$$A = y - b > 0, \qquad \tau > A + F_\infty, \qquad 1 < p_0 < (\sqrt{d+1} + \sqrt{d})^2. \tag{D.17}$$

If $\underline{w} < w_0^*(b, \tau)$ *from* (D.18)*, the firm has a unique positive-profit global optimum under unpaid overtime. It satisfies* $x^* > 0$*, a nonbinding wage floor, interior response thresholds, and* $\Delta > 0$*.*

Proof. First, positive current profit requires $S > 0$ and, since $C \leq S$,

$$0 < (y - w)S + f(x)C \leq [y - w + F_\infty]S.$$

Thus any profitable policy satisfies $w < y + F_\infty < b + \tau$. In particular, the upper threshold $R = w - b$ is below τ. A policy with $C = 0$ either has nonpositive profit, or is strictly improved by setting $x = 0$ at the same wage: the positive ordinary-day margin is then earned more frequently and for a longer expected duration. Therefore a profitable optimum satisfies $0 < R - x/q \leq R < \tau$, equivalent to (D.9). The middle inequality becomes strict once we establish $x^* > 0$. Policies with $S = 1$ necessarily have a negative flow margin under these assumptions and cannot improve on no employment.

At any $z > 0$, maximize $N(z, x)$ over $0 \leq x \leq z/d$. At the two endpoints,

$$N_x(z, 0) = (p_0 - 1)z > 0, \qquad N_x(z, z/d) = -z - df(z/d) < 0.$$

Since $N_{xx} = -K < 0$, there is a unique conditional demand $x(z) \in (0, z/d)$. Its first-order condi-

tion implies $1 < p \leq p_0$. For p in that interval,

$$\Delta = 2K - (p-1)^2 \geq 4dp - (p-1)^2 > 0,$$

where the last inequality follows from the upper bound on p_0.

Let $P(z) = N(z, x(z))$. The envelope theorem and implicit differentiation give

$$x'(z) = \frac{p-1}{K}, \qquad P''(z) = -2 + \frac{(p-1)^2}{K} = -\frac{\Delta}{K} < 0.$$

As z tends to zero, $x(z) = O(z)$, so $P(0) = 0$ and $P'(0) = A > 0$. Also $P(z) \leq Az - z^2 + F_\infty z \to -\infty$. Strict concavity therefore gives a unique positive zero $\bar{z}$, with $P > 0$ precisely on $(0, \bar{z})$. Wherever $P > 0$, its algebraic definition implies $w = b + z + x < y + F_\infty$; hence $z + x < \tau$ and the conditional solution is within the full probability model. At the positive zero the same weak inequality implies $\bar{z} < \tau$.

On the positive-profit interval, the derivative of $P(z)/(\tau - z)$ has the sign of

$$T(z) = P'(z)(\tau - z) + P(z), \qquad T'(z) = P''(z)(\tau - z) < 0.$$

The limits are $T(0) = A\tau > 0$ and $T(\bar{z}) = P'(\bar{z})(\tau - \bar{z}) < 0$. There is exactly one stationary point, and it is the unique positive global maximum.

Finally, the wage restriction is slack. Write

$$P(z) = Az - z^2 + E(z), \qquad E(z) = \max_x \{z[f(x) - x] - dxf(x)\}.$$

At the conditional optimum, $E(z) > 0$ because the derivative at $x = 0$ is positive, and $E'(z) = f(x) - x > 0$ because $f(x) \geq xp > x$. At the no-extra-work maximizer z_0^* the derivative numerator for $P/(\tau - z)$ is $E'(z_0^*)(\tau - z_0^*) + E(z_0^*) > 0$. The unique optimum consequently satisfies $z^* > z_0^*$ and $w^* = b + z^* + x^* > w_0^* > \underline{w}$. It is feasible for the constrained problem and therefore remains its unique global maximizer. □

D.4 Reliability

Proposition 1 (Reliability)**.** *Holding b_s, q_s, and productivity fixed, and allowing the firm to reoptimize:*

(i) Optimal wage: $\dfrac{dw_s^*}{d\tau_s} < 0.$

(ii) Retention at the optimum: $\dfrac{dS_s^*}{d\tau_s} < 0.$

(iii) Overtime requirement: $\dfrac{dx_s^*}{d\tau_s} < 0.$

(iv) Expected unpaid hours per completed workday: $\dfrac{dh_s^*}{d\tau_s} < 0.$

Proof of Proposition 1. First impose $x = 0$. With $A = y - b \in (0, \tau)$ and $z = w - b$, every profitable policy satisfies $0 < z < A$, and

$$J_0(z) = \frac{(A - z)z}{\tau - z}.$$

The derivative has the sign of $A\tau - 2\tau z + z^2$, which decreases on $(0, A)$ and changes sign once. Its root is $z_0^* = \tau - \sqrt{\tau(\tau - A)}$. With a nonbinding wage floor, the optimal wage is therefore

$$w_0^*(b, \tau) = b + \tau - \sqrt{\tau(\tau - y + b)}. \tag{D.18}$$

Moreover,

$$\frac{\partial w_0^*}{\partial \tau} = 1 - \frac{2\tau - A}{2\sqrt{\tau(\tau - A)}} < 0, \tag{D.19}$$

because $(2\tau - A)^2 - 4\tau(\tau - A) = A^2 > 0$.

With endogenous overtime, the envelope derivative at a stationary point is $J_\tau = -J/H$. Differentiating (D.13)–(D.14) yields

$$\begin{pmatrix} -2 & p - 1 \\ p - 1 & -K \end{pmatrix} \begin{pmatrix} z_\tau \\ x_\tau \end{pmatrix} = \begin{pmatrix} J/H \\ 0 \end{pmatrix}.$$

Inversion gives

$$\begin{aligned} z_\tau = -\frac{JK}{H\Delta}, \qquad x_\tau = -\frac{J(p-1)}{H\Delta}, \\ w_\tau = -\frac{J(K + p - 1)}{H\Delta} < 0. \end{aligned} \tag{D.20}$$

Since $S = z/\tau$ and $C = (z - dx)/\tau$,

$$S_\tau = \frac{\tau z_\tau - z}{\tau^2} < 0, \qquad C_\tau = \frac{z_\tau - dx_\tau}{\tau} - \frac{z - dx}{\tau^2} < 0.$$

The second inequality uses $K > 2dp > d(p - 1)$.

To establish the hours comparison, use concavity to obtain $f(x) \geq xp$. The demand first-order condition then implies

$$\frac{dx}{z} = \frac{x(p-1)}{f(x) + xp} \leq \frac{p-1}{2p} < \frac{1}{2}. \tag{D.21}$$

Conditional on z and d, the optimal demand satisfies $x_z = (p - 1)/K > 0$ and does not depend directly on b or τ. Suppressing the worker-type index in (D.5), $h = xC/S = x - dx^2/z$, so

$$\frac{dh}{dz} = \frac{p-1}{K}\left(1 - \frac{2dx}{z}\right) + \frac{dx^2}{z^2} > 0. \tag{D.22}$$

Hence $h_\tau < 0$. A decrease in τ raises both x and C, so expected unpaid hours per period, xC, also increase. Finite comparisons follow by integration along a path of interior optima. □

D.5 Dismissal risk

Proposition 2 (Dismissal risk). *Holding b_s, τ_s, and productivity fixed, and allowing the firm to reoptimize:*

(i) Optimal wage: $\dfrac{dw_s^*}{dq_s} > 0$.

(ii) Retention at the optimum: $\dfrac{dS_s^*}{dq_s} > 0$.

(iii) Overtime requirement: $\dfrac{dx_s^*}{dq_s} > 0$.

(iv) Expected unpaid hours per completed workday: $\dfrac{dh_s^*}{dq_s} > 0$.

Proof of Proposition 2. Changing q changes $d = q^{-1} - 1$, with $d_q = -q^{-2}$. At a stationary point, $J_d = -xf(x)/H$. Implicit differentiation gives

$$\begin{pmatrix} -2 & p-1 \\ p-1 & -K \end{pmatrix} \begin{pmatrix} z_d \\ x_d \end{pmatrix} = \begin{pmatrix} xf(x)/H \\ f(x) + xp \end{pmatrix}.$$

Consequently,

$$z_q = \frac{Kxf(x)/H + (p-1)[f(x) + xp]}{q^2\Delta} > 0, \tag{D.23}$$

$$x_q = \frac{(p-1)xf(x)/H + 2[f(x) + xp]}{q^2\Delta} > 0, \tag{D.24}$$

$$w_q = \frac{(K+p-1)xf(x)/H + (p+1)[f(x) + xp]}{q^2\Delta} > 0. \tag{D.25}$$

All numerators are positive because $x > 0$, $p > 1$, and $K > 0$. Retention increases since $S_q = z_q/\tau > 0$. Using (D.21),

$$h_q = x_q\left(1 - \frac{2dx}{z}\right) + \frac{dx^2}{z^2}z_q + \frac{x^2}{q^2 z} > 0. \tag{D.26}$$

Expected unpaid hours per period, $xC = hS$, therefore also increase. The quit probability falls because it is $1 - (z + x)/\tau$. The envelope theorem gives

$$\frac{\partial J^*}{\partial q} = \frac{xf(x)}{q^2 H} > 0. \tag{D.27}$$

The comparison across worker types follows by integration whenever the optimum remains in this region between q_L and q_M. □

At fixed wages and overtime, the uniform interior specification gives $C_q = x/(q^2\tau) > 0$ and $S_q = 0$. The increase in retention is therefore induced by the firm's wage and overtime responses.

D.6 Outside employment opportunities

At a stationary point, $J_b = -z/H$. The partial derivative of $N_z + J$ with respect to b is $-1 - z/H = -\tau/H$, while the corresponding derivative of N_x is zero. Hence

$$\begin{pmatrix} -2 & p-1 \\ p-1 & -K \end{pmatrix} \begin{pmatrix} z_b \\ x_b \end{pmatrix} = \begin{pmatrix} \tau/H \\ 0 \end{pmatrix},$$

and

$$\begin{aligned} z_b = -\frac{\tau K}{H\Delta}, \qquad x_b = -\frac{\tau(p-1)}{H\Delta}, \\ w_b = 1 - \frac{\tau(K+p-1)}{H\Delta}. \end{aligned} \tag{D.28}$$

More valuable outside employment opportunities directly raise the wage needed to maintain a given worker response, but reduce optimal overtime and the return to retention. A sufficient condition for the latter effect to dominate is

$$\frac{(p-1)^2}{2} < K < p(p-1). \tag{D.29}$$

The left inequality gives $\Delta > 0$; the right gives $K + p - 1 > \Delta$. Since $\tau/H > 1$, this implies $w_b < 0$. This additional condition is unnecessary for Proposition 2.

Completion and compliance satisfy

$$S_b = -\frac{K}{H\Delta} < 0, \qquad C_b = -\frac{K - d(p-1)}{H\Delta} < 0.$$

Equation (D.22) implies $h_b < 0$. Without additional work,

$$\frac{\partial w_0^*}{\partial b} = 1 - \frac{\tau}{2\sqrt{\tau(\tau - A)}} > 0 \quad \text{when } A < 3\tau/4.$$

For $3\tau/4 < A < \tau$, the no-overtime derivative is negative. The wage effect of outside employment opportunities is therefore ambiguous even without overtime: less valuable outside employment opportunities increase the profit margin at a given worker response and thereby the return to retention. Endogenous overtime provides an additional channel. When $A < 3\tau/4$, the no-overtime derivative is positive, and endogenous overtime can reverse that sign under the sufficient condition above.

D.7 Migrant–local comparisons

Proposition 3 (Migrant wage premium)**.** *Suppose $q_M \geq q_L$ and $\tau_M \leq \tau_L$, with at least one strict inequality.*

(i) At equal outside employment opportunities, $b_M = b_L$,

$$w_M^* > w_L^*, \qquad x_M^* > x_L^*, \qquad h_M^* > h_L^*.$$

(ii) If $b_M < b_L$, the overtime and unpaid-hours orderings continue to hold. The wage ordering also holds if condition (D.29) holds throughout the comparison of outside employment opportunities.[17]

The maintained interior and curvature conditions apply throughout the comparison.

Proof of Proposition 3. Consider a continuous path of regular interior optima from the local to the migrant parameters, holding productivity and the wage floor fixed. At equal b, take q weakly increasing and τ weakly decreasing. Equations (D.20) and (D.25) give $w_\tau < 0$ and $w_q > 0$, while (D.20) and (D.24) give $x_\tau < 0$ and $x_q > 0$. The hours derivatives satisfy $h_\tau < 0$ and $h_q > 0$ by (D.22)–(D.26). Integrating along the path gives $w_M^* > w_L^*$, $x_M^* > x_L^*$, and $h_M^* > h_L^*$ when at least one parameter ordering is strict.

If $b_M < b_L$, let the value of outside employment opportunities decrease weakly along the comparison. Equation (D.28) gives $x_b < 0$. Moreover, $h_b = h_z z_b < 0$ by (D.22) and (D.28). Less valuable migrant outside employment opportunities consequently reinforce both overtime and unpaid-hours orderings without any additional wage restriction. If (D.29) holds throughout the comparison of outside employment opportunities, $w_b < 0$, so the reduction in b also reinforces the wage ordering. Otherwise, the wage effect of the difference in outside employment opportunities has no determinate sign. □

D.8 Guarantee valuation

Let (w_s^*, x_s^*) be the optimal ordinary contract and $V_s^0 = J_s(w_s^*, x_s^*) > 0$ its value. The guaranteed contract fixes the overtime requirement at x_s^*, eliminating moral hazard in work requirements, and retains the same worker response parameters. A quit triggers a one-time indemnity $\kappa > 0$ to the firm; dismissal is excluded from coverage. The contract insures the firm without changing worker receipts. We abstract from replacement and any production following separation.

Expected indemnity. Let $Q_s(w) = 1 - G_s(w - b_s)$ denote the quit probability in a period. Under a stationary contract, the relationship continues with probability S_s and terminates with probability $1 - S_s$. The Bellman equation is

$$J_s^G = m_s + \kappa Q_s + S_s J_s^G. \tag{D.30}$$

[17] Given the maintained negative-definite Hessian, the additional sufficient restriction is

$$-f''(x_s^*)\left(w_s^* - b_s - \frac{x_s^*}{q_s}\right) + 2\frac{1-q_s}{q_s} f'(x_s^*) < f'(x_s^*)\big[f'(x_s^*) - 1\big].$$

It ensures that less valuable outside employment opportunities raise the optimal wage.

Solving gives

$$J_s^G(w, x_s^*) = J_s(w, x_s^*) + \kappa \frac{Q_s(w)}{1 - S_s(w, x_s^*)}. \tag{D.31}$$

Since the indemnity is paid only at a covered separation, its expected value is

$$\sum_{t=0}^{\infty} S_s^t Q_s \kappa = \kappa \frac{Q_s}{1 - S_s} \leq \kappa. \tag{D.32}$$

The payment dates are mutually exclusive. Since $Q_s \leq 1 - S_s$, the ratio is the probability that the relationship terminates through a quit. At $x_s^* = 0$, $Q_s = 1 - S_s$, so expected compensation equals κ. This equality uses the undiscounted infinite horizon; finite-duration coverage need not produce a payment with probability one.

Willingness to pay. Taking the ordinary-contract value as the firm's reservation value, define

$$\omega_s^G = \sup\{w \in \mathcal{W}_s : J_s^G(w, x_s^*) \geq V_s^0\}, \tag{D.33}$$

where $\mathcal{W}_s$ is the set of wages satisfying $w \geq \underline{w}$ for which relationship values are well defined. At an interior upper threshold, $J_s^G = V_s^0$: the firm is indifferent between the guaranteed contract and its ordinary alternative and retains positive profits. Interpreting the report as this threshold requires an appropriate elicitation mechanism; market unavailability of the guarantee alone does not establish truthful reporting. Unrestricted insured wage setting would instead solve $\max_w J_s^G(w, x_s^*)$.

Define $\ell_s = \tau_s - (w_s^* - b_s) > 0$. The wage premium that preserves the ordinary-contract value is

$$\delta_s := \omega_s^G - w_s^* = \frac{\sqrt{\kappa^2 + 4\kappa\ell_s} - \kappa}{2} > 0, \qquad \frac{\partial \delta_s}{\partial \ell_s} = \frac{\kappa}{2\delta_s + \kappa} > 0. \tag{D.34}$$

Proposition 4 (Guarantee valuation)**.** *Suppose the ordinary contract has the unique positive-profit global optimum in Lemma 1. Alternatively, impose $x = 0$ and $0 < y - b_s < \tau_s$ with a nonbinding wage floor. Fix overtime at x_s^* and let the guarantee pay a common indemnity $\kappa > 0$ upon a quit. Then (D.34) gives the unique maximum acceptable wage above w_s^*, with $0 < \delta_s < \ell_s$. At equal outside employment opportunities, $w_M^* > w_L^*$ and $\tau_L \geq \tau_M$ imply $\delta_L > \delta_M$.*

Proof. Suppress the group subscript, fix $x = x^*$, and set

$$z^* = w^* - b - x^*, \qquad H^* = \tau - z^*, \qquad \ell = H^* - x^* = \tau - (w^* - b) > 0.$$

For a wage increase $u = w - w^* \in [0, \ell)$, the response thresholds remain interior. By (D.11), $J = N/(\tau - z)$, where N is quadratic in z with coefficient -1 on z^2. Baseline optimality gives

$$N(z^*, x^*) = V^0 H^*, \qquad N_z(z^*, x^*) = -V^0.$$

Consequently, the exact loss from raising the wage at the fixed demand is

$$J(w^* + u, x^*) - V^0 = -\frac{u^2}{H^* - u}. \tag{D.35}$$

Meanwhile, $Q = (\ell - u)/\tau$ and $1 - S = (H^* - u)/\tau$. Hence

$$J^G(w^* + u, x^*) - V^0 = \frac{\kappa(\ell - u) - u^2}{H^* - u}. \tag{D.36}$$

The numerator is strictly decreasing for $u \geq 0$, positive at zero, and negative at $u = \ell$. Its unique root satisfies $u^2 = \kappa(\ell - u)$, giving (D.34) and $0 < \delta < \ell$. The floor remains satisfied. For $u \geq \ell$, voluntary departure and compensation are zero; any well-defined policy has strictly lower ordinary value than V^0 by uniqueness of the baseline global optimum. Thus there is no higher acceptable wage outside the interior interval. Policies with certain continuation and negative flow profits cannot improve on the positive baseline value. The same quadratic argument applies at $x^* = 0$, using the unique no-extra-work optimum.

Implicit differentiation of $\delta^2 = \kappa(\ell - \delta)$ gives

$$\delta_\ell = \frac{\kappa}{2\delta + \kappa} > 0, \qquad \delta_\kappa = \frac{\ell - \delta}{2\delta + \kappa} > 0. \tag{D.37}$$

At $b_M = b_L$,

$$\ell_L - \ell_M = (\tau_L - \tau_M) + (w_M^* - w_L^*) > 0.$$

$$\omega_M^G - \omega_L^G = (w_M^* - w_L^*) - (\delta_L - \delta_M). \tag{D.38}$$

Common compensation therefore implies $\delta_L > \delta_M$. The guaranteed migrant–local gap is the ordinary gap minus $\delta_L - \delta_M$. When $\tau_L = \tau_M$, $0 < \delta_\ell < 1$ also ensures that a positive ordinary migrant premium remains positive. When $\tau_L > \tau_M$, the guarantee reduces the signed gap but need not preserve its sign. □

Interpretation. The indemnity compensates the firm for the profit loss from paying above the ordinary optimum at a fixed overtime requirement. This loss is second order at the optimum, yielding the quadratic indifference condition. A larger ℓ_s supports a larger wage premium for a given indemnity. The comparison holds the distribution of shocks fixed and does not require greater expected compensation for locals: at $x = 0$, expected compensation is κ for both types, and the wage-premium difference reflects the different profit costs of increasing wages.

As κ converges to zero, the maximum acceptable wage converges to w_s^*. At $x = 0$, $J_s^G = J_s + \kappa$, so the profit-maximizing insured wage is unchanged even though willingness to pay relative to the ordinary alternative increases. The extension leaves the ordinary-contract problem and its comparative statics unchanged. It concerns a fixed indemnity under an infinite horizon; replacement provision and finite-duration coverage require distinct specifications. Interpretation of em-

pirical decomposition components requires separate identifying assumptions.