

Migrants, Experience, and Working Conditions in Bangladeshi Garment Factories

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Abstract

Working conditions in many large factories in low income countries are difficult, and many workers are internal migrants from rural areas. We examine the relationship between workers' migration status and their labor market outcomes, using a household survey of garment workers in Bangladesh. Migrants are in firms with higher wages but worse working conditions, but as their careers progress, they have higher mobility than locals as they move towards firms with better conditions. These facts are consistent with a model in which migrants are poorly informed about working conditions upon beginning work but learn more as they gain experience in the industry.

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1. Introduction

Working conditions are poor in many manufacturing firms throughout the world. These poor conditions can culminate in tragedies such as the Rana Plaza collapse in Bangladesh in 2013, which killed over 1100 workers, and even when not resulting in such visible tragedies, can cause health problems (Loewenson 1999; Frumkin 1999; Attanapola 2004; Akhter et al. 2010; Blattman and Dercon 2018). These factories are also frequently largely staffed by internal migrants. For instance, an estimated 85 percent of workers in Bangladeshi garment factories (Fujii, Raihan and Shonjoy, 2016), 68 percent of manufacturing workers in China (Harney, 2008), and half of workers in the Tirupur garments cluster in India (Pattanayak, 2021) are internal migrants. Internal migrants may be differentially more likely to work in factories with poor working conditions if they lack information about the industry (Shrestha 2016; Shrestha and Yang 2019), have lower skills or worse outside options, or have a higher willingness to tolerate poor working conditions in exchange for better wages.

In this paper, we empirically explore the relationship between migration and labor market outcomes in the Bangladeshi garment sector. We use a retrospective panel of the work history of 991 garment workers collected from a household survey of a peri-urban area outside Dhaka, Bangladesh in 2009. We combine workers' reports of problems in the factories, worker-manager relations, whether the factory provides medical care, and whether the worker has an appointment letter to create an index of working conditions. We compare the working conditions and wages faced by "local" workers originally from the survey area subdistricts (who constitute 14 percent of the sample) to those of internal migrants from rural areas.

We begin by considering differences in labor outcomes across the entire careers of migrants and locals. Migrants on average work in factories with a 0.29 standard deviation lower index of working conditions than locals. This disparity is not due to observable demographic differences between migrants and locals, and it holds when we compare migrants and locals in the same villages. At the same time, migrants are in factories that actually pay higher wages: over the course of their careers, migrants earn 4.9 percent more than other workers, but 1.7 percent less than other workers in their same factories.¹ While neither coefficient is statistically different from zero, they are significantly different from each other, providing suggestive evidence that migrants are in higher-paying factories than locals. Both of these tests use retrospective work histories; section 4 presents evidence that selective attrition does not drive our main findings.

Because the difference between migrants and locals may vary with experience as migrants gain information about the industry, develop skills, or connections with their home village weaken, we examine the mobility of migrants versus locals as they gain experience. A discrete-time hazard model indicates that a migrant is 1.1 percentage points more likely to leave a factory than a local in a given month. This difference drops in half and becomes insignificant when we include factory fixed effects, suggesting that the differential mobility of migrants is driven in part by the fact that they end up in the kinds of factories that people want to leave. We also document that migrants differentially improve their working conditions as they gain experience, compared to locals.

We then explore several theories that can explain the empirical results we obtain. We develop a theoretical model in which firms choose a bundle of working conditions and wages to compete for workers. We consider both the

1. That is, within-village and within-factory comparisons are valuable for our empirical work. Our data spans 44 villages, as we explain in section 2.1. And as we explain in more detail in section 2.3, we have 385 factories in the data that employ multiple workers; these factories account for 83% of worker-month observations.

full information case and the possibility that some workers are uninformed, in the sense that they cannot observe working conditions when beginning work. These uninformed workers are potentially disproportionately migrants, but we do not impose that condition *ex ante*. The model illustrates how uninformed workers can end up in firms with inefficiently low investments in working conditions – even in a competitive labor market – as firms compete for workers based on job aspects they can observe (wages) and not on those aspects they cannot observe (working conditions). We then extend the static model to a two period model to derive predictions on workers’ mobility as they gain experience in the industry and presumably become better informed about working conditions. If there is a cost to switching factories, workers will do so only if they are sufficiently poorly matched to their current factories. Such workers are more likely to be uninformed workers, who move toward factories with better conditions, even if this improvement comes at the expense of foregone wage gains.

In the context of this model, we consider several potential differences between internal migrants and local workers. We first consider differences that could arise in a world of full information: migrants could have stronger relative preference for money over working conditions given the desire to send remittances home or have lower average productivity than local workers. If there is imperfect information, migrants may have lower mobility costs, which enables them to move to factories where they are better suited after they learn about working conditions. We then consider the possibility that migrants are precisely the workers in the model who are less likely to be informed about working conditions upon beginning work in the industry.

Of these potential differences between migrants and locals, the possibility that migrants are initially either less informed than locals or have a higher relative preference for wages over working conditions can explain our key empirical facts, if these differences fade with experience in the industry. The information story fits with qualitative reports of migrant workers’ initial experiences in the industry (which we discuss in section 5.3.4), while evidence

against the differential tendency of migrants (versus locals) to accumulate assets over time provides some suggestive evidence against a story in which migrants had a particularly high marginal utility of income just after they migrated as their resources were low and financial needs were high. An information story also accords with recent experimental evidence that, at least in the context of international migration, many migrants are uninformed about the working conditions in a sector when they begin work. [Shrestha \(2016\)](#) finds that potential Nepali migrants misperceive both mortality rates and potential earnings abroad. [Shrestha and Yang \(2019\)](#) show that providing migrant Filipino domestic workers in Singapore with information on their legal rights improves their legal knowledge and their reported working conditions. We thus view our results as most suggestive of an information-based model, but we acknowledge that a clear delineation between the two models is not possible given our current data.

This research contributes to an emerging literature on labor markets in export manufacturing sectors in developing countries. Most existing work on this topic focuses on the determinants of wages, such as estimating export wage premia (see [Harrison and Rodríguez-Clare \(2010\)](#) for a review) or the wage effects of anti-sweatshop activism ([Harrison and Scorse, 2010](#)). Working conditions, especially subjective measures such as workers' relations with management, have received less attention, likely because collecting credible data is difficult. Firm-level surveys may be subject to misreporting if respondents do not feel comfortable truthfully reporting when interviewed at the firm.² Some studies have examined working conditions by using injury or fatality reports at the industry level ([Shanmugam 2001](#)), but within-industry variance is likely important too. Indeed, [Sorkin \(2018\)](#) finds that nonpecuniary

2. [Tanaka \(2020\)](#) collects data on fire safety procedures, healthcare management, and freedom of negotiation in garment factories in Myanmar, and demonstrates that the managers' reports of these measures were correlated with enumerators' observations during a factory tour. Still, components of working conditions such as abusive management would still likely not be observed by enumerators during a tour.

benefits are important in explaining variance in firm-level wages in the United States, and non-wage benefits could be even more important in developing countries given the scarcity or weak enforcement of formal regulation. Our contribution is to document variation in working conditions and wages between firms within an export manufacturing sector in a developing country and to propose a theory emphasizing the role of matching in explaining how workers are matched to these heterogeneous firms. On the measurement side, we use workers' reports in a household survey to construct firm-level measures of working conditions. While imperfect, we argue that they provide accurate reports of working conditions across firms within this industry.

These unique results on working conditions also contribute to the literature on rural to urban migration in developing countries. This literature goes back to the canonical models of [Lewis \(1954\)](#) and [Harris and Todaro \(1970\)](#), who argue that workers are on average more productive in urban than rural areas, so that rural to urban migration is a key driver of economic growth. Subsequent papers have focused on the determinants of the decision to migrate to an urban area ([Marchiori, Maystadt and Schumacher 2012](#); [Bryan, Chowdhury and Mobarak 2014](#); [Kleemans 2014](#); [Henderson, Storeygard and Deichmann 2015](#)) and the effect of migration on the migration household ([Beegle, De Weerd and Dercon 2011](#); [de Brauw et al. 2013](#); [Kinnan, Wang and Wang 2018](#)) and the broader village economy ([Munshi and Rosenzweig 2016](#); [Akram, Chowdhury and Mobarak 2017](#); [Morten 2019](#)). A related strand of literature examines the effects of internal migrants on wages and other outcomes in urban labor markets ([Strobl and Valfort 2015](#); [Kleemans 2014](#)). This paper brings these two strands together by examining how the migrants' characteristics affect their experience in urban labor markets. In particular, our results can help explain the high estimated utility cost of migration ([Lagakos, Mobarak and Waugh, 2018](#)); some of this cost might be driven by poor working conditions.

The Bangladeshi garment industry in the early 2000s is a particularly interesting context to examine working conditions in developing country

factories. The industry had been growing rapidly since the early 1980's, averaging 17 percent yearly employment growth. While NGOs had long been attempting to raise awareness of poor working conditions (see [International Restructuring Education Network Europe \(1990\)](#) for an early example), there was minimal government enforcement of safety standards, so compliance was largely voluntary, often encouraged by Western retailers ([Mahmud and Kabeer 2003](#); [Ahmed and Nathan 2014](#)). While there have been recent higher-visibility initiatives in Bangladesh after the Rana Plaza collapse in 2013,³ reports from other recent industrialized countries report similar lack of enforcement of regulations and resulting intra-industry variation in working conditions, including [Robertson et al. \(2009\)](#) in Indonesia, [Oka \(2010\)](#) in Cambodia, or [Tanaka \(2020\)](#) in Myanmar.

Neither at the time of our survey – nor today – do there exist formal mechanisms to publicize factories' working conditions (to our knowledge), most workers rely on either their own experience or word of mouth to learn about factories upon beginning work ([Amin et al. 1998](#); [Absar 2009](#)). Consequently, garment sector jobs can be thought of as “experience goods” whose quality cannot perfectly be observed before purchasing. While there is a long tradition in search models in labor economics of viewing jobs as experience goods ([Jovanovic, 1979](#)) in which nonpecuniary job characteristics could serve an important role ([Viscusi, 1980](#)), empirical tests of these models have focused on realizations over time of a worker's match-specific productivity. This could be due to data limitations, as workers' working conditions are much more difficult to observe than their wage trajectories.

3. Namely, the Bangladesh Accord on Fire and Building Safety and the Alliance for Bangladesh Worker Safety. [Boudreau \(2019\)](#) implements a randomized controlled trial in collaboration with one of these initiatives to study how buyers' enforcement of local labor laws affects working conditions in the sector. Both initiatives also worked with factories to conduct audits and develop Corrective Action Plans to fix any violations found, including the potential for low interest loans to make these improvements. As discussed in Appendix B, there is substantial variation in factories' performance on these initiatives' physical building safety audits.

By contrast, in our model, the firm knows its investment in working conditions, and it would like to be able to credibly signal it. This is a similar context to industrial organization models in which firms know a good's quality but consumers do not. Theoretical models of this scenario have highlighted the potential efficiency gains of market intermediaries (Biglaiser, 1993) or sellers' ability to build a reputation (see Mailath and Samuelson (2013) for an overview). As we do not see Bangladeshi garment factories engaging in these types of efforts, a natural question is why they don't. Our model suggests that labor market competition could be one reason. In particular, if there is a constant stream of new workers, the gains from establishing a reputation fall, since it is plausibly equally profitable to compete for uninformed workers than to invest in quality and then make costly efforts to advertise it.⁴

The evidence consistent with variation in workers' informedness at the time of hiring introduces a new concept to the literature on hiring in developing countries. The existing literature has highlighted factors that affect the workers' future productivity, like skill complementarity (De Melo, 2009) or the availability of a network member to reduce moral hazard (Heath, 2018). Other work has emphasized the role of search frictions (Franklin et al., 2015) and the use of networks as a way of rationing desirable jobs (Wang, 2013) or spread information about job openings (Magruder, 2010). More closely related to this paper are a series of papers that provide evidence of asymmetric information about workers' ability (Hardy and McCasland 2015; Bassi and Nansamba 2017; Abebe et al. 2018; Carranza et al. 2020; Abel, Burger and Piraino 2020). Our focus, by contrast, is on asymmetric information about the job rather than the worker. Given that a garment factory job is a new experience for recent migrants, this asymmetry may also be important in explaining labor market outcomes.

4. In appendix D, we find some evidence that firms with better working conditions are more likely to be still operating under the same management five years after the worker survey, suggesting that eventually, however, a good reputation is important.

The remainder of this paper is organized as follows: Section 2 describes the data and empirical context. Section 3 presents the empirical strategy and main results. Section 4 addresses a leading threat to our analysis, which is potential differential selection of migrant and local workers into remaining in the garments sector. Section 5 develops a model in which firms offer workers a bundle of wages and working conditions under different assumptions about workers' having full versus incomplete information about working conditions. Section 6 concludes.

2. Data and empirical setting

In this section, we explain the data collection process that provides information on migrants versus local workers, provide some background on Bangladesh's garment industry and the information that workers plausibly have about factories when choosing a workplace, and describe our method for constructing factory-level measures of working conditions.

2.1. Survey and characteristics of respondents

The survey that yields the data we use in this paper was conducted by Rachel Heath and Mushfiq Mobarak between August and November, 2009. The survey consisted of sixty villages in four subdistricts (Savar and Dhamrai subdistricts in Dhaka district and Gazipur Sadar and Kaliakur in Gazipur district) in the peri-urban area surrounding Dhaka. The villages (shown in figure A1) were chosen randomly from three strata of data: 44 villages were chosen from among those considered to be within commuting distance of a garment factory (by an official at the Bangladesh Garment Manufacturers Exporting Association), 12 were chosen from not those considered to be within commuting distance, and 4 from the in between area (to allow the data to be

representative at the subdistrict level).⁵ The sampling unit was an extended family compound, called a *bari* in Bangla. A census of *baris* was conducted, and those with current garment workers were oversampled, yielding the sample of garment workers we use in this paper.

In addition to household-level information, each garment worker in a sampled *bari* filled out a questionnaire asking information about each factory they had worked in since they began working, including information about problems, relationship with management, and other factory characteristics (described more in detail in Section 2.3). Workers were asked the name of each factory, so workers can be matched to other workers in the same factory to create factory-level measures of working conditions. To provide an entire wage history, workers were asked the initial wage offer they received at the factory and if they ever earned a wage other than the first offer in a factory, and the number of months they received each wage if so. We can thus construct a retrospective panel of the monthly wage of each worker since she began working, matched to the factory in which the wage was earned. Heath (2018) argues that retrospective wages have limited recall bias; there is little rounding of wages at round numbers of taka (thousands). Figure A2 provides a histogram of the number of factories worked in by each worker in the survey. Given migrants' higher mobility, they are more likely to have worked in multiple factories than locals; 53% of locals and 42% of migrants have only worked in one factory.

Several characteristics of the survey area are important in interpreting the results of the paper. First, these villages are near Dhaka, but not in Dhaka. This area was chosen because garment workers in these areas live in residential houses rather than dormitories, where factories tend to limit the access of outsiders and workers may feel less free to truthfully report characteristics of their job. Inasmuch as the typical worker in the survey area has fewer factories

5. These distinctions were very accurate in practice: of the 991 sampled workers, 976 were living in those designated as garment villages, 5 living in those designated as non-garment villages, and 20 living in "in between" villages.

within commuting distance of her current residence than a worker in Dhaka, these workers may work in factories with greater monopsony power over their workers than factories in Dhaka. However, the fact that workers tend to move factories frequently – the average worker has worked in 2.3 factories (2.9 among workers in the industry for three years or more) – presents prima facie evidence against complete monopsony power of firms.

Table 1 gives summary statistics of the workers in our sample, broken down by gender and migration status. Because some workers began working before moving to their current village (and we don't know whether they were originally from that village), our main measure of migration status is not whether the worker is originally from the village in which she now resides. Instead, we consider whether the worker was originally from Dhaka or Gazipur districts (which incorporate all of the surveyed villages). We refer to workers from these urban areas as "locals." By this definition, 15 percent of male workers and 11 percent of female workers are locals; we consider the rest of workers to be migrants.⁶ The slightly greater tendency of women to be migrants is unsurprising, given that women often migrate upon marriage in Bangladesh. Note, though, that the vast majority of married female respondents whom we classify as migrants are married to migrants. Thus, there is not a substantial group of female migrants whom we might expect to behave more like locals because they are married to locals.

The migrants in the sample were all born in Bangladesh, but they come from all over the country. The largest sending district of Mymensingh, which neighbors Gazipur to the north, constitutes only 13 percent of migrants. Indeed, 44 home districts (of the 64 total in Bangladesh) are represented in two or more bars in the sample.

Both groups of workers overall are young (average age 27.9 years for males and 24.4 for females), although they are overwhelmingly married (79

6. In the Appendix (Table A7), we show robustness of our main results to alternative definitions of the the migrant variable.

percent of male workers and 76 percent of females). Male workers have approximately the same education (7.2 years) and experience (4.9 years) regardless of whether they are migrants; female migrants have marginally more education (4.9 years, versus 4.4 years for locals, $P = 0.206$) but less experience (3.5 years, versus 4.5 years for locals). Both male and female migrants came to the village in which they were surveyed on average 4.5 years ago.

Panel B gives a sense of the living conditions of the workers in the sample. Garment workers are better off than the typical Bangladesh household in 2009 in several dimensions; they are likely to live in a house with a cement floor (78 percent of both genders), that has electricity (96 percent of both genders), and possesses a cell phone (77 percent of male workers and 67 percent of female workers). These averages mask substantial divides between migrant and local workers: migrant workers are more likely to live in a house with a cement floor or that has electricity, but actually less likely to live in a house with a mobile phone. While only a small minority (4 percent) of migrants own the homes they currently live in, most own a homestead (presumably, in their original village) and around half own agricultural land as well. By contrast, most local workers own the homes they live in, but are less likely to own agricultural land.

Finally, panel C describes the job characteristics of migrants and local workers. Local male workers were considerably more likely than migrant male workers to have been referred (53 percent of local workers; 37 percent of migrants), whereas 31 percent of both groups of female workers were referred. Local workers tend to have longer commutes; both males and female commute an average of 27 minutes, compared to approximately 18 minutes for male and female migrants. Both genders and migrants groups work on a regular day an average of approximately 8.5 hours and average about 3 hours of overtime per day in the peak season. Local workers have a longer tenure with the current firm, 39 months for males and 36 months for females, compared to 25 months for male migrants and 26 months for female migrants.

2.2. *The garment industry in Bangladesh*

Figure 1 depicts the consistent employment growth in the garment industry between the early 1980's and the 2009 survey; the average yearly employment growth over that period is 17 percent (BGMEA 2013). The high rates of migration in the surveyed villages displayed in table 1 are emblematic of the general rates of rural to urban migration that have accompanied the rapid growth of the garment sector. Thus, many workers enter the industry with no experience in the formal sector and little experience outside the village.

As is explained in detail in Heath (2018), which uses the same dataset as this paper, hiring is relatively informal. It is common for the hiring firm to receive a referral from one of their current workers (such referrals constitute 32 percent of hires); other workers find out about the job through a personal contact not working in the hiring factory (8 percent of hires). It is also common to show up at the factory and ask for work (40 percent of hires). Only 19 percent of workers are hired through more formal means (a written advertisement or recruitment by management). While referrals may give information about working conditions, recall that we reported in table 1 that migrants are less likely to have been referred, which is consistent with our information story.

There is anecdotal evidence that the factories these workers enter are quite heterogeneous, both in wages and in working conditions. At the time of the 2009 survey, the minimum wage was 1662.5 taka per month (about 22 US dollars at the time). While the minimum wage did bind in some factories (Heath, 2018), others paid substantially more.

Other sources also highlight that there have historically been – and continue even in light of initiatives to improve safety after the Rana Plaza collapse – wide variation in conditions across factories. One of the Post-Rana Plaza initiatives of Western retailers conducted building safety audits of 279 exporting factories in the commuting zone for workers in our sample. There is meaningful variation in compliance with the initiative's building safety requirements even among exporting establishments located nearby to

each other. Appendix B provides more information about the building safety audits.

Interviews Heath conducted with industry officials also underscore the difference between highly visible factories and more “shadowy” factories that try to evade detection from government inspectors and NGO watchdogs. This was relatively easy at the time of the survey (before post-Rana Plaza reforms), given that government inspectors were frequently out-manned. For instance, the [European Commission \(2014\)](#) reports that before Rana Plaza, the Department of Inspection for Factories and Establishments had 76 inspectors for 5000 factories. A private audit market sprung up as retailers sought to reassure their customers they were avoiding unsafe factories, but the results of these audits were rarely transparent, there were accusations of bribery, and even when safety violations were documented there was no mechanism in place to force factories to address the violations ([Clifford and Greenhouse, 2013](#)).

2.3. Identifying firms with good working conditions

We use workers’ reports of problems in the workplace, of the relationship between workers and management, and of services available to measure working conditions in each factory that she or he has worked in. Table 2 lists the variables. While the unit of observation in the empirical analysis is generally the worker-month level (so that the left column corresponds to the variation we use in the analysis), we also provide the rates of each outcome at the worker-factory level and in the worker’s current factory to show how the weighting by time in the factory affects the reporting of conditions and how the conditions on average evolve over a worker’s career.

Specifically, the problems that we use to construct the index are: Hours too long (8.2 percent of monthly observations), abusive management (3.2 percent), bad/unsafe working condition (0.8 percent), not paid on time (5.8 percent), unpaid overtime (1.9 percent), fired for sickness (1.7 percent), and “other” (1.6 percent). Note that the reports of problems are somewhat lower in the

current factory.⁷ Problems are more common at the worker-spell level than at the worker-month level, suggesting that workers spend less time in factories when there are problems.

We also use a worker's categorical response to the question, "Overall, during your time in this factory, did you feel you had good relations with the management?"; options were excellent, very good, good, bad, or very bad. The modal response, given in 67.0 percent of worker-months, was "good". Finally, we use information on whether the factory provides medical care for ill workers (70.5 percent of worker-months) and whether the worker received an appointment letter (37.4 percent of worker-months). Appointment letters lay out the details of employment (such as the salary and grade/level of the position for which the worker was hired) and say that the worker cannot be dismissed without cause. This record of employment is valuable in providing evidence of the worker's experience if she moves jobs, and accessing formal benefits, such as maternity leave.

We assume that these variables all reflect a single index of firm-level working conditions, independent from the mean wage paid by the factory. For instance, problems in the relationship with the management could reflect management's response to workers' complaints about working conditions. If workers are risk averse, then they also value the stability afforded by appointment letters. Relatedly, while some of the problems relate to wages (late payment or unpaid overtime), they would not be reflected in the base wage but lower the utility the worker gets from a baseline salary by increasing the uncertainty in that salary or decreasing the de facto hourly wage.

7. While this pattern is consistent with our argument that workers move towards factories with better conditions over time, it is also possible that underreporting in overall measures of working conditions is more severe in their current factory if workers fear retaliation if management hears about their responses. While there were no reports from enumerators of workers expressing concern about whether the responses would actually be kept private, we also show in appendix C that the key results on working conditions remain if we discard a respondent's report in her current factory.

We construct a working conditions index variable using the scores on the first principal component of the matrix of working condition variables. Call this variable \hat{c}_f . We recode the variables reporting problems to reflect lack of a particular problem, so that higher values indicate more favorable conditions. We create a series of mutually exclusive binary indicators from the categorical variable representing a worker's relationship with management. Accordingly, higher index values correspond to better conditions. Table A2 gives the loadings on each component of the index. The loadings on each component has a positive sign, providing reassurance that these measures of working conditions each reflect fundamentally good working conditions.

In interpreting this index, we assume that conditions do not change in response to workers' characteristics, so that workers sort based on fixed characteristics of factories. We address this concern in several ways. First, in extensions to our empirical analysis of worker-level characteristics and working conditions, we show in appendix C that our results persist when we reconstruct measures of working conditions that do not use a worker's own report. We also test for within-factory differences in reported working conditions between migrant and local workers employed at the same factory and find much smaller differences in magnitude than between-factory differences. The possibility that conditions are endogenous to worker-level characteristics may be a particular concern with appointment letters. While there is anecdotal evidence that the decision to offer appointment letters is made at the factory level, it is possible that some factories offer appointment letters to only their valued workers.⁸ Then the interpretation of the relationship between variation in factory quality from appointment letters and a worker-level characteristic such as migration status would reflect the value employers place on this characteristic rather than differences in how workers sort in factories based on working conditions. Accordingly, in

8. The Labour Law of 2006 required appointment letters. Before then, it was considered a characteristic of responsible factories.

section 3.1 we display the relationship between migrant status and individual measures of working conditions. We show that the results are not driven by appointment letters or any single measure of working conditions.

We also assess the plausibility of the assumption that factory-level working conditions are stable over time in Figure A3. If factories were changing their working conditions over time – either improving or regressing – we would expect the slope on the local polynomial smoother to be nonzero. The slope, however, is close to zero throughout the time period. In particular, from May 1999-July 2009, which are the 10th and 90th percentiles in the distribution of observations across time, the slope is approximately zero. Barring factories' changing conditions in ways that cancel out on average, the figure is consistent with factories maintaining one type of conditions and employing one type of worker.

Figure 2 shows the estimated distributions of worker observations and of working conditions across factories. The top panel shows the distribution of workers per factory. 911 factories appear in the data. The majority of these factories, 526 in total, only employ one sampled worker. This is unsurprising given that the data include any factory in which a sampled worker ever worked, even if the worker was living in another location. While these factories account for 58% of the factories that appear in the data, they account only 17% of the observations. There are 385 factories that employ multiple sampled workers, which is important for our empirical specifications that include firm fixed effects. The bottom panel shows the distribution of working conditions. The long left tail shows that the worst factories tend to have many problems.

3. Empirical strategy and main results

In this section, we explain how we estimate differences in factory-level working conditions, wages, and the mobility of migrants versus locals, in the context of the retrospective panel.

3.1. Firm-level working conditions

We begin by establishing the differences in the working conditions of migrants versus locals, across their experience in the industry. We estimate a regression that examines the factory-level working conditions \hat{c}_{ift} faced by worker i in factory f at time t as a function of whether that worker is a migrant and other worker-level characteristics (experience,⁹ education, gender) assembled in the vector X_{ift} :

$$\hat{c}_{ift} = \beta \text{Migrant}_i + \gamma' X_{ift} + \varepsilon_{ift} \quad (1)$$

Table 3 gives the estimation results. We standardize the outcome variable to have mean zero and standard deviation (sd) one. The coefficient on *Migrant* in the first column indicates that over the course of their careers, migrants are in factories with on average 0.29 standard deviations worse working conditions than locals. The second column shows that this effect is not due to differences in experience, education, or gender between migrants and locals; the coefficient on *Migrant* remains unchanged with these controls.

Columns 3-6 focus on the current factory of each worker to allow for the inclusion of village fixed effects (since we only know the current village of residence of each worker).¹⁰ This sample also facilitate interpretation by including only one observation per worker. Consistent with Prediction 1b in table 7 that the difference in informedness between migrant and local workers fades over time, the coefficient on migrant gets smaller when only the current factory is used. Migrant workers differentially move towards better conditions compared to locals. Still, there is a marginally statistically significant difference between the current working conditions of migrants and locals (columns 3 and 4). Columns 5 and 6 show that this difference is unchanged when village fixed effects are included: At the time of the

9. When we refer to experience, we always mean experience in the garment industry.

10. Note that the measures of working conditions still use past observations from other workers employed at that factory. In appendix C, we consider measures of working conditions constructed using only current reports.

survey, migrants were in factories that had 0.18 sds lower measured working conditions than locals in the same village. So there is no evidence that the tendency for migrants to be in factories with worse conditions is driven by residential sorting of migrants into areas in which the factories have worse conditions.

The relationship between working conditions and migration is far stronger than the relationship between other worker-level characteristics (namely, experience, education, and gender). Returning to table 3, in the sample that includes past observations (column 2), each year of education is associated with a 0.031 sd increase in working conditions. Male workers are also in factories with an average of 0.12 sds worse working conditions than females, although this effect is not significant at conventional levels. Both effects also disappear in the current sample of workers, and in neither the full nor current sample is there a relationship between experience and working conditions.¹¹

In Appendix C, we show that the result that migrants work in factories with worse working conditions is robust to a variety of different considerations, and we also present ancillary results that coincide with the finding. In particular, we show that the result is not driven by current reports or by any one working conditions measure. It also holds when we construct measures using only current reports, to minimize concerns that retrospective results are affected by recall bias, which could potentially be differential between migrants and locals. It is also robust to different definitions of who is a migrant. We also show that migrants tend to cluster in particular factories.

Finally, we provide some supplemental evidence for the role of information in determining the level of working conditions faced by workers

11. Given that the sample consists mostly of migrants, the zero coefficient on experience may at first seem to contradict our later finding that migrants move towards better conditions with experience. However, in Section 3.4, we show that a specification with individual fixed effects – our preferred specification for analyzing changes over time – does display a positive overall coefficient on experience, suggesting that changes in the composition of the sample over time may confound the experience estimates in the retrospective panel.

by examining referrals. Table A8 provides suggestive evidence that referrals serve to inform workers about the working conditions in a given factory; we add a referred dummy to equation 1. It is positive across the columns in table A8 (though not always statistically significant at conventional levels). For instance, at the time of the survey, referred workers are in factories with 0.096 standard deviations better conditions than non-referred workers in their village (column 6).

3.2. Firm-level wages

We next assess differences in average wages of migrants versus locals, and to what extent average wage differences are driven by factory-level differences, given the results we find on differential sorting into factories with different levels of working conditions. To do this, we compare the coefficient on *Migrant* in a wage regression with and without factory fixed effects:

$$\log(w_{ift}) = \beta_{ols}Migrant_i + \gamma'X_{ift} + \varepsilon_{ift} \quad (2)$$

$$\log(w_{ift}) = \delta_f + \beta_{fe}Migrant_i + \gamma'X_{ift} + \varepsilon_{ift} \quad (3)$$

Table 4 presents the coefficients on *Migrant* and the other worker-level characteristics in regressions with and without firm fixed effects. In the analysis, we subset the OLS sample to include only those factories used to identify β_{fe} in the fixed effects regressions. This approach reduces our sample size, but it ensures that we are comparing coefficients estimated using the same variation across regressions.¹²

Over the course of their careers, migrants earn 4.8 percent more than locals with the same characteristics, and surveyed migrants were currently earning 5.9 percent more than locals, although neither effect is statistically different from zero at conventional levels. However, in both cases the coefficient

12. The results are essentially unchanged if we do not restrict the sample. See table A9.

on migrant flips sign when factory fixed effects are added.¹³ The fact that the coefficients are statistically different from each other – i.e., fixed effects significantly lower the coefficient on migrant in the wage equation – suggests that migrants are indeed in firms with higher wages. We acknowledge, though, that the fact that the coefficients are not individually statistically different from zero indicates that these results are not entirely conclusive. Educated workers are also in higher-paying firms, but male workers are not. The returns to experience become less concave with firm fixed effects, suggesting that part of the diminishing returns to experience is driven by the sorting of workers across firms as they gain experience.

3.3. Mobility

Having established career-wide differences between migrants and locals in working conditions, we explore whether migrants are more likely to leave factories than locals as they seek better working conditions. First, we assess differences in overall mobility between migrants and locals by estimating a discrete-time hazard model in which the outcome is one in months where a worker leaves a factory for another factory and zero in months in which a worker remains in the factory.

$$1(\text{Leave})_{ift} = \beta \text{Migrant}_i + \gamma' X_{ift} + \varepsilon_{ift} \quad (4)$$

Table 5 gives these results. We report average marginal effects from a logit specification. As in the previous analysis, we subset the OLS sample to include only those factories that are used in the logit specification with factory fixed effects. This choice does not qualitatively affect our results. The first column indicates that migrants are 1.1 percentage points more likely to leave one factory for another in a given month than locals; this is a very large

13. The negative within-firm coefficient on migrant suggests that in the context of the discussion in Section 5.3.2, if anything, migrants are lower average productivity, unless there is a non-productivity-based reason that migrants earn less than others in the same firm (such as lower bargaining power in a noncompetitive labor market).

effect relative to the average mobility rate of 3.0 percent per month in this sample. Column 2 shows that firm fixed effects decrease the magnitude of the migration coefficient by approximately half (to 0.64 percentage points), and is no longer statistically significant at traditional levels ($p = 0.173$). The fact that some of the differentially high mobility of migrants is explained by factory fixed effects – migrants seem to be in the kind of factories that workers want to leave – suggests that the increased mobility of migrants is driven by both characteristics of migrants and the factories in which they end up.

3.4. *Changes in conditions and wages with experience*

Finally, in Table 6 we test whether the gap in working conditions between migrants and locals documented in table 3 fades with time. First, we include an interaction between *Migrant* and (industry-wide) experience in equation 1. When we do this, the results (shown in column 1) are not statistically significant and the point estimate on the interaction of *Migrant* \times *Experience* is actually negative. However, the OLS results conflate changes in the composition of the workforce over time with the within-worker changes in the working conditions a worker faces. To isolate these within-worker changes, we include worker fixed effects in equation 1 and interact migration status (as well as education and gender) with experience. We find that the overall coefficient on experience is small and not statistically significant, which suggests that the locals do not improve their conditions with experience. Migrants, in contrast, do improve their working conditions with experience. Specifically, with every year of experience, the working conditions faced by a migrant improve by 0.031 sds, compared to the trajectory of a local.

Note that at this rate of improvement, it would take on average 19 years of work for a migrant to make up for the initial difference in working conditions between migrants and locals that we estimate in column 3 of table A14. Given that the 90th percentile of the experience distribution at the time of the survey was 9.5 years, very few migrants would work long enough to fully make up the initial differences in working conditions. In the context of the model we

posit in section 5, this could either be because the process of learning is very slow or because of mobility frictions.

Figure A7 provides reassurance that this result is not likely driven by the changing composition of workers with different trajectories of conditions over time. Specifically, it reestimates the specification in column 2, including only workers with at least T years total experience, allowing T to vary from 1 year to 10 years. The point estimate on *Migrant* \times *Experience* is remarkably stable; it only barely loses statistical significance once T gets high and many observations are dropped. In columns 3 and 4 of table 6, we show the same regressions, but with the outcome as wages rather than conditions, and find no evidence of a differential within-worker trend in wages with experience between migrants and locals.

In Appendix C, we provide two more pieces of evidence consistent with migrants' tendency to move towards factories with better conditions as they progress. First, we test the prediction that as migrants move towards factories with better conditions, these factories should employ more locals. In several regressions with only migrant workers, we find marginally statistically significant evidence that this is the case. While not all estimates are statistically significant, it is in part due to the fact that nearly half of all migrants in our sample, 48%, never work in a factory with a local worker in our sample. Finally, we explore whether migrants are more likely to report leaving past factories because of bad conditions. We provide suggestive, although not statistically significant, evidence that they are: migrants are 5.9 percentage points more likely to report poor conditions as a reason for leaving a factory.

4. Addressing concerns about differential selection

In this section, we address a leading threat to our analysis, which is potential differential selection of migrant and local workers into remaining in the garments sector. Our data is from a retrospective survey of individuals employed in the sector in 2009. The participants in the sample were selected

conditional on being currently employed in the sector. As a result, we do not observe individuals who previously worked in the sector but who exited prior to the survey, which is potentially important given high turnover rates in developing country manufacturing (Blattman and Dercon 2018; Adhvaryu, Kala and Nyshadham 2018). This selection does not threaten our comparisons if the selection mechanisms for local and migrant workers are the same. If, however, there is differential selection of migrants and of locals, it may affect our analysis.

First, suppose that many workers experience bad conditions initially, but locals have better outside options due to family support or a greater ability to find jobs in other sectors. Then, locals are more likely than migrants to leave if they initially experience bad working conditions, and the observed migrants will appear to improve their conditions. We acknowledge this is a possibility in table A13, where the dependent variable is an indicator for temporarily exiting the garments sector when leaving a job.¹⁴ We report average marginal effects from a logit specification. Before examining the relationship between migration, working conditions, and temporary exits, it is useful to characterize the nature of temporary exits in columns 1 and 2. More experienced workers are less likely to exit the sector temporarily; column 2 shows that the greater likelihood to exit among new workers is particularly strong among locals and educated workers.

Turning to column 4, the estimated coefficient on working conditions shows that a one sd decline in conditions is associated with a 0.44% increase in the probability of a local with no experience exiting. Migrants are initially less sensitive to conditions: A one sd decline in conditions is associated with a 0.15% increase in their probability of temporarily leaving the sector. The interaction terms with experience show that locals' temporary exit decisions become less sensitive to conditions with additional experience compared

14. Workers may temporarily exit the sector to work for wages in a different sector or to not work for wages.

to migrants, for whom experience is not associated with changes in the probability of temporary exit.

Given evidence of differential temporary exit between migrants and locals early in their careers, we conduct an additional test to examine whether this type of differential selection could drive our results. We take advantage of the monthly frequency of our data to zoom in on workers who had very recently begun working in the industry at the time of the survey, and whom we plausibly are surveying before they make the decision to exit. Specifically, in table [A14](#), we look at the initial working conditions faced by migrants versus locals in within 2, 3, 4, 5, and 6 months of beginning work at the time of the survey. While the sample becomes small (especially at the very short windows) and the estimates accordingly noisy, the differential between migrants and locals becomes, if anything, stronger in this sample of very recent joiners. For instance, among workers who had been in the 3 or fewer months at the time of survey, migrants were in factories with working conditions that were 0.58 sds worse than locals.

Finally, suppose that low ability migrants are more likely to exit than low ability locals, and that this form of selection drives migrants' differential improvement in working conditions. In particular, suppose that locals and migrants have the same average marginal product and that workers prefer to live in their village of origin. Then migrants with the lowest skills are the most likely to exit the sector, as demonstrated in the historical US by [Abramitzky, Boustan and Eriksson \(2014\)](#). If low-skilled workers tend to remain in factories with worse conditions, this selection could explain the differential improvement of working conditions among the higher-skilled migrants who remain. If so, we would expect that the migrants who remain would be higher skill compared to locals and would be promoted more quickly.

We test this possibility by comparing promotions between locals and migrants. We code workers' positions using the garments sector's skill grade classification system. In this system, the least skilled workers (helpers) are

assigned a grade of 7, and higher skilled positions are assigned grades 6 through 3 (with grade decreasing as skill level increases). Lower-level manager positions are assigned a grade of 2, and higher-level manager positions are assigned a grade of 1.¹⁵ Consistent with recent research on promotions in Bangladesh's garments' sector by [Menzel and Woodruff \(2019\)](#), we reverse the direction of skill grades for our analysis. Our specification is analogous to that in [Table 6](#).

[Table A15](#) provides evidence that differential attrition of low-ability migrants does not drive our results. In column 1, the coefficient on migrant is small and not statistically significant, which shows that among workers with no experience, there is no difference in skill grade between migrants and locals. This is unsurprising, as most workers begin their career in the garments sector as helpers. The interaction between migrant and experience is also small and not statistically significant, which demonstrates that migrants' promotion trajectories do not differ from locals'. In both specifications, there is no difference in the within-worker promotion trajectory with additional experience between migrants and locals. Relatedly, [Appendix F](#) provides evidence against the possibility that the skill composition of migrants versus locals changes over time.

5. Interpreting the empirical results

In [section 3](#), we established some key differences between migrants and locals: migrants begin their careers in firms with worse working conditions (but, if anything, that pay higher wages), but move towards better conditions as they gain experience. [Section 4](#) argues that these key empirical patterns are not driven by differential attrition between migrants and locals. In this section, we facilitate interpretation of our key results by developing a model in which firms offer workers a bundle of wages and working conditions. We derive

15. We recode skill grades to add two levels of higher-level managers that appear in the data. Together, these two levels of managers account for fewer than 1% of observations.

implications of workers' decisions of initial firms and subsequent mobility in a world of full information, and then consider the possibility that workers do not have full information when starting work.

We find that either a story in which migrants are less likely to be informed (but this difference fades with experience) or that migrants have an initial relative preference for wages over working conditions (which also fades with experience) can generate the entire set of empirical predictions that we find in section 3. Given that both models can explain our primary empirical results, we present some suggestive evidence against the time-varying preferences model and qualitative evidence about migrants' experiences entering the garment sector. We thus interpret a model in which migrants are less likely to be informed about working conditions upon beginning garment work as an important potential explanation for the results we observe.

5.1. Set-up and full information case

Workers have marginal revenue product π . They get utility from wages (w) and working conditions (c). Utility is separable in wages and working conditions:¹⁶

$$u(w, c) = u_w(w) + \beta u_c(c)$$

16. If we relax this assumption – say, the marginal utility of wages could be higher with worse conditions – then there could be firm-level differences in conditions even without heterogeneity in workers' informedness, since workers' utility could either be maximized with a (high wage, poor conditions) offer or a (low wage, good conditions) offer. However, absent an additional assumption on migrants versus locals, such as the level of informedness, nonseparability wouldn't generate the same pattern of sorting across the firms we see in the data. Note that nonseparability would lower the utility loss from the model's predictions on uninformedness. Thus, it would attenuate the model's testable implications that stem from previously uninformed workers' taking steps to find firms that are better matches. This is because uninformed workers would, at least, value the additional wages that the poor-conditions firm pays them.

Firms can pay a per-unit cost of p to improve conditions. Labor markets are competitive, so firms bid the total offer up to the workers' perceived utility. That is, in a world of full information, they offer the (w, c) pair that solves:

$$\begin{aligned}
 & \max_{w, c} \quad u_w(w) + \beta u_c(c) \\
 & \text{s.t.} \quad w + pc = \pi \\
 & \text{FOC:} \quad u'_w(w) = \frac{\beta}{p} u'_c\left(\frac{\pi - w}{p}\right) \tag{5}
 \end{aligned}$$

The FOC indicates that firms offer a level of working conditions that equates the marginal value of wages with the marginal gains from better conditions, scaled by the cost of improving conditions. In a two-period set-up, if there is any mobility cost, workers will have no reason to move firms.

5.2. Imperfect information

Drawing upon qualitative information about some workers' lack of information about beginning work (Ahmed, 2006, Absar, 2009), we now consider the possibility that some workers observe and consider the working conditions in a firm but uninformed workers – who are called “myopes” in the language of Gabaix and Laibson (2006) – do not consider working conditions when making decisions about where to work.¹⁷ For these workers, firms will

17. While the set-up from Gabaix and Laibson (2006) fits our experience talking to migrant workers about how they select their initial job – namely, that they didn't consider the possibility that working conditions vary from workplace to workplace – this is not the only set-up that would yield the predictions of the model. In particular, we could also posit a model in which migrant workers do have a prior about working conditions, and would like to take them into account when choosing where to work, but just can't observe the actual working conditions from factory to factory. For this model to deliver the key testable implications, it would have to be the case that they don't assume that wage offers very close to π are only possible because conditions are bad, or that factories with lots of migrants may deliver lower utility than factories with more locals. This assumption also seems plausible, given that migrants' networks are likely made of

make zero investment in working conditions, instead bidding the wage up to their productivity π .

Assume that conditions must be the same for every worker in a firm, so that firms will either specialize in informed or uninformed workers.¹⁸ While we don't impose that firms must offer the same wage to all workers, they will optimally choose to do so: a firm offering conditions dictated by (5) to informed workers would not be able to offer any higher wages to lure uninformed workers. Similarly, a firm that has made no investment in conditions cannot offer a wage high enough to lure an informed worker and still make a profit. Thus, firms do not need to observe workers' informedness; they offer either $(\pi, 0)$ or the (w, c) paid that solves (5), and workers self-select their preferred options.

Now consider a second period in which previously uninformed workers can observe working conditions.¹⁹ All workers can choose to switch firms, but have to pay a mobility cost $m \sim U[0, \bar{m}]$ to do so.²⁰ So they will switch if they get an offer (w', c') such that

$$u(w', c') - m \geq u(w, c) \tag{6}$$

other migrants, who also are not well informed about working conditions and the industry in general.

18. If there are economies of scale in improving conditions, the model would imply that large firms are more likely to specialize in conditions and thus would attract more local workers. So they would then pay lower wages, unless there are firm-level differences in productivity that would imply that more productive firms grow bigger and also pay higher wages.

19. When we posit the possibility that preferences are fixed but learning happens over time, there is an analogy to the literature on labor market discrimination, which typically assumes that preferences are unchanging over time, but finds that learning happens relatively quickly (e.g. [Benson and Lepage \(2022\)](#)). We thank an anonymous referee for raising this analogy.

20. Note that uninformed workers' myopia about working conditions implies that they also do not consider the possibility that they may want to switch firms in the second period and pay this cost. That is, they only consider the current offer when making their firm decision in the first period.

Note that informed workers have no reason to switch firms, since they are already receiving the wage offer that would maximize their utility.²¹

5.3. *How are migrants different?*

There are several potential ways in which (internal) migrants could differ from locals in the above model. We list several possibilities and explain the results that would ensue if each were incorporated into the model. We first consider two differences (preference for wages and productivity) that pertain to a complete information set-up. We then turn to two further differences (mobility costs and variation in informedness) that potentially arise if we consider a world of imperfect information.

5.3.1. *Migrants have greater relative preference for wages over conditions.* It is possible that migrants can actually observe working conditions, but they have a higher relative preference for wages over working conditions than do locals ($\beta_m < \beta_l$). For example, if migrants prefer living in their home villages or place a high value on remittances,²² they would hope to earn a lot of money quickly, even at the risk of their safety or comfort. If so, they would make perfectly well-informed choices to be in firms with worse working conditions but higher wages. However, note that when they move, they would seek out firms with even higher wages (and worse conditions), compared to locals.

A related consideration about the marginal utility of income is that migrants cannot afford a lengthy search process, so they are more likely to take the first job offer they get, while locals can better afford to wait for a good offer. In the context of this model, it is indeed likely that the factories with

21. And even if there are idiosyncratic taste shocks to working in a specific firm that would lead informed workers to switch firms, the uninformed workers would still switch more often unless somehow they receive fewer of these idiosyncratic shocks.

22. [Albert and Monras \(2018\)](#) find that migrants in the U. S. tend to live in high wages – but also high cost – areas because they value their own consumption, suggesting that migrants indeed place a high value on remittances.

worse conditions have vacancies, since these are the factories that workers would like to leave once they observe working conditions. This could be a complementary mechanism to the model we posit. However, it is not obvious how this model alone can explain why migrants are in factories that pay higher wages.

It is also possible that migrants' relative preference for wages varies over time. Of particular interest is the possibility that migrants initially have higher preference for wages than working conditions than locals, but this difference decreases with experience in the industry. For instance, perhaps migrants have depleted savings or given up on risk-sharing networks as part of their move, and thus they have a particularly high value of income just after moving as they build up savings. This assumption can generate the prediction that migrants move towards better conditions with experience, even in a world of complete information.

5.3.2. *Migrants are lower productivity.* There could also be differences in average productivity (π) between locals and migrants who choose to enter – and stay in – the garment industry. The difference could go in either direction: Migrants could be lower productivity due to worse education or experience with modern technology, or they could be higher productivity given positive selection of migrants. If they are lower productivity, we expect them to be in factories with worse conditions and lower wages. By extension, if they are higher productivity, we expect them to be in firms with better working conditions and wages.

5.3.3. *Migrants have lower mobility costs.* Once we introduce the possibility of imperfect information, there is the possibility that workers later come to regret their initial choice of factories and consider whether it is worth paying a mobility cost to move. Another possible difference between migrants and locals is thus that migrants have lower mobility costs ($\bar{m}_m < \bar{m}_l$), since they have less of a network in any one particular area or factory. If so, then the prediction of the information model that the migrants have higher mobility

could instead result from the fact that it is easier for migrants to move. However, given that the way to improve working conditions is to move factories, it would then be easier for migrants to seek out factories with good conditions, so they would be in factories with better conditions than locals, whereas locals would be in factories with higher wages.

5.3.4. Migrants are more likely to be uninformed. In the model, workers who are uninformed about working conditions end up in firms with worse conditions but higher wages. There is reason to believe migrants are less informed about working conditions than local workers upon beginning work. There is little information about firms in print, so workers tend to rely on word of mouth. Indeed, qualitative evidence has documented that migrants typically know very little about the garment industry overall upon arrival in an urban or peri-urban area, much less about the working conditions in individual firms (Absar, 2009).²³ This is reflected by their lack of social contacts in their current factory: in our data, table 1 demonstrates that migrants are less likely to have received a referral in their current position, and even conditional on receiving a referral, they are less likely to know more than one worker in the firm.²⁴ In the extreme, there are anecdotal reports of unscrupulous factories issuing attendance cards without names to new workers so that they have no recourse to collect unpaid overtime (Ahmed, 2006). By contrast, workers do typically know their salaries upon beginning work. For instance, in a January 2020 focus group, a worker explained that “as soon as you get selected for the job in the entrance gate, you will have to sit in a meeting where admin officials will tell you about your working hours, overtime hours, attendance bonus and by which date of the month you will get the salary.”

23. This lack of firm-specific knowledge may be compounded by migrants’ lack of legal knowledge, as in Shrestha and Yang (2019). That is, if migrants do get a signal about some bad aspect of working conditions, they may not know that such conditions are illegal and thus may not be present in other workplaces.

24. 48 percent of referred local workers knew at least one other worker in the firm, compared to 36 percent of referred migrants, $P = 0.089$.

Further predictions on migrants will result if the difference in informedness fades with experience in the industry. In the context of the model, assume that all workers can observe working conditions in the second period. Since migrants started off in firms with worse conditions, it is more likely to be worthwhile to pay a cost to move in order to seek out a firm with a preferable balance between conditions in wages. So migrants are more likely to move factories and improve their working conditions with time in the industry than locals, while locals improve their wages more: $\Delta C_{migrant} > \Delta C_{local}$. So migrants' working conditions will improve with time in the industry more than local workers'.

5.4. *Relating the model to the empirical findings*

Table 7 summarizes the predictions of each potential difference between migrants and locals described in Section 5.3, in both worlds of complete and imperfect information. The fact that migrants are initially in factories with worse working conditions but higher wages than locals is consistent with migrants' having a greater relative preference for wages or migrants being more likely to be uninformed about conditions. The fact that after they begin working, migrants differentially move toward better conditions compared to locals suggests that the characteristics of migrants that drove the initial sorting diminishes with time. This fact is also consistent with the version these models in which differences fade over time.²⁵

25. It is possible that several of the potential differences between migrants and locals are present simultaneously. If so, then a finding in line with any given assumption suggests that that particular difference is the strongest. For instance, migrants could be both more poorly informed about conditions and have a higher desire for money over conditions. In this case, a finding that migrants move towards better conditions with time would imply that the difference in informedness (that fades with time) is stronger than migrants' preference for money over conditions, which would (ceteris paribus) tend to say they move towards factories with worse conditions over time compared to locals, who are the ones seeking better conditions in that model.

We cannot fully differentiate between these models. An information story, however, is consistent with the qualitative evidence of the industry presented in section 5.3.4. Further, we test for evidence consistent with a model in which their relative marginal utility of wages (relative to working conditions) decreases with time. In particular, figure A4 examines whether migrants differentially build up wealth over time. It graphs the average value of assets – measured at the time of the survey²⁶ – of migrants versus locals by experience. If migrants were building up precautionary savings (or replenishing savings after the costs of a move), we would expect the slope of the curve for migrants to be higher than for locals. It is not; the curves are statistically indistinguishable prior to 8 years of experience, where the majority of the support of the distribution of experience is (8 years is the 84th percentile of the experience distribution).²⁷

While this does not completely rule out other reasons why migrants' preference for wages may diminish over time – say, the marginal value of sending remittances could drop as their ties to their home community weaken, or they could build up assets in households in their home villages that are not captured in the survey – we view this as suggestive evidence against the most likely stories in which time-varying preferences drive the mobility of migrants towards better working conditions as their careers progress. In sum, we interpret our results as most consistent with a model in which migrants are initially less informed about working conditions than locals, but we acknowledge that we cannot fully rule out other models.

26. In particular, the survey asked the current value of the following assets owned by the respondent's household: agricultural land, homestead (including house), other real estate, riskshaw, cart/van, cows/buffaloes/goats, fan, radio/cassette player, tv, bicycle, wall/table clock, furniture, sewing machine, freezer, mobile phone, and other. So remittances sent to members of other households would not be considered assets.

27. The difference in slopes is small (0.027 log points per year) and statistically insignificant ($P = 0.434$). We similarly fail to reject that the slope of assets (unlogged and winsorized at the 5th and 95th percentiles) with experience is the same between migrants and locals ($P = 0.723$)

This section lays out the simplest version of a model of firms' choice of wages and working conditions – with and without full information – that can explain our results. Appendix D shows that the model's predictions persist when we extend it to incorporate a wide variety of considerations that are pertinent to the garment industry. First, we consider variation in workers' outside options. We then examine imperfectly competitive labor markets. We further consider the possibility that firms vary in productivity or the cost of improving working conditions or that there is a mobility cost that accrues to firms.

Finally, note that a strict interpretation of the model in which migrants are less likely to be informed (as well as the model in which they have higher relative preference for wages) would predict that migrants lose wages with experience, relative to locals, as they move away from high-wage, low-conditions factories. By contrast, we find no average difference in the within-worker wage trajectory of migrants versus locals. One possible countervailing force to the baseline model's prediction is that migrants are better at learning-by-doing, and they differentially improve their productivity with experience, as suggested by [Duleep and Regets \(1999\)](#), [Berman, Lang and Siniver \(2003\)](#), [Lofstrom \(2004\)](#), or [Cohen-Goldner and Eckstein \(2008\)](#). We think that this is unlikely to explain our results given the that we find that locals and migrants have similar returns to experience in terms of promotions ([Table A15](#)).

Another explanation, which we discuss in Appendix D, is the possibility of wage gains upon switching factories, say, because another factory has experienced a positive demand shock. Indeed, in the data, there is an average 0.37 percent monthly wage increase among workers if staying in a factory versus a 19 percent increase if changing factories. Then, if migrants also have lower mobility costs, they move towards both better conditions (as predicted by the model, even if they have the same mobility cost as locals) and higher wages.

6. Conclusion

Given evidence of poor working conditions and high numbers of migrants in many developing country manufacturing industries, we explore the relationship between working conditions and workers' migrant status in the Bangladeshi garment industry. The period we study is characterized by rapid growth that pulled many individuals from rural areas into the city and the industry. Using a retrospective panel of the wages and working conditions of 991 workers outside Dhaka collected in 2009, we show that during the course of their career in the garments sector, on average, migrant workers work at factories with working conditions that are between 0.2-0.3 sds worse than local workers. At the same time, we provide suggestive evidence that these factories, if anything, pay higher wages.

Our evidence is consistent with a model in which either migrants have a greater relative preference for wages or they are more likely to be uninformed about working conditions compared to locals. Based on qualitative evidence from the context and on evidence from supporting analyses, we argue that the latter is more likely. If so, it means that incomplete information leads to workers – and migrants in particular – to work in factories with inefficiently low investments in working conditions.

As migrants learn about the industry, they demonstrate a revealed preference for improving their working conditions, compared to their wages. In particular, we find that migrant workers are more mobile than locals and that each additional year of a migrant's experience in the garments sector is associated with 0.03 sd greater improvement in working conditions compared to locals. We find no average difference in changes in wages with more experience for migrants compared to locals. While a strict interpretation of our model would predict that, relative to locals, migrants should lose wages with experience, we argue that migrants' greater relative ability to learn by doing or lower mobility costs could represent countervailing forces.

Our findings provide important lessons for those who are interested in migration and manufacturing jobs as pathways to improved welfare

for poor populations in developing countries. Previous research affirms the benefits of both internal migration and manufacturing jobs (Bryan, Chowdhury and Mobarak 2014; Heath and Mobarak 2015). We nuance these findings by arguing that labor market imperfections lessen these benefits. Our results also illustrate that competition for labor does not guarantee efficient investment in working conditions in the presence of imperfect information. Instead, our results suggest that the provision of information could be an important, welfare-enhancing policy intervention in this context. More generally, additional research is needed that focuses on how alleviating such information asymmetries impacts workers and firms in developing countries.

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Figures and Tables

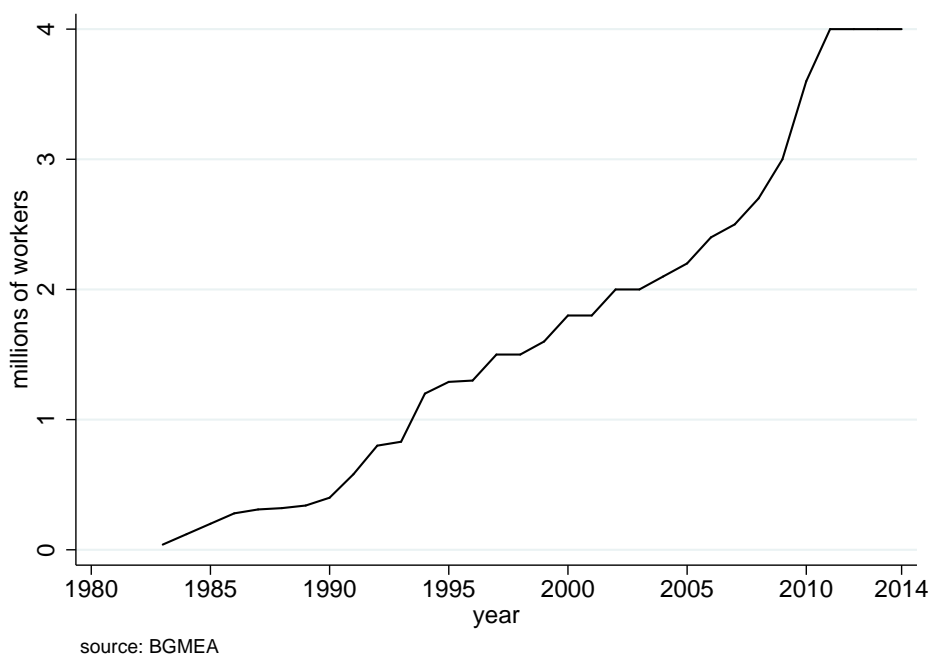
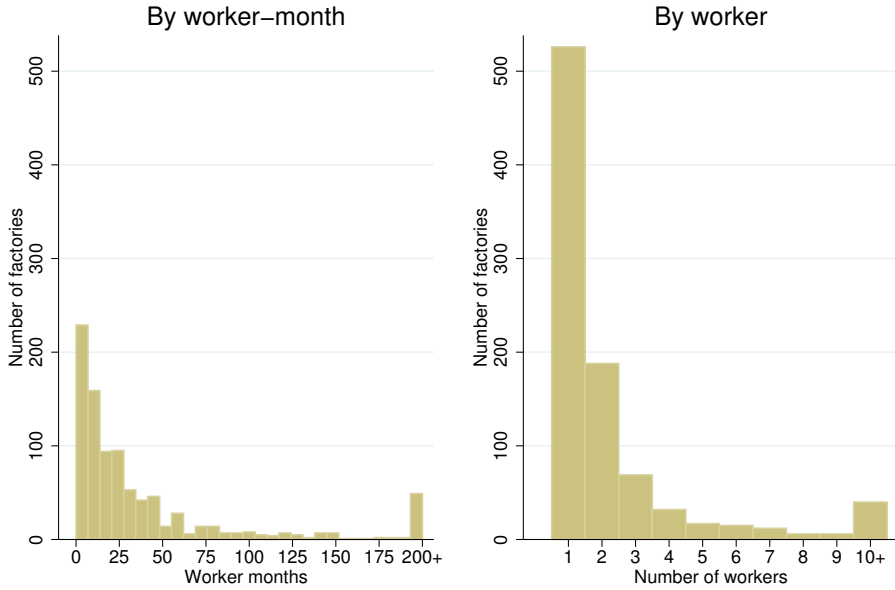
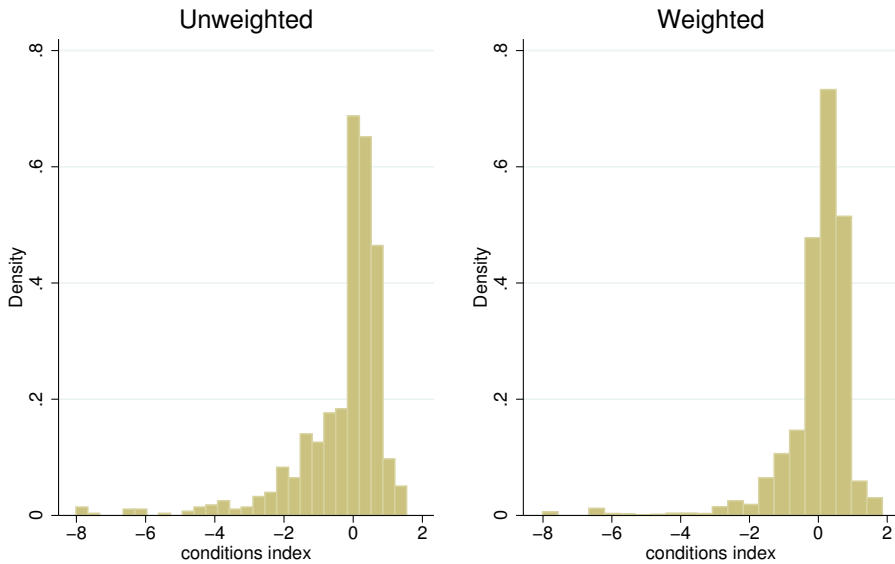


FIGURE 1. Garment sector employment

Observations, by factory



Estimated working conditions, by factory



weighted by the number of worker-month observations in that factory

FIGURE 2. Factory-level variation in working conditions

	Entire Sample		Migrants		Locals		P-value of t-test, Migrants vs Locals	
	Males	Females	Males	Females	Males	Females	Males	Females
<i>Panel A: Demographics</i>								
Age	27.93	24.42	28.03	24.49	27.44	23.94	0.577	0.591
Years of Education	7.22	4.86	7.21	4.92	7.24	4.37	0.960	0.206
Years of Experience	4.92	3.57	4.86	3.45	5.26	4.53	0.447	0.014
Married	0.788	0.756	0.805	0.761	0.699	0.714	0.042	0.415
From Urban Area	0.167	0.114						
Originally From Surveyed Village	0.112	0.052	0.000	0.000	0.671	0.460	0.000	0.000
Years Living in Village (If not from Village)	4.21	4.41	4.46	4.49	2.97	3.84	0.040	0.339
<i>Panel B: Socioeconomic Status</i>								
House has Cement Floor	0.781	0.776	0.866	0.822	0.356	0.413	0.000	0.000
House has Electricity	0.966	0.955	0.986	0.969	0.863	0.841	0.000	0.000
Household has a Mobile Phone	0.774	0.673	0.756	0.657	0.863	0.794	0.046	0.030
Household Owns Current Residence	0.146	0.112	0.027	0.045	0.740	0.635	0.000	0.000
Household Owns Homestead	0.902	0.868	0.901	0.857	0.904	0.952	0.943	0.036
Household Owns Agricultural Land	0.553	0.476	0.589	0.494	0.370	0.333	0.001	0.016
<i>Panel C: Job Characteristics</i>								
Monthly wage	4848	3177	4942	3137	4344	3515	0.175	0.082
Referred	0.347	0.317	0.311	0.311	0.528	0.367	0.000	0.380
Commute Time (Minutes)	19.13	19.13	17.56	18.17	26.99	26.90	0.000	0.000
Regular Hours	8.63	8.56	8.67	8.59	8.42	8.33	0.198	0.258
Avg Daily Hrs of Overtime in Peak Season	3.30	3.44	3.30	3.49	3.31	3.03	0.994	0.194
Tenure in Current Factory (Months)	27.22	26.89	24.90	25.70	38.85	36.18	0.000	0.015
N	438	553	365	490	73	63		

Note: From Urban Area = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. All other workers are considered migrants.

TABLE 1. Summary statistics

	All worker- month observations	All worker- factory spells	In current factory
Problems Listed			
hours too long	0.078	0.094	0.060
abusive management	0.033	0.037	0.021
bad/unsafe working conditions	0.009	0.013	0.009
not paid on time	0.059	0.071	0.030
unpaid overtime	0.019	0.024	0.017
fired for sickness	0.017	0.019	0.005
other	0.017	0.024	0.009
Relations with management (worst is "Very Bad")			
"Bad" or better	0.996	0.996	1.000
"Okay" or better	0.970	0.966	0.981
"Good" or better	0.822	0.800	0.830
Excellent	0.154	0.093	0.111
Other proxies			
appointment letter	0.376	0.281	0.345
provide medical care	0.711	0.642	0.753

TABLE 2. Components of the Working Conditions Index

Dependent Variable = Index of working conditions (\hat{c}_{it})						
	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	-0.3403*** [0.085]	-0.3604*** [0.095]	-0.2018* [0.102]	-0.2028* [0.101]	-0.1978*** [0.059]	-0.1893*** [0.061]
Male		-0.1502 [0.102]		0.0266 [0.071]		0.0544 [0.061]
Education (Years)		0.0364** [0.015]		0.0165* [0.009]		0.0121 [0.009]
Experience (Years)		0.0006 [0.021]		0.0155* [0.008]		0.0137* [0.007]
Past observations	Yes	Yes	No	No	No	No
Village fixed effect	No	No	No	No	Yes	Yes
Observations	50,180	50,114	990	987	990	987
R-squared	0.015	0.03	0.008	0.025	0.198	0.213

Notes: The index of working conditions is described in section 2.4; it is standardized to have mean 0 and standard deviation 1. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In columns 1 and 2, standard errors clustered at the level of the individual. In columns 3-6, standard errors clustered at the level of the village. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 3. The relationship between worker-level characteristics and factory-level working conditions

Dependent Variable = Log wage						
	(1)	(2)	P-value of test BetaFE = BetaOLS	(3)	(4)	P-value of test BetaFE = BetaOLS
Migrant	0.0484 [0.043]	-0.0172 [0.047]	0.073	0.059 [0.061]	-0.0396 [0.063]	0.009
Male	0.2088*** [0.034]	0.2295*** [0.031]	0.483	0.2366*** [0.032]	0.2072*** [0.035]	0.239
Education	0.0372*** [0.005]	0.0285*** [0.005]	0.040	0.0251*** [0.005]	0.0211*** [0.006]	0.381
Experience	0.1324*** [0.006]	0.1094*** [0.007]	0.000	0.1100*** [0.010]	0.0973*** [0.010]	0.221
Experience squared	-0.5582*** [0.047]	-0.4342*** [0.028]	0.001	-0.3858*** [0.053]	-0.3094*** [0.044]	0.141
Past observations	Yes	Yes		No	No	
Factory fixed effects	No	Yes		No	Yes	
Observations	46,847	46,847		877	877	
R-squared	0.313	0.642		0.361	0.743	

Notes: Wage expressed in 2009 taka. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Education and experience measured in years. Standard errors clustered at the level of the individual in columns 1 and 2 and the level of the factory in columns 3 and 4. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 4. The effect of factory fixed effects on coefficients in a wage regression

Dependent Variable = 1(Leave)		
	(1)	(2)
Migrant	0.0114*** [0.0032]	0.0068 [0.0047]
Experience	-0.0003 [0.0004]	-0.0015** [0.0006]
Education	0.0004 [0.0003]	0.0017*** [0.0004]
Male	0.0064*** [0.0020]	-0.0002 [0.0031]
Tenure in Firm	-0.0039*** [0.0006]	0.0057*** [0.0009]
Factory fixed effects	No	Yes
Observations	42,764	42,764

*Notes: Leave = 1 if the worker left the factory in a particular month and switched to another factory, also in the garment industry. Coefficients are average marginal effects from logit regressions. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Experience, education, and tenure measured in years. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

TABLE 5. Migration and the probability of leaving a factory

Dependent Variable	Index of working conditions (\hat{c})		Log(wage)	
	(1)	(2)	(3)	(4)
Experience	0.0056 [0.032]	0.0173 [0.021]	0.0247* [0.013]	0.0152 [0.013]
Migrant	-0.2495** [0.100]		0.0297 [0.057]	
Migrant X Experience	-0.0222 [0.031]	0.0305* [0.018]	0.0009 [0.015]	0.0000 [0.014]
Education	0.0052 [0.016]		0.0135 [0.009]	
Education X Experience	0.0069 [0.007]	-0.0055 [0.005]	0.0073*** [0.003]	0.0051** [0.002]
Male	0.1172 [0.118]		0.2641*** [0.067]	
Male X Experience	-0.065 [0.050]	0.0469 [0.031]	-0.0165 [0.020]	0.0044 [0.018]
Worker fixed effects	No	Yes	No	Yes
Observations	49,210	49,210	46,847	46,847
R-squared	0.033	0.032	0.294	0.170

Notes: Wage expressed in 2009 taka. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Education and experience measured in years. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 6. Changes in conditions over time

	Migrants in Factories with: Worse Conditions		Higher Wages	Migrants Higher Mobility	$\Delta c_m > \Delta c_l$
<i>Panel A: Complete Information</i>					
1. Migrants have greater relative preference for wages ($\beta_m < \beta_l$)	✓	✓	✓	(opposite)	(opposite)
a. time invariant	✓	✓	✓	✓	✓
b. which fades over time	✓	✓	(opposite)		
2. Migrants have lower productivity ($\pi_m < \pi_l$)	✓				
<i>Panel B: Imperfect Information</i>					
3. Migrants have lower mobility costs ($\bar{\pi}_m < \bar{\pi}_l$)	(opposite)		(opposite)	✓	✓
4. Migrants more likely to be uninformed about conditions	✓	✓	✓	✓	✓
a. time invariant	✓	✓	✓	✓	✓
b. which fades over time	✓	✓	✓	✓	✓

Note: The predictions of each row in the table assume that the given assumption is the only difference between migrants and locals. For instance, Panel A rows 1a and 1b assume that migrants and locals differ in their relative preferences for wages but both have complete information, the same mobility costs, and the same productivity.

TABLE 7. Summary of testable implications of different assumptions about migrants

Online Appendix: for online publication only

Appendix A

Dependent Variable = 1(Factory Still Operating Under Same Management in 2014)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Index of Working Conditions	0.0158 [0.013]	0.0342** [0.017]					0.0158 [0.013]	0.0347* [0.018]
Factory FE from Wage Equation			0.0258 [0.038]	0.036 [0.051]			0.0233 [0.038]	0.0292 [0.051]
Fraction Migrants					0.1197** [0.060]	0.0422 [0.063]	0.1217* [0.064]	0.0747 [0.067]
Weighted by Number of Obs	No	Yes	No	Yes	No	Yes	No	Yes
Observations	896	896	812	812	882	882	812	812
R-squared	0.002	0.005	0.001	0.000	0.005	0.001	0.006	0.006

Notes: Unit of observation is the factory. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A1. Correlates of Factory Survival

	Loading onto first Principal Component
Relationship is "Bad" or better	0.2767
Relationship is "Okay" or better	0.5055
Relationship is "Good" or better	0.4429
Relationship is Excellent	0.2310
No problem: hours too long	0.1429
No problem: abusive management	0.3564
No problem: bad/unsafe working conditions	0.1451
No problem: not paid on time	0.2101
No problem: unpaid overtime	0.2082
No problem: fired for sickness	0.0863
No problem: other	0.0974
Has medical care	0.2804
Medical care non-missing	0.1522
Appointment letter	0.2091

TABLE A2. PCA loadings for conditions index

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dependent Variable = Measures of conditions leaving out worker's own reports						
Migrant	-0.3111*** [0.082]	-0.3295*** [0.083]	-0.3028* [0.153]	-0.3053* [0.158]	-0.1563 [0.118]	-0.1563 [0.118]
Male		-0.1426** [0.069]		0.0116 [0.101]		0.029 [0.092]
Education		0.0295*** [0.010]		0.007 [0.013]		0.0037 [0.012]
Experience		0.0099 [0.009]		-0.0045 [0.018]		-0.0046 [0.015]
Observations	39,852	39,788	816	815	816	815
R-squared	0.013	0.025	0.008	0.008	0.153	0.154
Panel B: Dependent Variable = Measures of conditions leaving out reports from current factory						
Migrant	-0.3463*** [0.083]	-0.3778*** [0.092]	-0.3012** [0.119]	-0.3058** [0.115]	-0.0872 [0.138]	-0.0957 [0.132]
Male		0.0041 [0.094]		0.1094 [0.069]		0.1355** [0.062]
Education		0.0204 [0.014]		0.006 [0.011]		0.0045 [0.009]
Experience		-0.0255 [0.023]		-0.0152 [0.014]		-0.0131 [0.013]
Observations	43,018	42,954	715	714	715	714
R-squared	0.015	0.027	0.012	0.02	0.148	0.157
Panel C: Dependent Variable = Measure of conditions using only report from current factory						
Migrant	-0.2518** [0.116]	-0.2662** [0.116]	-0.2651* [0.156]	-0.2488 [0.152]	-0.2865** [0.111]	-0.2423** [0.100]
Male		-0.1730** [0.076]		-0.0241 [0.108]		0.0376 [0.080]
Education		0.0527*** [0.010]		0.0486*** [0.015]		0.0327** [0.015]
Experience		0.0302*** [0.008]		0.0371*** [0.008]		0.0289*** [0.008]
Observations	38,931	38,865	985	982	985	982
R-squared	0.009	0.053	0.008	0.058	0.269	0.297

TABLE A3. Alternate constructions of the working conditions measure

Panel D: Dependent Variable = Measure of conditions not weighted by tenure

Migrant	-0.3382*** [0.077]	-0.3625*** [0.089]	-0.2160** [0.092]	-0.2262** [0.096]	-0.2286*** [0.073]	-0.2360*** [0.075]
Male		-0.1375 [0.092]		0.007 [0.094]		0.0327 [0.069]
Education		0.0290* [0.016]		0.0112 [0.009]		0.0068 [0.008]
Experience		-0.0122 [0.022]		0.0073 [0.011]		0.0052 [0.009]
Observations	50,180	50,114	990	987	990	987
R-squared	0.015	0.026	0.01	0.017	0.224	0.231

Notes: Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In columns 1 and 2, standard errors clustered at the level of the individual. In columns 3-6, standard errors clustered at the level of the village *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Alternate constructions of the working conditions measure (continued)

Dependent Variable	c_{it}	
c_{jt}	0.1024*** [0.039]	0.0809 [0.089]
$c_{jt} \times 1(\text{Both } i \text{ and } j \text{ Migrants})$		0.0259 [0.095]
$c_{jt} \times 1(\text{Both } i \text{ and } j \text{ Locals})$		0.0326 [0.189]
Constant	0.2027*** [0.060]	0.2021*** [0.061]
Observations	59,475	57,647
R-squared	0.011	0.011

Notes: c_{it} gives the working conditions as reported by one worker in a given factory at a given time; c_{jt} gives the working conditions as reported by another worker in that factory at the same time. Standard errors calculated by block bootstrap, with repeated sampling at the individual level and 1000 repetitions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE A4. Correlation in reports of working conditions from workers in the same factory at the same time

Outcomes listed below:	(1)	(2)	(3)	(4)	(5)	(6)
Problem:	0.0356	0.0337	0.0349**	0.0338**	0.0172	0.0095
Hours too long	[0.030]	[0.029]	[0.017]	[0.017]	[0.022]	[0.024]
Problem:	0.0337***	0.0366***	0.0075	0.006	0.0162	0.0124
Abusive management	[0.009]	[0.011]	[0.010]	[0.011]	[0.022]	[0.021]
Problem:	0.0090***	0.0088***	-0.0065	-0.0078	-0.0127	-0.0144
Bad/unsafe working conditions	[0.003]	[0.003]	[0.009]	[0.009]	[0.011]	[0.012]
Problem:	-0.0318	-0.0324	-0.0331	-0.0339	-0.0189	-0.0205
Not paid on time	[0.033]	[0.032]	[0.026]	[0.026]	[0.025]	[0.024]
Problem:	0.0067	0.007	0.0028	0.0031	0.0009	-0.0006
Unpaid overtime	[0.013]	[0.013]	[0.011]	[0.012]	[0.010]	[0.010]
Problem:	0.0136**	0.0128**	0.0058*	0.0051*	0.0058*	0.0057
Fired for sickness	[0.006]	[0.006]	[0.003]	[0.003]	[0.003]	[0.003]
Problem:	-0.0007	-0.0016	-0.0236*	-0.0239	-0.0201	-0.0197
Other	[0.008]	[0.008]	[0.014]	[0.014]	[0.014]	[0.015]
Appointment letter	-0.092	-0.0996*	-0.0917	-0.0763	-0.0505	-0.015
	[0.056]	[0.056]	[0.056]	[0.055]	[0.057]	[0.063]
Medical Care	-0.1626***	-0.1740***	-0.0205	-0.036	0.0019	-0.0054
	[0.038]	[0.040]	[0.063]	[0.062]	[0.054]	[0.059]
Relationship with management	-0.4528	-0.4394	-0.4139	-0.3998	-0.4768**	-0.4106
	[0.282]	[0.282]	[0.257]	[0.288]	[0.242]	[0.264]
Past observations	Yes	Yes	No	No	No	No
Village fixed effects	No	No	No	No	Yes	Yes
Controls for sex, education, experience	No	Yes	No	Yes	No	Yes

Notes: Each cell is the coefficient on Migrant from a separate regression. Regressions for problems, appointment letter, and medical care are OLS and Relationship management (on a five point scale; where 1 = very bad; 2 = bad; 3 = okay; 4 = good; 5 = very good) is an ordered logit. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In columns 1 and 2, standard errors clustered at the level of the individual. In columns 3-6, standard errors clustered at the level of the village *** p<0.01, ** p<0.05, * p<0.1.

TABLE A5. Individual Measures of Working Conditions

Dependent Variable = Person-level index of working conditions

	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	-0.1224 [0.093]	-0.1116 [0.093]	0.0150 [0.136]	0.0339 [0.136]	-0.0622 [0.196]	-0.0343 [0.193]
Male		0.0354 [0.068]		0.0425 [0.106]		0.0445 [0.117]
Education (Years)		0.0084 [0.009]		0.0271*** [0.010]		0.0239** [0.011]
Experience (Years)		0.0205*** [0.006]		0.0228** [0.010]		0.0249** [0.011]
Factory FE	Yes	Yes	Yes	Yes	Yes	Yes
Past observations	Yes	Yes	No	No	No	No
Village fixed effects	No	No	No	No	Yes	Yes
Observations	49,206	49,140	977	974	977	974
R-squared	0.598	0.602	0.409	0.422	0.439	0.45

*Notes: The index of working conditions is described in section 2.4; in this analysis, it is standardized to have mean 0 and standard deviation 1 across all workers. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In column 1, standard errors clustered at the level of the individual. In columns 2-3, standard errors clustered at the level of the village. *** p<0.01, ** p<0.05, **

TABLE A6. Within-factory variation in the working conditions measure

Dependent Variable = Index of working conditions (\hat{c}_{it})						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Migrant=1 if individual is from outside of current village						
Migrant	-0.3173*** [0.104]	-0.3508*** [0.115]	-0.1807 [0.124]	-0.1973 [0.128]	-0.1708** [0.063]	-0.1837*** [0.064]
Male		-0.125 [0.104]		0.0312 [0.068]		0.0491 [0.061]
Education		0.0317** [0.016]		0.011 [0.008]		0.0097 [0.008]
Experience		-0.0041 [0.022]		0.0097 [0.008]		0.0095 [0.007]
Past observations	Yes	Yes	No	No	No	No
Village fixed effects	No	No	No	No	Yes	Yes
Observations	50,180	50,114	990	987	990	987
R-squared	0.008	0.02	0.004	0.014	0.184	0.195
Panel B: Migrant=1 if individual moved to village after age 10						
Migrant	-0.2513*** [0.089]	-0.2820*** [0.096]	-0.1568 [0.102]	-0.1780* [0.101]	-0.0982 [0.059]	-0.1178** [0.058]
Male		-0.1183 [0.104]		0.0279 [0.067]		0.049 [0.061]
Education		0.0319** [0.016]		0.0119 [0.008]		0.0103 [0.008]
Experience		-0.0034 [0.022]		0.0106 [0.008]		0.0103 [0.007]
Past observations	Yes	Yes	No	No	No	No
Village fixed effects	No	No	No	No	Yes	Yes
Observations	50,180	50,114	990	987	990	987
R-squared	0.007	0.018	0.005	0.015	0.184	0.195

Notes: In Panel A, Migrant = 1 if the individual was not born in the village where they reside at the time of survey. In Panel B, Migrant = 1 if the individual moved to the village after the age of 10. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In columns 1 and 2, standard errors clustered at the level of the individual. In columns 3-6, standard errors clustered at the level of the village *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A7. Robustness of Main Table 4 results to alternative definition of migrant variable

	Dependent Variable = Index of working conditions (\hat{c}_{it})					
	(1)	(2)	(3)	(4)	(5)	(6)
Referred	0.0663 [0.073]	0.1021 [0.073]	0.0277 [0.046]	0.0487 [0.049]	0.0773 [0.049]	0.0958* [0.048]
Migrant	-0.3113*** [0.080]	-0.3266*** [0.089]	-0.1773* [0.105]	-0.1698 [0.105]	-0.1341* [0.069]	-0.1098 [0.066]
Male		-0.164 [0.107]		0.0302 [0.070]		0.0574 [0.060]
Education (Years)		0.0398** [0.016]		0.0199** [0.009]		0.0164* [0.009]
Experience (Years)		0.0014 [0.021]		0.0198*** [0.006]		0.0182*** [0.005]
Past observations	Yes	Yes	No	No	No	No
Village fixed effect	No	No	No	No	Yes	Yes
Observations	49,206	49,140	977	974	977	974
R-squared	0.015	0.033	0.008	0.035	0.208	0.232

Notes: The index of working conditions is described in section 2.4; it is standardized to have mean 0 and standard deviation 1. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. In columns 1 and 2, standard errors clustered at the level of the individual. In columns 3-6, standard errors clustered at the level of the village. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A8. Referrals, Migration Status, and Working Conditions

Dependent Variable = Log wage						
	(1)	(2)	P-value of test BetaFE = BetaOLS	(3)	(4)	P-value of test BetaFE = BetaOLS
Migrant	0.0467 [0.043]	-0.0172 [0.047]	0.080	0.0819 [0.051]	-0.0396 [0.071]	0.002
Male	0.2108*** [0.033]	0.2295*** [0.031]	0.527	0.2246*** [0.029]	0.2072*** [0.039]	0.508
Education	0.0373*** [0.005]	0.0285*** [0.005]	0.038	0.0272*** [0.005]	0.0211*** [0.006]	0.178
Experience	0.1329*** [0.006]	0.1093*** [0.007]	0.000	0.1088*** [0.009]	0.0973*** [0.012]	0.267
Experience squared	-0.0056*** [0.000]	-0.0043*** [0.000]	0.000	-0.0039*** [0.001]	-0.0031*** [0.000]	0.132
Past observations	Yes	Yes		No	No	
Factory fixed effects	No	Yes		No	Yes	
Observations	46,937	46,937		883	883	
R-squared	0.317	0.646		0.36	0.741	

Notes: Wage expressed in 2009 taka. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Education and experience measured in years. Standard errors clustered at the level of the individual in columns 1 and 2 and the level of the factory in columns 3 and 4. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A9. The effect of factory fixed effects on coefficients in a wage regression, not holding sample fixed

Dependent Variable = 1(Leave)		
	(1)	(2)
Migrant	0.0137*** [0.0030]	0.0068 [0.0047]
Experience	-0.0008*** [0.0003]	-0.0015** [0.0006]
Education	0.0005* [0.0002]	0.0017*** [0.0004]
Male	0.0069*** [0.0019]	-0.0002 [0.0031]
Tenure in Firm	-0.0032*** [0.0006]	0.0057*** [0.0009]
Factory fixed effects	No	Yes
Observations	48,197	42,764

*Notes: Leave = 1 if the worker left the factory in a particular month and switched to another factory, also in the garment industry. Coefficients are average marginal effects from logit regressions. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Experience, education, and tenure measured in years. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

TABLE A10. Migration and the probability of leaving a factory, not holding sample fixed

	Dependent Variable:					
	1(Local works in factory)				Number of locals in factory	
	Linear Probability Model		Logit	Conditional Logit	Poisson IRR	
	(1)	(2)	(3)	(4)	(5)	(6)
Experience	0.0018 [0.0038]	0.0067 [0.0041]	0.0019 [0.0038]	0.0196* [0.0115]	1.0204*** [0.0024]	1.0219 [0.0151]
Male	-0.1413*** [0.0390]		-0.1407*** [0.0382]		0.6003*** [0.0135]	
Education (Years)	0.0111** [0.0052]		0.0111** [0.0053]		1.0155*** [0.0033]	
Worker fixed effects	No	Yes	No	Yes	No	Yes
Observations	42,245	42,245	42,245	17,397	42,245	24,619

Notes: Regression only includes migrant workers; Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. The number of locals (i.e., those for whom Migrant=0) in the respondent's factory is captured by the number of locals in the survey who were in the factory in the same month as the respondent. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A11. Migrants' experience and probability that they work at factory that employs 1 or more local workers who are observed in the data

Dependent Variable = 1(Reasons for leaving include working conditions)			
	(1)	(2)	(3)
Experience (Years)	0.0012 [0.0045]	0.0239 [0.0162]	0.1005 [0.1605]
Migrant	0.0587 [0.0507]	0.0693 [0.0570]	
Migrant X Experience		-0.0039 [0.0136]	-0.1012 [0.1602]
Male	-0.0059 [0.0238]	0.0159 [0.0311]	
Male X Experience		-0.0079 [0.0077]	0.0034 [0.0383]
Education (Years)	-0.0036 [0.0034]	0.0024 [0.0043]	
Education X Experience		-0.0020* [0.0011]	0.0015 [0.0077]
Tenure (Years)	-0.0154* [0.0093]	-0.0182* [0.0093]	-0.0205 [0.0292]
Worker fixed effects	No	No	Yes
Observations	1,254	1,254	314

Notes: The dependent variable is coded as =1 if worker reports working conditions among reasons for leaving a factory. Two working conditions-related reason categories are "bad relationship with management" and "late payment." Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A12. Reasons for leaving factory include working conditions

Dependent Variable = Temporary exit from sector

	(1)	(2)	(3)	(4)
Experience (Years)	-0.0005*** [0.000]	-0.0015*** [0.0005]	-0.0015*** [0.0005]	-0.0018*** [0.0006]
Migrant	0.0003 [0.001]	-0.0042** [0.0020]	-0.0049** [0.0019]	-0.0053*** [0.0019]
Migrant X Experience		0.0015*** [0.0005]	0.0015*** [0.0005]	0.0019*** [0.0006]
Education (Years)	0.0003 [0.000]	0.0004** [0.0002]	0.0005** [0.0002]	0.0005** [0.0002]
Education X Experience		-0.0001 [0.0000]	-0.0001 [0.0000]	-0.0001 [0.0000]
Male	0.000 [0.001]	-0.001 [0.0015]	-0.0011 [0.0015]	-0.001 [0.0014]
Male X Experience		0.0003 [0.0004]	0.0003 [0.0004]	0.0002 [0.0004]
Index of working conditions			-0.0019 [0.0018]	-0.0044*** [0.0016]
Migrant X Index of working conditions			0.0004 [0.0019]	0.0029* [0.0016]
Index of working conditions X Experience			0.0001 [0.0001]	0.0014** [0.0006]
Migrant X Index of working conditions X Experience				-0.0014** [0.0006]
Past observations	Yes	Yes	Yes	Yes
Factory fixed effects	No	No	No	No
Observations	50,171	50,171	50,114	50,114

Notes: Temporary Exit = 1 if a worker reports a temporary exit from the garments sector when leaving a factory at the end of an employment spell in the sector. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. "Past observations" refer to any month in which they worker has been in the garment industry since she began working, constructed using the retrospective panel structure of the data, as described in section 2.1. Standard errors clustered at the level of the individual. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A13. Temporary exits from the sector

Dependent Variable	Index of working conditions \hat{c}_{ift}				
	Migrant	-0.5120 [0.321]	-0.5763* [0.337]	-0.5763* [0.337]	-0.3301 [0.247]
Male	-0.1819 [0.234]	-0.0590 [0.242]	-0.0590 [0.242]	0.0863 [0.184]	0.0206 [0.147]
Education	-0.0113 [0.034]	-0.0107 [0.034]	-0.0107 [0.034]	-0.0013 [0.026]	-0.0119 [0.021]
Months of experience at time of survey	2	3	4	5	6
Observations	37	50	50	78	108
R-squared	0.074	0.065	0.065	0.033	0.041

Notes: The outcome is the reported working conditions in the factory in which the respondent worked in his/her first month in the industry. The index of working conditions is described in section 2.4; it is standardized to have mean 0 and standard deviation 1. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE A14. Initial reported working conditions among those who had recently joined the industry at the time of the survey

Dependent Variable	Reverse Skill Grade	
	(1)	(2)
Experience	0.0607 [0.052]	0.1557*** [0.034]
Migrant	0.0234 [0.160]	
Migrant X Experience	0.0478 [0.057]	-0.0168 [0.033]
Education	0.0797*** [0.023]	
Education X Experience	0.0170** [0.008]	0.0063 [0.005]
Male	0.4881*** [0.170]	
Male X Experience	-0.0604 [0.060]	0.0022 [0.035]
Worker fixed effects	No	Yes
Observations	40,536	40,536
R-squared	0.301	0.768

Notes: Table shows the results from regressing reversed skill grade (range: 0-8, with 8 being most skilled) on experience, an indicator for being a migrant, education, and an indicator for being male as well as, for each of the three latter variables, their interaction with experience. Column (2) includes person fixed effects. The regression sample excludes 8,232 observations for which workers' report "other" when asked their position type. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Education and experience measured in years. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE A15. Working experience and promotions

Dependent Variable	Years of Schooling (1)
Experience	-0.0715 [0.073]
Migrant	0.2584 [0.339]
Migrant X Experience	0.0686 [0.069]
Male	2.6293*** [0.296]
Male X Experience	0.0879 [0.079]
Worker fixed effects	No
Observations	50,171
R-squared	0.171

*Notes: Table shows the results from regressing years of schooling on experience, an indicator for being a migrant, and an indicator for being male as well as, for each of the two latter variables, their interaction with experience. Migrant = 1 if the individual is was not born in Gazipur or Dhaka districts, as described in section 2.1. Experience measured in years. Standard errors clustered at the level of the individual. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

TABLE A16. Test of differential selection of migrants by ability

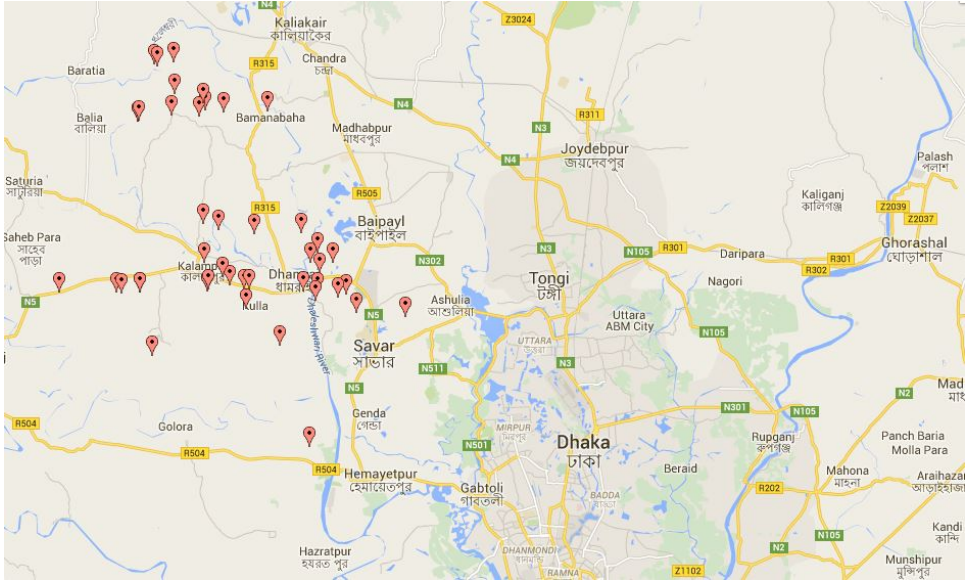


FIGURE A1. Sample villages

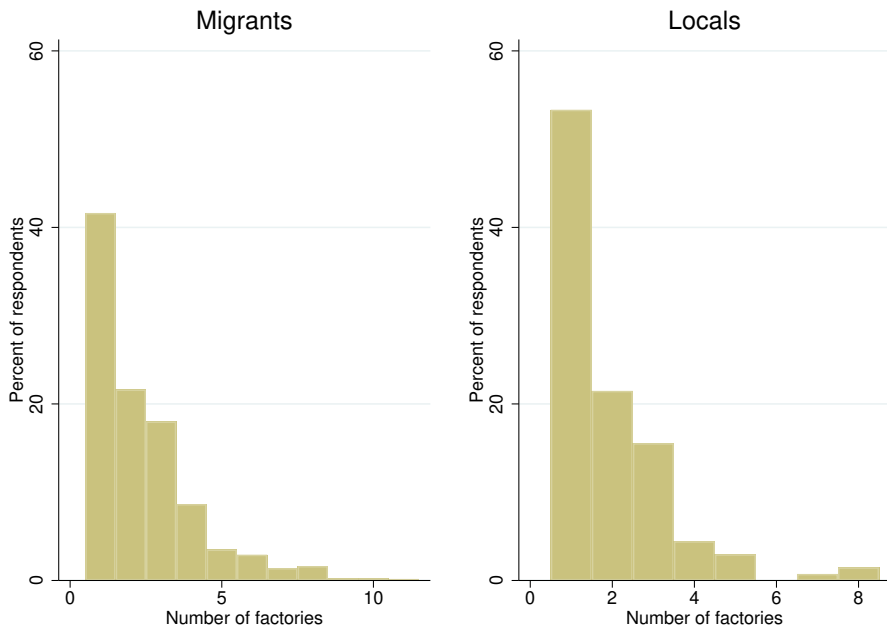


FIGURE A2. Number of factories worked in by each worker

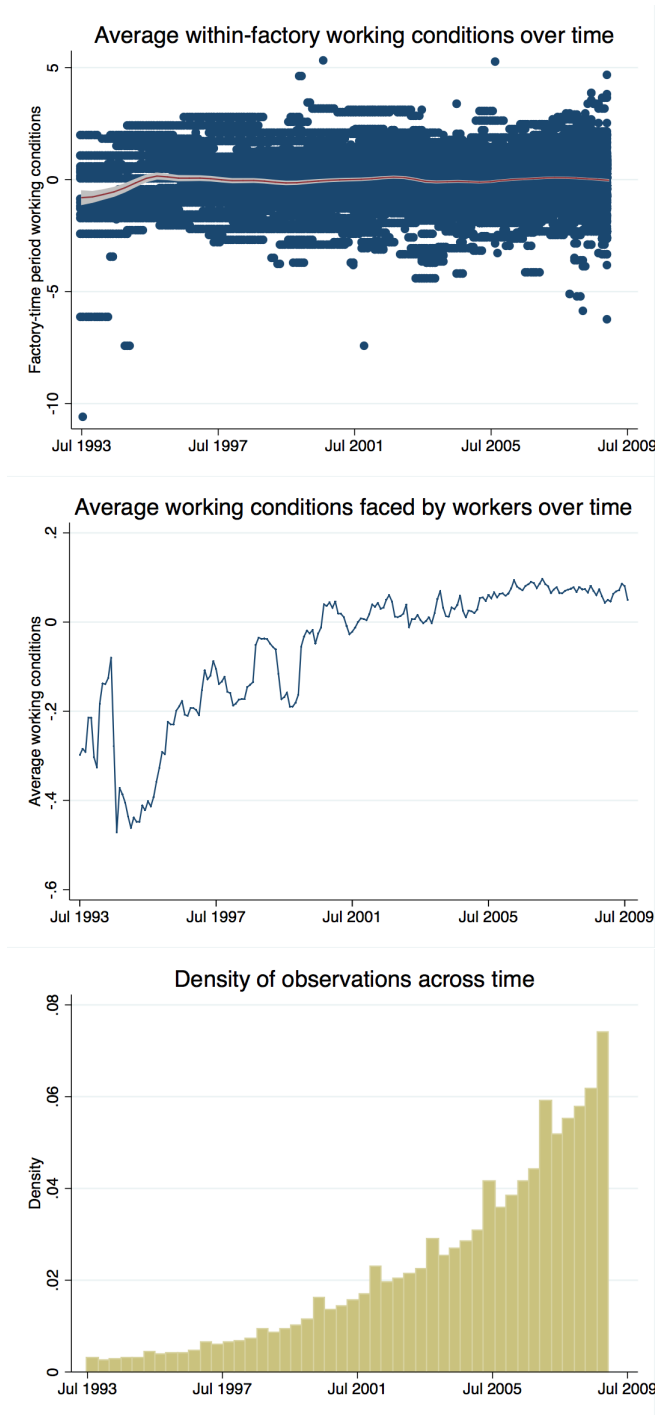


FIGURE A3. Factory- level working conditions over time

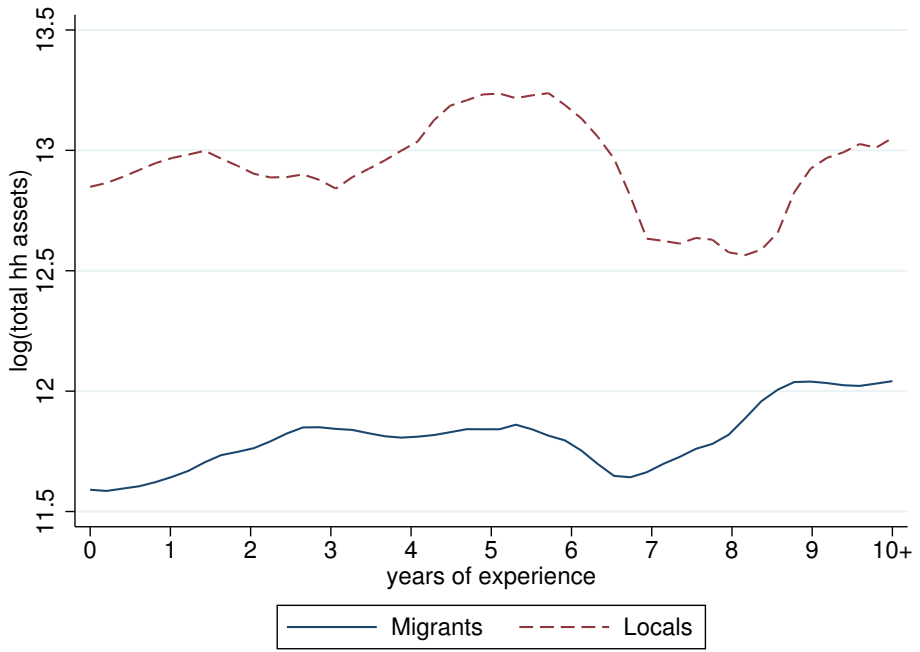


FIGURE A4. Assets with experience

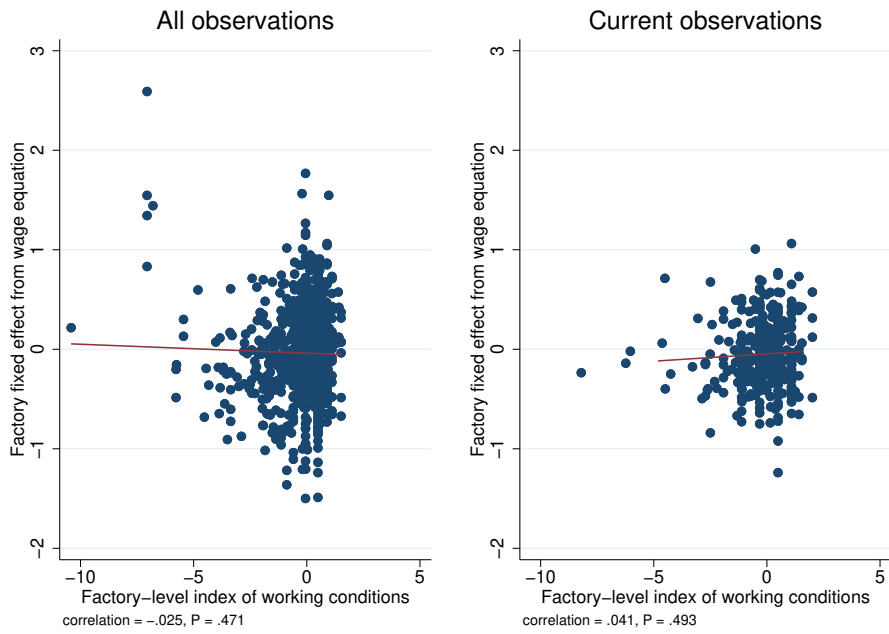


FIGURE A5. Factory- level working conditions versus factory-level wages

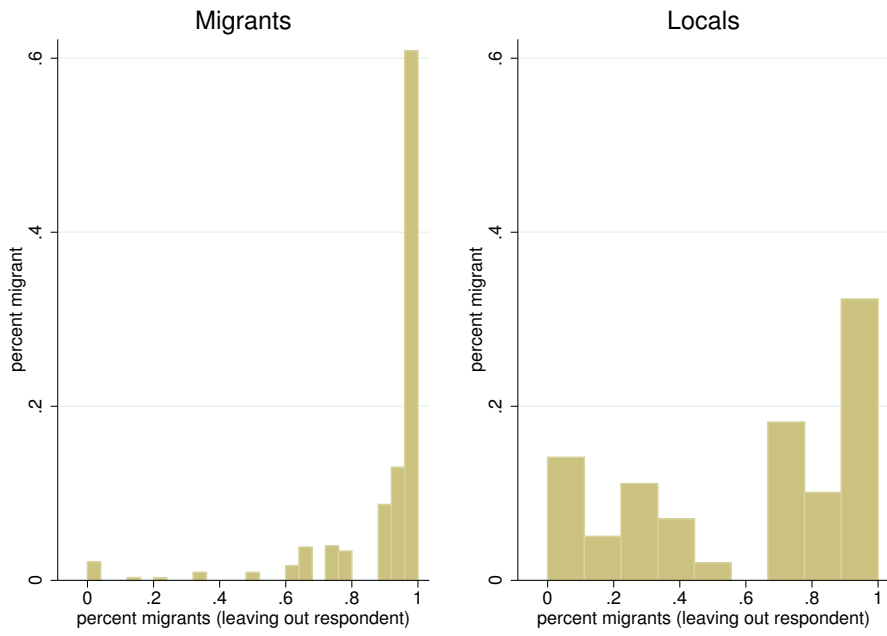


FIGURE A6. Distribution of other workers in factory, migrants versus local workers

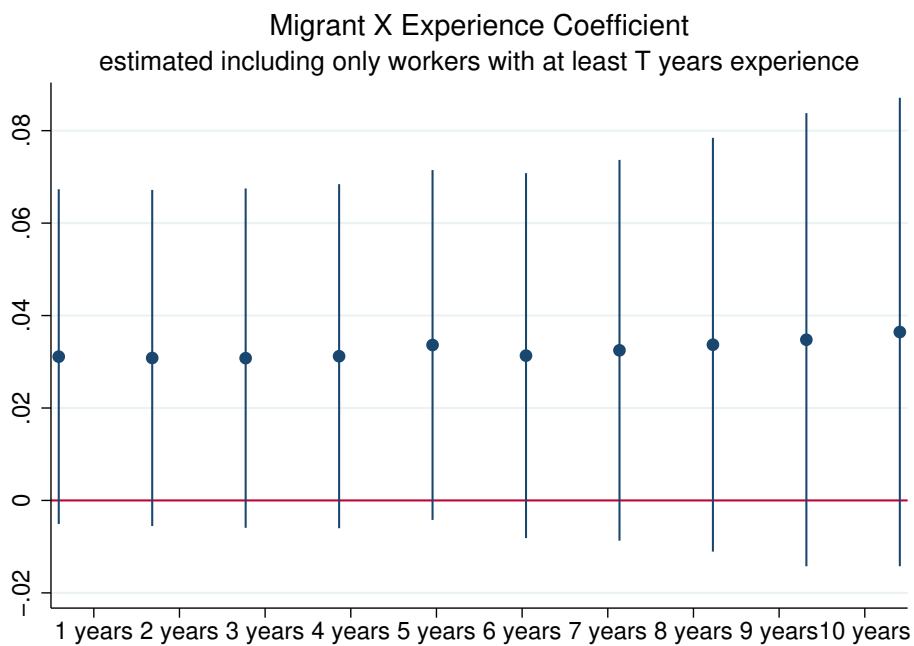


FIGURE A7. Differential improvement in conditions of migrant workers, among workers of minimum experience thresholds

Appendix B: Audit results

Following the 2013 Rana Plaza collapse, the Bangladesh Accord on Fire and Building Safety (the Accord) and the Alliance for Bangladesh Worker Safety (the Alliance) developed harmonized building safety standards for garment factories in Bangladesh. The building safety standards include requirements for structural, fire, and electrical building safety. The coalitions' building safety standards are largely based on the 2006 Bangladesh National Building Code (BNBC), although in some cases the standards exceed the standards set out by the BNBC ([The Alliance for Bangladesh Worker Safety, 2014](#)).

In 2013, both initiatives began conducting building safety audits of factories in their supplier bases. Both initiatives make the audits results publicly available on their websites. The Alliance's audits report factories' compliance with a standard set of requirements, which allows us to calculate overall compliance levels for factories audited by the Alliance. Figure A8 displays the distribution of building safety compliance levels for 279 garment factories audited by the Alliance that are located within commuting distance of workers in our sample.

Mean building safety compliance for Alliance-audited factories in this area was 63%, with a standard deviation of 7.4%. The lowest performing factory complied with 46% of the standards, and the highest performing factory complied with 86% of the standards.

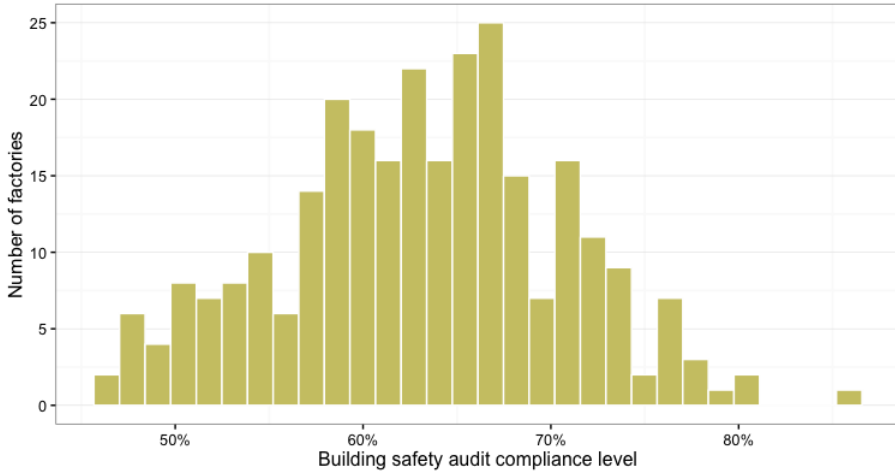


FIGURE A8. Distribution of building safety compliance of exporting factories in study area

Appendix C: Robustness checks for main results

Robustness checks for firm-level working conditions (Section 3.1)

We implement several tests of the robustness of the results in table 3. First, note that the results do not depend on the particular way the index is constructed. While the interpretation that higher values of an index correspond to better outcomes is not always valid with principal components (even if variables are coded to have the same direction), in our case, all variables have the same sign for the loading on the first component. To ensure that this interpretation is robust, we also implemented a non-negative principal components procedure (Sigg and Buhmann, 2008, Sigg, 2014) and found no substantive (and only minimal numerical) differences. Since all variables are binary, we also implemented non-linear PCA (Gifi, 1981, De Leeuw and Mair, 2007) and again found no substantive differences in our results.

Table A3 demonstrates their robustness to four important alternate constructions of the working conditions index. Panel A provides reassurance that migrants' tendency to face worse conditions within a factory does not drive their tendency to report worse working conditions; there is an

almost identical relationship between migrants and working conditions if we reconstruct the measure of working conditions leaving out the worker's own report (i.e. we only use reports from other workers in the factory). We further check whether migrants may have similar biases (compared to locals) in perceptions of working conditions, which might imply that throwing out a migrants' own report doesn't fully account for the possibility that differential reporting or memory drives our main results. In particular, we consider the correlation between reports of working conditions by workers employed at a given factory at a given time, and how this varies between migrants and locals. That is, for all possible pairs of workers employed at a given factory at the same time t , we consider the reported working conditions of any two, i and j , c_{it} and c_{jt} . We compare how reports vary between migrants and locals by running the regression

$$c_{it} = \beta_1 c_{jt} + \beta_2 c_{jt} \times 1(\text{Both } i \text{ and } j \text{ Migrants}) + \beta_3 c_{jt} \times 1(\text{Both } i \text{ and } j \text{ Locals}) \quad (7)$$

Then, β_2 and β_3 test whether the correlation in reports is stronger if both workers are either migrants or locals, compared to a pair in which one is a migrant and one is a local. If so, this would be consistent with a story in which migrants' memories are more similar to each other than locals'. However, table A4 shows that, while there is a positive correlation in workers' reports of conditions in a given factory at a given time, this correlation is no stronger among workers who are both migrants or both locals.

Returning to Table A3, Panel B reconstructs the measure of working conditions leaving out workers' reports from their current factories. If workers are more hesitant to report worse working conditions in their current factory – and differential sorting of workers into factories over time interacts with migration – then it is theoretically possible that this underreporting could driven some of the estimated relationship between migration and working conditions. However, with the exception of the specification that uses only current data and village fixed effects (which asks a lot of the data, given that we're throwing away current reports) the coefficient remains unchanged,

suggesting that any differential reporting in the current factory does not drive the estimated migration effect. Similarly, Panel C uses only current observations, to guard against the concern that conditions in previous factories are reported with error. This would be particularly of concern if this error was differential between migrants and non-migrants, as would be the case if migrants had bad memories of stressful times just after moving. However, the results are very similar when we do not use past observations. Finally, Panel D reconstructs the measure of working conditions using only one observation per worker-factory match, as opposed to weighting workers' reports by their tenure at the factory. The results remain unchanged.

Table A5 looks at each individual component of the working conditions measure; there is no evidence that the results in table 3 are driven entirely by a small number of measures. Moreover, there are particularly strong effects on the measures that may seem to measure bad working conditions particularly well – abusive management, bad/unsafe working conditions, no medical care, and a bad relationship with management.

Table A6 directly assesses the validity of the model's assumption that all workers face the same conditions within a factory by comparing working conditions reported by workers at the same factory. The point estimate on migrant is -0.12 standard deviations, but it is statistically insignificant and lower in magnitude than the effect of migrants on the factory-level measure. Thus, even if there are some differences within factory in how migrants are treated, these are considerably smaller in magnitude than the factory-level differences documented in table 3.

Table A7 also shows the robustness of the results to alternate definitions of the migrant variable, in particular, defining as a migrant as anyone not from the village in which they currently reside, or anyone not living in the village in which they currently reside by age 10. The point estimates vary with how strictly the migrant variable is defined, but generally support the main results.

Another implication of migrants' tendency to sort into factories with systematically worse working conditions is that they will sort into factories

with other migrants. Figure A6 shows the distribution of the migrant status of other workers in a factory faced by migrants versus locals. While approximately 60 percent of migrants are in factories with only other migrants (among the sampled workers), there is a much wider distribution of the percent migration status among other workers for locals; the differences are indeed highly statistically significant.

Finally, we provide some supplemental evidence for the role of information in determining the level of working conditions faced by workers by examining referrals. While referrals could serve a variety of purposes – and have been argued to increase effort in the context of the garment industry (Heath, 2018) – it is also plausible that referrals serve to inform workers about the working conditions in a given factory. Table A8 includes a dummy variable for whether the worker was referred in equation 1. In the sample using past observations, workers who are referred are in factories with 0.067 standard deviations better working conditions. While the coefficient rises to 0.10 standard deviations when controls for sex, education, and experience are included, neither coefficient is statistically significant at traditional levels. The effect of referrals becomes borderline significant in the sample of current observations when village fixed effects are included. We thus consider the relationship between referrals and working condition to be additional suggestive evidence of the theoretical model’s focus on the importance of information in helping workers assess working conditions at the factories in which they choose to work.

Robustness checks for changes in conditions and wages with experience (Section 3.4)

We provide two additional pieces of evidence consistent with the tendency of migrants to move towards factories with better conditions as they progress. Table A11 tests the prediction that as migrants move towards factories with better conditions, these factories should employ more local workers. In several regressions with only migrant workers, we find marginally statistically

significant evidence that this is the case. Columns (1) and (3) show that each year of experience that a migrant has is associated with a 0.18 percentage point increase in the probability that they work in a factory with at least one other local. The estimate is not statistically significant, which is in part due to the fact that nearly half of all migrants in our sample, 48%, never work in a factory with a local. Adding worker fixed effects allows us to estimate how experience is correlated with within-worker changes in the likelihood of working a factory with a local. In column (3), we find that an additional year of experience is associated with a 0.67 percentage point increase in this probability ($p = 0.106$). In column (4), we estimate a conditional logit model, which estimates that the probability increases by 1.96 percentage points per year of experience ($p = 0.089$). These two estimates are identified off of workers who switch between factories without and with local workers, which is about 33% of our sample; among this group, migrants are moving from factories with no locals to factories with locals. We also regress the count of locals who work in a factory on migrants' characteristics. In columns (5) and (6), we report the incident rate ratios from the Poisson models. Both regressions suggest that each additional year of experience is associated with an approximately 2% increase in the incident rate for the number of local workers in a migrant's factory. The column (5) estimate is highly statistically significant, but when worker fixed effects are added, the estimate becomes less precise ($p = 0.143$).

Finally, table [A12](#) explores whether migrants are more likely to report having left past factories because of bad conditions. While not statistically significant, a large point estimate indicates that migrants were 5.9 percentage points more likely to have left a past factory because of bad conditions, as reflected in reported reasons for leaving such as "bad relationship with management" or "late payment". Further, the point estimates on the interaction term between migrant and experience is negative (columns 2 and 3), consistent with migrants becoming relatively less likely to report reasons related to working conditions compared to locals.

Appendix D: Extensions to the baseline model

The baseline model in section 5 generates key predictions on the wages, working conditions, and mobility of migrant workers versus locals that match our main results. Its simple set-up, however, abstracts away from several realistic features of the garment industry in Bangladesh. In this section, we consider several extensions to the baseline model. We first consider an extension related to workers, namely variation in their outside options. Then we consider imperfectly competitive labor markets. Finally, we consider extensions related to firms, looking in particular at firm-level variation in productivity, a mobility cost that accrues to firms, and variation in the cost of improving working conditions.

While these extensions are realistic in the context of Bangladesh's garment industry, and we provide several pieces of ancillary evidence consistent with them, they do not substantially affect the main model's predictions. Similarly, while some of these extensions could generate some of the same predictions as the main model even if migrants and locals have the same information when beginning work, they cannot singlehandedly explain the set of empirical results in Section 3 without the assumption of differences in informedness between migrants and locals.

D.1 Building in a participation constraint

It is useful to incorporate reservation utility both because it is another potential difference between migrants and locals and to help interpret the retrospective nature of the data. Without variation in workers' productivity or outside option, the possibility that workers drop out if their total compensation is below reservation utility would not fundamentally change the model, since there would be no selection on unobserved characteristics. However, suppose that there is variation in workers' marginal revenue product (π). Since predictions on the change in a worker's wages, working conditions, or mobility between firms can be tested among workers whose

utility from the (w, c) offer they receive is at least as high as their outside option in both periods, the relationship between π and the outside option (are better or worse workers more likely to leave the industry?) determines whether the predictions are tested on a group of relatively high or low productivity workers. However, the fundamental predictions of the model – namely, the comparisons between migrants and locals – should still persist in the sample of stayers.

Differences in migrants' and locals' reservation utilities could, by contrast, generate differences between migrants and locals who stay in the labor market in consecutive periods. Migrants could have a lower reservation utility if they are less aware of non-garment job opportunities in the area or if their job opportunities at home are inferior. They would thus be more likely to remain in the industry after a bad (w, c) offer than locals. As with the possibility that migrants are low productivity, this could explain why they are in factories with worse conditions, but not why they are in factories with higher wages.

D.2 Imperfectly competitive labor markets

While the baseline model assumes that firms bid their total spending on wages and working conditions up to the value of the worker's productivity, firms may have some market power in the labor markets in which they operate. However, building this into the model does not substantively change the main predictions as long as the firm's problem is separable in the total compensation they offer workers and the division of this compensation between wages and investments in working conditions. If so, then the main model applies with a total compensation of $\tilde{\pi} < \pi$. For example, consider the opposite extreme from a competitive labor market: the firm has all the bargaining power and thus makes a take-it-or-leave-it offer to the worker. In this case $\tilde{\pi}$ would be set so that the worker's utility from wages and working conditions equals her reservation utility, but again it would still consist of relatively higher wages and lower conditions for the uninformed workers.

D.3 Extensions related to firms

D.3.1 Firm-level variation in productivity. Suppose firms vary in productivity, so that workers with the same ability have different marginal revenue products in different firms. These differences could either be permanent (say, due to variation in managerial ability), or temporary (the firm gets a big order that it needs to fill).

We first consider permanent differences in productivity between firms. In the extreme, the dispersion across firms is entirely vertical (so that there are no firms with similar marginal revenue products competing for workers). If so, then firms will set total compensation with some degree of monopsony power (as described in the previous subsection), and the division of this total compensation between wages and investment in working conditions will depend on the relative number of informed and uninformed workers, as in the baseline model. However, unless this monopsony power is complete, total compensation will still positively covary with productivity, as has been demonstrated to be the case in a wide variety of labor markets (Blanchflower, Oswald and Sanfey 1996; Van Reenen 1996; Budd, Konings and Slaughter 2005).

Some evidence for the empirical relevance of this extension is provided in figure A5, which graphs the distribution of wages versus working conditions of firms in the sample. The baseline model in Section 5 predicts a negative correlation between wages and working conditions, as firms paying the same total compensation decide to specialize in either wages or working conditions. However, figure A5 shows that there is a net zero relationship between wages and working conditions, suggesting that differing levels of spending on total compensation represents a countervailing force – such as vertical differentiation – that would tend to make total wages and working conditions positively comove.

If the process by which workers are matched into these firms of different tiers is driven at least in part by search frictions (rather than entirely by positive assortative matching based on time-invariant worker characteristics,

which leaves no role for workers' mobility between different tiers of firms), this extension can generate the higher mobility of migrants under the assumption that migrants have greater relative preference for wages ($\beta_m > \beta_l$) rather than our key assumption that migrants are more likely to be uninformed. Migrants would be more willing to pay a mobility cost to move to a higher productivity firm than locals. Note, however, that this prediction that migrants have higher mobility is not unambiguous: it is now the locals who are trying to move in order to seek out better conditions, in this case, by finding higher productivity firms that offer better working conditions. So the relative variance in conditions versus wages would determine whether the migrants or locals are more likely to move.

An alternative model of factory-level variation in productivity would generate this variation endogenously. In particular, some factories invest in working conditions and others do not. Workers in factories with poor working conditions would seek to move to factories with good working condition when they can (leading to lower productivity), while factories with good working conditions would have lower turnover and higher productivity. This model is similar to our main model, in that workers end up in factories with bad working conditions because they lack information, but no longer has a role for wage competition to entice workers to factories with poor working conditions. Because we view the wage results in section 3.2 as suggestive of the result that migrants are in factories with worse working conditions than locals – if not entirely statistically conclusive – we focus on that model in the main text, but acknowledge that we cannot rule out this similar model.²⁸

Next, consider the possibility that, due to demand shocks, the worker's marginal revenue product in a specific firm increases at a certain time. If so, then after receiving the positive shock, the firm would increase compensation to entice workers to move there, and workers who move are likely to end up in the firms with positive demand shocks. If migrants have lower mobility

28. We thank an anonymous referee for bringing this model to our attention.

costs and there is also a sunk cost to looking at other jobs, then while migrants particularly want to improve their conditions upon moving as predicted by the baseline model, if the demand shock is sufficiently large, they would also improve their wages, which would generate a channel through which migrants earn more with experience. We consider this possibility in Section 3.4 when we discuss the wage trajectory of migrants versus locals with experience.

D.3.2 Additional mobility cost to firms. The model assumes that the cost of mobility is borne by the worker, and since uninformed workers do not anticipate that they will want to move, there is no scope for firms with good conditions to attract uninformed workers with a (w, c) offer that will save workers later moving costs. A related question is whether there are additional costs to the firm to losing workers, which the firm would internalize when making wage offers. For instance, there could be costs to hiring or training new workers, or new workers could have initially lower productivity while they grow accustomed to the new firm. If these costs are important, then firms will lower the total value of compensation offered to uninformed workers by the amount of the turnover cost. In the extreme, if the turnover cost is high enough, firms will offer all workers the (w, c) bundle that maximizes the utility of an uninformed worker, and the model in Section 5 no longer applies. However, for lower values of turnover costs, some firms will still choose to go after uninformed workers.

D.3.3 Do firms prefer to target migrants or locals? In the baseline set-up – and even in the above scenario where mobility represents a direct cost to firms – firms still remain indifferent between targeting migrants and non-migrants. With perfectly competitive labor markets, firms bid the expected payment to a worker up to the value of their output (net of any expected mobility costs accruing to the firm), and firms are indifferent between migrants and locals. Even if we relax the assumption of perfectly competitive labor markets, the

firms still presumably would not choose to target migrants if doing so was unprofitable.

The above arguments are predicated, however, on the principle that firms are ex ante identical. An interesting alternate possibility to consider is whether there exists fundamental heterogeneity between firms that would lead some firms to target migrants and others to target locals. One possibility is variation in the relative cost of improving working conditions, p . This heterogeneity will prompt firms with lower cost of improving conditions to target locals, and firms with higher costs to target migrants. If there are sufficient firms in each category that firms again bid the value of total compensation up to the worker's productivity, the same argument from earlier applies, but consider instead an alternate extreme where there is just one firm of each category. If firms make a take-it-or-leave-it offer to workers, then firms targeting locals will be more profitable, because it is always weakly cheaper for them to offer a given (w, c) bundle.

Since this result is driven by the fact that firms with lower p will be overall lower-cost producers, in order to isolate the difference in conditions, suppose instead that firms with higher p have a higher output by the differential in the cost of providing the optimal level of conditions c^* , as given in equation 5. That is, the productivity of a worker net of the cost of providing the worker's preferred working conditions would be equalized. If so, then firms targeting migrants will be more profitable because they have higher output and spend nothing on working conditions. This profitability advantage could dissipate or reverse, however, in the presence of turnover costs, as described in the previous sub-section.

Overall, then, the model does not give strong predictions on whether firms targeting migrants or locals will be more profitable. While we don't have measures of profitability of the firms, we can explore the relationship between working conditions, wages, the decision to hire migrants, and whether the firms listed by workers in the original 2009 survey were still operational in

2014, when Heath and Mobarak did a follow-up survey of the original firms.²⁹ At that time, 47 percent of firms were still operating and 40 percent were still operating under the original management. While we cannot rule out the possibility of measurement error (maybe we were unable to locate some firms that were actually operating), other studies have also found high rates of firm-level turnover in the garment sector in Bangladesh (Labowitz, 2016).

Table A1 presents the results. There is a positive correlation between working conditions and firm-level survival when the regression is weighted by the number of observations in a factory. The effect is relatively large: A one-standard deviation increase in working conditions is associated with a 3.4 percentage point increase in survival probability. Firm-level wages are also positive, although statistically insignificant. While the lack of a strong positive relationship may seem surprising, note that this pattern fits with this paper's argument that higher productivity is not the only reason that firms would pay higher wages. There is also a positive relationship between the percentage of migrants in a factory and the probability that it survives, though it is only significant in the unweighted regression. Overall, we interpret these results as providing some evidence in line with the theory that firm that are otherwise more profitable have better ability to improve working conditions.

Appendix F: Ability composition of migrants with experience

To provide further reassurance against the possibility of differential attrition driving our results, we check whether the ability composition of the migrant sample changes with experience compared to locals. Tables 4 and A15 provide evidence that schooling is correlated with labor productivity in the garments

29. Previous literature has documented a positive correlation between firm-level productivity and survival among manufacturing firms in developing countries (Frazer 2005; Söderbom, Teal and Harding 2006), though in Söderbom, Teal and Harding (2006) the relationship is not present under small firms, which they argue is driven by a positive correlation between productivity and the owner's outside option.

sector: Workers with more schooling earn more and obtain higher skill grades. As such, we use education as our proxy for labor productivity.³⁰ If migrants are relatively more selected on education with experience, then low productivity migrants leaving the sample could generate our results. To test this possibility, we regress education on experience, an indicator for being a migrant and an indicator for being male as well as, for each of the latter two variables, their interactions with experience. Table A16 presents the results. The interaction term between migrant and experience is positive but small, less than an additional 0.07 year of schooling for each year of experience in the sector for migrants compared to locals, and is not statistically significant. We interpret these results as suggestive evidence that differential selection of migrants on ability does not drive our results.

30. We assume that education is acquired prior to beginning work in the sector.