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Laura Boudreau, Rachel Heath, Tyler H. McCormick

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Laura Boudreau*
Rachel Heath†
Tyler H. McCormick‡

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Abstract

Many workers in large factories in developing countries are internal migrants from rural areas. We examine the relationship between workers' migration status and the working conditions they face in a household survey of garment workers in Bangladesh. We document that 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.

Keywords: Migration, Imperfect Information, Labor, Turnover, Working Conditions, Safety, Garment Industry, Bangladesh

*Columbia Business School, Columbia University; l.boudreau@columbia.edu
†Department of Economics, University of Washington; rmheath@uw.edu
‡Department of Statistics and Department of Sociology, University of Washington; tylermc@uw.edu.
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1 Introduction

Working conditions are poor in many industries 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). A key question that arises is whether workers understand the tradeoffs they are making when they choose to work in such conditions. We argue that workers do not have full information about working conditions when beginning work, so that the market equilibrium results in an inefficiently low level of working conditions. Our empirical context is the garment industry in Bangladesh, where there has been substantial international attention to working conditions and wage levels.

We develop a theoretical model in which firms compete for informed workers (who can observe working conditions upon beginning a job) and uninformed workers. 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. In the context of this model, 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 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. We are motivated to consider this possibility by 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. Maheshwor Shrestha (2016) shows that potential Nepali migrants misperceive both mortality rates and potential earnings abroad. Slesh A. Shrestha and Dean Yang (forthcoming) show that providing migrant Filipino domestic workers with information on their legal rights improves their legal knowledge and their reported working conditions. We also consider several other potential hypotheses: Migrants could have lower costs to moving factories, stronger relative preference for money over working conditions given the desire

to send remittances home, or have lower average productivity than local workers.

We look for evidence of each of these possible differences between migrants and locals, using 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, relationship between workers and management, 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 same subdistricts as the survey area (who constitute 14 percent of workers in 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, corresponding to the predictions of the one-period model. 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 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 1.6 percent less than other workers in their same factories.

We then examine the model's implications for mobility of migrants versus locals as they gain experience. A discrete-time hazard model indicates that a migrant is 1.4 percentage points more likely to leave a factory than a local in a given month. This difference drops in half and become 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. Finally, we document that the migrants differentially improve their working conditions as they gain experience, compared to locals. Of these baseline models of differences between migrants and locals that we consider, the only one consistent with all four of these empirical facts is the assumption that migrants are more likely to be uninformed upon beginning work in the industry.

At the same time, we also recognize that our empirical results are also consistent with a model in which migrants have a stronger relative preference for wages than locals, but this difference fades over time. For instance, migrants may face moving costs, or lose access to risk sharing networks when they move. While evidence against the differential tendency of migrants to accumulate assets over time, compared to locals, is some suggestive evidence in favor of our information-based model, we acknowledge that a clear delineation between the two models is not possible given our current data.

There is relatively little literature on labor markets in export manufacturing sectors in

developing countries, and most of its focus is on the determinants of wages, such as estimating export wage premia (see Harrison and Rodríguez-Clare (2010) for a review) or the 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 conditions when interviewed at the firm.[1] 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 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 general scarcity or weak enforcement of formal regulation. While our firm-level measures of working conditions from workers' reports in a household survey are likely imperfect as well – even in the privacy of their homes, workers may be be unwilling to report bad conditions – we argue that these measures provide accurate reports of working conditions across firms with an industry.

The Bangladeshi garment industry in 2009 is a particularly interesting context to examine working conditions in developing countries. 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,[2] 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 (2015) in Myanmar.

[1] Tanaka (2015) collected 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.

[2] Namely, the 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.

Since neither at the time – 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). Indeed, 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 (which neither the firm nor the worker knows at the time of hiring). This could be due to data limitations, as these productivity realizations would be likely to show up in a worker's wage trajectory with tenure, which is generally much easier to observe than working conditions.

By contrast, in our model, the firm knows its investment in working conditions, and would like to be able to credibly signal it to the worker. 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). Given that we do not see Bangladeshi garment factories engaging in these types of efforts, a natural question is why they don't. While it is generally hard to spread information in the garment industry in Bangladesh – as previously mentioned, we know of no institutions that allow workers to share information about firms with other workers – our model suggests that labor market competition could be a further 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. In section 5.3.3, 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.

Our emphasis on workers' informedness in 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 Hardy and McCasland (2015) and Bassi and Nansamba (2017), which focused on asymmetric information about

workers' ability. Our focus, by contrast, is on asymmetric information about the job rather than the worker. Given how new an experience a garment factory job is to recent migrants, there is reason to believe that this asymmetry is also important in explaining labor market outcomes.

Our paper also relates to the literature on firm-level heterogeneity, which points out that similar workers receive different compensation in different firms in both developed (Krueger and Summers 1988; Brown and Medoff 1989; Abowd, Kramarz and Margolis 1999) and developing (Teal 1996; El Badaoui, Strobl and Walsh 2008) countries. Indeed, this heterogeneity may be even greater in developing countries, where government interference and market imperfections prop up inefficient firms (Banerjee and Duflo, 2005). Minimal workplace safety regulations and other legal protections for workers further contribute to the between-firm variation in non-wage benefits. Given this variation, we document variation in wages and working conditions between firms within an industry, and propose a theory emphasizing the role of matching in explaining how workers are matched to these heterogeneous firms.

Finally, this paper contributes 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. Papers building on this theme 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 Weerdt and Dercon 2011; de Brauw et al. 2013; Kinnan, Wang and Wang 2015) and the broader village economy (Morten 2013; Munshi and Rosenzweig 2016). Another strand of this literature examines the effects of internal migrants on wages and other outcomes in urban labor markets (Kleemans and Magruder 2015; Strobl and Valfort 2015). This paper brings these two strands of literature together by examining how the characteristics of migrants affect their experience in urban labor markets.

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 the garment industry in Bangladesh and the information that workers plausibly have about factories when choosing a workplace, and describe our method for constructing factory-level measures of working con-

ditions.

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).[3] The sampling unit was an extended family compound, called a *bari* in Bangla.

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. Furthermore, workers were also asked if they ever earned a wage other than the first offer in a factory, and if so, the number of months they received each wage. 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.

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 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

[3]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.

monopsony power of firms.

Another important characteristic of the firms in the sample is that they hire more males than the typical firm in Bangladesh: 56 percent of the workers in the survey are female, while the national labor force was estimated to be 80 percent female at this time (Bangladesh Garment Manufacturing Exporters Association 2013; Saxena 2014).[4]. The garment factories in the survey area are disproportionately woven factories (compared to the national sample, which has a greater proportional share of knitwear factories). Woven factories, while still conducting the sewing activities that are overwhelmingly female, tend to hire more males to operate the looms, which require upper body strength to operate.

Table 1 gives summary statistics of the workers in our sample, broken down by gender and migration status. Because some of our sample began working before moving to their current village (and we don't know whether they were originally from that village or not), 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), which we refer to as urban areas, and the workers born there as "locals." By this definition, only 15 percent of male workers and 11 percent of female workers are locals; we consider the rest of workers to be migrants.[5] While the slightly greater tendency of women to be migrants is unsurprising, given that women tend to migrate upon marriage in Bangladesh, note that the vast majority (99 % of female heads of the household) of married female respondents whom we classify as migrants are also 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, and 44 home districts (of the 64 total in Bangladesh) are represented in two or more baris 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 overwhelming married (79 percent of male workers and 76 percent of females). Male workers have approximately the same education (7.2 years)

[4]Other sources put the figure at 90 percent female (Chowdhury and Ullah 2010; Ghosh 2014). Part of the disparity may be the question of whether only sewing-line operators (versus other factory employees) are included (Chris Woodruff, personal communication). This general lack of consensus highlights the general scarcity of detailed information about garment workers and factories.

[5]In the Appendix (Table A5), we show robustness of our main results to alternative definitions of the the migrant variable.

	Entire Sample		Migrants		Workers from Urban Areas		P-value of t-test, Migrants vs Urban	
	Males	Females	Males	Females	Males	Females	Males	Females
Panel A: Demographics								
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
Panel B: Socioeconomic Status								
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
Panel C: Job Characteristics								
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
Average Daily 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		

Table 1: Summary statistics

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 urban 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 urban 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 in the peak season. Workers from urban areas 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.

Overall, while the discussion we have just made highlights several reasons why the workers in the sample are not necessarily representative of workers throughout garment industry in Bangladesh, we posit that this is an important sample in its own right. For one, the workers are heavily migrants, which is a common characteristics of workers throughout the industry; any disadvantages endured by migrants probably highlight a common problem throughout the industry. Secondly, the higher than usual proportion of males in the sample gives us power to detect gender differences in outcomes, which could potentially be important in understanding the overall labor market outcomes in Bangladesh.

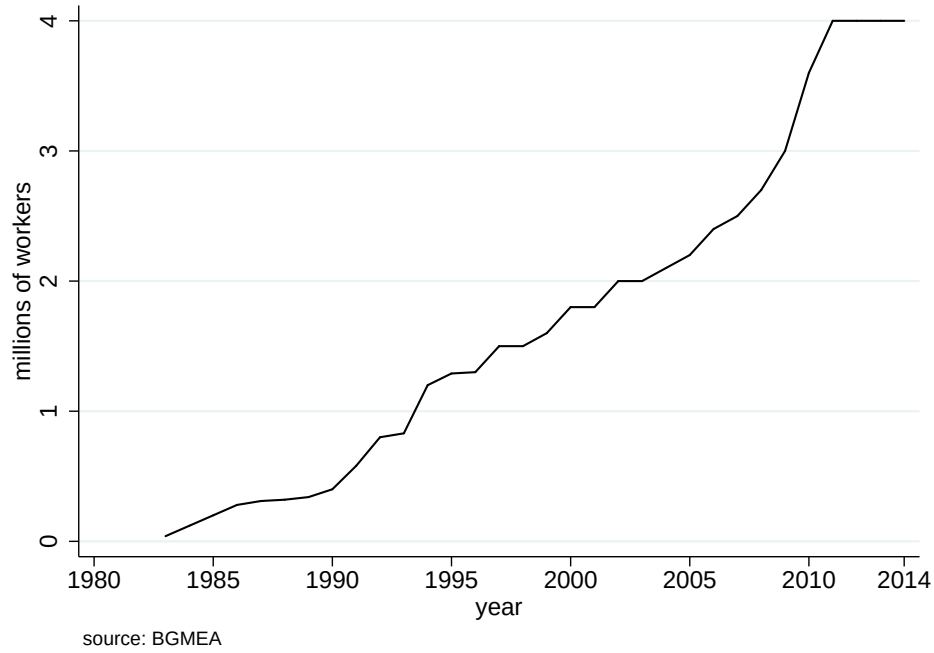

Figure 1: Garment sector employment

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 tend to enter the industry with no experience in the formal sector, and little experience outside the home or village.

As is explained more in detail in Heath (2018) – which uses the same dataset as this paper – hiring is relatively informal. It is common for the firm hiring a worker 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 factory that is hiring (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). The fact that most hiring is done informally again suggests that workers may know little about a factory when they begin working.

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.[6]

Other sources also highlight that there have historically been – and continue even in light of the initiatives to improve safety after the Rana Plaza collapse – wide variation in working 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. The audits reveal significant variation in compliance with the initiative's building safety requirements even among 100% export-oriented establishments: Factories ranged from complying with fewer than half of requirements to about 85% of requirements (mean compliance was 63%, with a standard deviation of 7.4%). 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 outmanned. 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 specific 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

[6] After the Rana Plaza collapse in 2013, the minimum wage was raised to 5300 taka. While we know of no systematic wage data collected after this hike, anecdotal evidence from conversations from Heath's trip to Dhaka in December 2014 suggest that there is indeed now less variation between factories in wage levels.

	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
N	48,687	2,267	991

Table 2: Components of the Working Conditions Index

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 were more common when reported at the worker-spell level than

[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 Section 4.1 that the key results on working conditions remain if we discard a respondent's report in her current factory.

the worker-month level, suggesting that workers spend less time in factories when there are problems present.

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.

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 and we created a series of mutually exclusive binary indicators from the categorical variable representing a worker's relationship with management. Accordingly, higher values in our index correspond to better working conditions. This interpretation is not always valid with principal components, even if variables are coded to have the same direction. In our case, however, 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.

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, rather than factories offering different conditions to individual workers. We address this

concern in several ways. First, in our empirical analysis of worker-level characteristics and working conditions in Section 4.1, we show 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 differences that are much smaller 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 (the Labour Law of 2006 required them, and before that, it was considered a characteristic of responsible factories), it is possible that some factories offer appointment letters to only their valued workers. 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 section 4.1 we also display the relationship between migrant status and individual measures of working conditions, and show that the results are not driven by appointment letters, or more generally, any single measure of working conditions.

We also assess the empirical plausibility of the assumption that factory-level working conditions are stable over time in the top figure in figure A2. 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 about May 1999 to July 2009, which are the 10th and 90th percentiles in the distribution of observations across time (see bottom figure in figure A2), the slope remains approximately zero. Barring the case where factories change 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 over time.

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 Model

In this section, we characterize a model of workers' decisions of initial firms and subsequent mobility if they are informed about working conditions when beginning work versus if they are not. We then characterize the model's predictions on migrants' labor outcomes, versus locals, under several plausible assumptions about the differences between migrants and locals. For one, migrants could precisely be the workers who are more likely to be informed. We also consider the possibilities that migrants have lower mobility costs, greater relative preference for wages over working conditions, and are lower productivity. Out of these scenarios, only the one that migrants are less likely to be informed (but this difference fades with experience) generates the entire set of empirical predictions that we find in section 4: Migrants are in factories with higher wages but worse working conditions; as they gain experience, they move more than locals and differentially improve their working conditions.

Following the presentation of our main results in section 4, we consider several extensions to the baseline model in section 5. As we show in that section, the model's main intuition and predictions persist under these extensions.

3.1 Set-up and baseline results

Workers have marginal revenue product π. They get utility from wages (w) and working conditions (c). Utility is separable in wages and working conditions:[8]

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

[8]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 working conditions even without heterogeneity in workers' level of informedness, since workers' utility could either be maximized with a (high wage, low 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 alone wouldn't generate the same pattern of sorting across the firms we see in the data. Do note though that nonseparability would lower the utility loss from the model's predictions on uninformedness. Thus, it would attenuate the testable implications of the model that stem from previously uninformed workers' taking steps to find firms that are better matches, since the uninformed workers would at least value the additional wages that the low-conditions firm is paying them.

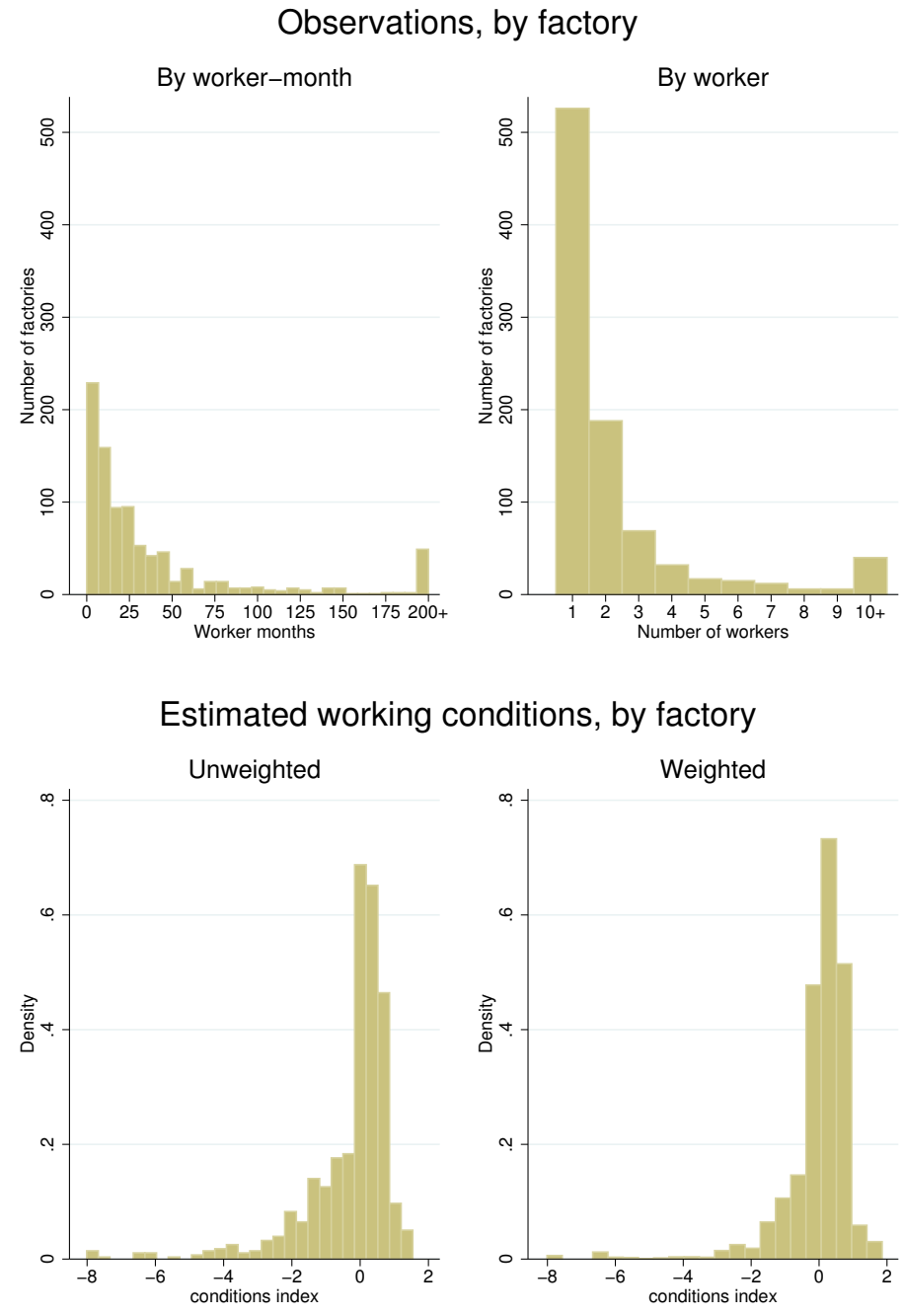

Figure 2: Factory-level variation in working conditions

Some workers observe and consider the working conditions in a firm but uninformed workers (these are called "myopes" in the language of Gabaix and Laibson (2006)) do not consider working conditions when making decisions about where to work.[9] 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, they offer $(\pi, 0)$ to uninformed workers, and to informed workers they offer the (w, c) pair that solves:

$$\begin{aligned} max_{w,c} \quad & u_w(w) + \beta u_c(c) \\ s.t. \quad & w + pc = \pi \\ FOC: \quad & u'_w(w) = \frac{\beta}{p} u'_c(\frac{\pi - w}{p}) \end{aligned} \tag{1}$$

The FOC indicates that firms offer a level of conditions to informed workers that equates the marginal value of wages with the marginal gains from better conditions, scaled by the cost of improving conditions. Assume that conditions must be the same for every worker in a firm, so that firms will either specialize in informed or uniformed workers.[10] 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 1 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 (1), and workers self-select their preferred options.

Now consider a second period in which previously uninformed workers can now ob-

[9] 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 other migrants, who also are not well informed about working conditions and the industry in general. For migrants, working conditions are then an "unknown unknown", in the framework of Banerjee et al. (2019).

[10] 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.

serve working conditions. All workers can choose to switch firms, but would have to pay a mobility cost $m \sim U[0, \bar{m}]$ to do so. So they will switch if they get an offer (w', c') such that

$$u(w', c') - m \geq u(w, c) \tag{2}$$

Note that informed workers have no reason to switch firms, since they are already receiving the wage offer that would maximize their utility.[11]

3.2 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.

3.2.1 Migrants are more likely to be uninformed

In the model, workers who are uninformed about working conditions will end up in firms with worse conditions but higher wages. There is indeed reason to believe migrants are less informed 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 individual firms (Absar, 2009). In the extreme, there are anecdotal reports of unscrupulous factories issuing attendance cards without names to newly hired workers so that the workers have no recourse to collect unpaid overtime (Ahmed, 2006). Indeed, 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 (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

[11] 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.

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'.

3.2.2 Migrants have lower mobility costs

Another possible difference between migrants and locals is 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 the migrants have higher mobility that we earlier derived from the assumption that migrants are less likely to be informed upon beginning work could just be because it is easier for migrants to move. However, it would then be easier all along for migrants to seek out factories with good conditions, so they would be in factories with better conditions than locals, whereas locals would be the ones in factories with higher wages.

3.2.3 Migrants have greater relative preference for wages over conditions

Another potential explanation for why migrants are in factories with worse conditions is that they 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,[12] 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. But then, if anything, when they move, they would seek out firms with even higher wages (and worse conditions), compared to locals. And this assumption generates the opposite prediction as would the assumption of differences in informedness: the conditions faced by migrants would actually worsen with experience in the industry, compared to those faced by 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 indeed likely that the factories with 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, without differences in

[12] 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.

informedness, it is not obvious how this model alone can explain why migrants are in factories that pay higher wages.

3.2.4 Migrants are lower productivity

Finally, there could 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, this could explain why they are in factories with worse conditions, but not why they are actually in factories with higher wages. By extension, if they are higher productivity, it is hard to explain why they are in firms with worse working conditions.

3.3 Summary of testable implications of different assumptions about migrants

Table 3 summarizes the predictions of each of the potential differences between migrants and locals described in Section 3.2. There are many reasons why migrants would be in factories with worse working conditions than locals, including the possibility that they knowingly chose that option because these factories pay higher wages. However, the fact that after they begin working, they differentially move towards better conditions than do locals suggests that they actually do have a preference for better conditions and begin trying to improve their conditions as they learn about the variance of working conditions between firms.

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.

	Migrants in Factories with:		Migrants Higher Mobility	$\Delta c_m > \Delta c_l$
	Worse Conditions	Higher Wages		
1. More likely to be uninformed about conditions				
a. time invariant	✓	✓		
b. which fades over time	✓	✓	✓	✓
2. Lower mobility costs ($\bar{m}_m < \bar{m}_l$)	(opposite)	(opposite)	✓	✓
3. Greater relative preference for wages ($\beta_m < \beta_l$)	✓	✓	(opposite)	(opposite)
4. Lower productivity ($\pi_m < \pi_l$)	✓	(opposite)		

Note: The predictions of each row in the table assume that the given assumption is the only difference between migrants and locals. For instance, the first two rows assume that migrants are more likely to be uninformed, but have the same mobility costs, preferences, and productivity as locals.

Table 3: Summary of testable implications of different assumptions about migrants

4 Empirical strategy and main results

In this section, we explain how we test the results of the model's predictions on the factory level working conditions, wages, and the mobility of migrants versus locals, in the context of the retrospective panel.

4.1 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 $\hat{c}_{ft}$ 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,[13] education, gender) assembled in the vector X_{ift}:

$$\hat{c}_{ift} = \beta Migrant_i + \gamma' X_{ift} + \varepsilon_{ift} \tag{3}$$

Table 4 gives the estimation results. We standardize the outcome variable to have mean zero and standard deviation one. Consistent with the model's main prediction for working conditions, 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.

The third through sixth columns focus only on the current observation for each worker to allow for the inclusion of village fixed effects (since we only know the current village of residence of each worker). This sample also facilitate interpretation by including only one observation per worker. The coefficients get smaller when only the current observation is used. This result is consistent with Prediction 1b in table 3 that the difference in informedness between migrant and local workers fades over time. 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 survey, migrants were in factories that had 0.18 standard deviations 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 not driven by residential sorting of migrants into areas in which the

[13] When we refer to experience, we always mean experience in the garment industry.

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 4, in the sample that includes past observations (column 2), each year of education is associated with a 0.031 standard deviation increase in working conditions. Male workers are also in factories with an average of 0.12 standard deviations worse working conditions than females, although this is 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.[14]

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 A5 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.

In the Appendix, we implement several tests of the robustness of the results in table 4. First, table A2 demonstrates their robustness to three 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 current report. 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

[14]Given that the sample consists mostly of migrants, the zero coefficient on experience may at first seem to contradict the model's prediction that migrants move towards better conditions with experience. However, in Section 4.4, 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.

reporting in the current factory does not drive the estimated migration effect. Finally, Panel C 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 A3 looks at each individual component of the working conditions measure; there is no evidence that the results in table 4 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 A4 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 that 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 4.

Table A5 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.

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 A6 includes a dummy variable for whether the worker was referred in equation 3. 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.

Dependent Variable = Index of working conditions ($\hat{c}_{ift}$)						
	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	-0.2931***	-0.3127***	-0.1663*	-0.1718*	-0.1801***	-0.1772***
	[0.086]	[0.096]	[0.096]	[0.096]	[0.052]	[0.055]
Male		-0.1153		0.0345		0.0531
		[0.103]		[0.066]		[0.059]
Education (Years)		0.0314**		0.0109		0.0091
		[0.016]		[0.008]		[0.008]
Experience (Years)		-0.005		0.0094		0.0092
		[0.022]		[0.008]		[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	0.011	0.022	0.006	0.015	0.186	0.197

*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 4: The relationship between worker-level characteristics and factory-level working conditions

4.2 Firm-level wages

We next test the model's prediction on the average wages of factories with and without migrants. To do this, we compare the coefficient on *Migrant* in a wage regression with and without factory fixed effects:

$$log(w_{ift}) = \beta_{ols} Migrant_i + \gamma' X_{ift} + \varepsilon_{ift} \tag{4}$$

$$log(w_{ift}) = \delta_f + \beta_{fe} Migrant_i + \gamma' X_{ift} + \varepsilon_{ift} \tag{5}$$

Table 5 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.[15]

Consistent with the model's prediction that migrant workers sort into factories with higher wages (but worse conditions) compared to locals, over the course of their careers, migrants earn 5.1 percent more than local workers with the same characteristics, and surveyed migrants were currently earning 5.2 percent more than locals, although neither effect is statistically significant at conventional levels. However, in both cases the coefficient on migrant flips sign when factory fixed effects are added.[16] The fact that the coefficients are statistically different from each other confirms that migrants are indeed in firms with higher wages. 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.

[15]The results are unchanged if we do not restrict the sample. See table A7.

[16]This negative within-firm coefficient on migrant suggests that in the context of the discussion in Section 3.2.4, 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).

	Dependent Variable = Log wage					
			P-value of test BetaFE = BetaOLS			P-value of test BetaFE = BetaOLS
	(1)	(2)		(3)	(4)	
Migrant	0.0484	-0.0172	0.073	0.0590	-0.0396	0.009
	[0.043]	[0.047]		[0.061]	[0.063]	
Male	0.2088***	0.2295***	0.483	0.2366***	0.2072***	0.239
	[0.034]	[0.031]		[0.032]	[0.035]	
Education	0.0372***	0.0285***	0.040	0.0251***	0.0211***	0.381
	[0.005]	[0.005]		[0.005]	[0.006]	
Experience	0.1324***	0.1094***	0.000	0.1100***	0.0973***	0.221
	[0.006]	[0.007]		[0.010]	[0.010]	
Experience squared	-0.0056***	-0.0043***	0.001	-0.0039***	-0.0031***	0.141
	[0.000]	[0.000]		[0.001]	[0.000]	
Past wages	Yes	Yes		No	No	
Factory fixed effects	No	Yes		No	Yes	
Observations	46,236	46,236		690	690	
R-squared	0.316	0.639		0.356	0.662	

*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 5: The effect of factory fixed effects on coefficients in a wage regression

4.3 Mobility

The model's next set of predictions relate to differential mobility of migrants versus locals as they begin to observe working conditions and reoptimize accordingly. Firstly, the model predicts that migrants will have higher mobility than locals. We test this with a discrete-time hazard model, where 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.

$$1(Leave)_{ift} = \beta Migrant_i + \gamma' X_{ift} + \varepsilon_{ift} \tag{6}$$

Table 6 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 effect relative to the average mobility rate of 3.0 percent per month in this sample. The second column shows that firm fixed effects decrease the magnitude of the migration coefficient to 0.64 percentage points, which is no longer significant at traditional levels ($p = 0.173$). This result is consistent with the model in the sense that the increased mobility of migrants is not driven entirely by a lower mobility costs, rather, migrants are more likely to end up in factories that are worth paying a mobility cost to leave.

Dependent Variable = 1(Leave)		
	(1)	(2)
Migrant	0.0114***	0.0068
	[0.0032]	[0.0047]
Experience	-0.0003	-0.0015**
	[0.0004]	[0.0006]
Education	0.0004	0.0017***
	[0.0003]	[0.0004]
Male	0.0064***	-0.0002
	[0.0020]	[0.0031]
Tenure in Firm	-0.0039***	0.0057***
	[0.0006]	[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 6: Migration and the probability of leaving a factory

4.4 Changes in conditions and wages with experience

Finally, in table 7 we further test the model's prediction that the gap in conditions between migrants and locals fades with time. First we include an interaction between *Migrant* and experience in equation 3. 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 improvements suggested by the model. To isolate these within-worker changes, we include worker fixed effects in equation 3 and interact migration status (as well as education and gender) with experience. When we do this, we find that while the overall coefficient on experience is small in magnitude and not statistically significant – suggesting that the locals do not change their conditions with experience, migrants do improve their working conditions with experience. Specifically, with every year of experience, the working conditions faced by a migrant improve by 0.031 standard deviations, compared to the trajectory of a local. Figure A6 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, and only barely losing statistical significance once T gets high and many observations are dropped.

In the third and fourth columns, we show the same regressions, but with the outcome as wages rather than conditions. A strict interpretation of the model in which migrants are less likely to be informed would predict that migrants actually 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 and learning-by-doing, and they differentially improve their productivity with experience, as suggested by Duleep and Regets (1999) or Berman, Lang and Siniver (2003).

As we will discuss in section 5.3.1, an alternative explanation is that there could be wage gains upon switching factories. 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 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. Finally, if the mobility cost is sunk (rather than the way it is modeled, when individuals know the options for free and decide whether to move),

then after individuals (who are more likely to be migrants) pay the mobility cost, they will then move for both better conditions and better wages.

We also provide two additional pieces of evidence consistent with the tendency of migrants to move towards factories with better conditions as they progress. Table A9 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 be 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 A10 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.

Dependent Variable	Index of working conditions ($\hat{c}$)		Log(wage)	
	(1)	(2)	(3)	(4)
Experience	0.0056	0.0173	0.0247*	0.0152
	[0.032]	[0.021]	[0.013]	[0.013]
Migrant	-0.2495**		0.0297	
	[0.100]		[0.057]	
Migrant X Experience	-0.0222	0.0305*	0.0009	0.0000
	[0.031]	[0.018]	[0.015]	[0.014]
Education	0.0052		0.0135	
	[0.016]		[0.009]	
Education X Experience	0.0069	-0.0055	0.0073***	0.0051**
	[0.007]	[0.005]	[0.003]	[0.002]
Male	0.1172		0.2641***	
	[0.118]		[0.067]	
Male X Experience	-0.065	0.0469	-0.0165	0.0044
	[0.050]	[0.031]	[0.020]	[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 7: Changes in conditions over time

5 Extensions to the baseline model

The baseline model in section 3 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 extensions related to workers, namely variation in their outside options or

the possibility that workers' relative preference for wages versus working conditions can change over time. 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 these models, they do not substantially affect the predictions in the main model. Similarly, while several extensions could generate some of the predictions as the main model even if migrants and locals have the same information about firms when beginning work, most cannot singlehandedly explain the set of empirical results in Section 4 without the assumption of differences in informedness between migrants and locals. We acknowledge that the possibility that migrants begin with a higher relative value of wages (compared to working conditions) than locals – but this difference fades with time – can, by contrast, generate all the predictions of the baseline model. We do, however, provide some suggestive evidence that is more consistent with a story of imperfect information than time-variant preferences.

5.1 Extensions related to workers

5.1.1 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 reservation utility between migrants and locals 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 actually in factories with higher wages.

5.1.2 Time-varying relative preferences for wages

While the baseline model allows for the possibility that migrant workers have different relative preferences for income (versus working conditions) than locals, these preferences are assumed to be time invariant. However, it is possible that this preference 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.

Some suggestive evidence against this hypothesis is presented in figure A3, which graphs the average value of assets – measured at the time of the survey[17] – 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 does not; the curves are particularly clearly parallel 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). Indeed, the difference in slopes is small (0.027 log points per year) and statistically insignificant ($P = 0.434$). 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 be building up assets in households in their home villages that are not captured in the survey – we still view this suggestive evidence against the most likely stories in which time-varying preferences drive the mobility of migrants towards better working conditions as their careers

[17] 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.

progress.

5.2 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.

5.3 Extensions related to firms

5.3.1 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 A4, which graphs the distribution of wages versus working conditions of firms in the sample. The baseline model in Section 3 predicts a negative correlation between wages and work-

ing conditions, as firms paying the same total compensation decide to specialize in either wages or working conditions. However, figure A4 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.

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 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 return to this possibility in Section 4.4 when we discuss the wage trajectory of migrants versus locals with experience.

5.3.2 Additional mobility cost to firms

The model assumes that the cost of mobility is borne by the worker, and since uniformed 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 imparted on the firm to losing workers, which the firm then would internalize when making original 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 3 no longer applies. However, for lower values of turnover costs, some firms will still choose to go after uninformed workers.

5.3.3 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 1. 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 instead be more profitable, since 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 subsection.

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.[18] 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 (Labowitze, 2016).

The results are given in table A1. There is a positive effect on working conditions on firm-level survival when the regression is weighted by the number of observations in a factory, and the effect is relatively large: a one-standard deviation increase in working conditions leads to a 3.4 percentage point increase in the probability of surviving. Firm-level wages are also positive, although statistically insignificant. While the lack of a strong positive relationship may initially seem surprising, note that this pattern fits with the argument of this paper, 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 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.

6 Addressing concerns about differential selection

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

[18] 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.

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.

The most serious threat to our interpretation of the results is that low ability migrants are more likely to exit the sector than low ability locals, and that this form of selection drives migrants' differential improvement in working conditions compared to locals. 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 working conditions, this selection could explain the differential improvement of working conditions among the higher-skilled migrants who stay in the sector. If this selection exists in our sample, 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. First, we code workers' positions using the skill grade classification system used in the garments sector. 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.[19] 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. We use a specification analogous to that in Table 7.

Table 8 presents the results. It provides evidence against the possibility that differential attrition of low-ability migrants drives our results. In column (1), the coefficient on the migrant variable is small and not statistically significant, showing 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 the migrant variable and experience is also small and not statistically significant, which demonstrates that migrants' promotion trajectories are not different than locals'. To be consistent with our previous analysis, we also present results with individual fixed effects in column (2). There is also no difference in the within-worker promotion trajectory with additional experience between migrants and locals.

[19]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.

Dependent Variable	Reverse Skill Grade	
	(1)	(2)
Experience	0.0607	0.1557***
	[0.052]	[0.034]
Migrant	0.0234	
	[0.160]	
Migrant X Experience	0.0478	-0.0168
	[0.057]	[0.033]
Education	0.0797***	
	[0.023]	
Education X Experience	0.0170**	0.0063
	[0.008]	[0.005]
Male	0.4881***	
	[0.170]	
Male X Experience	-0.0604	0.0022
	[0.060]	[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 8: Working experience and promotions

Next, we check whether the ability composition of the migrant sample changes with experience compared to locals. Tables 5 and 8 provide evidence that schooling is correlated with labor productivity in the garments sector: Workers with more schooling earn

more and obtain higher skill grades. As such, we use education as our proxy for labor productivity.[20] 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 A11 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 confirmation that differential selection of migrants on ability does not drive our results.

Finally, suppose migrants who arrive in the sector and sample bad working conditions return to their home village and exit the sector. Locals, on the other hand, remain in the area and in the sector. This pattern of selection could generate the differential, within-worker improvement in conditions with experience that we find for migrants compared to locals. If this mechanism drives our results, then we would also expect that migrants would be more likely to temporarily exit the sector after experiencing poor conditions. Table 9 tests for this possibility. The dependent variable is an indicator for temporarily exiting the garments sector when leaving a job.[21] We report average marginal effects from a logit specification. Focusing on column (3), the estimated coefficient on the index of working conditions shows that a one s.d. decline in working conditions is associated with a 0.44% increase in the probability of a local with no experience exiting the sector. Migrants are initially less sensitive to conditions: A one s.d. 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 to migrants, for whom experience is not associated with changes in the probability of temporary exit. This pattern of differential response is contrary to our hypothesized threat. It suggests that our estimates of the gap in working conditions and the differential improvement in conditions for migrants and locals may be lower bounds on the actual estimates.

[20] We assume that education is acquired prior to beginning work in the sector.

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

Dependent Variable = Temporary exit from sector

	(1)	(2)	(3)
Experience (Years)	-0.0015***	-0.0015***	-0.0019***
	[0.0005]	[0.0005]	[0.0006]
Migrant	-0.0042**	-0.0050***	-0.0055***
	[0.0020]	[0.0019]	[0.0019]
Migrant X Experience	0.0015***	0.0015***	0.0019***
	[0.0005]	[0.0005]	[0.0006]
Education (Years)	0.0004**	0.0005**	0.0005**
	[0.0002]	[0.0002]	[0.0002]
Education X Experience	-0.0001	-0.0001	-0.0001
	[0.0000]	[0.0000]	[0.0000]
Male	-0.001	-0.0012	-0.0010
	[0.0015]	[0.0015]	[0.0015]
Male X Experience	0.0003	0.0003	0.0002
	[0.0004]	[0.0004]	[0.0004]
Index of working conditions		-0.0024	-0.0051***
		[0.0017]	[0.0015]
Migrant X Index of working conditions		0.0008	0.0035**
		[0.0018]	[0.0015]
Index of working conditions X Experience		0.0001	0.0015**
		[0.0001]	[0.0006]
Migrant X Index of working conditions X Experience			-0.0015**
			[0.0006]
Past observations	Yes	Yes	Yes
Factory fixed effects	No	No	No
Observations	50,171	50,114	50,114
R-squared	0.006	0.009	0.010

*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 9: Temporary exits from the sector

7 Conclusion

Given evidence of poor working conditions in many developing country industries, we propose a theory in which incomplete information leads to workers – and migrants in particular – working in factories with inefficiently low investments in working conditions. We examine this theory in the empirical garment industry in Bangladesh during a period in which rapid growth pulled lots of recent migrants from rural areas into the industry. Using a retrospective panel of the wages and working conditions through the career of 991 workers outside Dhaka collected in 2009, we argue that recent migrants are less able to observe working conditions across firms, and thus end up in firms worse working conditions than local workers. In particular, 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 standard deviations worse than local workers. At the same time, these factories if anything pay higher wages, suggesting that they compete for uninformed migrants by raising wages but not worker conditions. Our findings are consistent with a model in which firms select to specialize in informed or uninformed workers and offer different bundles of wages and working conditions in equilibrium.

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 standard deviation 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, however, by documenting how 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. Additional research is needed on how alleviating such information asymmetries impacts workers and firms in developing countries. Towards this end, Boudreau (2019) complements this study by experimentally varying workers' information about working conditions and

studying the effects on workers' mobility and referrals. Together with the current paper, this body of research aims to provide information both on market frictions that explain how workers end up in jobs with poor working conditions, and what policy can do to minimize these frictions.

References

Abowd, John M, Francis Kramarz, and David N Margolis. 1999. "High wage workers and high wage firms." *Econometrica*, 67(2): 251–333.

Abramitzky, Ran, Leah Platt Boustan, and Katherine Eriksson. 2014. "A nation of immigrants: Assimilation and economic outcomes in the age of mass migration." *Journal of Political Economy*, 122(3): 467–506.

Absar, Syeda Sharmin. 2009. "Problems surrounding wages: the ready made garment sector in Bangladesh." *Labour and Management in Development*, 2.

Adhvaryu, Achyuta, Namrata Kala, and Anant Nyshadham. 2018. "The skills to pay the bills: Returns to on-the-job soft skills training." National Bureau of Economic Research.

Ahmed, Nazneen. 2006. *Bangladesh apparel industry and its workers in a changing world economy.* Wageningen University Thesis.

Ahmed, Nazneen, and Dev Nathan. 2014. "Improving wages and working conditions in the Bangladeshi garment sector: The role of horizontal and vertical relations." *Capturing the Gains Working Paper*.

Akhter, Salma, AFM Salahuddin, Mohammad Iqbal, ABMA Malek, and N Jahan. 2010. "Health and occupational safety for female workforce of garment industries in Bangladesh." *Journal of Mechanical Engineering*, 41(1): 65–70.

Albert, Christoph, and Joan Monras. 2018. "Immigrants' Residential Choices and Their Consequences."

Amin, Sajeda, Ian Diamond, Ruchira T Naved, and Margaret Newby. 1998. "Transition to adulthood of female garment-factory workers in Bangladesh." *Studies in family planning*, 185–200.

Attanapola, Chamila T. 2004. "Changing gender roles and health impacts among female workers in export-processing industries in Sri Lanka." *Social science & medicine*, 58(11): 2301–2312.

Banerjee, Abhijit, Emily Breza, Arun G Chandrasekhar, and Markus Mobius. 2019. "Naive learning with uninformed agents." National Bureau of Economic Research.

Banerjee, Abhijit V, and Esther Duflo. 2005. "Growth theory through the lens of development economics." *Handbook of economic growth*, 1: 473–552.

Bangladesh Garment Manufacturing Exporters Association. 2013. "Ready-made Garment Yearbook."

Bassi, Vittorio, and Aisha Nansamba. 2017. "Information Frictions in the Labor Market: Evidence from a Field Experiment in Uganda." *University College London. Processed*.

Beegle, Kathleen, Joachim De Weerdt, and Stefan Dercon. 2011. "Migration and economic mobility in Tanzania: Evidence from a tracking survey." *Review of Economics and Statistics*, 93(3): 1010–1033.

Berman, Eli, Kevin Lang, and Erez Siniver. 2003. "Language-skill complementarity: returns to immigrant language acquisition." *Labour Economics*, 10(3): 265–290.

Biglaiser, Gary. 1993. "Middlemen as experts." *The RAND Journal of Economics*, 212–223.

Blanchflower, David G, Andrew J Oswald, and Peter Sanfey. 1996. "Wages, profits, and rent-sharing." *The Quarterly Journal of Economics*, 111(1): 227–251.

Blattman, Christopher, and Stefan Dercon. 2018. "The impacts of industrial and entrepreneurial work on income and health: Experimental evidence from Ethiopia." *American Economic Journal-Applied*, 10.

Boudreau, Laura. 2019. "Multinational enforcement of labor law: Experimental evidence from Bangladesh's apparel sector." Working Paper.

Brown, Charles, and James Medoff. 1989. "The Employer Size-Wage Effect." *The Journal of Political Economy*, 97(5): 1027–1059.

Bryan, Gharad, Shyamal Chowdhury, and Ahmed Mushfiq Mobarak. 2014. "Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh." *Econometrica*, 82(5): 1671–1748.

Budd, John W, Jozef Konings, and Matthew J Slaughter. 2005. "Wages and international rent sharing in multinational firms." *Review of Economics and Statistics*, 87(1): 73–84.

Chowdhury, Nazneen Jahan, and Md Hafu Ullah. 2010. "Socio-Economic Conditions of Female Garment Workers in Chittagong Metropolitan Area–An Empirical Study." *Journal of Business and Technology (Dhaka)*, 5(2): 53–70.

Clifford, Stephanie, and Steven Greenhouse. 2013. "Fast and flawed inspections of factories abroad." *The New York Times*, September 1.

de Brauw, Alan, Valerie Mueller, Tassew Woldehanna, et al. 2013. "Does internal migration improve overall well-being in Ethiopia?" *Ethiopia Strategy Support Program II*, 55.

De Leeuw, Jan, and Patrick Mair. 2007. "Homogeneity Analysis in R: The package homals."

De Melo, Rafael Lopes. 2009. "Sorting in the labor market: Theory and measurement." PhD diss. Yale University.

Duleep, Harriet Orcutt, and Mark C Regets. 1999. "Immigrants and human-capital investment." *American Economic Review*, 89(2): 186–191.

El Badaoui, Eliane, Eric Strobl, and Frank Walsh. 2008. "Is there an informal employment wage penalty? Evidence from South Africa." *Economic Development and Cultural Change*, 56(3): 683–710.

European Commission. 2014. "Staying Engaged - A Sustainability Compact for continuous improvements in labour rights and factory safety in the Ready-Made Garment and Knitwear Industry in Bangladesh."

Franklin, Simon, et al. 2015. "Location, search costs and youth unemployment: A randomized trial of transport subsidies in Ethiopia." Centre for the Study of African Economies, University of Oxford.

Frazer, Garth. 2005. "Which firms die? A look at manufacturing firm exit in Ghana." *Economic Development and cultural change*, 53(3): 585–617.

Frumkin, Howard. 1999. "Across the water and down the ladder: occupational health in the global economy." *Occupational medicine (Philadelphia, Pa.)*, 14(3): 637–663.

Gabaix, Xavier, and David Laibson. 2006. "Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets." *The Quarterly Journal of Economics*, 121(2): 505–540.

Ghosh, Palash. 2014. "Despite Low Pay, Poor Work Conditions, Garment Factories Empowering Millions Of Bangladeshi Women." *International Business Tribune*, March 24(1).

Gifi, Albert. 1981. *Nonlinear multivariate analysis*. University of Leiden Leiden.

Hardy, Morgan, and Jamie McCasland. 2015. "Are Small Firms Labor Constrained? Experimental Evidence from Ghana." Working paper.

Harris, John R, and Michael P Todaro. 1970. "Migration, unemployment and development: a two-sector analysis." *The American Economic Review*, 60(1): 126–142.

Harrison, Ann, and Andrés Rodríguez-Clare. 2010. "Trade, Foreign Investment, and Industrial Policy for Developing Countries." *Handbook of Development Economics*, 5: 4039–4214.

Harrison, Ann, and Jason Scorse. 2010. "Multinationals and anti-sweatshop activism." *The American Economic Review*, 100(1): 247–273.

Heath, Rachel. 2018. "Why do firms hire using referrals? Evidence from Bangladeshi Garment Factories." *Journal of Political Economy*, 126(4): 1691–1746.

Heath, Rachel, and Ahmed Mushfiq Mobarak. 2015. "Manufacturing growth and the lives of Bangladeshi women." *Journal of Development Economics*, 115.

Henderson, V, Adam Storeygard, and U Deichmann. 2015. "Has climate change driven urbanization in Africa?" Working paper, London School of Economics.

International Restructuring Education Network Europe. 1990. "Textile and Garment Industry in Bangladesh: Reports from Women Workers' Struggles." *South Asia Bulletin*, 10(2).

Jovanovic, Boyan. 1979. "Job matching and the theory of turnover." *The Journal of Political Economy*, 972–990.

Kinnan, Cynthia, Shing-Yi Wang, and Yongxiang Wang. 2015. "Relaxing Migration Constraints for Rural Households." National Bureau of Economic Research.

Kleemans, Marieke. 2014. "Migration Choice under Risk and Liquidity Constraints." *University of California, Berkeley*.

Kleemans, Marieke, and Jeremy Magruder. 2015. "Labor market changes in response to immigration: evidence from internal migration driven by weather shocks." *Unpublished manuscript*.

Krueger, Alan B, and Lawrence H Summers. 1988. "Efficiency wages and the inter-industry wage structure." *Econometrica: Journal of the Econometric Society*, 259–293.

Labowitze, Sarah. 2016. "New data on the number of factories in Bangladesh." *NYU Stern Center for Business and Human Rights; https://bhr.stern.nyu.edu/blogs/-data-on-number-of-factories-bd*.

Lewis, W Arthur. 1954. "Economic development with unlimited supplies of labour." *The manchester school*, 22(2): 139–191.

Loewenson, Rene H. 1999. "Women's occupational health in globalization and development." *American journal of industrial medicine*, 36(1): 34–42.

Magruder, Jeremy R. 2010. "Intergenerational networks, unemployment, and persistent inequality in South Africa." *American Economic Journal: Applied Economics*, 2(1): 62–85.

Maheshwor Shrestha. 2016. "Get rich or die tryin': Perceived earnings, perceived mortality rate and the value of a statistical life of potential work-migrants from Nepal." *Working paper*.

Mahmud, Simeen, and Naila Kabeer. 2003. "Compliance versus accountability: struggles for dignity and daily bread in the Bangladesh garment industry." *The Bangladesh Development Studies*, 21–46.

Mailath, George J, and Larry Samuelson. 2013. "Reputations in repeated games." *The Handbook of Game Theory*, 4.

Marchiori, Luca, Jean-François Maystadt, and Ingmar Schumacher. 2012. "The impact of weather anomalies on migration in sub-Saharan Africa." *Journal of Environmental Economics and Management*, 63(3): 355–374.

Menzel, Andreas, and Christopher Woodruff. 2019. "Gender Wage Gaps and Worker Mobility: Evidence from the Garment Sector in Bangladesh."

Morten, Melanie. 2013. "Temporary migration and endogenous risk sharing in village india." *Unpublished Manuscript*.

Munshi, Kaivan, and Mark Rosenzweig. 2016. "Why is mobility in India so low? Social insurance, inequality, and growth." *American Economic Review*.

Oka, Chikako. 2010. "Accounting for the gaps in labour standard compliance: The role of reputation-conscious buyers in the Cambodian garment industry." *European Journal of Development Research*, 22(1): 59.

Robertson, Raymond, Sari Sitalaksmi, Poppy Ismalina, and Ardyanto Fitrady. 2009. "Globalization and working conditions: Evidence from Indonesia." *Globalization, Wages, and the Quality of Jobs*, 203.

Saxena, Sanchita. 2014. *Made in Bangladesh, Cambodia, and Sri Lanka: the labor behind the global garments and textiles industries.* Cambria Press.

Shanmugam, KR. 2001. "Self selection bias in the estimates of compensating differentials for job risks in India." *Journal of Risk and Uncertainty*, 22(3): 263–275.

Sigg, Christian. 2014. "Package nsprcomp."

Sigg, Christian D, and Joachim M Buhmann. 2008. "Expectation-maximization for sparse and non-negative PCA." 960–967, ACM.

Slesh A. Shrestha and Dean Yang. forthcoming. "Facilitating Worker Mobility: A Randomized Information Intervention among Migrant Workers in Singapore." *Economic Development and Cultural Change*.

Söderbom, Måns, Francis Teal, and Alan Harding. 2006. "The determinants of survival among African manufacturing firms." *Economic Development and Cultural Change*, 54(3): 533–555.

Sorkin, Isaac. 2018. "Ranking firms using revealed preference." *The Quarterly Journal of Economics*, 1: 63.

Strobl, Eric, and Marie-Anne Valfort. 2015. "The effect of weather-induced internal migration on local labor markets. Evidence from Uganda." *The World Bank Economic Review*, 29(2): 385–412.

Tanaka, Mari. 2015. "Exporting Sweatshops? Evidence from Myanmar." *mimeo*.

Teal, Francis. 1996. "The size and sources of economic rents in a developing country manufacturing labour market." *The Economic Journal*, 963–976.

The Alliance for Bangladesh Worker Safety. 2014. "Alliance Fire Safety and Structural Integrity Standard."

Van Reenen, John. 1996. "The creation and capture of rents: wages and innovation in a panel of UK companies." *The Quarterly Journal of Economics*, 111(1): 195–226.

Viscusi, W Kip. 1980. "A theory of job shopping: A Bayesian perspective." *The Quarterly Journal of Economics*, 94(3): 609–614.

Wang, Shing-Yi. 2013. "Marriage Networks, Nepotism, and Labor Market Outcomes in China." *American Economic Journal: Applied Economics*, 5(3): 91–112.
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Appendix A

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Dependent Variable = Measures of conditions leaving out worker's own reports						
Migrant	-0.3111***	-0.3295***	-0.3028*	-0.3053*	-0.1563	-0.1563
	[0.082]	[0.083]	[0.153]	[0.158]	[0.118]	[0.118]
Male		-0.1426**		0.0116		0.029
		[0.069]		[0.101]		[0.092]
Education		0.0295***		0.007		0.0037
		[0.010]		[0.013]		[0.012]
Experience		0.0099		-0.0045		-0.0046
		[0.009]		[0.018]		[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***	-0.3778***	-0.3012**	-0.3058**	-0.0872	-0.0957
	[0.083]	[0.092]	[0.119]	[0.115]	[0.138]	[0.132]
Male		0.0041		0.1094		0.1355**
		[0.094]		[0.069]		[0.062]
Education		0.0204		0.006		0.0045
		[0.014]		[0.011]		[0.009]
Experience		-0.0255		-0.0152		-0.0131
		[0.023]		[0.014]		[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 not weighted by tenure						
Migrant	-0.3382***	-0.3625***	-0.2160**	-0.2262**	-0.2286***	-0.2360***
	[0.077]	[0.089]	[0.092]	[0.096]	[0.073]	[0.075]
Male		-0.1375		0.007		0.0327
		[0.092]		[0.094]		[0.069]
Education		0.0290*		0.0112		0.0068
		[0.016]		[0.009]		[0.008]
Experience		-0.0122		0.0073		0.0052
		[0.022]		[0.011]		[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.*

Table A2: Alternate constructions of the working conditions measure

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	0.0342**					0.0158	0.0347*
	[0.013]	[0.017]					[0.013]	[0.018]
Factory FE from Wage Equation			0.0258	0.036			0.0233	0.0292
			[0.038]	[0.051]			[0.038]	[0.051]
Fraction Migrants					0.1197**	0.0422	0.1217*	0.0747
					[0.060]	[0.063]	[0.064]	[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

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 = ver y 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 A3: Individual Measures of Working Conditions

Dependent Variable = Person-level index of working conditions						
	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	-0.1224	-0.1116	0.0150	0.0339	-0.0622	-0.0343
	[0.093]	[0.093]	[0.136]	[0.136]	[0.196]	[0.193]
Male		0.0354		0.0425		0.0445
		[0.068]		[0.106]		[0.117]
Education (Years)		0.0084		0.0271***		0.0239**
		[0.009]		[0.010]		[0.011]
Experience (Years)		0.0205***		0.0228**		0.0249**
		[0.006]		[0.010]		[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, * p<0.1.*

Table A4: Within-factory variation in the working conditions measure

Dependent Variable = Index of working conditions ($\hat{c}_{ift}$)						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Migrant=1 if individual is from outside of current village						
Migrant	-0.3173***	-0.3508***	-0.1807	-0.1973	-0.1708**	-0.1837***
	[0.104]	[0.115]	[0.124]	[0.128]	[0.063]	[0.064]
Male		-0.125		0.0312		0.0491
		[0.104]		[0.068]		[0.061]
Education		0.0317**		0.011		0.0097
		[0.016]		[0.008]		[0.008]
Experience		-0.0041		0.0097		0.0095
		[0.022]		[0.008]		[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***	-0.2820***	-0.1568	-0.1780*	-0.0982	-0.1178**
	[0.089]	[0.096]	[0.102]	[0.101]	[0.059]	[0.058]
Male		-0.1183		0.0279		0.049
		[0.104]		[0.067]		[0.061]
Education		0.0319**		0.0119		0.0103
		[0.016]		[0.008]		[0.008]
Experience		-0.0034		0.0106		0.0103
		[0.022]		[0.008]		[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 A5: Robustness of Main Table 4 results to alternative definition of migrant variable

Dependent Variable = Index of working conditions ($\hat{c}_{ift}$)						
	(1)	(2)	(3)	(4)	(5)	(6)
Referred	0.0663	0.1021	0.0277	0.0487	0.0773	0.0958*
	[0.073]	[0.073]	[0.046]	[0.049]	[0.049]	[0.048]
Migrant	-0.3113***	-0.3266***	-0.1773*	-0.1698	-0.1341*	-0.1098
	[0.080]	[0.089]	[0.105]	[0.105]	[0.069]	[0.066]
Male		-0.164		0.0302		0.0574
		[0.107]		[0.070]		[0.060]
Education (Years)		0.0398**		0.0199**		0.0164*
		[0.016]		[0.009]		[0.009]
Experience (Years)		0.0014		0.0198***		0.0182***
		[0.021]		[0.006]		[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 A6: 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	0.0490	-0.0155	0.0769	0.0806	-0.0436	0.002
	[0.043]	[0.048]		[0.051]	[0.071]	
Male	0.2103***	0.2255***	0.6057	0.2242***	0.2090***	0.571
	[0.034]	[0.032]		[0.029]	[0.039]	
Education	0.0377***	0.0289***	0.0380	0.0272***	0.0208***	0.162
	[0.005]	[0.005]		[0.005]	[0.006]	
Experience	0.1313***	0.1069***	0.0001	0.1100***	0.0986***	0.270
	[0.006]	[0.007]		[0.009]	[0.012]	
Experience squared	-0.0055***	-0.0042***	0.0004	-0.0040***	-0.0032***	0.141
	[0.000]	[0.000]		[0.001]	[0.000]	
Past wages	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 A7: 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***	0.0068
	[0.0030]	[0.0047]
Experience	-0.0008***	-0.0015**
	[0.0003]	[0.0006]
Education	0.0005*	0.0017***
	[0.0002]	[0.0004]
Male	0.0069***	-0.0002
	[0.0019]	[0.0031]
Tenure in Firm	-0.0032***	0.0057***
	[0.0006]	[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 A8: 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	0.0067	0.0019	0.0196*	1.0204***	1.0219
	[0.0038]	[0.0041]	[0.0038]	[0.0115]	[0.0024]	[0.0151]
Male	-0.1413***		-0.1407***		0.6003***	
	[0.0390]		[0.0382]		[0.0135]	
Education (Years)	0.0111**		0.0111**		1.0155***	
	[0.0052]		[0.0053]		[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. Standard errors clustered at the level of the individual. *** p<0.01, ** p<0.05, * p<0.1.*

Table A9: Migrants' experience and probability that they work at factory that employs 1 or more local workers

Dependent Variable = 1(Reasons for leaving include working conditions)			
	(1)	(2)	(3)
Experience (Years)	0.0012	0.0239	0.1005
	[0.0045]	[0.0162]	[0.1605]
Migrant	0.0587	0.0693	
	[0.0507]	[0.0570]	
Migrant X Experience		-0.0039	-0.1012
		[0.0136]	[0.1602]
Male	-0.0059	0.0159	
	[0.0238]	[0.0311]	
Male X Experience		-0.0079	0.0034
		[0.0077]	[0.0383]
Education (Years)	-0.0036	0.0024	
	[0.0034]	[0.0043]	
Education X Experience		-0.0020*	0.0015
		[0.0011]	[0.0077]
Tenure (Years)	-0.0154*	-0.0182*	-0.0205
	[0.0093]	[0.0093]	[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 A10: Reasons for leaving factory include working conditions

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 A11: Test of differential selection of migrants by ability

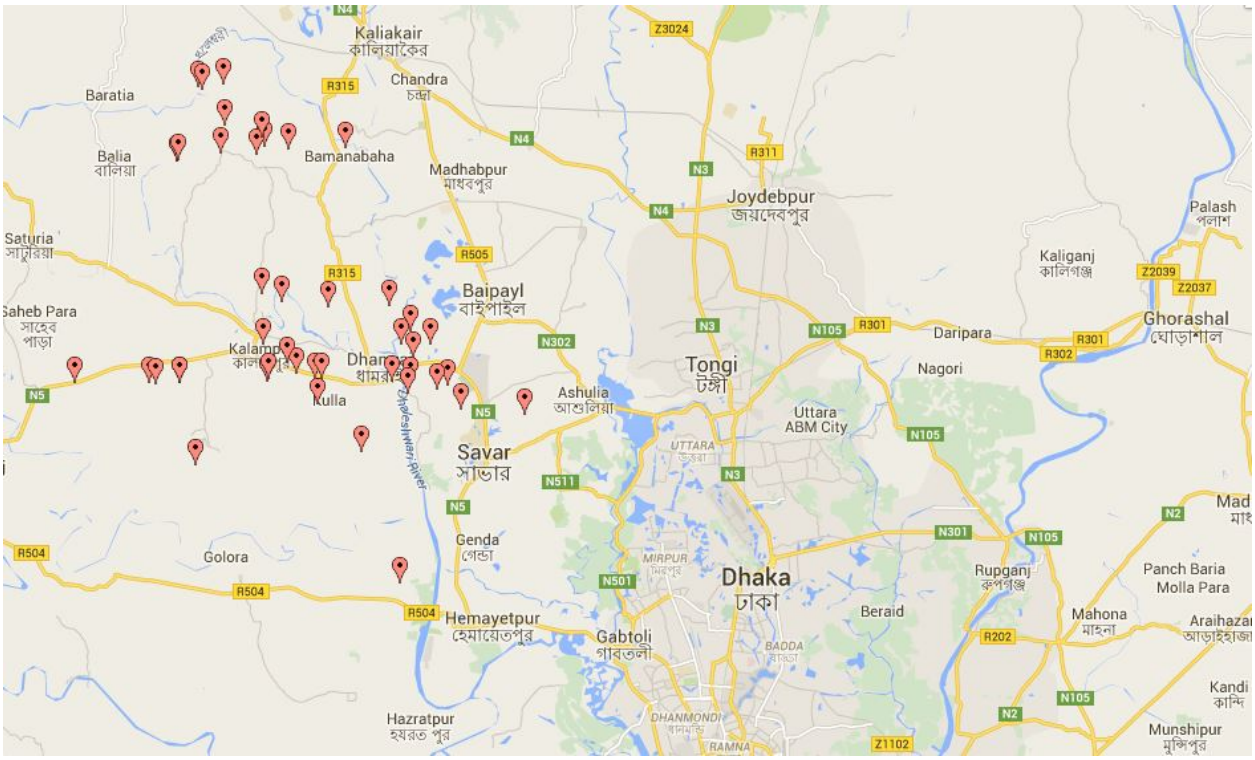
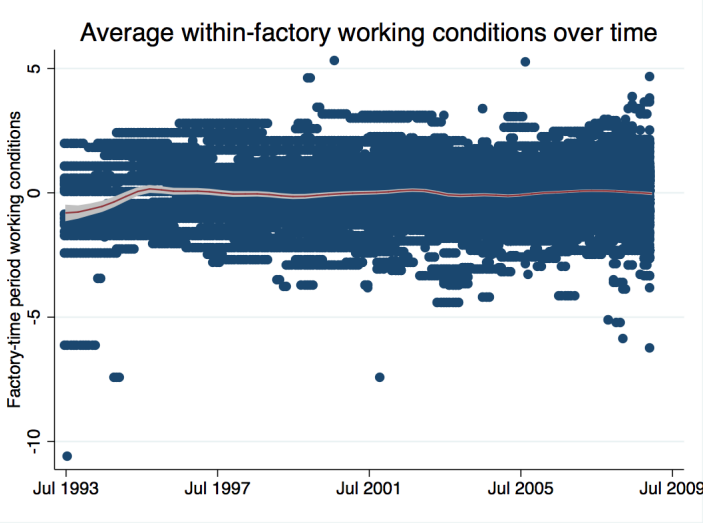
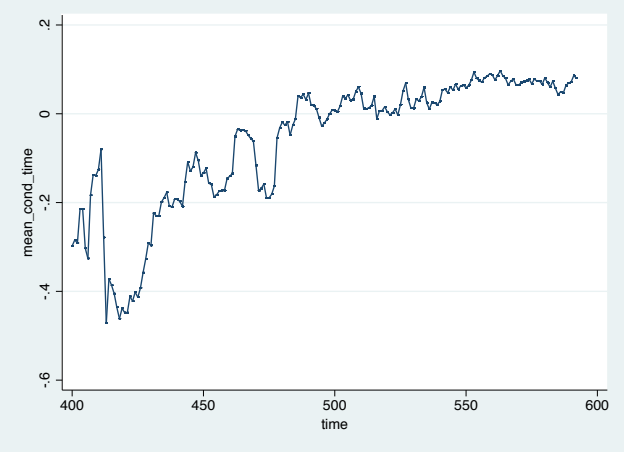
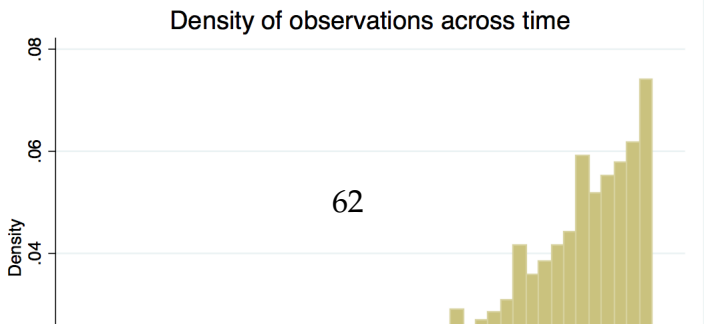


Figure A1: Sample villages



Graph 4/13/18, 2:32 PM





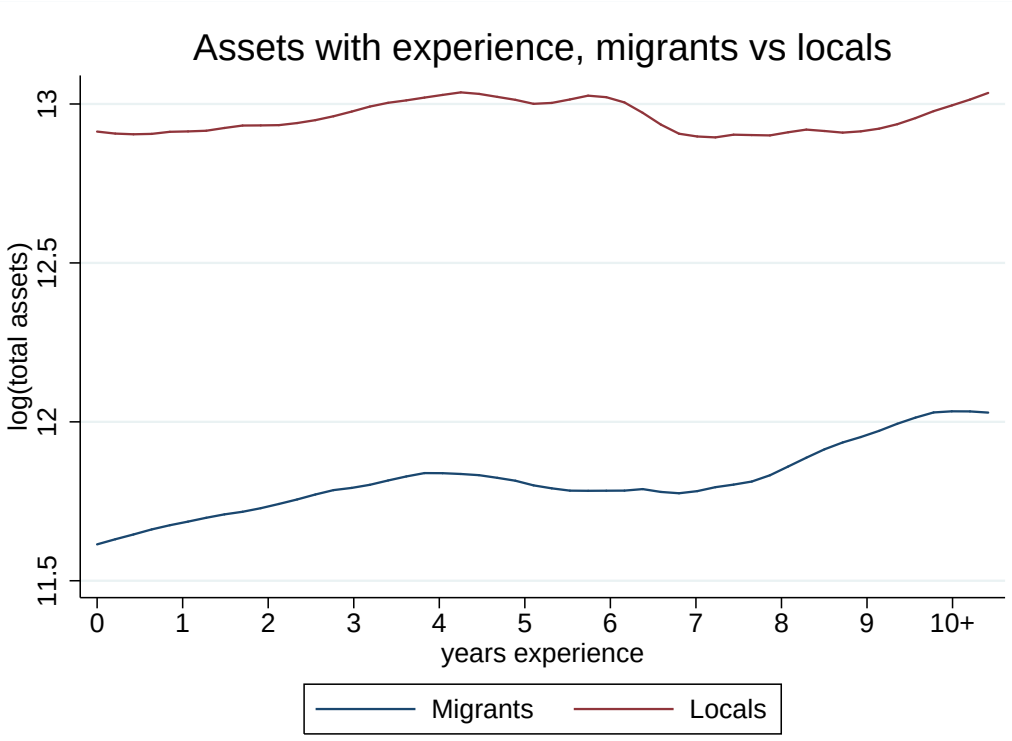


Figure A3: Assets with experience

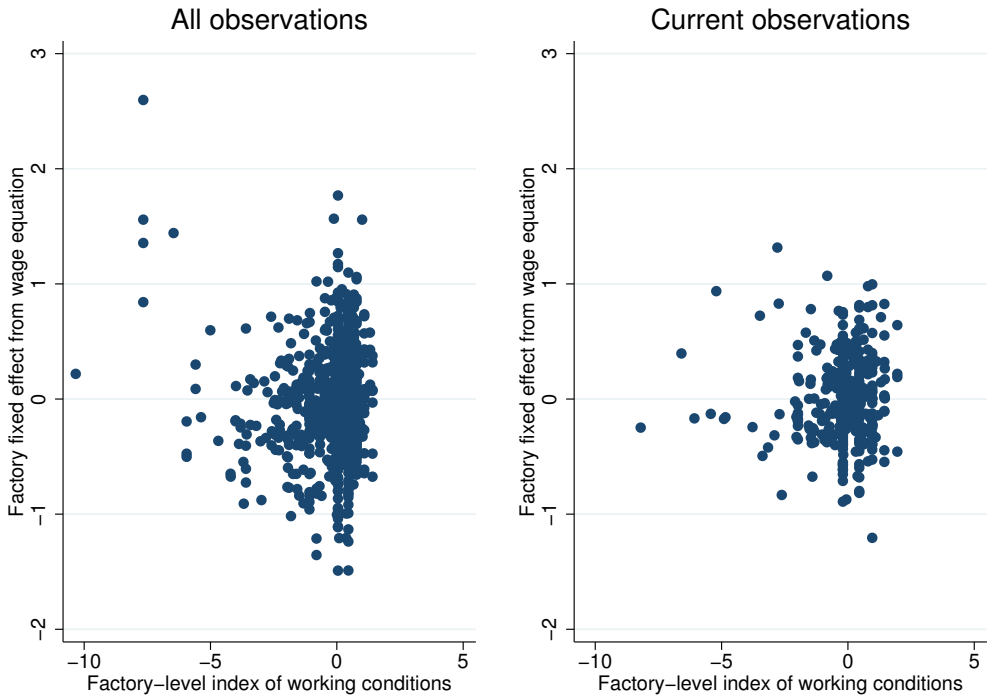


Figure A4: Factory- level working conditions versus factory-level wages

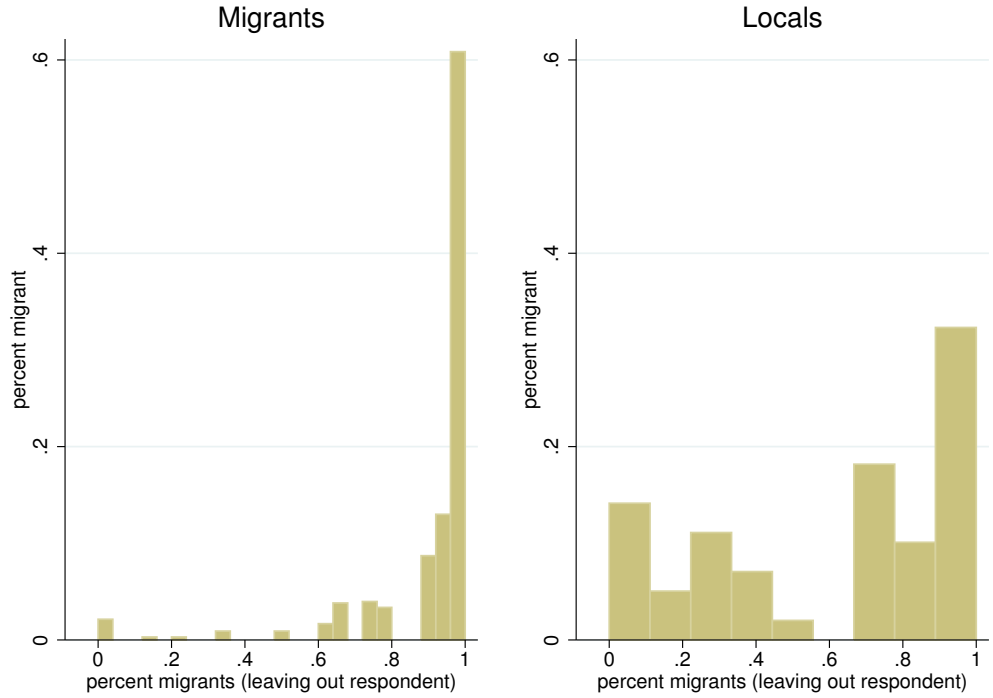


Figure A5: Distribution of other workers in factory, migrants versus local workers

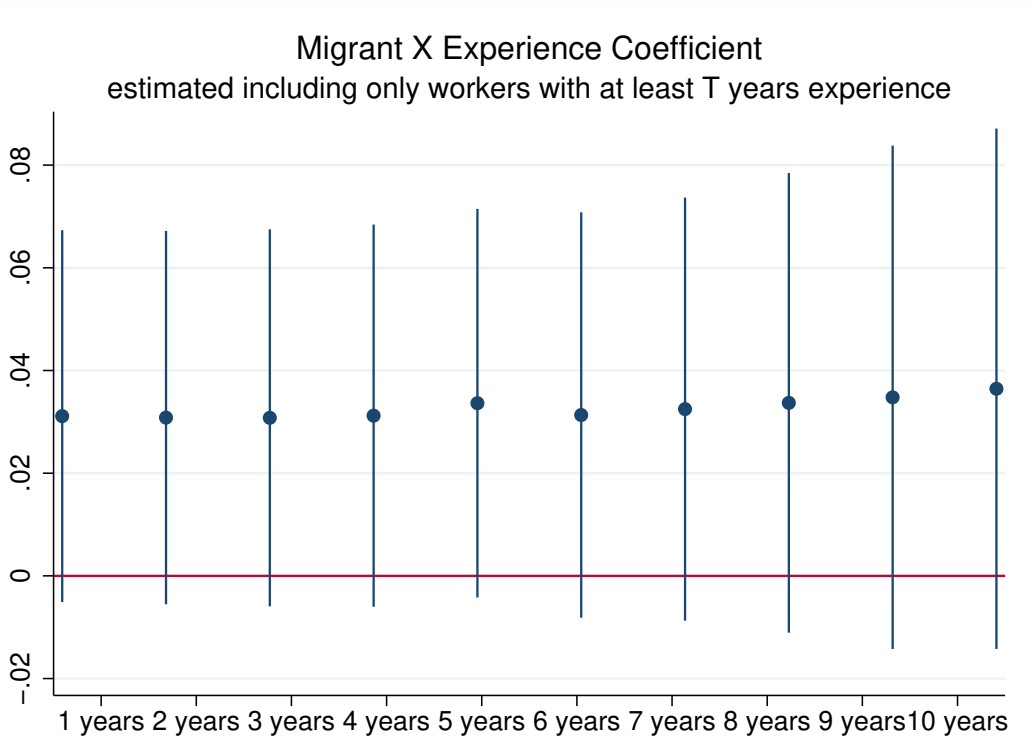


Figure A6: Differential improvement in conditions of migrant workers, among workers of minimum experience thresholds

Appendix B

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 A7 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.

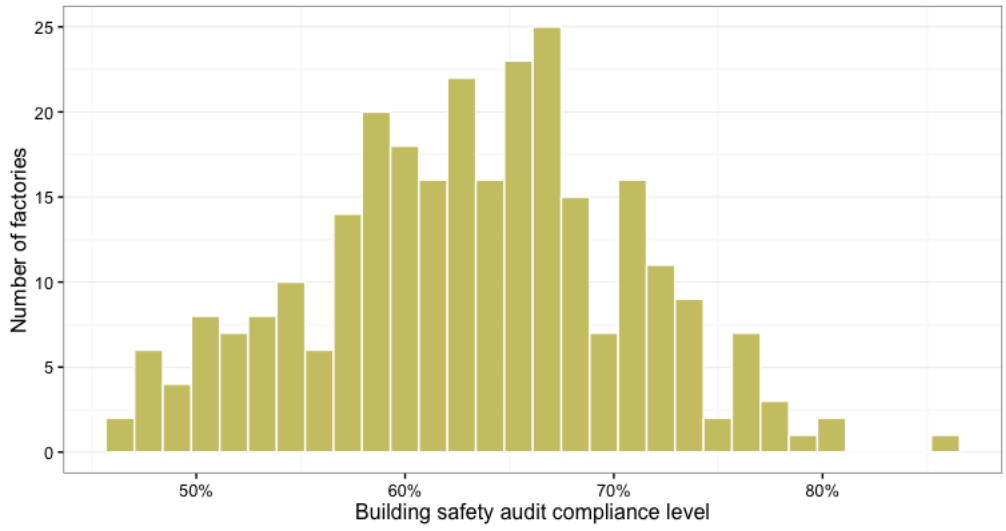


Figure A7: Distribution of building safety compliance of exporting factories in study area