Migrants, Information, and Working Conditions in Bangladeshi Garment Factories

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Abstract

A large portion of the labor force in many large factories in developing countries consists of internal migrants from rural areas, who may have little information about the industry upon beginning work. We examine whether workers' lack of information affects working conditions in the garment industry in Bangladesh. We use a retrospective panel of the wages and working conditions of 991 garment workers (matched to the factories they work in) collected in 2009. We find that internal migrants work in factories with worse conditions, but move towards factories with better conditions as they gain experience. These facts are consistent with a model in which migrants are poorly informed about working conditions upon beginning work but do learn as they gain experience in the industry.

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1 Introduction

Firms are heterogeneous. Consequently, 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. There is, however, little evidence documenting variation in wages or working conditions between firms in developing countries, or studying how workers are matched to these heterogeneous firms.

We examine this question in 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) and uninformed workers. The model illustrates how uninformed workers end up in firms with inefficiently low investments in working conditions, even in a competitive labor market. In the context of this model, we consider several potential differences between internal migrants and local workers. Migrants could indeed be less informed, but they could also have lower mobility costs, differential preferences for money over working conditions, or have lower average productivity than local workers.

We look for evidence 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 compare the working conditions and wages faced by "local" workers originally from 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. Only the assumptions that migrants are less informed upon beginning work fits all of our empirical findings: migrants are in firms with higher wages but worse working conditions, but as their careers develop, they have higher mobility than locals as they move toward firms with better conditions.

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. Even if a firm-level sur-

vey collected information, it is hard to imagine that respondents would truthfully report 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 (2015) 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 nonetheless argue that these measures are the closest we can get to accurate reports of working conditions across firms with an industry.

The Bangladeshi garment industry in 2009 is a particular 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 NGO's 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.

Since at the time there were no formal mechanisms (to our knowledge) to publicize the working conditions upon factories, most workers relied 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), these models generally assume that the information revealed with time is the worker's match-

[1] Tanaka (2015) is a notable exception. She collected data on fire safety procedures, health, 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, her question of interest – how exporting affects working conditions – is different from our focus on the sorting of workers into different kinds of factories.

[2] Namely, the The Bangladesh Accord on Fire and Building Safety and the Alliance for Bangladesh Worker Safety both work 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.

specific productivity (which neither the firm nor the worker knows at the time of hiring).

By contrast, in our model, the firm knows its working conditions, and would like to be able to credibly signal it to the worker. This is a similar context to IO 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 harder to spread information in the garment industry in Bangladesh – we know of no institutions such as online forums operating at the time that could allow workers could share information about firms – our model suggests that labor market competition could be a further reason. In particular, if there is a constant stream of new workers, competitive labor markets lower the gains from establishing a reputation, since it is equally profitable to compete for uninformed workers than to invest in quality and then make costly efforts to advertise it.

Our emphasis on workers' informedness in hiring introduces a new concept to the literature on hiring in developing countries. The existing literature has focused both on 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, 2011). Other work has highlighted 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 is Hardy and McCasland (2015), 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 explaining labor market outcomes.

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 key to 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

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

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

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 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 is estimated to be 80 percent female (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 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". Only 15 percent of male workers and 11 percent of female workers are originally from an urban area. 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) and experience (4.9 years) regardless of whether they are migrants; female migrants have more education (4.9 years, versus 4.2 years for locals) but less experience (3.5 years, versus 4.6 years for locals). Both male and female workers who have migrated to the village in which they were surveyed came on average approximately 4 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

[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.

	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

of male workers and 67 percent of female workers). These averages mark substantial divides between urban and local workers: migrant workers are more likely to own cellular phones but less likely to live in a house with a cement floor or that has electricity. 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 local 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 through the industry. So 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 may be important in understanding the overall labor market outcomes in Bangladesh.

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 at all.

As is explained more in detail in Heath (2011) – which uses the same dataset as this

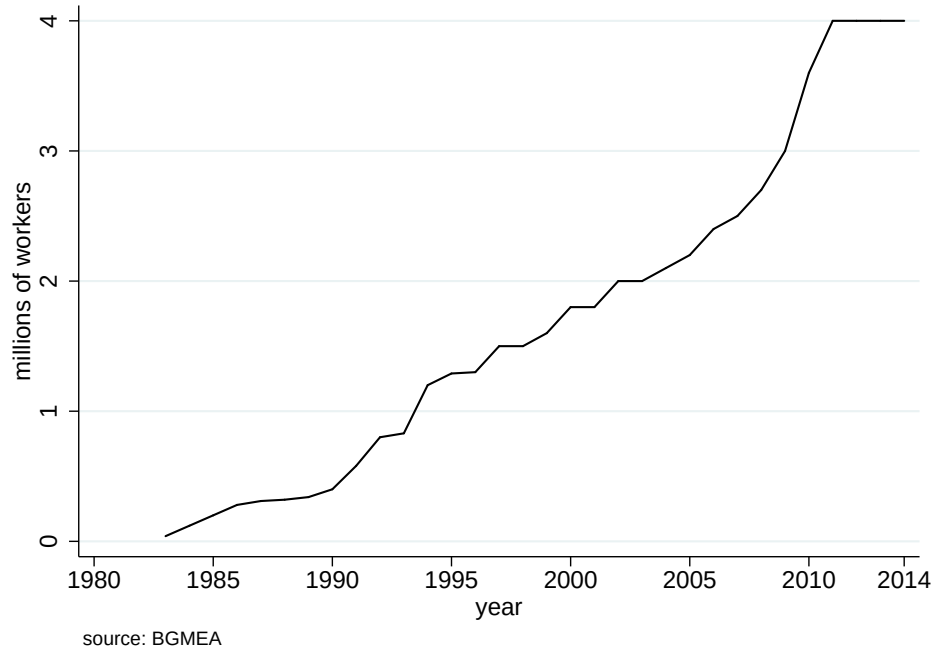

Figure 1: Garment sector employment

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 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, 2011), others paid substantially more.[5] Interviews Heath conducted with industry officials also suggest 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. These

[5]In negotations 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.

officials highlighted the difference between highly visible factories whose owners participate in industry-wide events and more "shadowy" factories who 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, the relationship between workers and management, and services available to measure working conditions in each factory that she or he has worked in. Table 2 lists these variables specifically. 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 rates each condition at the worker-factory level and in the worker's current factory to show how the weighting by time in the factory affects the reporting of conditions and how the conditions on average evolve over a worker's career. Specifically, the problems that we use to construct the index were: 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.[6] Problems were more common when reported at the worker-spell level than the worker-month level, confirming 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

[6]It is possible that any 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 we cannot conclusively disprove this hypothesis, there were no reports from enumerators of workers expressing concern about whether the responses would actually be kept private.

	All worker-month observations	All worker-factory spells in data	In current factory
Problems Listed			
hours too long	8.2%	9.2%	5.8%
abusive management	3.2%	3.5%	2.1%
bad/unsafe working conditions	0.8%	1.2%	0.7%
not paid on time	5.8%	6.8%	3.0%
unpaid overtime	1.9%	2.2%	1.5%
fired for sickness	1.7%	1.9%	0.5%
other	1.6%	2.1%	0.8%
Relations with management (worst is "Very Bad")			
"Bad" or better	99.6%	99.6%	99.9%
"Okay" or better	97.1%	96.7%	97.8%
"Good" or better	82.6%	80.1%	83.1%
Excellent	15.6%	9.2%	10.5%
Other proxies			
appointment letter	37.4%	27.9%	34.7%
provide medical care	70.5%	64.3%	76.8%
N	49482	2283	1003

Table 2: Components of the Working Conditions Index

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 salary) and say that the worker cannot be dismissed without cause.

We assume that these variables all reflect a single index of firm-level working conditions, independent from the mean wages. 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.

Specifically, 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 recoded 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 and 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 also 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. This may be a 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 education would be about how employers value education rather than differences in how workers sort in factories based on condi-

tions. Accordingly, we also show that our results are robust to removing the indicator for an appointment letter.

Figure 2 shows the estimated distribution in working conditions. The top panel shows the distribution of workers per factory. While the majority of factories in the data have only one worker appear – unsurprising, given that this includes any factory ever worked at by a sampled worker, even if they were living in another location – there is a large absolute number of factories with multiple workers in the sample, which is important for our empirical specifications that include wages and 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

3.1 Set-up and baseline results

Workers have marginal revenue product π. They get utility from wages (w) and working conditions (b). Utility is separable in wages and working conditions:[7]

$$u(w, b) = u_w(w) + \beta u_b(b)$$

Some workers observe the working conditions in a firm but others cannot.[8]. Firms can pay a per-unit cost of c to improve conditions. Labor markets are competitive, so firms bid the total offer up to the workers' perceived utility.[9] That is, they offer $(\pi, 0)$ to uninformed

[7]This assumption does matter. If the marginal utility of money is higher with worse conditions, you could get firms with different levels of conditions even without differences in informedness. But unless this tendency is differentially stronger in migrants, you wouldn't have the same pattern of sorting across the firms we see in the data.

[8]There is a close parallel to the IO-behavioral literature on shrouded attributes (Gabaix and Laibson, 2006). These uninformed workers would then represent the "unaware" or myopic in their model.

[9]So the uninformed workers' prior is key here. In a perfect Bayesian equilibrium where workers know π, they will infer that firms with higher wages can only afford to do so because the conditions are bad. This is undoubtedly a strong assumption, but one that we think is reasonable given just how little migrants typically know when first looking for work in a garment factory.

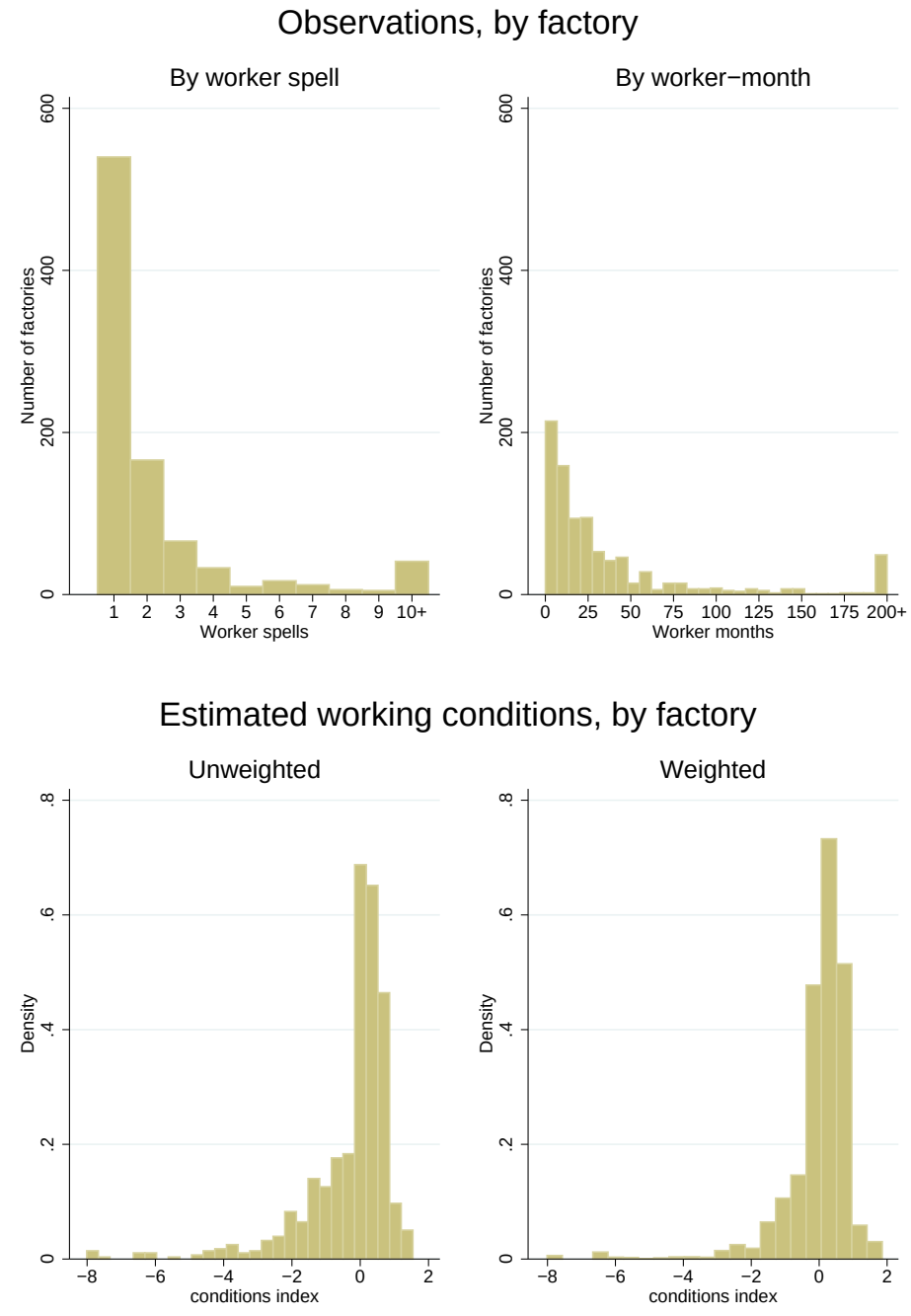

Figure 2: Factory-level variation in working conditions

workers, and to informed workers they offer the (w, b) pair that solves:

$$\begin{aligned} max \quad & u_w(w) + \beta u_b(b) \\ w, b & \\ s.t. \quad & w + cb = \pi \\ FOC: \quad & cu'_w(w) = \beta u'_b(\frac{\pi - w}{c}) \end{aligned} \tag{1}$$

Assume that conditions must be the same for every worker in a firm,[10] so that firms will either specialize in informed or uniformed workers.

Now consider a second period in which previously uninformed workers can now observe 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', b') such that

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

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 was incorporated into the model.

3.2.1 Migrants are more likely to 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,

[10] If there were economies of scale in improving conditions, the model would imply that large firms more likely to specialize in conditions. So they would then pay lower wages, unless a vertical hierarchy dominates (Melitz, 2003).

[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.

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 likely to move factories and improve their working conditions with time in the industry than locals, while locals improve their wages more. So migrants' wages will improve with time in the industry more than local workers: $\Delta c_{migrant} > \Delta c_{local}$.

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 above prediction that migrants are more likely to move to seek out better conditions 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 migration is unpleasant, migrants would they hope to send home 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 they would seek out firms with even higher wages (and worse conditions), compared to locals.

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 extensions, 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		
More likely to be uninformed about conditions				
time invariant	✓	✓		
which fades over time	✓	✓	✓	✓
Lower mobility costs ($\bar{m}_m < \bar{m}_l$)	(opposite)	(opposite)	✓	✓
Greater relative preference for wages ($\beta_m < \beta_l$)	✓	✓	(opposite)	(opposite)
Lower productivity ($\pi_m < \pi_l$)	✓	(opposite)		

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

4 Extensions

4.1 Building in a participation constraint

It is useful to incorporate reservation utility both because it is another potential difference between migrants and nonmigrants and to help interpret the retrospective nature of the data. Without variation in workers' productivity (or other unobserved differences between workers), the possibility that workers drop out if their wage offer is below a reservation wage will 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 so that $\pi \sim N(\mu_\pi, \sigma_\pi^2)$. Since predictions on the change in a worker's wages, working conditions, or mobility between firms can be tested among workers whose utility is above reservation 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, b) 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.

4.2 Imperfectly competitive labor markets

While the baseline model assumes that firms bid wages up to workers' perceived utility, firms may have some market power in the labor markets in which they operate. However, building this into the model will 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 markets: 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 equal the worker's reservation utility, but again it would still consist of relatively higher wages

and lower conditions for the uninformed workers.

4.3 Firm-level variation in productivity

Suppose firms vary in productivity, so that workers with the same ability have different marginal revenue product in different 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, and if firms are sufficiently far apart in total productivity, they will no longer specialize in conditions versus wages, and workers' informedness about conditions no longer matters, since conditions comove with wages. However, if there is both horizontal and vertical differentiation, the baseline model would still apply within a certain tier of firm. Given that migrants are actually in higher-paying firms, it seems unlikely that their tendency to be in firms with worse conditions is driven entirely by their increased likelihood of sorting into firms that are lower down on the quality ladder.

However, do note that this extension could generate the higher mobility of migrants with the assumption that migrants have greater relative preference for wages ($\beta_m > \beta_l$). Migrants would be more willing to pay a mobility cost to move to a higher productivity firm than locals. Note, however, that this prediction could go the other way: since in this model locals would be more willing to move for higher conditions. So the relative variance in conditions versus wages would determine who is more likely to move.

5 Empirical strategy and results

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

5.1 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 thus estimate a regression that examines the conditions $\hat{c}_f$ 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, education, gender) assembled in the variable X_{ift}:

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

Table 4 gives the estimation results. We standardize the outcome variable to have mean zero and standard deviation one, so the coefficient on *Migrant* in the first column indicates that migrants are in factories with on average of a 0.32 standard deviations lower 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 six 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 focusing only on one observation per worker. The coefficients get smaller when only the current observation is used, as would be expected if migrant workers are differentially moving towards better conditions over time. Still, however, there is a marginally statistically significant difference between the current working conditions of migrants and locals (columns 3 and 4), and columns 5 and 6 show that these differences if anything get stronger when village fixed effects are included. So there is no evidence that areas with lots of migrants have factories with systematically worse working conditions.

5.2 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 firm 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 gives the coefficients on *Migrant* and the other worker-level characteristics in regressions with and without firm fixed effects. Over the course of their careers, migrants earn 4.7 percent more than local workers with the same characteristics, and surveyed migrants were currently earning 6.9 percent more than locals, although neither effect is statistically significant at conventional magnitudes. However, in both cases the coefficient on migrant flips sign when factory fixed effects are added.[12] Indeed, the fact that the coefficients are statistically different from each other confirms that migrants are indeed

[12]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 = Index of working conditions ($\hat{c}_{ift}$)						
	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	-0.3163***	-0.3370***	-0.1718	-0.1809	-0.2030***	-0.2022***
	[0.091]	[0.101]	[0.109]	[0.110]	[0.061]	[0.066]
Male		-0.1107		0.0413		0.0655
		[0.099]		[0.078]		[0.070]
Education (Years)		0.0301*		0.0094		0.008
		[0.016]		[0.009]		[0.010]
Experience (Years)		-0.0072		0.0081		0.0097
		[0.025]		[0.009]		[0.008]
Past observations	Yes	Yes	No	No	No	No
Village fixed effects	No	No	No	No	Yes	Yes
Observations	49,276	49,210	962	959	962	959
R-squared	0.012	0.021	0.005	0.011	0.174	0.183

*Notes: The index of working conditions is described in section 2.4 of the paper; it is standardized to have mean 0 and standard deviation 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 working conditions and factory-level working conditions

	Dependent Variable = Log wage					
	(1)	(2)	P-value of test BetaFE = BetaOLS	(3)	(4)	P-value of test BetaFE = BetaOLS
Migrant	0.0486	-0.0203	0.0598	0.0684	-0.0469	0.004
	[0.043]	[0.048]		[0.051]	[0.072]	
Male	0.2080***	0.2183***	0.7291	0.2191***	0.1999***	0.467
	[0.034]	[0.032]		[0.028]	[0.040]	
Education (Years)	0.0378***	0.0297***	0.0599	0.0275***	0.0210***	0.157
	[0.005]	[0.005]		[0.005]	[0.006]	
Experience (Years)	0.1320***	0.1079***	0.0001	0.1089***	0.0970***	0.252
	[0.006]	[0.007]		[0.009]	[0.012]	
Experience squared	-0.0056***	-0.0043***	0.0003	-0.0039***	-0.0031***	0.135
	[0.000]	[0.000]		[0.001]	[0.000]	
Past wages	Yes	Yes		No	No	
Factory fixed effects	No	Yes		No	Yes	
Observations	46,890	46,890		879	879	
R-squared	0.314	0.645		0.361	0.739	

Notes: Wage expressed in 2009 taka. Standard errors clustered at the level of the individual in columns 1 and 2; robust 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

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.

5.3 Mobility

The next set of predictions relate to differential mobility of migrants versus locals as they begin to observe working conditions and reoptimize accordingly. Firstly, 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.

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

Table 6 gives these results. The first column indicates that migrants are 0.8 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 2.6 percent per month. The second column suggests that the difference in mobility between migrants and locals fades somewhat with experience. The marginal effects implied by the coefficients suggest, for instance, that a migrant with no experience is 1.4 percentage points more likely to leave a factory than a local. By six years of experience (the 75th percentile of experience among current workers), the gap has narrowed to 0.9 percentage points. In the context of the model, this result suggests that as migrants gain experience and learn about the industry, they begin behaving more like locals, but do not fully learn or that there is also a role for differential preferences or lower mobility costs. The third column adds firm fixed effects and demonstrates that migrants do not have substantially higher mobility than others in the same factory. This is consistent with the model in the sense that migrants do not have higher mobility per se, rather, they are more likely to end up in factories that are worth paying a mobility cost to leave.

5.4 Changes in conditions and wages with experience

Finally, in table 7 we test the model's prediction that the gap in wages 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, note that the OLS results conflate changes in 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 effect 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. As with the results on mobility, the migrant coefficient would not fully disappear over the course of the average worker's career: after six years, the average migrant has made up

Dependent Variable = 1(Leave)			
	(1)	(2)	(3)
Experience (Years)	-0.0008***	0.0004	-0.0009**
	[0.0003]	[0.0005]	[0.0004]
Migrant	0.0110***	0.0137***	0.0037
	[0.0020]	[0.0030]	[0.0027]
Migrant X Experience		-0.0006	
		[0.0004]	
Education (Years)	0.0004*	0.0009**	0.0011***
	[0.0003]	[0.0003]	[0.0003]
Education X Experience		-0.0001**	
		[0.0000]	
Male	0.0070***	0.0062**	0.0004
	[0.0019]	[0.0027]	[0.0022]
Male X Experience		0.0002	
		[0.0004]	
Tenure in firm (Months)	-0.0002***	-0.0002***	0.0002***
	[0.0000]	[0.0000]	[0.0000]
Factory fixed effects?	No	No	Yes
Worker fixed effects?	No	No	No
Observations	48,197	48,197	48,197
R-squared	0.003	0.003	0.072

*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

59 percent of the overall gap between migrants of 0.32 standard deviations.

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 non-migrants, as they move away from high-wage, low-conditions factories. We, by contrast, find no average difference in the within-worker wage trajectory of migrants versus non-migrants. However, several extensions to the model could predict that (ceteris paribus) migrants have higher returns to experience than nonmigrants, such as the possibility of wage gains upon switching factories (due to moving up a vertical hierarchy or moving to a factory with a recent positive demand shocks). If so, while migrants would still switch factories for working conditions, they would also enjoy the wage gains that come with switching. If mobility costs are sufficiently high, then it would still not be worthwhile for nonmigrants to switch for these wage gains.

6 Conclusion

While there is reason to believe that firms are very heterogeneous in developing countries, there is little evidence on how workers are matched to firms. We examine this question in the 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 with better wages but worse working conditions. However, as they learn about the industry, they demonstrate a revealed preference for improving their working conditions, compared to their wages.

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Dependent Variable	Index of working conditions (ĉ)		Log(wage)	
	(1)	(2)	(3)	(4)
Experience	0.0053	0.0168	0.0247*	0.0158
	[0.032]	[0.021]	[0.013]	[0.013]
Migrant	-0.2514**		0.0265	
	[0.100]		[0.057]	
Migrant X Experience	-0.0217	0.0312*	0.0017	0.0002
	[0.031]	[0.018]	[0.015]	[0.014]
Education	0.0053		0.0131	
	[0.016]		[0.009]	
Education X Experience	0.0069	-0.0056	0.0074***	0.0052**
	[0.007]	[0.005]	[0.003]	[0.002]
Male	0.1177		0.2678***	
	[0.118]		[0.067]	
Male X Experience	-0.0651	0.0467	-0.0182	0.0029
	[0.050]	[0.031]	[0.020]	[0.018]
Worker fixed effects	No	Yes	No	Yes
Observations	49,274	49,274	46,890	46,890
R-squared	0.013	0.022	0.296	0.174

*Wage expressed in 2009 taka. 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

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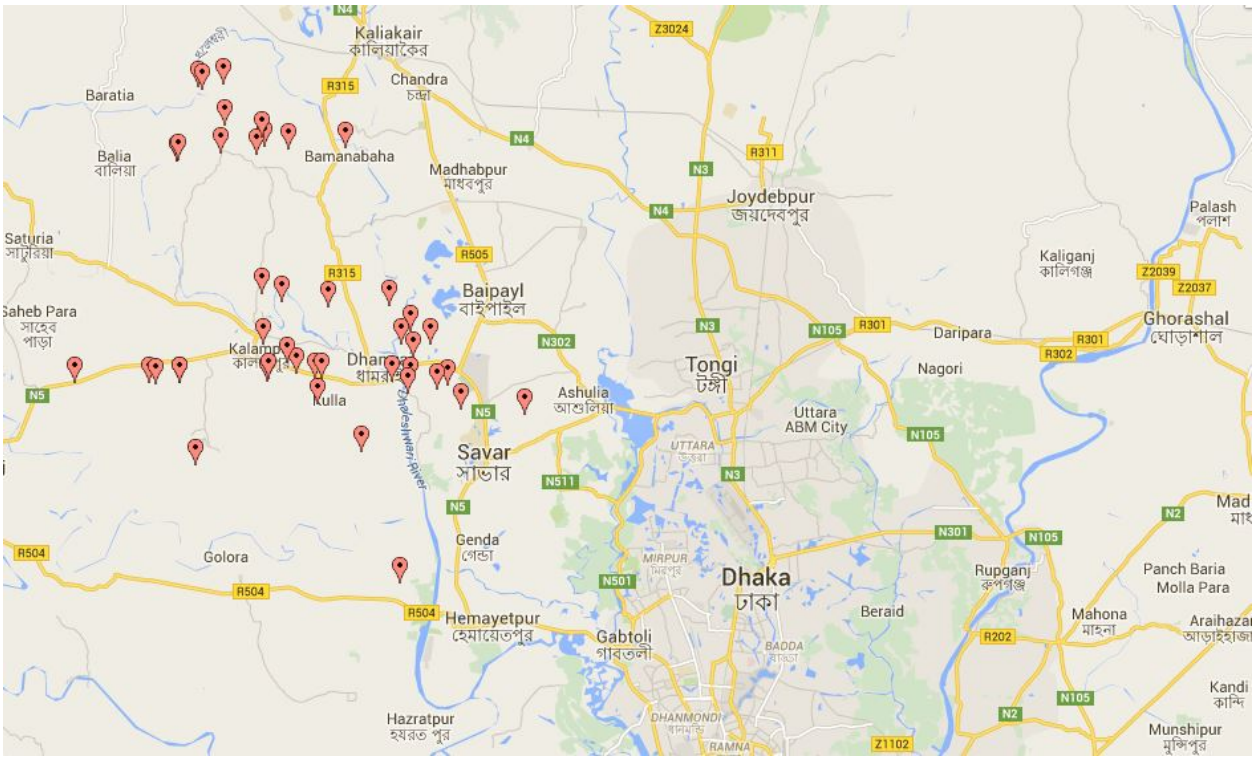

Figure A1: Sample villages

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