Misperceptions of Career Ladder and Turnover: Evidence from Ethiopian Manufacturing Workers *

David Qihang Wu† Maximiliano Lauletta‡

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Abstract

Many developing countries are undergoing a rapid process of industrialization, yet high worker turnover rates constitute a barrier for manufacturing firms to sustain their operation. This paper studies how misperceptions about career ladder can affect turnover rates in manufacturing sector in developing countries. We conducted a field experiment in one of the main industrial parks in Ethiopia, where we document significant misperceptions about the salary trajectory and the likelihood of being promoted to higher positions. We then conduct an information treatment, where we provide accurate information on career ladder estimated using records from the industrial park, and examine how misperceptions about career ladder causally affects workers' turnover decisions. We find that optimistic updates about upper-level salary significantly increase the probability of remaining employed within the industrial park, while pessimistic updates reduce it. We find no evidence of spillover effects to control workers, suggesting informal network may not be able to fully address the information frictions. For workers with higher educational attainment and previous garment experience, providing accurate information does not drive away over-optimistic workers and instead, it decreases overall turnover rates, suggesting skilled workers may be incentivized to exert more effort and climb up the career ladder when their over-optimistic perceptions are corrected. Our findings call for firms to provide more transparency of the career ladder to address information frictions and retain skilled workers.

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†Department of Economics, UC Berkeley, qihangwu@berkeley.edu.

‡Federal Reserve Board, maximiliano_lauletta@frb.gov.

1 Introduction

Numerous emerging countries are undergoing a rapid process of industrialization, with governments actively pushing to transition away from subsistence-agriculture in favor of manufacturing. A major part of this effort includes industrial park policies: governments provide amenities and subsidies to attract large-scale, often multinational, manufacturing firms to start production in the country. Despite the fact that these manufacturing firms generally offer comparatively good formal job opportunities, turnover rates are high: over 30% of workers in large manufacturing firms quit within the first month of work (e.g. Blattman and Dercon, 2018). Given that industrialization is a relatively new process with most workers never having engaged in manufacturing sector before, it is possible for potential workers to have misperceptions of the career incentives within manufacturing jobs, contributing to the high turnover rates.

In this paper, we study how misperceptions about *career ladder* can lead to high turnover rates in manufacturing firms in Ethiopia. We focus on career ladder because from a qualitative interview, we notice many entry-level workers deeply care about promotion and upper-level salary, whereas most firms do not think entry-level workers care too much about long-run career incentives. As a result, firms and the industrial park provide detailed information of entry-level salary and amenities, but not on long-run career ladder. To address this information gap, we conducted a field experiment in a flagship industrial park in Ethiopia, where around 20 foreign firms hire more than 20,000 of workers in the garment and textile industry (Hardy et al., 2022). We conducted a survey on over 1,203 workers in the industrial park, in which we document significant baseline misperceptions about career ladder: workers tend to be overly-optimistic about after-promotion wages and the likelihood of being promoted into upper-level positions within a year, although there is substantial variation in prior beliefs.

We then implement an information treatment, in which we randomly select a subset of respondents and provide them with accurate information on after-promotion wages and the likelihood of being promoted to an upper-level position, both of which are calculated from a confidential survey conducted by the government. We document significant updates in respondents' beliefs about the career ladder, with posterior beliefs being concentrated around the true values for the treated group and remaining relatively unchanged for the control group. We then use administrative records merged with our survey to track workers'

turnover rates, where our main variable of interest is an indicator of whether the worker left the industrial park prior to signing a formal contract, which happens after a 45-day trial period. Our identification strategy relies on the random variation in posterior beliefs induced by the information treatment.

We find that beliefs about career ladder incentives significantly affect turnover rates: optimistic updates about after-promotion salaries increase the likelihood of remaining employed within the industrial park, while pessimistic updates reduce it. Specifically, a 20% increase in the perceived after-promotion salary reduces the probability of the worker quitting before signing a contract by about 8.36 percentage points, which is about 20% relative to the average rate of early turnover. Interestingly, we find little effect of beliefs about the probability of being promoted to an upper-level position. The results are not subject to different functional forms of measuring misperceptions.

We conduct a direct mechanism test on the causal interpretation. If over-optimism of after-promotion salary leads to less early quitting, such causal relationship should be stronger among workers who plan to stay longer and care more about career ladder. We examine the heterogeneous effect regarding whether workers plan to stay in the industrial park longer than median answer, and whether workers list promotion or after-promotion salary as the most important factor during job search, and find the significant effects concentrated among these two subgroups of workers, consistent with our hypothesis. As a sanity check, we do not find heterogeneous effect of workers who list entry-level salary as the most important factor during job search.

We examine four alternative learning mechanisms. We first rule out the possibility that treated workers may learn that the assigned firm pays less than average and choose to quit to wait for another firm assignment. The main result remains significant after we add fixed effects of final firm assignment and cluster at the firm level. Second, one may wonder if treated workers use the benchmark information to update their own types compared to average workers. We control for interaction terms of treatment status and baseline variables that capture workers' potential update of own types relative to average worker, and the results remain significant. Third, we interact treatment with characteristics that predict higher retention of information and still find a significant main effect, suggesting the main effect is not fully explained by the ability to retain information. Fourth, we do not find suggestive evidence that updates on other job aspects can explain the main results.

We find no evidence of spillovers of the information from treated workers into control workers. To measure potential spillovers in our experimental design, we randomly assign 80% of workers hired in treated days to the treatment group, while the remaining third receives no information. We then analyze their behavior according to their baseline beliefs relative to the pure control cohorts in which no worker received any information. We find no significantly different behavior for control workers in treated days relative to workers in control days, suggesting that within-cohort spillovers are not significant. In addition, the main effect holds even after controlling for knowing other workers who have been treated and the number of friends who have worked in the industrial park in the past, suggesting a low-level across-cohort spillover. Our findings potentially indicate that informal network may not fully address the information friction regarding career ladder.

Does information treatment of career ladder impose differential effects on skilled workers? We examine heterogeneous effect regarding four categories of workers: educated (received vocational training or attended college), experienced (previously worked in a garment factory), cognitive skill measured from a series of cognitive questions, and dexterity skill measured from two common exercises in garment factories. Surprisingly, we find that over-optimistic educated workers are not more likely to quit after learning the true salary after promotion, and over-optimistic experienced workers are more likely to stay after learning the true promotion likelihood. We further examine the overall treatment effect on turnover and discover that turnover rates actually decrease among educated and experienced workers after learning accurate information of career ladder. Our findings suggest that such an information treatment does not simply drive out over-optimistic skilled workers, but may incentivize them to exert more effort to get promoted and earn above-average salary after promotion. We plan to collect personnel record on effort from the industrial park to further test this hypothesis.

Our paper contributes to several branches of the literature. The main contribution is to the literature that studies high turnover rates in manufacturing industries. The early literature focused on rich countries (Montgomery, 1989; Beckert, 2015; Farber, 1994, 1999), while more recent work has found high turnover rates in developing countries (Groh et al., 2016; Blattman and Dercon, 2018). These papers provide suggestive evidence of potential causes of high worker turnover rates. Our findings contribute to this literature by providing compelling, causal evidence that misinformation about career ladder in manufacturing can drive the high turnover rates seen in industrial jobs in developing countries.

Our paper also contributes to the literature on frictions in job search. This literature has found that search frictions (Franklin, 2018; Abebe et al., 2018), matching frictions (Banerjee and Chiplunkar, 2022), and over-optimism (Spinnewijn, 2015; Banerjee and Sequeira, 2020) are significant factors behind low likelihoods of finding stable jobs. In a broader sense, this paper speaks to the literature on behavioral job search (DellaVigna and Paserman, 2005; DellaVigna et al., 2017) where behavioral factors may hinder optimal job search outcomes. Our paper contributes to this literature by documenting how misinformation about career ladder incentives can also constitute a significant friction in job search that then results in high turnover rates.

Finally, our findings contribute to the importance of financial incentives on selection of workers (Dal Bó et al., 2013; Deserranno, 2019; Ashraf et al., 2020). In particular, Ashraf et al. (2020) emphasizes the career opportunities in a public-sector jobs and observe selection of more talented and prosocial workers on the margin. Our findings on the treatment heterogeneity suggest that more transparent information of the career opportunities may select more skilled workers to achieve higher in the career ladder.

The rest of the paper is structured as follows. Section 2 describes the context and the experiment. Section 3 describes the data. Section 4 presents the main results. Section 5 presents results on treatment effect heterogeneity and sorting. Section 6 concludes.

2 Context and experiment

Context Ethiopia is a low-income country in East Africa, with a GDP per capita of US$944 in 2021. Our setting is Hawassa Industrial Park, a major government project of industrialization in Ethiopia and one of the largest industrial parks in sub-Saharan Africa. There is a total of 20 active firms currently in the industrial park, all but one in the garment industry.[1] Since its start of operation in 2016, the industrial park has been employing 20,000 to 30,000 workers every year.

[1]Before November 2021, there used to be 22 active firms. Since then, the civil war and the termination of African Growth and Opportunity Act (AGOA) agreement in Ethiopia heavily affected the exporting industries, especially firms who predominantly exported to the United States and Europe. One major US company exited the park in December 2021; another one exited a few months later in 2022. Nevertheless, the majority of the companies are from East and South Asia whose major exporting markets are not in US or Europe, therefore less affected. Most of the remaining companies are operating at the normal capacity currently.

An important issue in the industrial park is the high turnover rate. Many workers come from agricultural backgrounds with little knowledge of industrial jobs and the work schedule. Once they experience a day of work, they quickly update the information, may realize the job is not a good fit for them, and may quit immediately. Almost 10% workers left the jobs on the first day, 25% workers quit the work in the first month, and 41% workers quit before they sign an official contract with the firm.[2] To tackle this issue, the government set up a centralized grading center right next to the industrial park in 2018. Job applicants can either directly walk in the grading center and register for a job, or they can sign up in one of the 10 local recruiting centers within 60km around the industrial park. Workers' entry or exit from any firms in the industrial park will be automatically recorded in the system. This is the main data source of turnover used in the main analysis.

Hiring process Applicants who register in the grading center first go through a basic screening process. Only applicants at least 18 years old who graduate from eighth grade are qualified for a job in the industrial park. After that, the grading center will conduct the following quasi-random "first-come-first-served" assignment: The first applicant in the labor pool will be matched to the first firm who requests for new workers. The ranking of applicants in the labor pool is determined by the registration time. If a worker quits her previous job and wants to be assigned another job, she will re-enter the labor pool and go through the same allocation algorithm with no special treatment.[3] Firms are not allowed to make a public announcement before they request for new workers. Thus, applicants do not observe and cannot affect what firms they will be assigned to.[4]

[2]High turnover rates are commonly documented in the early stage of industrialization. Montgomery (1989) documented as high as almost 100% turnover within a year in the US factories in the early 20th century. Blattman and Dercon (2018) documented a 31% turnover in the first month among workers from five major manufacturing companies in Ethiopia, a very similar statistics as in our context.

[3]In principle, firms can reject the assigned workers and ask for new ones. In reality, firms accept 95% of the first-assigned workers. The ones rejected by firms are usually the following two scenarios: (i) The workers used to work in the firm and are already fired by the firm once before. (ii) The firm requests for workers for specific tasks for which they have more stringent criteria.

[4]Firms used to conduct their own hiring before the establishment of the grading center. Since then, to ensure each firm has an equal access to the labor pool, firms agreed to use the centralized grading center as the sole hiring platform and not to conduct their own hiring or make any public announcement of their hiring requests. On average, each firm submits one hiring request every two weeks during the survey period.

Career ladder About 90% new hires are assigned to entry-level positions, such as sewing, cutting, and helpers. All 20 firms have the same entry-level base salary in the first month: 1,000 ETB, or about US$20. New hires first go through a probational phase. Roughly 45 days after, workers will sign a formal contract with firms and can enjoy more incentives such as performance pay and attendance bonus.

All 20 firms have a similar career ladder. Many entry-level operators with top performance will be promoted to quality control team where better skills are required. Some entry-level operators with exceptional performance will be promoted to line supervisors if the vacancy is open and the former line supervisors leave a good recommendation. On average, 15% of the entry-level operators will be promoted to either quality control team or line supervisors within one year. Workers from both upper-level positions enjoy a similar monthly salary 2,413 ETB, or about US$ 48.[5] Firms may have some small differences in each career ladder design, but a worker cannot choose the employer with better pay scheme: she has to first quit the job and re-enter the quasi-random draw as described above. Thus, in this paper, we refer to career ladder as the average salary in each level across all firms, and the average likelihood of being promoted across all firms.

During November and December 2021, we conducted a qualitative interview with the human resource managers from the 10 major companies from the industrial park who take up nearly 60% of the total employment. All 10 firms inform new hires of the entry-level salary, amenities, performance pay schemes, and bonuses. However, only one firm would inform new hires of the promotion likelihood and salary of upper-level positions.[6] When asked why not providing such information, other human resource managers simply mentioned they never thought about it, or they thought this information does not matter to most entry-level operators. In the experiment described below, we will exactly fill in this information gap by providing benchmark information of career ladder.[7]

[5]The most recent record of local salary in Hawassa is from Living Standard Measurement Study Ethiopia 2015-2016. Assuming local wage increases at the same rate as overall inflation from 2016 to 2022, among female workers aged 18-30 from outside of Addis Ababa, the median monthly salary is estimated to be 2,374 ETB in 2022.

[6]Interestingly, the only firm who provides information of career progression to workers happens to be the only Ethiopian-owned firm.

[7]In Appendix A.1, we discuss in further detail why career ladder is among the most important factors in this context. First, workers learn about other job aspects fairly quickly on the first few days of work. Second, career ladder is listed as one of the most important job aspects for workers during job search. Third, it is difficult for workers to learn about true career ladder through their social network, as observed in our data.

Turnover decision Most separation happens before the contract is in effect. If a worker wants to quit the job after signing a formal contract, she has to submit a notice 30 days before her intended quit date; if a firm wants to fire a worker after signing a formal contract, according to Ethiopian labor law, the firm is required to pay severance fee in certain situations. Neither fees would occur if the turnover happens before the signing the formal contract. During 2018 and 2019, 24% workers were separated before signing a formal contract, of which 51% is factory termination; however, only 14% workers were separated after signing the contract, of which only 17% is initiated by the firm. Still, about 11% workers voluntarily quit after signing the contract, suggesting a large extent of mismatch that should have been resolved as early as before the contract stage.[8]

Baseline survey From March to May 2022, we sampled 1,203 workers from the grading center and conducted baseline survey after they registered in the industrial park and were waiting for job assignment. For each respondent, we elicit a set of baseline perceptions of jobs in the industrial park, collect baseline demographics, education, work experience, social network, career plans, and reasons of joining the industrial park, and design additional tests to measure cognitive skills and dexterity skills.[9] We plan to conduct a follow-up survey on all workers one year after to measure their labor outcomes and welfare outcomes.

Information experiment We selected a random subset of 63% of survey days to implement an information treatment, and for each of these treated days we randomly selected 80% of the sampled workers to receive the information treatment. In total, 53% of the sampled workers received benchmark information of career ladder at the end of the baseline survey.

Specifically, we first collect salary and position information from a representative worker survey during October 2021 - February 2022, conducted by the Ethiopian Investment Committee (EIC). We generate two benchmark statistics: (i) The likelihood of being promoted

Fourth, misperceptions of career ladder are the main predictor of early turnover among control workers, and the only one determinant negatively correlated with early turnover.

[8] Blattman and Dercon (2018) found almost 80% workers left their industrial jobs within one year, suggesting an even much higher turnover post contract stage.

[9] To elicit workers' perceptions, we inform workers that we will award them at most an additional 20 ETB if their answers are close to the benchmark information. The program would calculate their awards based on their answers on four job aspects: entry-level salary in the first month, percentage of new hires assigned to entry-level, salary of upper-level positions, percentage of entry-level workers promoted in one year. Respondents were awarded 11 ETB on average from this module.

from entry-level to an upper-level position within 1 year is 15%; (ii) the average salary of upper-level positions is 2,413 ETB. We cross-check these two statistics with the qualitative interviews with 10 major recruiters and confirm the accuracy.[10] Then, at the end of the baseline, we inform treated workers of the two benchmark statistics. We also design a visual presentation of the two statistics to help workers understand the meanings.[11] Immediately after providing the information, we elicit workers' perceptions one more time to observe whether they update the perceptions. Control workers will be asked again the perception questions but without any new information provided.

3 Data

We combine three sources of data for the analysis. The first source of data is our own survey, which we conducted among 1,203 newly hired workers in Hawassa Industrial Park between March and May of 2022. Our second source of data comes from administrative records from the government authorities of the industrial park, which track the workers' entry and exit within the industrial park. We plan to collect a third source of data — personnel records from major firms of the industrial park, including salary, effort, and productivity measures.

In our survey, we collected a series of demographic characteristics (age, marital status, origin, languages, religion), educational attainment, prior work experience, social network information, career plans, and reasons of joining the industrial park. We also conducted a series of cognitive tests and dexterity tests to generate an objective measure of skills. Appendix A.2 describes the measurement of each variable in detail. Table 1 shows the balance between treated and control workers. Treated workers are not significantly different from control workers in most of the characteristics; they are more likely to come from Hawassa, more likely to be a high school graduate, less likely to have friends who apply for the for job together, and less likely to apply for the job because the job is interesting. None of these differences pose a challenge to our design: our main results remain unchanged after controlling for the unbalanced observable characteristics.

[10] Ideally, one would calculate the true promotion likelihood and salary of upper-level positions from the personnel records from each firm. This method is not feasible in this context because international firms are very protective of any human resources records. EIC was the only institute at the time that were allowed to conduct surveys with current workers and obtain information such as salary.

[11] The infographic card used by enumerators can be found in appendix figure D1.

We also collect a comprehensive set of respondents' impressions on multiple aspects of the industrial jobs. Figure B1 presents the 14 job aspects in four categories (career progression, entry-level career incentives, performance pay and bonus, amenities), benchmark information, and distribution of relative perceptions. The benchmark information is collected from either the worker survey conducted by EIC from October 2021 to February 2022 or the qualitative interview with 10 major employers from November to December 2021, as described in Section 2. Appendix A.1 provides a detailed description of the measurement of each of the 14 perceptions.

In particular, regarding career ladder within the industrial park, we ask respondents what they believe is the monthly salary for a worker after they are promoted to an upper-level position. To collect information regarding the promotion likelihood, we ask respondents how many workers out of 100 they think can be promoted to an upper level position within a year of working in the industrial park. For treated workers, we ask them these questions again immediately after presenting them with the information treatment, while control workers are also asked these questions for a second time but without receiving any information. To see whether the information treatment may affect other types of perceptions, we did the same exercise on the perception of entry-level salary in the first month and the percentage of workers being assigned to entry level initially.

Panel (a) of figure 1 shows the distribution of baseline beliefs about the salary after promotion, and Panel (b) shows the distribution for the perceived likelihood of being promoted to an upper-level position. The dashed vertical line indicates the benchmark values. In both panels, although workers on average have roughly correct perceptions of career ladder, there is substantial variation with some workers being overly-optimistic and some overly-pessimistic. Table C2 shows the balance between control and treated groups in terms of baseline perceptions. Although treated workers have a slightly higher perception on salary after promotion and a slightly lower perception on the promotion likelihood, the difference is much smaller than the standard deviation. In all the main regressions, we include baseline perceptions to control for the baseline balance. We will also exploit the variation in the baseline perceptions for our main IV specification in Section 4.

We merge our survey with administrative records from the grading center of the industrial park using anonymized identification numbers. The administrative record first shows the date of workers entering the general labor pool. Then, more importantly, if workers signs a

formal contract with firms, firms are required to enter the information through the grading center system. Thus, if we observe a worker enters the labor pool but is never assigned to any firm, we infer that this worker quits the job without signing a contract.[12] Usually, the firm has up to 45 days to decide whether to sign a formal contract with the worker. If the worker shows up in a firm record but quits within 45 days of entering the general labor pool, we also consider this worker to have left the job without signing a formal contract. The remaining quitting events are considered as quitting after signing a formal contract.[13]

4 Results

4.1 Efficacy of the information treatment

We first estimate the first-stage effect of information treatment on updated misperceptions on career incentives using a Bayesian update specification. Let $P_i^{x,0}$ be worker i's prior belief of job aspect x, $P_i^{x,1}$ the posterior belief immediately after the information provision, $P_i^{x,2}$ the posterior belief in the follow-up survey, $P_i^{x,s}$ the signal provided by the survey team. Bayesian learning implies that, after the signal is provided (information treatment), the mean of the posterior belief should be a weighted average between the signal and the mean of the prior belief; the weight α, ranging from 0 and 1, is determined by the variance of the prior and the variance of the signal. This prediction can be summarized as follows:

$$\log(P_i^{x,1}) - \log(P_i^{x,0}) = \alpha_1 \big(\log(P_i^{x,s}) - \log(P_i^{x,0}) \big)$$

To empirically test the first-stage effect of information treatment on belief update, we use the following specification:

$$\begin{aligned} \log(P_i^{x,1}) - \log(P_i^{x,0}) = \tau + \alpha_1 T_{c(i)} \cdot \big(\log(P_i^{x,s}) - \log(P_i^{x,0}) \big) \\ + \beta_1 \big(\log(P_i^{x,s}) - \log(P_i^{x,0}) \big) + \epsilon_i, \text{ where} \end{aligned} \tag{1}$$

[12] Many workers are hired on the same day and most workers will be assigned a job within 3 days. It is likely that applicants may leave on the first day without being assigned any job. We will use workers' retrospective employment records to cross check the turnover data.

[13] Figure B4 shows that there exists a bunching right before the 45-day cutoff, suggesting that separation after 45 days is more expensive to both workers and firms. We will also use different definitions of turnover to check the robustness of main results.

$T_{c(i)}$ is whether the entire cohort is treated. α_1 is the parameter of interest—the weight by which treated workers immediately update their perceptions when presented the benchmark information compared to control workers. We plan to collect long-run perceptions to test the persistence of information treatment. β_1 captures the spurious reversion towards the signal among control worker, which is not the focus of the analysis.

Figure 2 shows the binned scatterplot plot of workers' updated perceptions immediately after the information treatment, with the Bayesian weight α_1 shown in the graph. Across both measures of long-run career incentives, the information treatment is impactful: posterior beliefs for the treatment group are closely concentrated around the true value we inform respondents of, while posteriors for the control group closely track baseline beliefs.

4.2 Effect of misperceptions on turnover

To causally identify the effect of misperceptions of career incentive on turnover, f a simple regression of turnover on baseline perceptions would potentially suffer from classic omitted variable bias: workers with over-optimistic perceptions at baseline may have specific characteristics that affect turnover. Figure 3 shows the reduced form effect of misperceptions on turnover by treated cohorts and control cohorts. In Panel (a), among control cohorts, higher baseline perception of average salary after promotion is correlated with lower quitting rate before signing a contract, but such pattern is reversed among treatment cohorts. In Panel (b), the correlation between baseline perception of promotion likelihood and early quitting is much higher among treatment cohorts than control cohorts.

The comparison implies several important facts. First, without information treatment, workers who are over-optimistic of salary after promotion are associated with lower quitting rate before signing a contract. With information treatment at the end of baseline, workers present drastically different turnover behavior. Since the treatment is random given each level of baseline perceptions, one can causally infer the effect of misperceptions on turnover at each level of baseline perceptions. Second, the treatment effect on turnover is positive if workers are over-optimistic at baseline, negative if workers are over-pessimistic at baseline, and insignificant if workers have roughly correct perceptions at baseline. Third, the magnitude of the treatment effect is larger when the baseline perceptions are further away from the benchmark.

Therefore, we use the interaction of cluster treatment and baseline perceptions as the main instrumental variable for causal inference and to capture a larger first-stage correlation. Specifically, we follow Cullen and Perez-Truglia (2022) and adopt the following instrumental variable approach:

$$Y_i^t = \pi + \delta \log(P_i^{x,t}) + \eta \log(P_i^{x,0}) + A_i\phi + u_i \tag{2}$$

$$\log(P_i^{x,t}) = \kappa + \gamma_t T_{c(i)} \cdot \left(\log(P_i^{x,0}) - \log(P_i^{x,s})\right) + \zeta \log(P_i^{x,0}) + A_i\psi + v_i \tag{3}$$

Equation 3 corresponds to the first stage of the IV regression, a variation of the Bayesian update model-derived equation 1. Equation 2 is the second stage of the IV regression. In particular, the main parameter of interest is δ, interpreted as the magnitude change in outcome Y_i^t caused by a 100 percentage change in perception $P_i^{x,t}$, *i.e.* worker i's updated perception on job aspect x. We use $P_i^{x,1}$ as the main independent variable, that is, the immediate updated perception of x (promotion likelihood or salary after promotion) at the end of baseline in Round 2. The reason we use $\log(P_i^{x,t})$ as the main independent variable instead of the bias measure $\log(P_i^{x,t}) - \log(P_i^{x,0})$ is to keep a flexible functional form in the estimation.

Table 2 presents the main results from this specification. The dependent variable is an indicator equal to 1 if the worker leaves the firm before signing a contract (after the 45-day trial period). Column (2) shows the reduced-form estimate. Column (3) shows the IV estimate of the causal effect: 100 percentage increase in the posterior belief of average salary after promotion leads to 41.8 fewer percentage points in early turnover. Given the average posterior of salary after promotion is 49.2 USD and the standard deviation 7.7 USD, 1 standard deviation increase in the posterior belief of average salary after promotion causes 6.5 percentage points decrease in early turnover, or a 16.0% decrease compared to the average early turnover rate. Column (1) shows the OLS estimate, almost half as large as the IV estimate, suggesting a downward bias in the OLS estimate.

We do not find such a large effect on turnover when it comes to the posterior belief of promotion likelihood. Column (4), (5), and (6) show the OLS, reduced-form, and IV estimates. The IV specification suggests a precise zero effect of the perceived promotion likelihood. Column (7) and (8) applies IV estimation on both misperceptions in the same regression; results do not differ significantly from the previous four columns. Thus, the

primary driver of early turnover among long-run career incentives is the misperceptions of upper-level salary, less so about the misperception of the promotion likelihood.[14]

Table C4 replicates the main table but replacing the natural logs of perceptions with the levels of perceptions. Results are very similar to Table 2. Specifically, in Column (2), Table C4, one dollar increase in the posterior perception of average salary of upper-level positions leads to 1.01 percentage points decrease in early turnover. Given the standard deviation of posterior perception is 7.7 USD, one standard deviation increase in the posterior belief of average salary of upper-level positions causes 7.8 percentage points decrease in early turnover, very similar to the estimate from Table 2 (6.5 percentage points). Although the effect of promotion likelihood is still insignificant, the standard error of the estimate is smaller (p-value 0.399). Results suggest that the functional form of beliefs do not significantly affect the inference or interpretation.

4.3 Exclusion restrictions and robustness

The main exclusion restriction assumption to establish the causation is $E\big[\big(\log(P_i^{x,s}) - \log(P_i^{x,0})\big) \cdot T_{c(i)} \cdot u_i\big] = 0$. For all levels of prior belief of job aspect x, the clustered treatment is not correlated with unobserved factors captured in the error term ϵ_i'.

One potential violation of this assumption may happen when the treatment provides general information different than the career trajectory of the assigned firm. Treated workers may update the perceptions of the average career trajectory, but when they are assigned to a firm with higher (or lower) promotion likelihood or salary after promotion, they may be less (or more) likely to quit before signing the contract and rejoin the industrial park in the hope for a better draw. Mathematically, $E[T_{c(i)} \cdot u_i] \neq 0$.

One way to deal with this concern is to include firm fixed effects and cluster standard errors within firm (workers who never join any firm will be considered as one group). If the main results hold, the treatment effect is unlikely to be explained by within-firm correlation, inconsistent with the alternative mechanism that workers may quit early because the salary of the assigned firms fare below the provided information. Table C3, Column (2) includes fixed effect of the first assigned firm and cluster within firm to the main specification. The

[14]The results on promotion likelihood are different from the graphic intuition from Figure 3, most likely because the OLS or IV regression assigns more weights to lower values of baseline belief of promotion.

magnitude shrinks by 34%, but the estimate remains statistical significant, suggesting this alternative mechanism is unlikely to fully explain the results.

Another potential violation of exclusion restriction is that workers may update their true type after receiving the information. For example, when a worker learns the average salary after promotion is higher than what they expected they can earn in one year, she may lower her ranking compared to average workers and reassess how likely she can be promoted. This is the case when $E\big[\big(\log(P_i^{x,s}) - \log(P_i^{x,0})\big) \cdot T_{c(i)} \cdot u_i\big] < 0$. To address this concern, we first compute the expected earnings of an average worker in one year using workers' answers of entry-level salary in one year, promotion likelihood in one year, and average salary after promotion. Then, we ask each worker how much they expect to earn in one year, and divide it by the computed average earnings in one year to calculate each worker's self-assessed relative type compared to average workers. We then add two interaction terms to control for potential update of workers' own types: treatment interacted with self-assessed relative type, treatment interacted with the difference between expected own earnings in one year and expected earnings of average workers calculating with benchmark information. Table C3, Column (3) shows the estimate is still statistically significant after controlling for potential update of own type.

A third concern is that worker's characteristics correlated with prior belief may affect the retention of information. For example, suppose workers with higher cognitive ability are more likely to have overly high prior of promotion likelihood; meanwhile, they are also more likely to retain information when treated. This is the case when $E\big[\big(\log(P_i^{x,s}) - \log(P_i^{x,0})\big) \cdot T_{c(i)} \cdot u_i\big] > 0$, leading to overestimation of parameters of interest. To deal with this concern, we first examine what observed characteristics predict higher retention of information in Equation 1. Then, we include these characteristics interacting treatment status in the control vector A_i of Equation 2 and 3. Table C3, Column (4) includes the interaction of treatment status and four variables that affect treated workers' retention of information.[15] The effect remains unchanged, suggesting that differential information retention cannot fully explain the main empirical patterns.

[15]We first run regression 1 including interactions of treatment status and a set of demographic characteristics, skills-relevant variables, social network proxies, and behavioral traits. We then select variables where the p-value of the coefficients is at least lower than 0.20. These four variables are: whether the worker has work experience before, standardized raven score, whether the worker has friends who will join in the industrial park after, whether the worker joins the industrial park because they want to develop skills.

Last, one may be concerned that the treatment may also update workers' other perceptions and affect turnover. Table C3, Column (5) includes the interaction of treatment status and other perceptions at baseline that may be related to career incentives.[16] The effect is partially absorbed, in particular through perception of entry-level salary in the first month, but the main result still stays significant, suggesting the main effect cannot be explained through the misperceptions in other job aspects.

4.4 Mechanism test

Thus far, we provide evidence that the information treatment corrects workers' beliefs of career ladders, which further affects workers' turnover decision. If the causality between beliefs of career ladder and turnover holds true, the treatment effect should be larger among workers whose utility function puts a heavier weight on long-run career incentives.

We directly test this hypothesis by a heterogeneity analysis regarding whether workers report to care about long-run career incentives at the baseline. To increase statistical power, we only conduct heterogeneity analysis on reduced-form estimates. Table 3 presents the results. Column (1) shows a much larger treatment effect among workers who plan to stay for a long time (at least four years), significantly different than the estimate among workers who plan to leave earlier. Column (2) also shows a much larger treatment effect among workers who think the long-run career incentives are the most important factor during job search. As a placebo test, we further look at whether such differential treatment effect exists among workers who listed short-run salary as the most important factor during job search. We do not find such evidence in Column (3). We further confirm in Table C5 that there is not such differential first-stage effect on the updated beliefs of career ladder.

We thus establish all causal evidence that misperceptions of upper-level salary lead to higher turnover rates.

4.5 Spillovers

The information treatment may spread to other workers in the same cohorts or through social networks. For instance, if control workers discuss with their treated peers hired on

[16] These perceptions include: perception of entry-level salary in the first month, perception of percentage of new workers assigned to entry-level positions, perception of promotion likelihood.

the same day or with acquaintances who were treated on a previous day. In this section, we analyze these two types of spillovers: (i) within-cohort spillovers, where workers may observe the information treatment taking place and actively seek out for information; and (ii) across-cohort spillovers, where workers may absorb new information from co-workers hired on a previous day.

Table 4, Column (1) examines the within-cohort spillover. We use reduced-form specification to look at whether control workers in treated cohorts behave differently than other control workers in control cohorts. Results suggest control workers in treated cohorts who are over-optimistic of salary after promotion are no less likely to quit, if not more likely, suggesting a small within-cohort spillover.

Column (2) and (3) inspect across-cohort spillover with our measurement of social network in the baseline. Each worker is presented names of five treated workers in the last two weeks and asked if they know any of them. In Column (2), we control in the main specification for whether workers know any treated workers. The main result does not change much; the well-connected workers are actually more likely to stay on the job, despite the fact that they might receive the benchmark information from previous treated workers. In Column (3), we construct a network index by extracting principal component from the following variables: Number of previous treated workers that the worker knows, number of friends who joined the industrial park before, number of friends who joined the industrial park today. Results are similar to Column (2).

These results suggest that not only spillover does not affect the main estimation, workers with better connections to treated workers are more likely to stay even with higher misperceptions at the baseline. In Figure B2, we show suggestive evidence that better-networked workers are more likely to learn work amenities but not career incentives, which possibly leads to persisting misperceptions of career incentives in this context even with the enormous effort from the government and the firms to promote benchmark information. At the bottom line, the lack of evidence on spillover effects suggest that informal connections may not be able to address the information friction on career ladder, likely because only a low percentage of workers eventually climb up the career ladder and develop accurate perceptions.

5 Sorting of Workers

So far, we have estimated the effect of misperceptions on average turnover before and after signing the contract. A more subtle potential effect is on sorting. For instance, workers of higher skills with over-pessimistic prior beliefs may be less likely to quit after treatment because they stand a higher chance of being promoted; workers of higher skills with over-optimistic prior beliefs, however, may also want to stay because they may want to exert more effort to get the promotion. There is potentially a trade-off between exerting more effort to get the higher salary after promotion and leaving complex for a higher-paid job, and the trade-off varies for workers of different types. In this section, we will first look at the heterogeneous treatment effect on workers' turnover. We will collect personnel from firms to measure workers' effort to further confirm the mechanism.

We focus on the following heterogeneity: (i) Education, (ii) Experience, (iii) Cognitive ability, (iv) Dexterity skills specific to garment industry. We continue to look at the reduced-form estimates, using the interaction of treatment and baseline salary or promotion bias as the main independent variable.

Education We look at whether worker at least receives vocational training (TVET) or college education. Table 5, Panel A, Column (1) shows that unlike workers with only high school degree, educated workers do not quit earlier after the intervention. This is not because they do not update the information; in fact, we replicate the results on updated beliefs in Table C5 and find equally strong update on the perceptions of upper-level salary. We do not find significant heterogeneous effect by baseline promotion bias in Panel B, Column (1).

Experience We look at whether worker has previous experience of working in garment factory. Panel A, Column (2) shows no heterogeneous effect by baseline salary bias regarding previous experience. However, in Panel B, Column (2), we find that experienced workers are actually *less* likely to quit early after the information treatment at 5% significance level. Together with the results on education, this suggests that correcting misperception of career ladder may actually retain, or at least not drive away, workers with higher educational attainment or experience. Although they now realize the average promotion likelihood and upper-level salary is lower, by exerting more effort, they may have a higher chance of be-

ing promoted or earning above-average salary after promotion. In the future, we will use personnel record of effort to provide further evidence on this mechanism.

Cognitive ability We first conduct a 12-question Raven test on each worker and compute a Raven score from the test. We then conduct a short memory test to measure the extent to which they remember a number sequence. In addition, we ask two simple questions to test their knowledge of current affairs (the year when Prime Minister Abiy Ahmed won Nobel Peace Prize; number of regions in Ethiopia). We extract the principal component from these measures as a cognitive index, and examine the heterogeneity on whether the cognitive index is above median. We do not find significant treatment heterogeneity in terms of cognitive ability in both Panel A and Panel B.

Dexterity skills specific to garment industry We conduct two simple games to measure workers' dexterity relevant to sewing and coordination. The first game requires workers to thread three needles within a minute. The second game requires workers to take 10 pin balls from a box, put each pin ball through a tube and drop it in a different box. Both games were inspired from the grading center of the industrial park who used to conduct grading test on new workers. We extract the principal component from the two measures as a dexterity index, and examine the heterogeneity on whether the dexterity is above median. Panel, Column (5) shows there may exist some treatment heterogeneity regarding dexterity level (p-value 0.0949), that over-optimistic, high-dexterity workers are less likely to quit compared to low-dexterity workers, consistent with the findings of educated and experienced workers. We do not observe such heterogeneity in Panel B.

Summary We find suggestive, somewhat counterintuitive evidence of heterogeneous treatment effect — workers with higher educational attainment or previous garment experience do not quit early when their over-optimistic perceptions of average career ladder are corrected. One potential explanation is that skilled workers may exert more effort as a result to get the promotion and earn above-average salary after promotion. We will collect personnel records in the future to examine the hypothesis.

We further examine the overall effect of the information treatment on turnover rates in Table 6. On average, the information increases the turnover rate by 4.5 percentage

points although insignificantly, consistent with the fact that a large share of workers are over-pessimistic of the career ladder and are more likely to stay because of the information treatment. However, we observe that among educated, experienced, or high-dexterity workers, providing accurate information of career ladder decreases the turnover rates by a large magnitude (12.0–16.1 percentage points), and none of these groups of workers have systematically different baseline misperceptions. Combined with the results from Table 5, we believe the information treatment may incentivize more skilled workers to stay and exert more effort to get promoted in the future.

6 Conclusion

In this paper, we study how misperceptions about career incentives can affect turnover rates in manufacturing jobs in developing countries. We conducted a field experiment in one of the main industrial parks in Ethiopia, documenting that workers report significant misperceptions about long-run career incentives. In particular, workers misperceive the probability of being promoted and the after-promotion salary by being slightly overly-optimistic on average, although there is substantial variation in prior beliefs across workers.

We then conduct an information provision experiment, providing a randomly chosen subset of workers with accurate information regarding these career incentives, which we estimate using confidential records from the industrial park. We leverage the variation induced by our experiment to study how perceptions about career incentives causally affect their turnover decisions. We find that optimistic updates about career prospects significantly increase the probability of remaining employed within the industrial park, while pessimistic updates reduce it. The effect is primarily driven by workers who plan to stay longer in the industrial park and those who consider long-run career ladder as the most important factor during job search, confirming the causal relationship between perceptions of career ladder and turnover. We find evidence of limited spillover effects, suggesting that potential information sharing among workers does not substantially address the information friction regarding career ladder. Last, we find that workers with higher educational attainment, former experience in garment factory, and high dexterity scores do not quit earlier after correcting the over-optimistic bias, and we observe overall decreased turnover rates among these skilled workers, suggesting the information treatment may incentivize the skilled workers to stay and exert

more effort to climb higher in the career ladder.

Our findings suggest that the lack of accurate information about career incentives can lead to high turnover rates in manufacturing jobs in developing countries. With manufacturing jobs being relatively new in many countries, potential workers could be ill-informed about their career prospects. If they happen to be overly-optimistic about manufacturing jobs, this may lead many of them to enter into jobs that they will want to leave once they find out the true career incentives, resulting in high turnover rates. Our evidence of low spillover suggests that informal network may not address this information friction, given that only a small proportion of workers have climbed up the career ladder. We call for firms or the industrial park to incorporate information of career ladders on the first day of training. In particular, our findings on the treatment heterogeneity suggest the information of career ladders may incentivize more skilled workers to stay. We will collect personnel records from firms and examine the treatment effect on effort to explore how career ladders may serve as an incentive to retain skilled workers.

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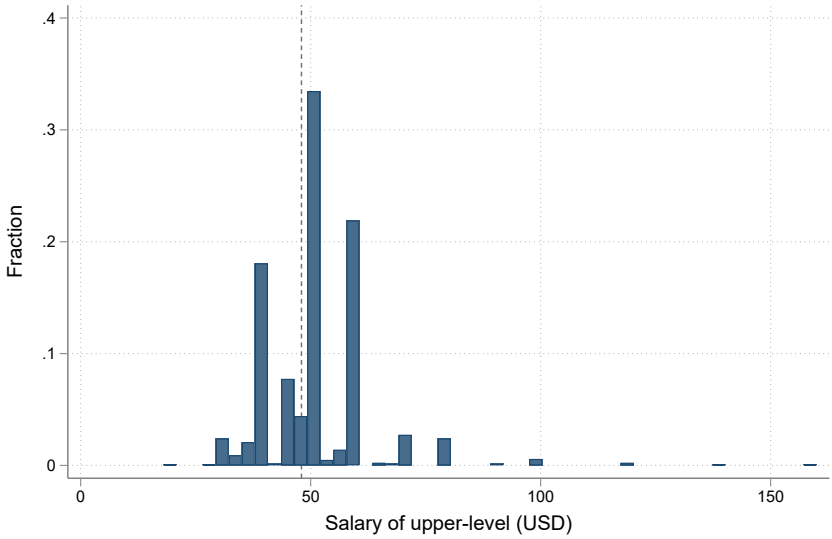
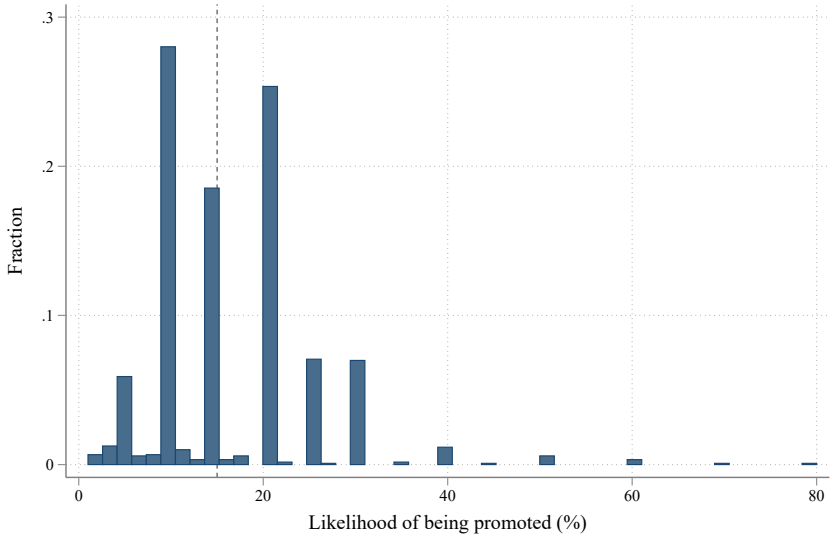
FIGURES

Figure 1: Baseline Perceptions of Career Incentives

(a) Belief about salary after promotion



(b) Belief about likelihood of being promoted

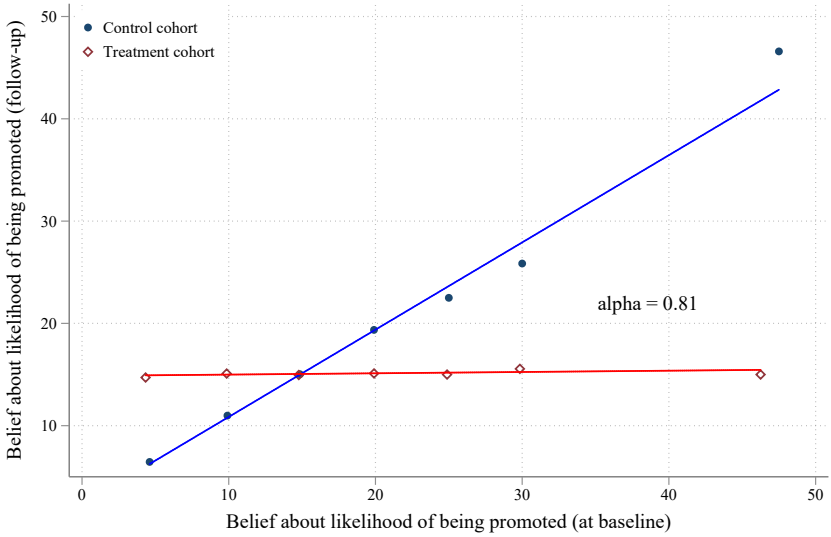


Notes: This figure shows histograms of the prior beliefs reported in the survey. Panel (a) shows the histogram of prior beliefs about the after-promotion salary (measured in US dollars) and panel (b) shows the histogram for prior beliefs about the probability of being promoted to an upper-level position (measured as a percentage). The dashed vertical line indicates the true value in both plots.

Figure 2: Perception update of career incentives

(a) Belief about salary after promotion

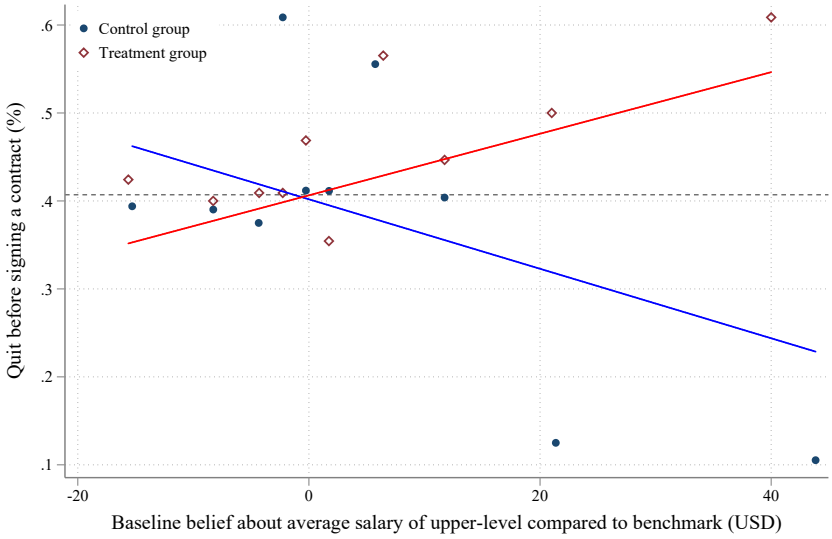
(b) Belief about likelihood of being promoted



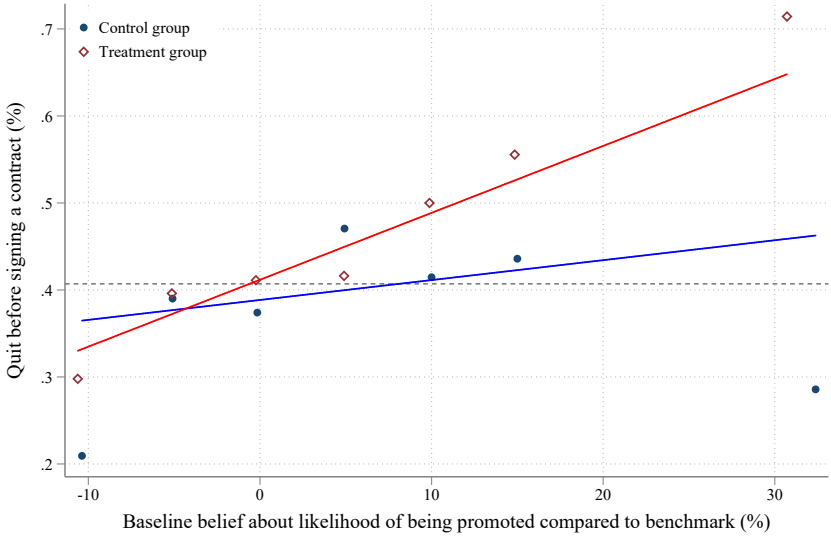
Notes: This figure shows binned scatterplots of the posterior beliefs relative to the prior beliefs reported in the survey. The control group is shown in blue and the treatment group is shown in red. Panel (a) reports beliefs about the after-promotion salary and panel (b) reports beliefs about the probability of being promoted to an upper-level position. The Bayesian update coefficient α from equation 1 is overlayed in both plots.

Figure 3: Reduced Form: Effect of Misperceptions on Early Turnover

(a) Belief about salary after promotion



(b) Belief about likelihood of being promoted



Notes: This figure shows reduced-form binned scatterplots of the probability of quitting before signing a formal contract (before the 45-day trial period ends) in relation to baseline beliefs. Panel (a) shows the probability of early exit relative to baseline beliefs about the after-promotion salary and panel (b) shows the probability of early exit relative to baseline beliefs about the probability of being promoted to an upper-level position within a year.

TABLES

Table 1: Balance Table

	All	Mean outcomes				Diff
		Control		Treated		
Observations	1203	566		637		
A. Demographics						
Age	21.53	21.62	(2.07)	21.44	(2.11)	-0.17
Married	0.12	0.11	(0.32)	0.12	(0.33)	0.01
From Hawassa	0.38	0.34	(0.47)	0.41	(0.49)	0.07**
Speaks Sidamagna at home	0.76	0.74	(0.44)	0.78	(0.42)	0.03
Speaks Amharic at home	0.24	0.25	(0.44)	0.23	(0.42)	-0.03
Protestant	0.91	0.90	(0.30)	0.91	(0.29)	0.01
B. Education and experience						
TVET or college educated	0.31	0.31	(0.46)	0.31	(0.46)	-0.00
High school graduate	0.31	0.28	(0.45)	0.34	(0.47)	0.06*
Has work experience	0.17	0.16	(0.37)	0.19	(0.39)	0.02
Has work experience in garment	0.11	0.09	(0.29)	0.13	(0.33)	0.04
C. Skill measures						
Memory score	5.32	5.32	(1.05)	5.32	(1.02)	-0.00
Raven score	3.90	3.91	(2.12)	3.90	(2.09)	-0.01
Game: When Abiy got Nobel Prize	0.46	0.48	(0.50)	0.44	(0.50)	-0.03
Game: How many regions in Ethiopia	0.39	0.37	(0.48)	0.40	(0.49)	0.02
Cognitive score (normalized)	0.00	0.01	(1.00)	-0.01	(1.00)	-0.01
Game: Finger coordination	34.80	34.83	(9.15)	34.76	(8.54)	-0.07
Game: Threading needles	11.78	11.56	(4.79)	11.97	(4.53)	0.41
Dexterity score (normalized)	0.00	-0.03	(1.02)	0.02	(0.98)	0.05
D. Social network						
Number of friends who worked in HIP before	2.30	2.35	(5.33)	2.24	(4.95)	-0.11
Number of friends who apply together	2.98	3.30	(4.98)	2.70	(4.08)	-0.60*
Number of the treated workers she knows	0.06	0.07	(0.35)	0.05	(0.28)	-0.01
Network score (normalized)	-0.00	0.05	(1.07)	-0.05	(0.94)	-0.10
E. Career plan and motivations						
Plans to start their own business	0.54	0.54	(0.50)	0.53	(0.50)	-0.01
Number of years planned to stay in HIP	3.75	3.77	(1.92)	3.73	(1.80)	-0.04
Cares about long-run salary	0.20	0.18	(0.38)	0.22	(0.41)	0.03
Applies for HIP b/c she wants to learn skills	0.89	0.90	(0.29)	0.88	(0.32)	-0.02
Applies for HIP b/c the future salary is good	0.48	0.47	(0.50)	0.49	(0.50)	0.02
Applies for HIP b/c the job is interesting	0.80	0.83	(0.38)	0.77	(0.42)	-0.06***
Intrinsic motivation score (normalized)	-0.00	0.03	(0.98)	-0.02	(1.01)	-0.05

Notes: This table shows balance between the baseline characteristics of treated and control workers. Standard deviations in brackets. We compute the difference in the last column; standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 2: Main result: Effect of Misperceptions on Early Turnover

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early	(5) Quit early	(6) Quit early	(7) Quit early	(8) Quit early
Updated belief of upper-level salary	-0.219*		-0.418**					-0.408*
	(0.130)		(0.208)					(0.211)
Treated cohort * Baseline salary bias		0.262**					0.257**	
		(0.121)					(0.122)	
Updated belief of promotion likelihood				-0.0342		-0.000718		0.0129
				(0.0576)		(0.107)		(0.0960)
Treated cohort * Baseline promotion bias					0.000472		0.00267	
					(0.0711)		(0.0701)	
Observations	1,165	1,166	1,165	1,167	1,167	1,167	1,166	1,165
R-squared	0.003	0.003	0.000	0.010	0.009	0.009	0.012	0.011
Specification	OLS	RF	IV	OLS	RF	IV	RF	IV
Cluster	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort
Dep var mean	0.407	0.407	0.407	0.407	0.407	0.407	0.407	0.407
F-stat			33.33			179.6		17.60

Notes: This table reports estimates of equation 2. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Updated belief of upper-level salary is the natural logarithm of the posterior belief of the after-promotion salary. Updated belief of promotion likelihood is the natural logarithm of the posterior belief of the probability of being promoted to an upper-level position. Columns 1 and 4 report OLS estimates; Column 2, 5, and 7 report reduced-form estimates; Columns 3, 6, and 8 report instrumental variables estimates. Dep var mean reports the mean for the dependent variable. F-stat reports the first-stage F-statistics for IV estimation. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 3: Mechanism

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early
Treated cohort * Baseline salary bias * (1-X) [a]	0.0619	0.190	0.279*
	(0.119)	(0.132)	(0.140)
Treated cohort * Baseline salary bias * X [b]	0.404***	0.450**	0.252
	(0.148)	(0.212)	(0.151)
Observations	1,166	1,166	1,166
R-squared	0.033	0.006	0.005
Specification	RF	RF	RF
Cluster	Cohort	Cohort	Cohort
Heterogeneity X	Plan to stay	Care long-run	Care short-run
Dep var mean	0.407	0.407	0.407
P-value: [b] - [a]	0.0219	0.256	0.870

Notes: This table reports the mechanism test. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Baseline salary bias is the natural logarithm of the baseline belief of the after-promotion salary minus the logarithm of benchmark. We break down the main reduced-form estimates by (1) whether worker plans to stay at least 4 years (median) in the industrial park, (2) whether the worker lists long-run career ladder as the most important factor during job search, and (3) whether the worker lists short-run salary as the most important factor during job search. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 4: Spillover

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early
Treated cohort * Baseline bias	0.162		
	(0.200)		
Updated belief of upper-level salary		-0.385*	-0.370*
		(0.200)	(0.198)
Know previous treated workers		-0.150***	
		(0.0501)	
High network index			-0.118***
			(0.0348)
Observations	543	1,165	1,165
R-squared	0.007	0.005	0.011
Specification	RF	IV	IV
Cluster	Cohort	Cohort	Cohort
Sample	Control workers	All	All
Dep var mean	0.407	0.407	0.407
F-stat		38.03	34.10

Notes: This table reports estimates of spillover effects. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Updated belief of upper-level salary is the natural logarithm of the posterior belief of the after-promotion salary. Baseline salary bias is the natural logarithm of the baseline belief of the after-promotion salary minus the logarithm of benchmark. Knows previous treated workers is a dummy variable equal to 1 if the respondent knows workers who were previously treated. High network index is an index constructed using the principal component of the number of previous treated workers that the worker knows, number of friends who joined the industrial park before, number of friends who joined the industrial park today. Columns 1 reports OLS estimates of the reduced form, only including control workers. Columns 2 and 3 report IV estimates. F-stat reports the F-statistic for the excluded instruments in the first stage. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 5: Sorting of Workers

Panel A. Baseline salary bias

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early
Treated cohort * Baseline salary bias * (1-X) [b]	0.390***	0.254*	0.242*	0.452**
	(0.130)	(0.140)	(0.143)	(0.169)
Treated cohort * Baseline salary bias * X [a]	-0.0580	0.381	0.284*	0.143
	(0.144)	(0.242)	(0.154)	(0.147)
Observations	1,166	1,153	1,166	1,135
R-squared	0.023	0.040	0.003	0.007
Specification	RF	RF	RF	RF
Cluster	Cohort	Cohort	Cohort	Cohort
Heterogeneity X	Educated	Experienced	High cognitive	High dexterity
Dep var mean	0.407	0.407	0.407	0.407
P-value: [b]-[a]	0.00479	0.632	0.806	0.0949

Panel B. Baseline promotion bias

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early
Treated cohort * Baseline salary bias * (1-X) [b]	-0.00653	0.0238	-0.0773	-0.0439
	(0.0769)	(0.0706)	(0.0774)	(0.0688)
Treated cohort * Baseline salary bias * X [a]	0.0105	-0.150**	0.0887	-0.0425
	(0.0792)	(0.0710)	(0.0748)	(0.0704)
Observations	1,167	1,154	1,167	1,136
R-squared	0.024	0.045	0.015	0.013
Specification	RF	RF	RF	RF
Cluster	Cohort	Cohort	Cohort	Cohort
Heterogeneity X	Educated	Experienced	High cognitive	High dexterity
Dep var mean	0.407	0.407	0.407	0.407
P-value: [b]-[a]	0.811	0.00384	0.00787	0.979

Notes: This table reports heterogeneity analysis by workers' skills. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Baseline salary (promotion) bias is the natural logarithm of the baseline belief of the after-promotion salary (promotion likelihood) minus the logarithm of benchmark. We break down the main reduced-form estimates by (1) whether worker attended vocational training school or colleges, (2) whether the worker worked in a garment factory before, (3) whether the worker has an above-median cognitive score measured in our survey, and (4) whether the worker has an above-median dexterity score measured in our survey. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table 6: Overall Treatment Effect on Early Turnover

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early	(5) Quit early
Treated cohort	0.0451	0.0872	0.0729	0.0712	0.0809
	(0.0532)	(0.0618)	(0.0575)	(0.0677)	(0.0674)
Treated cohort * X		-0.141*	-0.161*	-0.0526	-0.120
		(0.0766)	(0.0928)	(0.0704)	(0.0736)
Observations	1,167	1,167	1,154	1,167	1,136
R-squared	0.002	0.021	0.042	0.003	0.004
Specification	OLS	OLS	OLS	OLS	OLS
Cluster	Cohort	Cohort	Cohort	Cohort	Cohort
Heterogeneity X	No	Educated	Experienced	High cognitive	High dexterity
Dep var mean	0.407	0.407	0.407	0.407	0.407

Notes: This table reports the overall treatment effect on early turnover. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. The main independent variable is whether worker comes from the treated cohorts. In Column (2)-(5), we break down the main OLS estimates by (1) whether worker attended vocational training school or colleges, (2) whether the worker worked in a garment factory before, (3) whether the worker has an above-median cognitive score measured in our survey, and (4) whether the worker has an above-median dexterity score measured in our survey. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

A Data and measurements

A.1 Perception questions

To guide through our conceptual classification of all job aspects, suppose a worker decides to stay for 2 periods. In the first period, she gets paid by $w + r(y)$, where w is the base salary, $r(y)$ is the wage premium determined by her production $y = y(\theta, e)$, which is itself a function of worker's productivity θ and effort e with a convex cost function $c(e)$. In the second period, she may be fired by the firm by a probability of $\delta(y)$ and enjoy zero utility. If she stays on the job, she has a probability of $p(y)$ to get promoted to upper-level positions where she enjoys a fixed salary w_H. If the worker is not promoted, she gets paid by a fixed salary $w_L < w_H$. Suppose there is no discount of future utility, and the amenities add a constant utility term a to the worker. The expected utility of working in the industrial park can be broken down into four parts:

$$\begin{aligned} U &= w + r(y) - c(e) + (1 - \delta(y))(p(y)w_H + (1 - p(y))w_L) \\ &= \underbrace{w}_{\text{(i)}} + \underbrace{p(y)(1 - \delta(y))(w_H - w_L)}_{\text{(ii)}} + \underbrace{r(y) + (1 - \delta(y))w_L}_{\text{(iii)}} + \underbrace{a}_{\text{(iv)}} - c(e) \end{aligned}$$

The first part (i), w, represents the entry-level career incentive. In the context of the industrial park, we ask each respondent to guess the base salary for all entry-level operators in the first month (1,000 ETB), and the percentage of new hires assigned to entry-level (90%). This does not depend on workers' effort level. There is a chance that high-productivity workers can be assigned to upper-level positions (mostly quality control team); given the small percentage of such workers, the entry-level salary is the same for most workers regardless of productivity.

The second part (ii), $p(y)(1 - \delta(y))(w_H - w_L)$, relates to career ladder in the long run. $w_H - w_L$ is the salary premium of upper-level positions; $p(y)$ is the promotion likelihood to upper-level positions. To simplify the survey questions, we ask each respondent to guess the average salary of upper-level positions (2,413 ETB), and the percentage of entry-level operators being promoted to upper-level in one year (15%).

The third part (iii), $r(y) + (1 - \delta(y))w_L$, relates to performance pay and bonus which

depends on productivity and effort on the same level position. In particular, we model the wage premium $r(y)$ as a function of worker's production, which is a very common practice of firms to decide worker's performance pay. To simplify the question, we ask each respondent to guess how much a top-10% entry-level worker can earn more than average entry-level workers (400 ETB). The second component, $(1 - \delta(y))w_L$, can be interpreted as the salary if the entry-level worker manages to stay in the firm. Most firms designs a tenure bonus for workers who stay more than one year. We thus ask each respondent how much more an entry-level worker can earn if she stays one year after (300 ETB). In addition, we ask workers how many of the 10 major firms provide attendance bonus, a major type of bonus relevant to workers' effort and all 10 major firms provide. We also collect respondents' perception of the likelihood of being fired in the first month $\delta(y)$ (10%).

The fourth part (iv), a, captures all utility terms regardless of workers' positions, productivity type, or effort. This includes: number of days per week workers are required to work (6 days), hours per day (8 hours), average overtime hours per week (7 hours), average minutes per day allowed during work (30 minutes), number of the 10 major firms providing free transportation instead of transport subsidies (4), and number of the 10 major firms providing free lunch instead of lunch subsidies (6).

Distribution of all these 14 perceptions is summarized in Figure B1. We calculate relative perceptions as the difference of workers' answers to the benchmark divided by the benchmark. The benchmark information of average salary of upper-level, promotion likelihood, entry-level salary in the first month, and the percentage of new hires assigned to entry-level is calculated from the current worker survey conducted by EIC during October 2021 and February 2022. The rest of the benchmark information is calculated from the qualitative interview with 10 major firms during November and December 2021.

In general, workers have a roughly correct idea of jobs in the industrial park, but with great variations. Workers tend to underestimate the percentage of new hires assigned to entry-level positions, top performance salary premium, the number of firms providing attendance bonus, and overtime hours per week, but overestimate the hours per day required to work and number of firms providing free transportation. Interestingly, most workers guess correctly how many minutes of break per day allowed at work (30 minutes).

We chose to focus on career ladder for four reasons. First, workers learn about other

job aspects fairly quickly on the first few days of work. Firms provide detailed information of entry-level career incentives, performance pay scheme, bonus, and amenities during orientation. The grading center is also giving out brochures to job applicants with basic information. Neither firms nor the grading center provides detailed information of the career ladder, partly because they think career ladder matters less for most entry-level workers.

Second, career ladder is listed as one of the most important job aspects for workers. Each respondent is asked to choose three most important job aspects from a list of options. Table C1 shows the proportion of workers choosing which item as the first, second, and third most important job aspects. The last column shows the proportion of workers listing which item in the top 3 job aspects. In general, career ladder aspects (upper-level salary, chance of promotion to upper-level in one year) are listed consistently as the #3 or #4 aspects during job search. 34.7% workers listed upper-level salary in the top-3 job aspects, 35.9 % listed chance of promotion to upper-level in one year in the top-3 job aspects, right below "providing good benefits" (61.6%) and "entry-level salary in the first month" (46.1%), the two job aspects the grading center and firms have been trying very hard to inform all job applicants.

Third, it is difficult for workers to learn about true career ladder through their social network. During baseline survey, we asked each respondent the number of family and friends they know who worked in the industrial park before. In addition, we presented 5 names of treated workers in the previous two weeks and asked how many of these names they recognize. 39% of the respondents know at least one person who worked in the industrial park before or were treated during our survey. Figure B2 compares the level of relative perceptions of these workers to those who know no one from the industrial park before. Indeed, networked workers have more correct perceptions on amenities. However, they have very similar levels of misperceptions on salary after promotion, promotion likelihood from entry-level, entry-level salary in the first month, the likelihood of being fired in the first month, and performance salary premium. They are even more biased in terms of the percentage of new hires assigned to entry-level, tenure bonus, or the number of firms providing attendance bonus. The evidence suggests workers may learn work amenities efficiently through social network, but not so in terms of career incentives in short or long run.

Last, misperceptions of career ladder are the main predictor of early turnover. Figure B3 regresses workers' quitting before signing a formal contract on the 14 relative baseline

perceptions, only among control cohorts. Results suggest a significant negative correlation between early turnover and perceived salary after promotion: workers who overestimated salary after promotion by 1 standard deviation are 5.93% less likely to quit before signing a contract. This is the only negative correlation observed in the regression; in fact, workers with overoptimistic baseline perceptions in entry-level salary of the first month or number of firms providing attendance bonus are more likely to quit early, aligned with the fact that firms usually provide these two pieces of information on the first day of work and may dissuade these overoptimistic workers at the beginning. It is thus very likely that workers with overoptimistic baseline perceptions of career ladder may stay in the firm for too long, only to find out a lower salary after promotion after they sign a formal contract and quitting becomes more costly.

A.2 Details of other baseline characteristics

Demographics During baseline, we asked each respondent of their age, marital status, whether their family is from Hawassa where the industrial park is located, whether they speak Sidamanagna (the main local language) or Amharic (the national language) at home, and their religious belief.

Education and experience We asked each respondent of their education background and work experience. Most respondents only graduate from 8th or 10th grade. 31% graduate from high school; another 31% either graduate from vocational training school (TVET) or are educated in the college. Only 17% have any previous work experience, 11% have any work experience in garment industry.

Skill measures We conducted multiple tests in this following.

1. Memory test: Enumerator would read a series of numbers and ask the respondent to repeat. For example, given a random number series $\{8, 1, 4, 2, 5, 6, 7\}$, enumerator would first say 8 and ask the respondent to repeat 8. Then, enumerator would read $\{8, 1\}$ and ask the respondent to repeat again; if the respondent repeated them correctly, the enumerator would add the third number to the sequence, until the respondent cannot repeat correctly the number sequence. The average length of the number sequence the

respondent can repeat correctly is 5.32.

2. Raven score: Enumerator would conduct a simplified 12-question standard Raven test with each respondent. For each question, respondent would be asked to select an object to fill in a simple geometric pattern. The average Raven score is 3.90.

3. Knowledge games: Enumerator asked two additional questions to test respondents' common knowledge, (i) what year Prime Minister Abiy Ahmed got Nobel Peace Prize (2019, or 2012 in Ethiopian calendar), and (ii) how many regions in Ethiopia (10, this is a very relevant question because the 10th region Sidama, where the industrial park is located, was only recently approved in 2019). 46% and 39% respondents answered correctly the first and second question, respectively. We then extract a principal component from the four measures above to construct a normalized cognitive score.

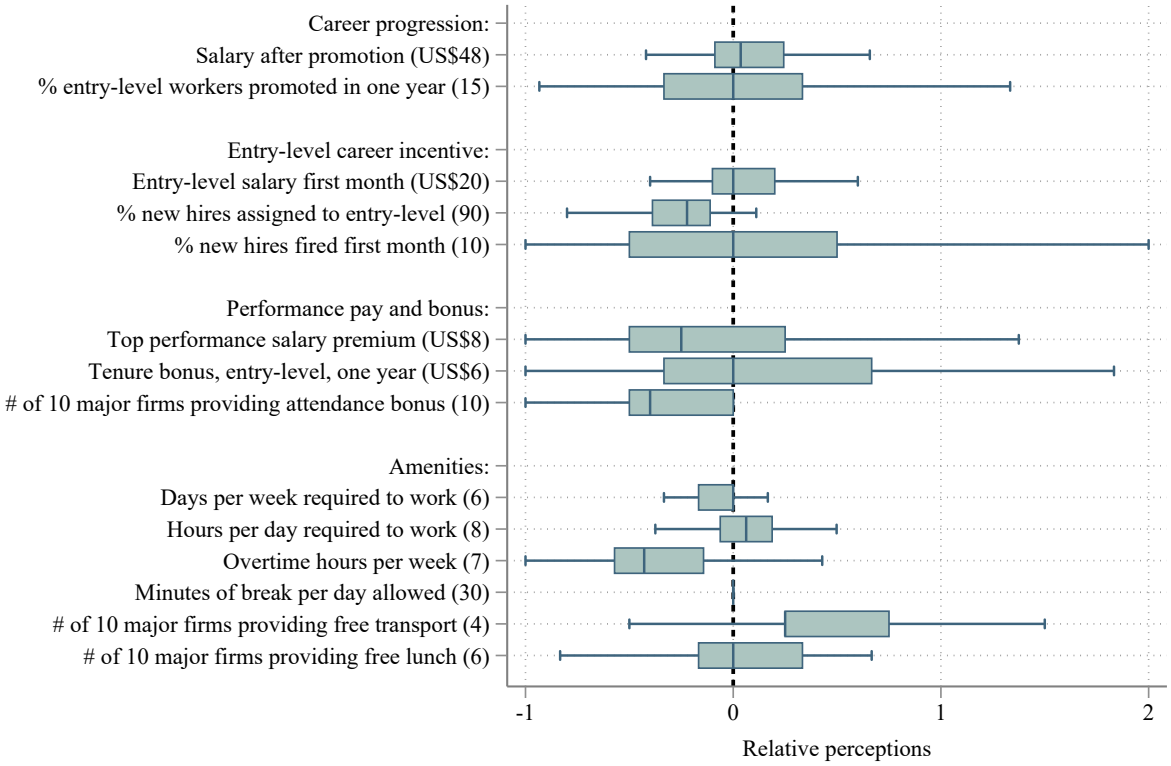
4. Dexterity games: Enumerator conducted two additional games to capture workers' dexterity skills, following the previous grading test conducted in the grading center. (i) Finger coordination: Respondent was asked to take one pin ball out from a case, move it through a specific design, catch the pin ball with the other hand, and put it in another case. Enumerator then calculated the number of pin balls each respondent can relocate within 60 seconds. The average number is 34.80. (ii) Threading needles: Respondent was asked to thread three needles as fast as possible. Enumerator then calculates the number of needles respondent to thread within 60 seconds. The average number is 11.78. We then extract a principal component from these two measures to construct a normalized dexterity score.

Social network We asked each respondent the number of family or friends they know who worked in the industrial park before and the number of family or friends who applied for the job together on the same day. On average, respondents know 2.30 people who worked in the industrial park before and was accompanied by 2.98 friends on the same day. Then, we presented 5 names of treated workers from the previous two weeks of survey and asked how many of these names each respondent recognized. On average, only 4.57% respondents recognize any treated worker from the list. We then extract a principal component from these three measures to construct a normalized social network score.

Career plan and motivations We first asked each respondent whether they planned to start their own business within 5 years; on average, 54% respondents expressed having such a plan. We then asked how long each respondent planned to stay in the industrial park, and what are the three most important aspects during job search. On average, worker plans to stay for 3.75 years, and 20% workers care about long-run career ladder during job search. We then asked for the reasons why respondent applied for the jobs in the industrial park: because she wants to learn skills, because the future salary is attractive, or because the job is interesting. 89%, 48%, and 80% respondents agreed with the three reasons, respectively. We then extract a principal component from these six measures to construct a normalized intrinsic motivation score.

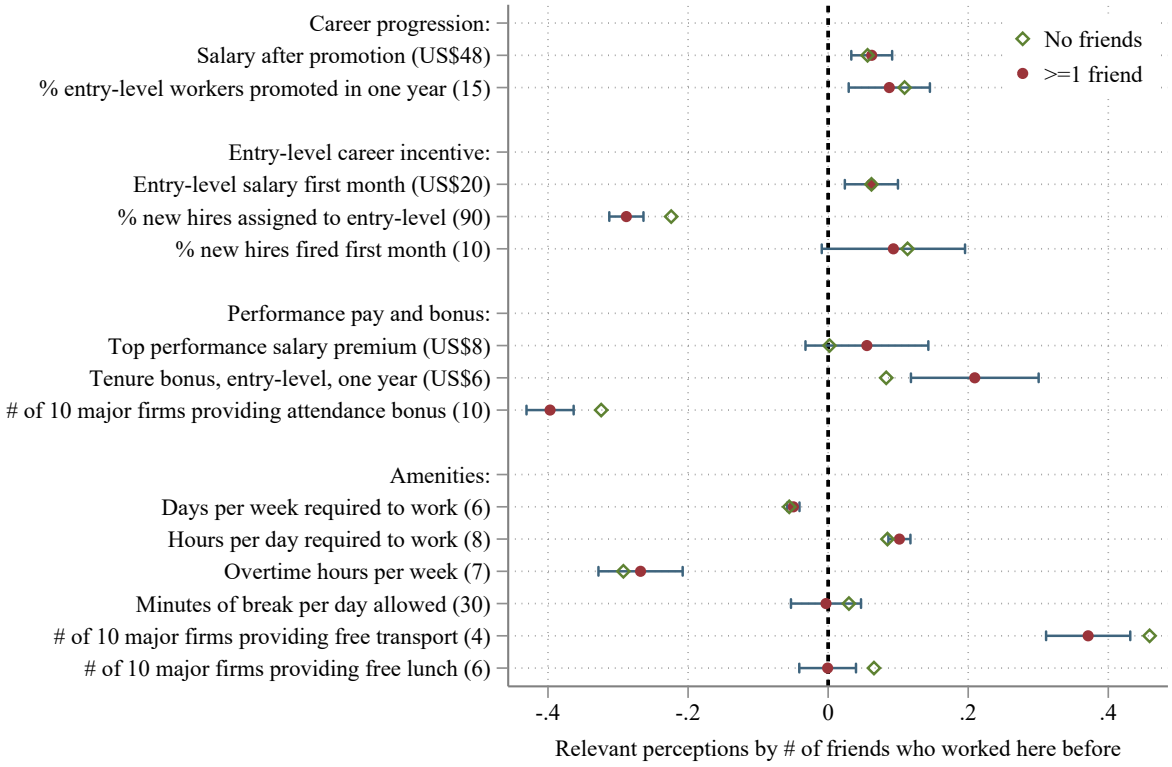
B Figure

Figure B1: Distribution of baseline perceptions of industrial jobs



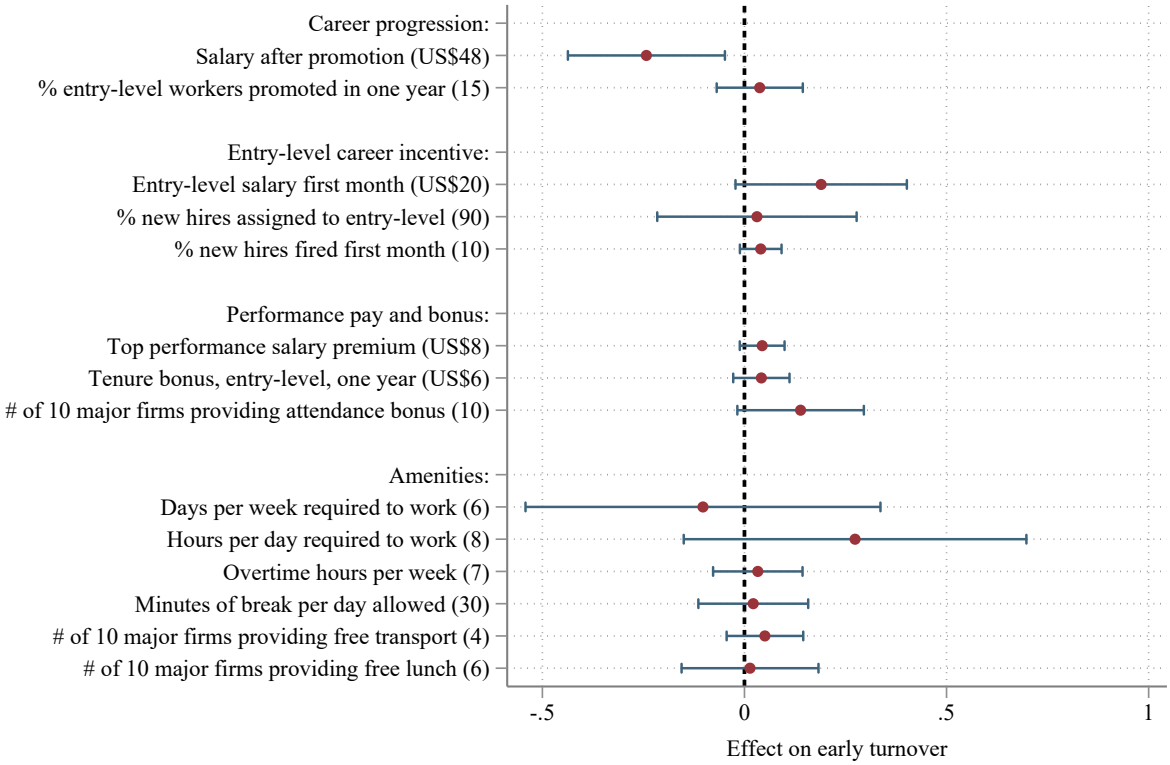
Notes: This figure shows the distributions of all 14 perceptions of industrial jobs. All benchmark information is shown in the brackets on the vertical axis. Relevant perceptions are calculated as the difference between workers' perceptions and benchmark divided by the benchmark. Each box presents 25, 50, and 75 percentile points, as well as lower and upper adjacent values. The bar of "Minutes of break per day allowed" is invisible because the 25, 50, and 75 percentile points are the same. See Section A.1 for detailed discussion.

Figure B2: Baseline misperceptions by social network



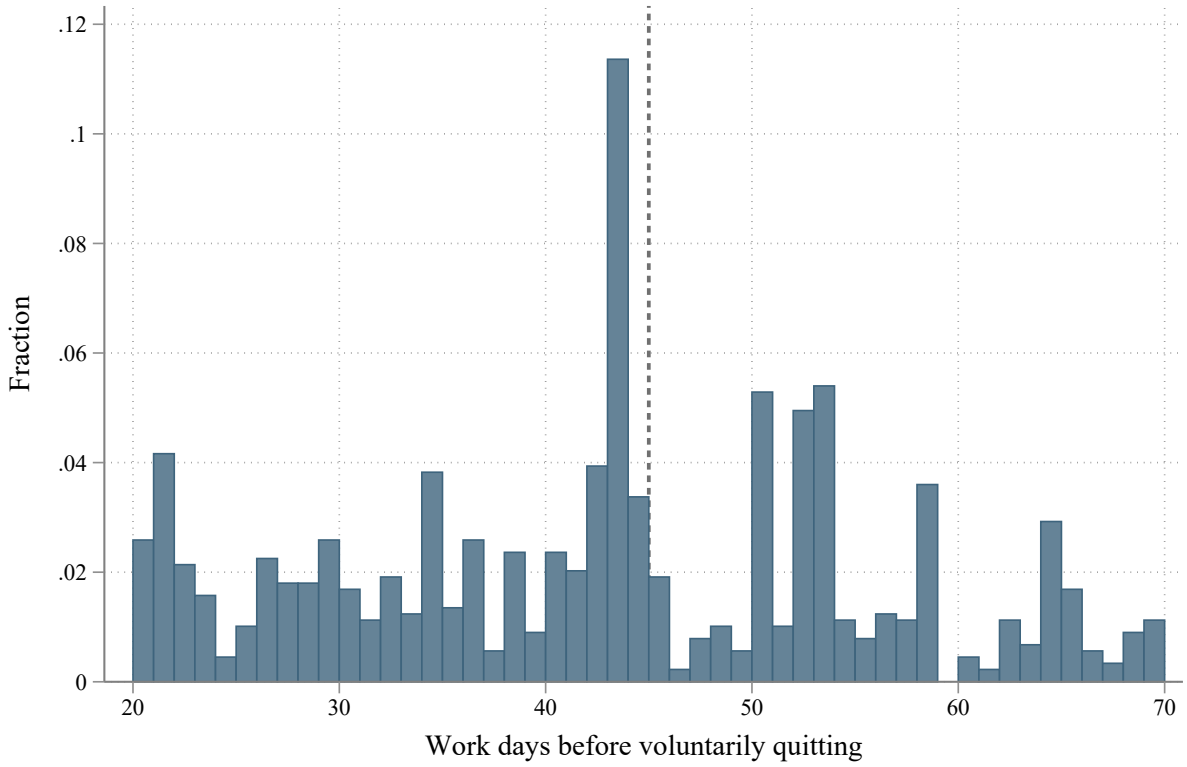
Notes: This figure shows the average of the 14 relative perceptions by social network. The hollow diamond dots are the average perceptions of workers who have no family or friends working in the industrial park before, nor do they recognize any of the 5 treated workers during baseline. The red solid dots are the average perceptions of workers who have at least 1 family member or friend working in the industrial park before, or they recognize at least 1 treated worker during baseline. All benchmark information is shown in the brackets on the vertical axis. Relevant perceptions are calculated as the difference between workers' perceptions and benchmark divided by the benchmark. See Section A.1 for detailed discussion.

Figure B3: Predictions of early turnover



Notes: This figure shows the prediction of workers quitting before signing a formal contract using the 14 relative perceptions. The regression only includes workers in control cohorts and cluster at the cohort (day of hire) level. The coefficient and 95% confidence interval are shown. All benchmark information is shown in the brackets on the vertical axis. Relevant perceptions are calculated as the difference between workers' perceptions and benchmark divided by the benchmark. See Section A.1 for detailed discussion.

Figure B4: Bunching around 45-day probation cutoff



Notes: This figure shows the distribution of work days before voluntarily quitting. Data is the entire administrative turnover record from the grading center between July 2018 and March 2020, before Covid started and the grading center stopped sharing the entire turnover record to researchers. The histogram only shows the distribution around the cutoff of 45 days. See Section 3 for detailed discussion.

C Tables

Table C1: Importance of career ladder

	First (%)	Second (%)	Third (%)	Listed in top 3 (%)
Upper-level salary	11.0	13.4	10.3	34.7
Chance of promotion to upper-level in 1 year	8.9	13.7	13.3	35.9
Entry-level salary in the first month	32.2	8.0	6.0	46.1
Entry-level salary after 1 year	2.2	2.4	1.4	6.0
Provide good benefits	13.1	28.1	20.4	61.6
Reasonable work hours	4.8	8.6	12.6	25.9
Interesting task	5.7	8.2	13.6	27.5
Skill development	4.8	6.1	11.7	22.6
Good management	9.7	6.4	9.0	25.1
Others	7.7	5.2	1.7	8.6

Notes: This table shows workers' ranking of job aspects during job search. Each respondent was asked to choose three most important job aspects from a list of options. The last column shows the percentage of workers choosing each item as one of the top 3 job aspects. See Section A.1 for detailed discussion.

Table C2: Balance table: Baseline perceptions of industrial jobs

	All	Mean outcomes				Diff
		Control		Treated		
Observations	1203	566		637		
A. Career progression						
Salary after promotion	0.06	0.04	(0.25)	0.07	(0.24)	0.03*
% entry-level workers promoted in one year	0.10	0.14	(0.62)	0.06	(0.51)	-0.08*
B. Entry-level career incentive						
Entry-level salary first month	0.06	0.08	(0.28)	0.05	(0.25)	-0.03
% new hires assigned to entry-level	-0.25	-0.26	(0.23)	-0.24	(0.22)	0.01
% new hires fired first month	0.11	0.14	(0.95)	0.07	(0.85)	-0.07
C. Performance pay and bonus						
Top performance salary premium	0.02	0.01	(0.82)	0.04	(0.83)	0.03
Tenure bonus, entry-level, one year	0.13	0.18	(0.78)	0.09	(0.68)	-0.10*
# of 10 major firms providing attendance bonus	-0.35	-0.35	(0.27)	-0.36	(0.28)	-0.01
D. Amenities						
Days per week required to work	-0.05	-0.05	(0.08)	-0.05	(0.08)	-0.00
Hours per day required to work	0.09	0.10	(0.16)	0.08	(0.15)	-0.01
Overtime hours per week	-0.28	-0.29	(0.52)	-0.27	(0.47)	0.02
Minutes of break per day allowed	0.02	0.03	(0.48)	0.01	(0.44)	-0.02
# of 10 major firms providing free transport	0.42	0.42	(0.53)	0.43	(0.54)	0.01
# of 10 major firms providing free lunch	0.04	0.03	(0.36)	0.04	(0.36)	0.01

Notes: This table shows balance between the baseline perceptions of treated and control workers. All perceptions are calculated as the percentage difference from the benchmark. Standard deviations in brackets. We compute the difference in the last column; standard errors are clustered at the cohort (day of hire) level. See Section 3 for detailed discussion. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table C3: Robustness of main result

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early	(5) Quit early
Updated belief of upper-level salary	-0.418**	-0.275**	-0.298*	-0.465**	-0.347*
	(0.208)	(0.0822)	(0.179)	(0.215)	(0.200)
Observations	1,165	1,163	1,163	1,152	1,165
R-squared	0.000	0.002	0.005	0.034	0.023
Specification	IV	IV	IV	IV	IV
Cluster	Cohort	Firm	Cohort	Cohort	Cohort
Firm FE	No	Yes	No	No	No
Control	No	No	Own type update	Info retention	Other perceptions
Dep var mean	0.407	0.407	0.407	0.407	0.407
F-stat	33.33	32.89	355.6	31.13	34.32

Notes: This table reports robustness check of the IV estimates of equation 2. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Updated belief of upper-level salary is the natural logarithm of the posterior belief of the after-promotion salary. F-stat reports the first-stage F-statistic for IV estimations. Column 1 reports our baseline specification. Column 2 includes fixed effects for the initially assigned firm and clusters standard errors at the firm level. Column 3 includes interaction terms for the treatment indicator and two variables that capture workers' potential update of own type (expected own salary in one year divided by expected average salary in one year computed from workers' answers, expected own salary in one year compared to benchmark expected average salary in one year). Column 4 includes interaction terms for the treatment indicator and several variables that affect the retention of information (an indicator of having previous work experience, a standardized raven score, an indicator of having friends who will join the industrial park later-on, and an indicator of whether the worker reports joining the industrial park because they want to develop skills). Column 5 adds interaction terms of the treatment status with other perceptions that can affect the turnover decision: the perception of the average entry-level salary in the first month, the perception of the percentage of new workers assigned to entry-level positions, and the perception of the probability of being promoted to an upper-level position. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table C4: Robustness check: Functional form of perceptions

VARIABLES	(1) Quit early	(2) Quit early	(3) Quit early	(4) Quit early	(5) Quit early
Updated belief of upper-level salary	-0.00540**	-0.0101***			-0.0107***
	(0.00214)	(0.00319)			(0.00348)
Updated belief of promotion likelihood			-0.00515	-0.00703	-0.00569
			(0.00425)	(0.00590)	(0.00547)
Observations	1,165	1,165	1,167	1,167	1,165
R-squared	0.005	0.003	0.008	0.008	0.008
Specification	OLS	IV	OLS	IV	IV
Cluster	Cohort	Cohort	Cohort	Cohort	Cohort
Dep var mean	0.407	0.407	0.407	0.407	0.407
F-stat		76.39		562.9	11.44

Notes: This table reports main results with different functional forms of perceptions. In all specifications the dependent variable is a dummy variable equal to 1 if the worker left the industrial park prior to signing a formal contract, which occurs after completing the 45-day trial period. Updated belief of upper-level salary is the level, instead of natural logarithm, of the posterior belief of the after-promotion salary. Columns 1 and 3 report OLS estimates and Columns 2, 4, and 5 report instrumental variables estimates. F-stat reports the first-stage F-statistic for IV estimations. Standard errors are clustered at the cohort (day of hire) level. See Section **??** for detailed discussion. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

Table C5: Mechanism: Effect on Update on Upper-level Salary

VARIABLES	(1) Updated log salary	(2) Updated log salary	(3) Updated log salary
Treated cohort * Baseline salary bias * (1-X) [a]	-0.639***	-0.606***	-0.631***
	(0.102)	(0.106)	(0.104)
Treated cohort * Baseline salary bias * X [b]	-0.616***	-0.682***	-0.616***
	(0.107)	(0.100)	(0.106)
Observations	1,200	1,200	1,200
R-squared	0.690	0.691	0.690
Specification	RF	RF	RF
Cluster	Cohort	Cohort	Cohort
Heterogeneity X	Plan to stay	Care long-run	Care short-run
Dep var mean	-0.0249	-0.0249	-0.0249
P-value: [b] - [a]	0.675	0.125	0.766

Notes: This table reports the robustness check to the mechanism test. In all specifications the dependent variable is the updated belief of upper-level salary, measured by the natural logarithm of the posterior belief of the after-promotion salary minus the logarithm of benchmark. Baseline salary bias is the natural logarithm of the baseline belief of the after-promotion salary minus the logarithm of benchmark. We break down the main reduced-form estimates by (1) whether worker plans to stay at least 4 years (median) in the industrial park, (2) whether the worker lists long-run career ladder as the most important factor during job search, and (3) whether the worker lists short-run salary as the most important factor during job search. Standard errors are clustered at the cohort (day of hire) level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

D Additional materials

Figure D1: Visualization card for information treatment

Notes: This figure shows the visualization card enumerators used during the information treatment. The infographic on the left states that 15 out of 100 workers were promoted to an upper-level position (quality Control, team leader, line supervisor, supervisor) within one year. The infographic on the right states the average salary for an upper-level position. The bottom note states that this was estimated with a survey of 385 workers conducted by the Ethiopian Investment Committee. See Section 2 for detailed discussion.