Impacts of industrial and entrepreneurial jobs on youth: 5-year experimental evidence on factory job offers and cash grants in Ethiopia

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Abstract

Can one-time interventions help poor and underemployed youth overcome barriers to wage or self employment? We study the effects of two interventions across five sites in Ethiopia: a start-up grant of $300 plus business training (intended to relieve capital constraints); and a one-time industrial job offer (intended to help low-skilled youth with no formal work experience gain entry into the formal sector). Among young, mostly female, job applicants in Ethiopia, we randomly assigned them to the start-up grant, job offer, or a control group. After one year, grant recipients were more likely to be self-employed and had a third greater earnings than controls. Those offered industrial jobs were somewhat more likely to be working in the industrial sector, but the offer had no impact on incomes and adverse effects on health. After five years, all these effects dissipated. We find nearly total convergence in incomes, health, occupational choice, and hours of work between in all experimental conditions. Over time, the control group overcame entry barriers to self-employment and wage work, and in part caught up to the start-up group in incomes and employment. Many of those in the start-up arm also exited their enterprises over time and saw their real incomes and employment fall. Those offered the industrial job tended to exit the sector over time. We see no long term effects on ill health, though this could be in part because some of the control group found work in industry as well.

JEL codes: J24, O14, F16, J81, O17
Keywords: entrepreneurship, cash transfers, wage labor, factories, employment, poverty, occupational choice, health, field experiment

1 Introduction

We report on an experiment in offering industrial jobs or cash grants to low-skilled Ethiopian youth to assess their barriers into successful employment. We look at whether one-time interventions can overcome impediments to entering low-skill wage work or self-employment, and the longer run (5-year) economic and other impacts. Our aim is to assess what employment barriers may be important, as well as earnings and employment dynamics over time. We also want to assess any unintended consequences on health.

In developing countries, such as Ethiopia, low-skilled youth often spend long periods of time underemployed or not employed at all. When they do find work, it is typically some kind of low-productivity "entrepreneurial" self-employment in agriculture or petty trades. Of the many barriers to more and better self-employment, a lack of capital and access to credit are thought to be especially important.[1] Young women often face steeper challenges than men, and in many societies, upon marriage women may reduce their work or exit the labor force entirely.

Ethiopia is a growing export hub in horticulture, textiles, and leather. As countries like Ethiopia enter the early stages of industrialization, the number of low-skill industrial job opportunities have grown. At the outset of the experiment, we observed queuing for these kinds of jobs, mainly unemployed young women. We hypothesized that these jobs were scarce and desirable either because they paid wage premiums or get set on a job ladder that leads to scarce skills, better jobs, and higher wages over time.[2]

In this context, cash grants or other start-up help could dramatically increase long run earnings. A considerable amount of mostly short term evidence suggests this may be the case.[3] Young people may have the potential to be successful entrepreneurs but lack the initial capital required to start such small businesses. They may also face uncertainty about their own ability to run an enterprise and not be able to take the risk with experimenting with

[1] See Banerjee and Duflo (2011), Blattman and Ralston (2015), Brudevold-Newman, Honorati, Jakiela, and Ozier (2017), McKenzie (2017).

[2] Theoretically, there are several reasons why industrial work would pay a wage premium compared to informal work. Firms may pay efficiency wages or there may also be institutional and legislative sources, such minimum wages, labor codes, or union bargaining (Katz, Summers, Hall, Schultze, & Topel, 1989; Akerlof & Yellen, 1986; Card, 1996). If so, the result is a dual or segmented labor market, in which those gaining industrial jobs earn rents while informal workers queue for those jobs (Lewis, 1954; Harris & Todaro, 1970; Fields, 1975). Empirically, a large body of observational evidence suggests that formal firms pay premium wages, especially large, foreign-owned, or exporting firms (Bernard, Robertson, & Schott, 2010; Verhoogen, 2008; Söderbom & Teal, 2004; El Badaoui, Strobl, & Walsh, 2008). Plant-level data show that large and foreign firms pay higher wages than smaller or domestically-owned ones (Aitken, Harrison, & Lipsey, 1996; Lipsey & Sjöholm, 2004; Strobl & Thornton, 2004).

[3] See Blattman, Fiala, and Martinez (2014), Blattman, Annan, Green, Lehmann, and Jamison (2015), Beaman, Karlan, Thuysbaert, and Udry (2018), Blattman, Fiala, and Martinez (2018), Haushofer and Shapiro (2018).

this kind of work. The same could be true for the person in the queue who gets the industrial job.[4] Although not all people may be well-suited to industrial work, there may be some, for it offers improved earnings prospects relative to their other options. But because so many low-skilled people apply, these well-matched individuals may never get the opportunity to enter into these occupations.

To investigate, we identified five industrial firms in different sectors and regions, each hiring large batches of workers for a line expansion. The nearly 1000 eligible applicants were mainly unemployed women in their early 20s, with no formal work experience and little self-employment. We worked with the firms and applicants to randomly assign the applicants to one of three arms: (1) an entry-level job offer in the firm; (2) a business start-up grant worth roughly $300 (close to one year's income in the firm) along with a few days of training and consulting on small enterprises; or (3) a control group. We followed up after 1 and 5 years, finding 85–90% of the sample over time.

We do not find support for any of our hypotheses. We see almost complete convergence in earnings, employment and health over five years. Medium-run equilibrium labor market outcomes seem unaffected by interventions that either smooth the entry into industry or microenterprises.

In Blattman and Dercon (2018) we reported 1-year impacts, finding that industrial jobs were hazardous and failing to provide wage premiums, but the start-up assistance (the grant) supported relatively high-return entrepreneurship. We observed immediate and powerful effects of both interventions on earnings and employment. At the end of a year, however, all three arms had converged in terms of employment hours, as most people in the sample were nearly fully employed in some low skill work. In the absence of the job offer or the grant, the control group managed to find other low-skill work. Also, many of the people offered factory jobs found them low-paid, unpleasant and risky to their health, and they often left quickly. While those offered the grant weren't working many more hours, their earnings were about a third higher than the other two groups. This corresponded to nearly $1 a day greater income—a huge amount considering the counterfactual was only about $3 (in PPP, or about a third of this amount in dollars of 2010).

We returned after 5 years for a few reasons. First, we wanted to see whether the entrepreneurs who received the grant continued to raise their productivity and incomes. One-time business start-up grants have become a popular poverty alleviation tool.[5] Some very

[4]Women are commonly employed in low-skill firms, and there is observational evidence that working in textile factories or other export manufacturers raises women's status in the household, their quality of life, and the health of children (Kabeer, 2002; Hewett & Amin, 2000; Atkin, 2009; Getahun & Villanger, 2016).

[5]In addition to the cash grant studies cited above, a number of studies have found large poverty impacts from giving the ultrapoor income-producing assets such as livestock (Banerjee et al., 2015; Bandiera et al.,

promising short-run results have prompted economists to conclude that many poor people have high returns to capital but are too credit constrained to take advantage of them (Karlan, Osei, Osei-Akoto, & Udry, 2014; Brudevold-Newman, Honorati, Jakiela, & Ozier, 2017). There were no long run studies until very recently, and at least one of these found convergence between the treatment and control groups after 9 years (Blattman, Fiala, & Martinez, 2018), since the control group eventually overcame its credit constraint and founded small enterprises.

Second, we wanted to assess longer run impacts of the industrial job offer on income and employment. We might not expect earnings gains after one year because entry level wages are so low, but by fostering experimentation with a new sector, new matches, and allowing 'good' types to get a foot in the door, we may see their wages rise with tenure and from climbing up the job ladder (even if this is a minority of those assigned to the job).

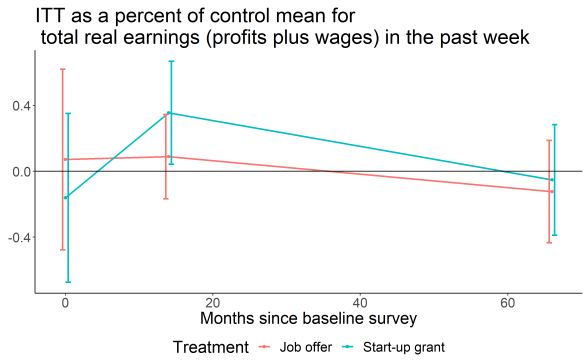
Third, the 1-year impacts of factory work suggested that those who took the factory job were more likely report substantial health problems, even though the average person quit after a few months. Were these real and chronic health problems? Our 1-year measures were limited, as was the time frame. We returned with a battery of new measures. This is why, alongside income, we prespecified health as our second primary outcome.

Figures 1a and 1b summarize the paths of income and employment in all three arms over the 5 years. In Figure 1a, which shows all results deflated to 2010 Birr, we see a steep jump in weekly earnings in all three groups in the first year. This suggests that people were selecting into the sample of job applicants because they were new labor market entrants or had suffered a shock, and so there is a powerful mean reversion in income and hours, complemented by a life-cycle effect from youth increasing hours and earnings over time. But the start-group has earnings about a third greater than any other arm after 1 year. There is no significant earnings difference after 5 years, however.

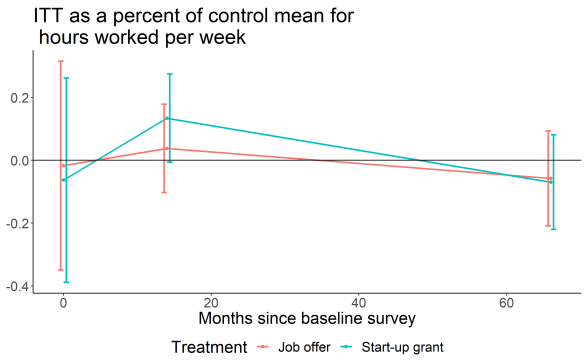
2013, 2017), or from giving poor existing entrepreneurs added investment capital. (Gertler, Martinez, & Rubio, 2012; Bianchi & Bobba, 2013)

Figure 1: Progression of income and hours worked across time by treatment status

(a) Mean income (all profits and wages) in past week across time for all cohorts



(b) Mean hours worked across time for all cohorts



The figure makes it seem that factory and control group incomes are stagnating and the start-up arm is converging down to their level. This is possible, though we note that this is a period of high inflation, and nominally earnings and consumption are rising. When we use the sole available inflation index, real incomes appear stagnant, but it is hard to know if this is the relevant inflation index for poor young people. Nonetheless, whether the control group is converging up or the start-up arm is converging down, we see no sustained effect of cash on income. The same is true of our consumption measures.

From Figure 2, we see a similar convergence in employment. We find that this is driven predominantly by reductions in hours worked among the start-up arm, which is turn driven by an exit from self-employment in large numbers. Hours worked among the control group are similar between years 1 and 5, while participation in self-employment remains roughly constant between the endline surveys. It appears that the additional experimentation with self-employment induced by receiving the grant does not lead to any long-run entrepreneurial success.

Only one in six people remain in factory work, even among those offered the job. Self-employment and other wage work are more common. Again this is likely a combination of mean reversion and life-cycle evolution as poor younger labor market entrants (mainly girls) acquire human, physical, social capital and opportunities. Could also reflect a shift to home employment as girls get older and married. From our data and qualitative work, it seems that factory jobs were being used as a safety net to smooth income temporarily until other less rigid and less risky work could be found, rather than a permanent employment option for most people.

In terms of health, we see no evidence of long term adverse effects from the factory employment. It could be that factory adverse health effects we observed after one year

were temporary, yet this is hard to stay because the "first stage" effect of the job offer on cumulative months of factory experience has attenuated to 3 months (since the control group is tending to find and take factory jobs, also somewhat temporarily).

In the end, a main takeaway from this experiment is that two of the interventions that some schools of thought think should have large lasting effects on poverty simply do not have these impacts, at least in this setting and with young women.

As in a similar cash start-up experiment in Uganda, the cash acted more like a temporary kick start that a permanent lift out of poverty. The industrial job offer, meanwhile, turned out to be more of a nudge than helping people to jump a queue or accelerate a search and matching process. Nudging people into an industrial job had at most short term effects on income, employment and health, and the only lasting effect is a minor effect on occupational choice. In the end, we found factory jobs to be much more like "normal" jobs (little real queuing or wage premiums) except insofar as they seemed to be associated with health risks.

One interpretation is that one-off interventions and nudges addressing a single or small number of market failures may be non-lasting. Powerful forces may push individuals back towards equilibrium outcomes irrespective of interventions. This is largely speculative, but if more interventions in more places fail to find long run effects of initially-successful poverty interventions, it may pose a serious challenge to the marginalist view of poverty alleviation and push interventions to be more multifaceted addressing multiple barriers at once, and perhaps addressing constraints at the local or macro level as well.

2 Setting

Ethiopia is the second most populous nation in Africa after Nigeria, and also one of the poorest. 27 percent live under $2 a day in purchasing power parity (PPP) terms, and agriculture employs 85 percent of the workforce. Like many African countries, the underdeveloped private sector has offered few formal sector jobs. Youth unemployment and underemployment are high. Most young people are engaged in informal wage work or self-employment.

At the same time, Ethiopia is also one of the fastest growing economies in the region, with GDP growth of roughly 10% per year from 2006–16. In particular, Ethiopia has become a growing export hub in horticulture, textiles, and leather. Although the economy has been moving in fits and starts through the early stages of of industrialization, Ethiopia has been touted as one of "China's successors" in light manufacturing (NPR, 2014; The Economist, 2014). The country has several advantages from a manufacturer's point of view: low wages, a politically stable and foreign investment-friendly regime, a domestic market of 94 million people, and proximity to Europe.

Over the last two decades, there has been a transformation in Ethiopia's urban labor markets. They have become more flexible, with rising importance of private sector work, no obvious skill premiums between the private and public sector, and lower (but still considerable) urban unemployment. In all the firms in our study, and in general across the private sector, employers can set wages without any legal restriction or reference to union deals. The governing labor law makes it also relatively straightforward to fire an employee. Appendix I elaborates.

In the years prior to our study, 2000–08, national income and industrial output both grew about 10 percent per year, with the number of medium and large manufacturers doubling in number (CSA, 2011). The beginning of the study period was first a boom time followed by a mild slow down. Even so, during this period new foreign firms were entering the market and starting small plants, and some domestic firms were continuing to invest and expand. Growth picked up later in the study period, and again Ethiopia is now one of the fastest growing economies in the region.

3 Experimental sample, procedures, and data

3.1 Experimental sample

Our sample of young people comes from job applicants to 5 industrial firms, in 5 different sectors and 4 regions of the country, both urban and rural. Two firms hired more than one cohort over the study period, 2010–13, for a total of eight cohorts. Table 2 describes the firms and cohorts, with further details in Appendix II. Three firms engaged in light manufacturing (textiles and garments, shoes, and beverages) and two in commercial agriculture (flowers and vegetables). Four were export-oriented. Only one was foreign-owned.

Eligible job applicants were recruited and screened in the firm's standard fashion, described below. Only these screened applicants were eligible for one of the two treatments: an industrial job offer or the start-up grant package.

Table 1 reports baseline characteristics of these screened applicants, from self-reported surveys.[6] 80 percent were women. The average applicant was 22 and had completed grade 9. Most were unmarried. They had 7.5 hours of work per week, typically a portfolio of activities such as farming, casual labor, or petty business. They had earned little cash in the previous month. Only 27 percent had worked in a large, formal firm before, and only 19

[6] Applicants completed a 90-minute baseline survey plus 45 minutes of interactive games, with real money, to measure time and risk preferences, and cognitive abilities such as executive function. An Ethiopian enumerator delivered surveys and the games verbally in the local language. The games remunerated the respondent with roughly a half days wages.

Table 1: Baseline summary means and test of randomization balance

Baseline covariate (n=947)	Control mean (n=358) (1)	Balance test (OLS) Job–Control Diff (2)	Job–Control p-value (3)	Entrepreneur–Control Diff (4)	Entrepreneur–Control p-value (5)
Female	0.80				
Age	22.02	-0.12	0.68	-0.14	0.63
Unmarried	0.81	-0.06	0.07	-0.04	0.25
Muslim	0.05	-0.00	0.90	0.00	0.98
Household size	4.35	-0.13	0.45	-0.14	0.45
Household head	0.23	0.04	0.25	-0.00	0.96
Proportion household dependents	0.43	-0.00	0.98	-0.00	0.96
Total years of education and training	9.31	-0.20	0.34	-0.02	0.92
Executive function, z-score	0.11	-0.18	0.01	-0.13	0.08
Weekly cash earnings (2010 birr)	9.57	0.59	0.81	-1.44	0.57
Durable assets, z-score	0.09	-0.11	0.13	-0.13	0.06
Ever worked in a large firm	0.27	-0.03	0.43	0.05	0.18
Average weekly hours of work	7.52	-0.09	0.94	-0.36	0.80
No work in past 4 weeks	0.68	0.01	0.86	-0.01	0.76
Highest - lowest earnings, past month	181.38	39.44	0.05	15.84	0.33
Could borrow 3000 birr	0.31	0.04	0.27	-0.00	0.98
Ability to do activities of daily life (0–15)	14.32	0.09	0.40	0.10	0.31
Disability (great difficulty at >1 ADL)	0.01	-0.01	0.26	-0.00	0.77
Risk aversion, z-score	-0.01	-0.05	0.55	0.10	0.20
Future orientation, z-score	0.10	-0.06	0.45	-0.03	0.73
Locus of control index, z-score	-0.04	0.04	0.62	0.13	0.12
Self-esteem index, z-score	-0.05	0.03	0.75	0.06	0.42
Family relations index, z-score	-0.05	-0.02	0.77	0.07	0.35
Friends and neighbors relations index	-0.01	-0.05	0.49	0.00	0.95
Change in subjective well being, past yr.	0.22	0.20	0.03	0.09	0.33
Symptoms of depression, z-score	-0.02	0.02	0.82	0.01	0.94
Symptoms of anxiety, z-score	-0.04	0.05	0.50	-0.01	0.92
Aggressive or hostile behaviors, z-score	0.04	-0.06	0.44	-0.13	0.11
Conscientiousness index, z-score	-0.00	0.01	0.89	0.04	0.65
Years experience, private firm	0.34	0.17	0.08	0.22	0.02
Years experience, workshop	0.01	0.00	0.73	0.01	0.27
Years experience, government/NGO	0.08	-0.02	0.67	0.02	0.73
Probability of better job, next month	0.68	-0.01	0.47	-0.01	0.72
Probability of full-time work, next month	0.55	0.01	0.74	0.03	0.17
p -value from F-test of joint significance		0.04		0.01	
Observations		662		643	

Notes: Medians are imputed for baseline variables with missing observations. Treatment and control group differences are calculated using an OLS regression of each covariate on treatment indicators plus block (cohort-gender) fixed effects. Balance tests for the female dummy are omitted because randomization was blocked on gender. Standard errors are heteroskedastic-robust.

Table 2: Characteristics of our study cohorts and interventions

	Firm and cohort						
Characteristic	Beverage producer		Horticulture farm	Flower farm	Shoe factory	Garment & Textile factory	
Site type	Peri-urban		Rural	Peri-urban	Urban	Peri-urban	
Region	Oromia		SNNP	Oromia	Addis	Tigray	
Approximate number of employees	150		250	2,000	1,400	700	
Foreign owner?	N		Y	Y	N	N	
Exporter	N		Y	Y	Y	Y	
Unionized?	Y		N	Y	Y	Y	
Start date (MM/YY)	04/10	03/11	10/11	11/11	01/13	05/12	05/13	06/13
Eligible sample	53	68	89	152	158	89	140	188
Jobs available	15	19	30	50	50	30	45	60
Monthly wage (current birr)	350	350	574	535	734	417	420	420
Monthly wage (2010 birr)	348	280	381	395	422	247	234	233
Weekly work hours	48	48	48	47	44	48	48	48
Grants (after tax)								
In current birr		4,872	5,016	4,969	5,773	5,124	5,849	5,884
In 2010 birr		3594	3330	3293	3278	3048	3266	3196
In USD		290	290	290	315	290	315	315
Tranches		2	2	2	1	1	1	1
Applicants								
Age	22	24	23	22	24	22	21	20
Female	64%	44%	77%	100%	66%	52%	100%	100%
Married	15%	22%	31%	34%	34%	10%	25%	8%
Education	11	11	6	6	12	10	11	9

Notes: Firm data come from firm manager interviews. Applicant data come from a baseline survey, described in Section 3.4.

percent in a factory. Based on qualitative interviews, most applicants had only a hazy idea of the type and difficulty of the work in advance, and often only learned the salary being offered at the time of hiring.

3.2 Interventions

3.2.1 "Start-up" grant and training

The core of the start-up treatment was an unconditional cash grant of nearly 5000 Birr, or roughly $300. (see Table 2).[7] We chose the $300 amount based on our qualitative assessment of the costs required to set up a small part-time enterprise. While we framed the cash grant as a business start-up fund, throughout the intervention we made clear that it was nonetheless an unconditional grant and grantees were free to use it as they saw fit—savings, consumption, or investment.

To encourage and enable business start-up, however, grantees initially received five days of business training and planning.[8] Professional skills trainers led classes of about 20, and each person also received individual mentoring during those five days.[9] Subjects had to complete at least three days of the training to receive the grant.

3.2.2 Industrial job offer

The jobs involved working on production lines where the workers bottled water, picked and packed produce and flowers, cut fabric, or sewed shoes. They could involve heavy machinery or simple tools.

In terms of eligibility, the positions required no previous work experience. Applicants had to be healthy and able-bodied. All firms also had a minimum education requirement —grade 6 in the two rural horticulture firms, and grade 8 or 10 in the more urban manufacturing ones. Most firms had separate jobs for men and women, and depending on the position they were hiring for, they would specify a gender.

[7]The grant amount varied slightly from cohort to cohort because of inflation, currency devaluation, and tax issues. For cohorts 2 to 4, a for-profit firm ran the intervention and was required to withhold tax on the grants. To minimize the tax burden the cash was disbursed in two tranches several weeks apart. We used a for-profit firm because we could not find a non-profit organization willing to disburse cash without conditions at low cost. For cohorts 5 to 8, we ran the intervention through a parastatal research organization to avoid the tax burden. The amount of the grant was increased to maintain the rough purchasing power and disbursed in a single tranche to reduce implementation costs.

[8]Total implementation cost of training and grant was roughly $450 per person including the grant, training, and local program administration.

[9]Cohorts 2 and 3 also received a follow-up visit by the trainer after three months for additional advice. Grantees did not see this service as helpful, and given the cost it was discontinued after cohort 3.

The positions required 45 to 50 hours per week over 5 or 6 days. At the time of the baseline surveys, the jobs typically paid a wage of $1 to $1.50 per day at 2010 market exchange rates (where $1 = 13.5 birr in 2010). Some firms offered non-wage benefits such as on-site health care and bus transport.

The workplaces were professional and well-maintained, and firms never coerced employees. Nonetheless, health risks were common, especially: air quality (dust particles or chemical fumes); discomfort and fainting from standing or lack of breaks or water; and safety hazards such as wet floors, sharp instruments, and so forth. In interviews, workers who used cleaning solvents, pesticides, dyes and glues sometimes reported fainting from inhalation.

Most firms were unionized, but these were generally worker associations that mediated disputes but did not engage in collective bargaining. Occasionally, however, we did observe short strikes or walkouts in response to salary delays.

3.3 Recruitment

3.3.1 Firm recruitment and selection

We approached roughly 300 firms, about half of all private industrial firms in Ethiopia with 50 or more employees.[10] We contacted them by phone or walk-in. To be eligible for the study, a firm had to be in manufacturing or commercial farming, expect to hire a batch of at least 15 low-skill, full-time workers, and be willing to randomly assign job offers among screened applicants.

The limiting factor was whether a firm had imminent large expansion plans. Only a handful had plans to open a entire new production line and hire a large batch of workers at once.[11] Firms with more modest expansion plans were a poor fit for the study, as they planned to hire people piecemeal, to accommodate more gradual growth and cope with regular attrition.

Randomization was seldom an issue, and more than three-quarters of the firms we approached were open to the study.[12] While one might expect that firms want to select the

[10]We identified these firms through applications for investment certificates, public business listings, industry associations, and personal contacts.

[11]One reason is that sector growth was slowing in this period. 2010 to 2012 in Ethiopia was a period of moderate government financial repression and pre-election uncertainty. Despite a growing economy and a boom in some sectors, such as construction, many of the existing firms we approached were temporarily holding off on growth plans. Other common sources of delay included difficulty in obtaining licenses, foreign exchange, importing equipment, and obtaining parts. At least two other firms intended to participate, but suffered prolonged delays and did not open their new line during the study period. Also, some sector growth was coming from new firms, often foreign-owned, who were reluctant to participate because their start-up was already complicated enough.

[12]They typically expressed interest in participation in the study for several reasons: curiosity in the

best workers, low-skill entry-level positions were often filled without a substantive interview process. In most of the firms we approached, entry-level hiring was ad hoc in the sense firms filling low-skill positions on a first-come, first-hire manner, with little or no interview process.

What are these five study firms a case of? Our data suggest the jobs are similar to other labor-intensive, low-skill, entry-level positions in the large textile, garment, footwear, beverage, and commercial farming sectors, and thus different from positions in higher-skill and heavier or more capital-intensive manufacturing. Compared to a representative sample of industrial firms in 2014 in the capital Addis Ababa, our five firms had higher revenues, lower profits, two to three times as many production employees, and lower-skilled employees.[13]

It is reasonable to worry that firms willing to randomize employment were poorly managed or had unusual turnover. While possible, qualitatively we saw little difference between our firms and the others we approached. On the contrary, all were expanding employment, suggesting they had more credit and higher returns to investment than others.

3.3.2 Sample recruitment and selection

We followed each firm's normal procedures for hiring batches of new employees to staff new production lines. The firms advertised jobs through a posting on the front gate, word of mouth, and local job boards.[14] Applicants were instructed to gather on a specific day. Firm managers would then screen written or verbal applications, typically based on job-specific gender, education, and health requirements. Across all 8 cohorts, between 75 and 95 percent of applicants passed these criteria and thus entered the study sample. We do not have data on ineligible applicants.

answer; the opportunity to bring some structure to relatively unstructured hiring processes; and an interest in learning more about their applicant pool and the other opportunities available to their employees.

[13]Given the low-skill nature of the work and the entry-level positions, starting salaries were lower than the manufacturing average—at roughly the 25th percentile of manufacturers in the capital. Since most of our firms are outside the capital, the purchasing power of their wages is greater, probably putting them between the 25th and 50th percentile in terms of wages. Moreover, comparing wages to the distribution quoted in the 2009/10 census of manufacturing firms suggest that they were not at all uncommon for the specific sectors involved. The modal workers in the census earned between 400-600 birr in 2010 prices, with the second most common interval 200-400 birr, jointly making up 40 percent of the workforce in manufacturing in general and more than 60 percent in textiles or footwear (CSA, 2011). The wages of the workers in our sample fall in these ranges. See Appendix IV for data and analysis.

[14]In order to ensure sufficient applicants, we only made one change to standard procedures: we assisted the firm in posting more notices within a wider radius than usual (usually no more than a few kilometers). Since the firm typically drew employees from this radius, we expected this to generate an applicant pool very similar to the usual one. It is possible, however, that the experimental pool of applicants is further outside the family/friend network, and lives slightly further from the factory, than would otherwise have been the case. That said, most applicants live within a few miles of the firm, and so are extremely local by any measure. (The firms, who were reluctant to hire people who lived far away, reported that they did not think the distance would make a material difference, since all live nearby.)

A research team from Innovations for Poverty Action (IPA) and the Ethiopian Development Research Institute (EDRI) then debriefed eligible applicants on the study, the start-up start-up arm arm, and the survey and randomization procedures. Nearly all agreed to enter the study, completed a baseline survey, and entered the lottery.

Following randomization, the firm posted the names of people receiving the job offer at the factory site and the IPA/EDRI research team contacted all those assigned to two treatment arms. Job offers began within a few days and the start-up training and grants within a few weeks.

We gave each firm a list of unsuccessful applicants and asked the firm not to hire them for at least 1–2 months. In practice, however, the firms kept poor records and within a few days or weeks of the randomization could have hired control group members.

3.4 Randomization and balance

We randomized by cohort, stratified by gender, using a uniform random variable generator. 304 were assigned to the job offer, 285 to the start-up grant arm, and 358 to the control arm.

Table 2 reports tests of randomization balance, where we regress each covariate on treatment indicators plus randomization block (cohort-gender) fixed effects. This sample is somewhat imbalanced across the treatment arms at baseline. As Table 1 shows, of the 34 covariates across two treatments, 8 of the 68 mean differences (12 percent) have $p < .1$. Those assigned to jobs are less likely to be married and have slightly lower executive functions and education compared to the control group. Those assigned to the entrepreneurship program have lower assets and more firm experience. A test of joint significance of all covariates has a p-value of 0.04 for the job offer and 0.01 for the entrepreneurship program. To minimize bias, we control for baseline covariates when estimating treatment effects.

3.5 Outcomes

3.5.1 1- and 5-year endline data

We conducted follow-up surveys roughly 1 and 5 years after assignment to the two treatments. At each of these two endlines, we attempted to reach each respondent twice, roughly 2–3 months apart, to measure our main outcomes twice. We did so to improve statistical precision with highly-variable outcomes such as earnings or consumption (McKenzie, 2012).[15]

[15]For the 1-year survey, we also attempted to interview the household head once, since the sample member may have been a dependent and unaware of household labor allocations, wealth, and attitudes. At the 5-year survey, given that the sample is considerably older, we did not interview household heads.

During site visits to several dozen factories and commercial farms we conducted informal interviews with workers and managers. At each study firm we systematically interviewed managers at every level from senior management to line managers. Research assistants also interviewed 138 workers and microenterprise owners, both in and out of the sample. They also conducted 60 exit interviews by phone with sample members who quit the study firms.

We also conducted qualitative work over the first year of the interventions. During site visits to several dozen factories and commercial farms we also conducted informal interviews with workers and managers. At each study firm we systematically interviewed managers at every level from senior management to line managers. Research assistants also interviewed 138 workers and microenterprise owners, both in and out of the sample. They also conducted 60 exit interviews by phone with sample members who quit the study firms.

3.5.2 Attrition

Our sample frequently moved between survey rounds. We were able to track down 88% after 1 year and 84.3% after five.[16] Table 3 reports the correlates of attrition after 5 years, from a simple regression of an attrition indicator on baseline covariates.

After 1 year, all treatment arms were roughly as likely to be found. After 5 years, those assigned to the job offer were no more likely to be found after five years than the control group. But those assigned to the start-up arm were roughly 5 percentage points more likely to be found and interviewed. Controlling for baseline covariates, this difference is not statistically significant, but it is potentially substantively important. Thus, below, we will consider the robustness of our estimates to alternative attrition scenarios and sensitivity analysis.

Otherwise, attrition is mostly uncorrelated with baseline characteristics. The exception is marriage, as unmarried individuals at baseline are 6.5 percentage points less likely to be found after five years. Women commonly move to become married, and this may account for their loss.

3.5.3 Primary outcomes and dealing with multiple outcomes

Based on the 1-year findings, our pre-analysis plan for the 5-year endline pre-specified two primary outcomes of interest: income and physical health. As secondary outcomes we specified an interest in occupational choice and quality. We designated all other outcomes as exploratory.[17]

[16] For discussion of the rates and pattern of attrition for the 1-year endline survey, see Blattman and Dercon (2018).

[17] See `https://www.socialscienceregistry.org/trials/2198`

Table 3: Attrition

	Attrition and Non-Response			
	Only FE		All Covariates	
Dependent Variable: No-response in both rounds in this endline	Beta	Std. error	Beta	Std. error
	(1)	(2)	(3)	(4)
Assignment to Treatment: formal sector job	0.006	0.032	0.017	0.034
Assignment to Treatment: grant and training	-0.048	0.031	-0.040	0.032
Age			0.941	1.351
Age squared			-0.057	0.079
Age cubed			0.002	0.002
Age quartic			-0.000	0.000
Female			0.123	0.096
Unmarried			0.053	0.034
Muslim			0.233	0.071***
Household Size			0.007	0.008
Household head			0.048	0.039
Proportion of household dependents			-0.027	0.026
Numeracy score			-0.004	0.006
Total years of education and training			-0.000	0.008
Cognitive function score			-0.022	0.019
Executive function, z-score			0.037	0.018**
Completed secondary school			0.007	0.046
Weekly cash earnings, 2010 Birr			0.000	0.001
Durable assets, z-score			-0.013	0.020
Wealth index: Production Durables (Z-Score)			-0.036	0.015**
Total debt			0.000	0.000
Total savings			0.000	0.000*
Average weekly work hours (over past 2 weeks) :			0.003	0.005
Hrs work/wk, cas non-farm labor			0.002	0.003
Hrs work/wk, factory			-0.003	0.004
Hrs work/wk, petty business			-0.000	0.002
Hrs work/wk, skilled trades			-0.002	0.004
Hrs work/wk, low skill sal labor			-0.002	0.002
Hrs work/wk, med skill sal labor			0.000	0.000
Hrs work/wk, other work			-0.001	0.003
Did no work in the past 2 weeks (formal and informal)			0.002	0.060
Ever worked in a large firm			0.004	0.040
Months experience: Agriculture			0.000	0.000
Months experience: Casual work			-0.002	0.001
Months experience: Factory labor			-0.000	0.002
Months experience: Petty business			-0.000	0.001
Months experience: Skilled trade			-0.002	0.001**
Months experience: Wage labor - low skill			0.000	0.001
Months experience: Wage labor - medium skill			0.002	0.006
Months experience: Other			0.000	0.002
Years experience, private firm			-0.015	0.015
Years experience, workshop			-0.122	0.086
Years experience working in state/parastatal org			0.040	0.035
Years experience working in NGO			-0.025	0.063
Self perception of health			-0.003	0.006
Probability of a better job, next month			-0.035	0.064
Probability of full-time work, next month			0.066	0.062
Predicted income uncertainty in next year			-0.000	0.000
Predicted income uncertainty in next month			-0.000	0.000
Highest - lowest earnings, past month			-0.000	0.000
Could borrow 3000 birr			0.062	0.033*
Family relations index, z-score			0.026	0.015*
Friends and nieghbors relations index			-0.028	0.015*
Ability to do activities of daily life (0-15)			0.002	0.012
Disability: Great difficulty at more than 1 activities			0.211	0.192
Change in subjective well being, past yr.			-0.008	0.013
Symptoms of depression, z-score			-0.003	0.019
Symptoms of anxiety, z-score			0.012	0.020
Risk aversion from IBM games			0.004	0.015
Risk aversion score			0.005	0.011
Patience score from IBM games			-0.006	0.017
Time inonsistency score			0.013	0.022
Patience index			0.021	0.009**
Locus of control index			-0.007	0.015
Self esteem index, s-score			0.023	0.016
Self control index			-0.015	0.014
Agressive or hostile behaviors, z-score			0.015	0.014
Conscientiousness index, z-score			-0.024	0.016
P-value of F-test	0.1751		0.0017	
N	947		947	

* indicates $p < .1$, ** indicates $p < .05$, and *** indicates $p < .01$

Regression estimates use the full sample of baseline respondents with cohort and district fixed effects.

We divided outcomes into primary and secondary to minimize the number of hypotheses tested. To further minimize comparisons, we assemble our various measures a family index of income and a family index of health. Our tables report treatment effects on the components of these indexes as well, but those comparisons should be regarded as exploratory. At present we have not adjusted our p-values for multiple comparisons across the two primary measures or within these indexes.

3.6 Estimation

To estimate program impacts on outcome Y, we calculate the intent-to-treat (ITT) estimate of the job offer and start-up arms via OLS:

$$Y_{irj} = \alpha_j + \gamma_{r=13} + \theta_J Job_{ij} + \theta_E Startup_{ij} + \beta \mathbf{X}_{ij} + \epsilon_{ij} \quad (1)$$

where *Job* and *Startup* are indicators for random assignment to the treatment arms. To account for observed baseline imbalance and endline attrition, we control for the baseline covariates, X, listed in Table 1, as well as gender-cohort fixed effects, α_j. Recall that at each endline we surveyed respondents in two different rounds r, collecting the same outcome two times. Each round enters the regression as a separate observation, and we cluster standard errors by individual and include a fixed effect, $\gamma_{r=2}$, for the second round.

Note that all outcomes are self-reported, and each treatment arm was aware of their assignment and the existence of other arms. Thus there is the potential for self-reported outcomes to vary with treatment status. As with most low-income countries, there are no administrative data on earnings. And as with most countries there are no systematic and available administrative data on health or informal earnings.

4 Results

4.1 Economic impacts

Table 4 reports 1- and 5-year ITT estimates for measures of income and employment levels. Figures 1a and 1b in the introduction trace the earnings and employment results over time, and this table expands the range of measures and components.

Our primary economic outcome is income. We have two measures of income, pre-specified, that we combine into an income family index. One is the sum of weekly cash earnings across 22 different occupations. Earnings are seasonal and do not reflect home production, so we also

Table 4: Impacts on income and employment

Outcome	1-year Endline				5-year Endline			
	Control mean	N	ITT Estimate		Control mean	N	ITT Estimate	
			Job offer	Start-up grant			Job offer	Start-up grant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income and consumption, z-score	-0.005	1,587	0.016	0.139**	0.007	1,390	-0.047	-0.044
			[0.053]	[0.059]			[0.067]	[0.069]
Weekly earnings, 2010 Birr	34.227	1,586	3.036	12.156**	35.316	1,390	-4.370	-1.857
			[4.476]	[5.466]			[5.606]	[6.051]
Earnings per hour, 2010 Birr	1.562	1,019	0.073	0.126	1.484	758	-0.169	0.176
			[0.267]	[0.266]			[0.379]	[0.340]
SD of weekly earnings	58.150	1,587	6.472	4.653	56.412	1,390	1.131	3.876
			[7.673]	[8.139]			[8.950]	[9.986]
Household nondurable consumption, 2010 birr	665.049	1,584	20.363	59.320*	1,733.461	1,390	-28.372	-58.147
			[35.300]	[35.845]			[93.067]	[88.259]
Employment and occupational choice, z-score	-0.038	1,587	0.078	0.041	0.072	1,390	-0.066	-0.076
			[0.074]	[0.076]			[0.080]	[0.080]
Hours work/week, past 2 weeks	26.394	1,585	0.995	3.535*	26.504	1,390	-1.532	-1.848
			[1.894]	[1.892]			[2.043]	[2.034]
Factory labor	7.463	1,581	3.017**	-4.114***	6.132	1,390	0.560	-3.517***
			[1.380]	[1.168]			[1.423]	[1.222]
Farm wage labor	3.074	1,584	1.816**	-1.469**	0.440	1,390	1.008**	-0.045
			[0.914]	[0.744]			[0.454]	[0.334]
Smallhoder farming	0.821	1,584	-0.258	1.480***	0.219	1,390	-0.001	0.130
			[0.323]	[0.398]			[0.116]	[0.143]
Petty business	4.037	1,586	-0.877	5.378***	6.016	1,390	-1.881	-0.411
			[0.977]	[1.378]			[1.312]	[1.289]
Skilled trades	1.592	1,583	-0.737	-0.570	3.134	1,390	-1.483**	-1.403*
			[0.449]	[0.483]			[0.633]	[0.779]
Casual nonfarm labor	2.180	1,586	-0.952*	0.726	0.828	1,390	0.616	0.859
			[0.568]	[0.770]			[0.467]	[0.546]
Low-skill salaried labor	4.187	1,586	0.064	-0.410	3.359	1,390	0.039	0.076
			[1.095]	[0.955]			[0.875]	[0.892]
Hrs Medium-skill salaried labor	1.209	1,586	-0.415	1.610***	3.281	1,390	1.051	3.313***
			[0.419]	[0.590]			[0.869]	[0.983]
Other work	2.268	1,439	-0.094	0.493	2.257	1,390	-0.886	-0.784
			[0.693]	[0.737]			[0.577]	[0.593]
No work in past two weeks	0.343	1,586	-0.013	-0.082**	0.411	1,390	-0.007	-0.038
			[0.033]	[0.032]			[0.040]	[0.038]
SD of hours/week	16.444	1,586	-1.307	3.956***	11.841	1,390	1.378	2.517
			[1.342]	[1.476]			[1.515]	[1.594]

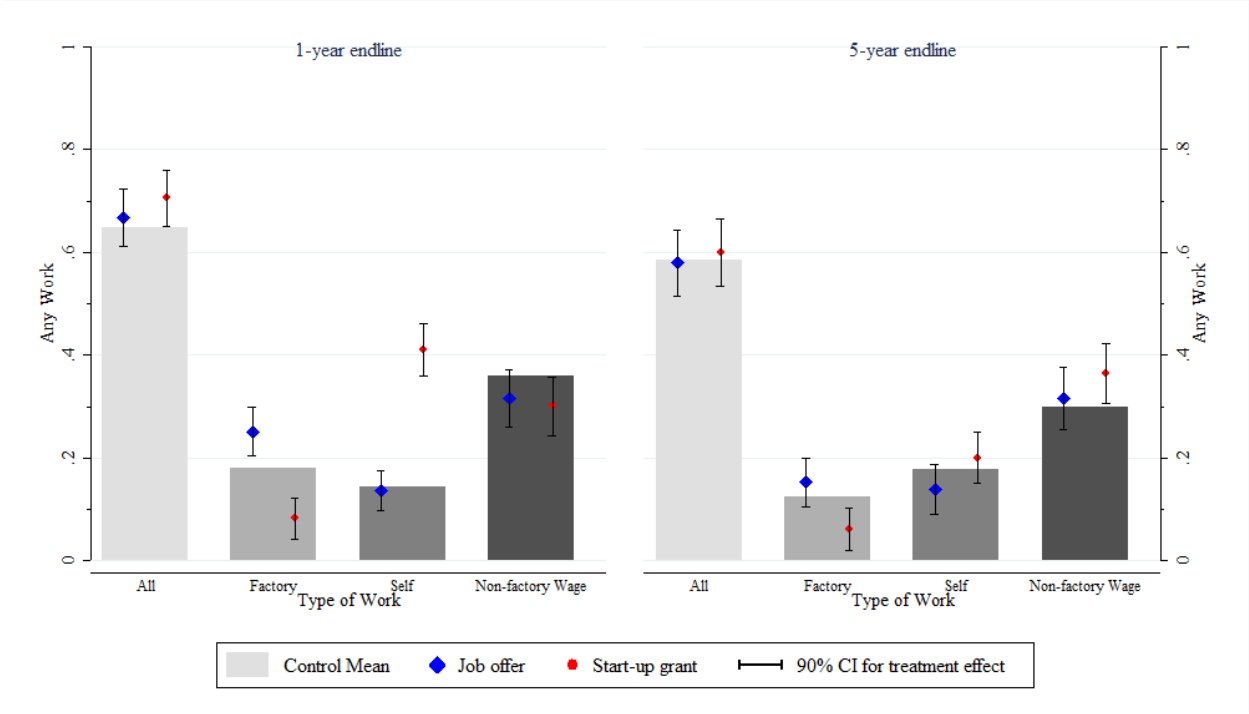
* indicates $p < .1$, ** indicates $p < .05$, and *** indicates $p < .01$. Regression estimates are calculated with district and cohort fixed effects Standard errors are clustered at the level of the respondent due to having two observations per person. All observations are weighted by the inverse of their sampling probability and the inverse of their predicted probability of attrition using a Leave-One-Out logistic predictive method. Control means are also calculated using these weights.

consider a measure of non-durable consumption in the previous 4 weeks via an abbreviated consumption module of 82 items.[18]

Beginning with the start-up arm, we see a striking divergence followed by convergence: a 0.16 standard deviation increase in income after one year (including a one third increase in reported earnings and a nearly 10% increase in consumption), but virtually no income effect after 5 years. This temporary income effect was driven mainly by increased hours of work, almost all through the channel of self-employment in retail trades. We see little difference in earnings per hour reported worked. This increase in employment has disappeared after 5 years.

In contrast, we see no evidence of an effect of a factory job offer on income or total hours of work after 1 and 5 years.

Figure 2: Employment status and program impacts after 1 and 5 years



After one year, the start-up arm were significantly more likely to be engaged in self-employment, and earnings significantly more as a result. We ask whether the outcomes of treated and control individuals have converged because the control group have increased their employment and earnings in self-employment over time, or whether those individuals

[18]See Beegle, De Weerdt, Friedman, and Gibson (2012) for this approach. This abbreviated measure likely understates total consumption by excluding durable asset use and less common purchases. Note that we also pre-specified a third measure of income, an index of almost two dozen durable assets. Due to a survey programming error, however, these durables data were mistakenly not collected in the 5-year endline.

induced to do more self-employment exited the sector over time. Similarly, after one year, the job group were significantly more likely to be doing factory work, but not after 5 years. Did the control group, who were looking for factory jobs at the time of the baseline, eventually get those jobs, or did the treatment group quit?

Figure 2 summarizes the main findings for employment and occupational choice (both prespecified as secondary outcomes). Broadly, we find that employment outcomes have not improved the control group over the last four years. In fact, we observe that a lower proportion are employed at all. Many young women have exited the labour force, many others report looking for employment. Among the control group, total hours worked in the last week is very similar between the 1 and 5-year endlines, while hours have fallen slightly for the start-up arm.

Turning to the specific changes in occupation that we observed after one year, we find that individuals in the control group are only slightly more likely to be self-employed in 2017 than they were in 2013: the control group do not appear to be catching-up in this regard. Instead, participation in self-employment among the start-up arm has fallen dramatically, from more than 40% Using detail recall data, we reconstruct the employment histories of respondents over the four years between the 1- and 5-year surveys. We find that 41% of the control group try self-employment of any kind, at any time in the five years. The start-up arm induces significantly higher levels of experimentation with self-employment employment. 78% of the start-up arm try self-employment at any time over five years, and most of this experimentation takes places with in the first year of receiving the treatment.

This finding runs counter to the notion that says that are individuals in our sample who would be successful in entrepreneurial work if they could only overcome barriers to starting a small business. The large number of people who were induced to start small enterprises by the start-up arm do not appear to have stuck with them five years later.

Similarly, we find rapid exit from factory group among those randomly assigned the job offer. In the meantime, participation in factory work has declined over time for in the control group, falling from 18% to below 12% at the extensive margin. In other words, the high rate of exit from factory jobs continued after year 1, such that the job-offer are not significantly more likely to be in factory jobs five years later. So it does not appear to the be the case that recruitment for these positions is inefficient, in the sense that well-matched workers who queue for these jobs are not getting hired.

Table 5 summarizes the effects of the two treatment on arms on participation in self-employment and factory work, respectively, at different points in time. This shows how many more people did any factory work as a result of the job offer, and self-employment as a result of receiving the start-up grant. Most of this additional time spent in the respective

Table 5: Effect on time spent in factory and self-employment work since baseline

Outcome	Control mean (1)	N (2)	ITT Estimate: Job offer (3)	ITT Estimate: Start-up grant (4)
Any factory work since baseline	0.413	725	0.284***	-0.212***
			[0.044]	[0.043]
Months of factory work since baseline	8.794	725	2.898**	-5.046***
			[1.474]	[1.263]
Months of factory work by 1-year follow up	1.884	672	1.680***	-0.987***
			[0.346]	[0.276]
Months of factory work in 3-years between surveys	5.369	725	1.353	-3.156***
			[1.115]	[0.942]
Months of factory work in year before 5-year follow-up	1.605	725	0.143	-0.929***
			[0.374]	[0.329]
Any self-employment since baseline	0.443	725	-0.003	0.339***
			[0.046]	[0.042]
Months of self-employment since baseline	8.336	725	-2.703*	4.548***
			[1.383]	[1.582]
Months of self-employment by 1-year follow up	1.094	692	-0.536**	2.428***
			[0.262]	[0.394]
Months of self-employment in 3 years between surveys	5.197	692	-1.708	2.603**
			[1.064]	[1.241]
Months of self-employment in year before 5-year follow up	2.277	725	-0.622	-0.252
			[0.433]	[0.423]

* indicates $p < .1$, ** indicates $p < .05$, and *** indicates $p < .01$. Regression estimates are calculated with district and cohort fixed effects Standard errors are clustered at the level of the respondent due to having two observations per person. All observations are weighted by the inverse of their sampling probability and the inverse of their predicted probability of attrition using a Leave-One-Out logistic predictive method. Control means are also calculated using these weights.

occupations took place within the first year of receiving the treatments.

To understand the rapid rate of exit from factory jobs, we begin with Blattman and Dercon (2018), where we analyzed the first year of qualitative data and patterns in the panel. A few findings stand out.

- We saw no evidence of an industrial wage premium in our five firms. A simple non-experimental wage comparison suggested that industrial jobs seemed to pay almost a quarter lower wages than informal opportunities.

- Industrial work came with more stable employment hours, though only modestly so. Most members of the control arm were able to find full-time informal work by the time of the 1-year endline. Informal work also tended to pay higher wages than the industrial firms, but it typically came with the risk of short unemployment spells. Over the horizon of a month or a year, however, earnings in the industrial sector were no more stable than the alternatives.

- A third of people offered an industrial job quit the study firm in the first month, and 77 percent quit within the year. People generally quit the sector altogether, rather than simply switch firms. Firm managers said they found the high levels of turnover inconvenient, but were generally able to fill the positions with other low-skill workers.

- Qualitatively, our interviews suggested that young people used low-skill industrial jobs more as a safety net than a long-term job, and where self-employment and informal work were typically preferred to, and more profitable than, industrial jobs.

We do find one significant and persistent difference in outcomes among those who receive the start-up grant, five years later, which is that they are significantly less likely to be engaged in factory work. One interpretation of this finding is that unemployed workers seek factory work as a last resort in times of need. By providing them with a cash grant a source of income, even if this does not lead to persistent earnings gains, prevents them from taking up potentially harmful factory work. Five years later they are less likely to have transitioned into factory work: instead they are significantly more likely to be in wage work at a non-factory job.

4.2 Health impacts

One year after receiving the job offers, we found evidence of reduced health outcomes, as measured by self-reported ability to perform activities of daily life, among those who were assigned to the factory job.

Table 6: Impacts on health

Outcome	1-year Endline				5-year Endline			
	Control mean	N	ITT Estimate		Control mean	N	ITT Estimate	
			Job offer	Start-up grant			Job offer	Start-up grant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Physical health, z-score	0.058	1,587	-0.193***	-0.098	0.007	1,390	-0.006	0.104
			[0.066]	[0.062]			[0.068]	[0.077]
Ability to do 5 core activities of daily life (0–15)	14.072	1,587	-0.274**	-0.240*	13.479	1,390	-0.152	-0.066
			[0.125]	[0.128]			[0.192]	[0.199]
Ability to do 15 activities of daily life (0-45)					39.212	1,390	-0.353	0.219
							[0.491]	[0.553]
Disability	0.040	1,587	0.033**	0.017	0.022	1,390	0.007	0.010
			[0.015]	[0.014]			[0.011]	[0.014]
Subjective health assessment (0–10)	8.909	1,586	-0.233**	0.001	8.776	1,388	0.061	0.135
			[0.104]	[0.104]			[0.105]	[0.100]
Subjective health assessment, 5 years from now (-10 to 10)	0.760	1,586	0.055	-0.001	0.077	1,388	-0.027	0.141*
			[0.093]	[0.091]			[0.082]	[0.082]
General health (0-60)					56.884	1,390	0.258	0.514
							[0.379]	[0.343]
Physical sympton count (1-5)					0.198	1,390	-0.022	-0.009
							[0.033]	[0.031]
Abnormal Spirometry Reading (colour system)					0.021	531	0.022	0.001
							[0.021]	[0.020]
Mental health and subjective well-being, z-score	-0.110	1,587	0.072	0.233***	0.004	1,390	-0.068	0.060
			[0.071]	[0.065]			[0.078]	[0.067]
Depression symptoms (0–27)	2.545	1,587	-0.088	-0.281	2.314	1,390	0.185	-0.301
			[0.219]	[0.211]			[0.281]	[0.248]
Generailized Anxiety index (0–27)	2.028	1,587	0.054	-0.284	1.974	1,390	0.260	-0.107
			[0.197]	[0.183]			[0.256]	[0.222]

* indicates $p < .1$, ** indicates $p < .05$, and *** indicates $p < .01$. Regression estimates are calculated with district and cohort fixed effects Standard errors are clustered at the level of the respondent due to having two observations per person. All observations are weighted by the inverse of their sampling probability and the inverse of their predicted probability of attrition using a Leave-One-Out logistic predictive method. Control means are also calculated using these weights.

For the long-run data collection, we collected an expanded set of health measures from the first endline survey. First, we used an expanded list of fifteen activities to improve our measurement of ability to perform activities of daily activities, ranging from 0 to 45. Second, we conducted a comprehensive questionnaire covering a list of twenty symptoms of ill health. Here respondents could report the regularity with which they experienced these physical symptoms from zero (never) to three (often), without having to be diagnosed with a particular condition. Third, we asked about four specific health conditions that are particularly common among individuals working in industrial work, namely: asthma, respiratory problems, dermatitis, and carpal tunnel. Fourth, to more accurately measure respiratory health, and verify our self-reported measures, we conducted a spirometry procedure. Here we followed guidelines from the European Respiratory Society, reported in Moore (2012). For the main results we report on indicator for whether the spirometry test shows an abnormal reading, indicating a respiratory problem.

In the pre-analysis plan we committed to report the effect of the two treatments these four aggregate measures. Table 6 shows these results. We find that these negative health effects do not persist. Across a wide range of health outcomes, health outcomes are not significantly different for either treatment group.

One interpretation of these findings is that the maladies experienced one year after receiving the factory job offer were not permanent. Indeed, we find no evidence that the convergence in health outcomes is driven by individuals entering into unpleasant factory work. Analysis of employment recall data shows that the control group were not more likely to enter factory work in the years following the first endline survey (see Table 5). Therefore, the additional time in factory work done by the job-offer group was done almost four years ago, and does not appear to have had long-lasting effects.

5 Discussion and conclusions

We report of two interventions that we reasonably could have thought could have had large and lasting effects on long run labor market outcomes: among people appearing to queue for industrial employment, offering an entry-level factory job in a country that is just beginning to industrialize; and offering approximately one year of factory wages as a cash grant plus some business training.

We find, after five years, neither has any effect on the likelihood to be in a factory or being self-employed, compared to the control group. Earnings are also not different between any of these groups. The labour market choices and outcomes for our population has reversed back to the structure and earnings that the treated would have had without the intervention, as if nothing had happened.

We can understand that the factory trajectory may not have been specifically attractive: wages were no better than elsewhere, and jobs were unpleasant and seemingly hazardous, and those that spent more months in factory work reported more serious health problems after one year. The impact of the start-up grant after five years, despite higher self-employment and earnings after one year, is more surprising. It suggests either that the control group was able to overcome the capital and credit constraints in a short space of time. Or perhaps the returns to capital among these youth was not that high in the long run, despite the apparent scarcity of private capital in Ethiopia. Or, plausibly, the number of constraints entrepreneurial success in this setting meant that lifting a single, marginal constraint is not enough to have a lasting return for this particular group of young mainly female workers. Given that many of the microenterprises folded, we suspect that low returns to capital given other barriers is a likely factor.

Contrary to the (largely rural) Ugandan grants and self-employment program evaluated by Blattman, Fiala, and Martinez (2018), the effects are not driven solely by the control group catching up in self-employment — as if they gradually saved themselves out of the cash constraint. Here in Ethiopia, there are reasons to believe these mostly young women

did not have high sustained returns to self-employment relative to non-industrial wage work (something that was generally unavailable in rural Uganda). Of course, it is possible that our sample – drawn from a population queuing for a factory job – are per definition not terribly representative, nor full of entrepreneurial talent. Still, evidence points to a large number of them regularly engaging in some self-employment as a temporary alternative to wage work.

We cannot answer which combination of lifting of constraints from market or government failures (or indeed, from social norms and preferences) would be required to spur more sustained and successful self-employment, but we need more than just a relatively marginal increase in the number of jobs in factories or a once-off capital injection to generate sustained earnings gains.

Naturally there are limits to what we can learn from five sites and five firms. Yet the same is true of any single program evaluation. Our start-up program is comparable in many respects to a suite of anti-poverty programs that give youth start-up capital, and the industrial results speak to low-skill light industry in contexts where workers are effectively disposable to firms. This is a reasonable description of early and middle-stage industrialization in the US, Europe, and Asia.

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Online appendix

I A brief history of the Ethiopian labor market

Over the last three decades, Ethiopia has seen the transformation of urban employment dominated by public sector work, paying skills premiums with considerable queuing unemployment, to one that is more flexible, with a rising importance of private sector work, without obvious skill premiums between the private and public sector, and with lower (but still considerable) unemployment. The private sector labor market has limited unionization and no minimum wages, and firms face few restrictions in wage setting, hiring or firing. We draw these conclusions from a literature that draws on large sample cross-section and panel data surveys in urban areas, focusing on descriptive statistics, and regression analysis using participation selectivity corrections.

Before 1991, labor market data suggest a dual labor market in Ethiopia, as urban young people queued for public sector jobs, allocated in part by patronage. Ethiopia was a controlled (command) economy, with strong controls on labor mobility. There was centralized recruitment and deployment of civil service personnel and employees of publicly owned companies. Workers were not allowed to move without permission. The private sector was repressed, with very few larger private sector companies. By 1989, more than 75 percent of those aged 15-29 in formal wage work were working for government and state-run enterprises.[19] The public sector was paying better than the private sector. Krishnan (1996) estimated selectivity-corrected Mincerian earnings regressions to find returns to secondary education that were 65 percent higher for public sector employment than private sector wage work. She also found that connections (in the form of family background) strongly influenced whether a public sector job could be obtained.

Post-1991, these restrictions were gradually removed, with the end of central recruitment. Still, using data from 1994, Serneels (2007) found that the informal sector remained small and the urban labor market preserved the qualities of a dual sector with queuing for scarcer public jobs. Using data from a random sample across 7 urban areas, 80 percent of male adults in a wage job were employed in the public sector. The data suggest there was a large pay gap between public and private organizations—80 percent higher pay in the government sector for men (although that is not by skills). With a third of the labor force supposedly looking for work, there was also large unemployment, larger than what we usually see among urban workers in sub-Saharan Africa.[20] The urban informal sector was also surprisingly small

[19] Krishnan (1996), using data from the Survey of Adolescent Fertility, Reproductive Behavior and Employment Status of the Youth Population in Urban Ethiopia, 1990, representative of urban areas.

[20] See Kingdon, Sandefur, and Teal (2006) for a comparison with Ghana, Uganda and Tanzania.

throughout the 1990s, as there were about as many people in formal wage work (private and public) as in the informal sector.

Thus urban unemployment was most highly concentrated among very young men. In 1994, half of men between 15 and 30 reported they were unemployed, but this peaked at 19 years of age (Serneels, 2007). In 1989, only a third of the same group was unemployed, suggesting a rapid increase (Krishnan, 1996). Rather similar to 1989, however, in 1994 young men had a median duration in unemployment of nearly 4 years, and a majority of the unemployed had never held paid work in their lifetimes. Half the men aged 15 to 30 reported searching for a job in the public sector, implying job queues for this sector were far in excess of the employment opportunities. Of the remainder, half were indifferent between informal sector and private sector wage work.[21]

But a shift towards informality was already underway in the 1990s. Comparing panel data for the same group of young male adults in 1989 and 1994, among those working in 1989, 58 percent were in public sector wage work and only 20 percent in the informal sector. By 1994, this was 31 percent in public sector wage jobs and more than half in the informal sector. So while there was still queuing, probabilities of success were declining fast.

From 1994 to 2004, private sector jobs began growing quickly.[22] Not only were far fewer public sector jobs created in urban areas, but also central recruitment and other restrictions on the inter-sectoral movement of labor were removed, resulting in much more labor market flexibility. Private formal sector wage employment doubled in this period. Large public wage premiums remained, but the link between this premium and skills disappeared. There was also increasing mobility between these three sectors (private wage, public wage and informal). The increase in the rates of mobility, especially after 2000, across sectors of employment was accompanied by a small but persistent decline in the rate of open unemployment.

Franklin (2014) used data from the Urban Employment and Unemployment Survey to assess labor markets in 2012. Unemployment among those aged 15-29 was estimated now at about 25 percent. Many of them aspired still to government jobs. For very low levels of education, they still pay better, though there is no skill premium anymore for higher levels of education. But the labor market is much more flexible and the private sector plays an

[21]Education raised unemployment as well, and as returns to education remained higher in the public sector in this period (Krishnan, Selassie, & Dercon, 1998), this is suggestive of a 'queueing' story. Similarly, having a father in the civil service raised unemployment—but duration of unemployment was lower the higher family wealth and connections (Serneels, 2007), similar to the Krishnan (1996) results: particular types have good reasons to queue, as they can be more successful to get the prized public sector jobs. This is not inconsistent with the early conclusion by Myrdal (1968) that unemployment in developing countries like Ethiopia is a 'bourgeois phenomenon'.

[22]See Bigsten, Mengistae, and Shimeles (2013) who use panel data covering 10 years. The data have some problems: this is a panel so we observe aging and attrition of older workers.

increasingly important role offering stable employment opportunities. Median unemployment spells for these young adults are 13 months, and there is much evidence of temporary wage work, mainly in the private or informal sector. Of those in work, a quarter were in public sector jobs, a third in private sector jobs and the rest in the informal sector including domestic work.

Labor hiring, firing and compensation is governed by the 2003 Labor Law (FDRE, 2003). It does not stipulate a minimum wage, but allows for trade union activity and collective bargaining, without requiring it. Active unions and collective bargaining, including over minimum wages, are very common in the public sector and state-owned enterprises, but not in the private sector (ILO, 2011). Unions are present in some private enterprises, but union activity is largely focused on workers' rights and benefits, and on specific labor conditions. Unionization remains limited, with less than 13 percent of workers on salaries or wages belonging to a union (ILO, 2011), In general, employers can set wages without frictions in the form of legal restrictions or reference to unions.

II Firm and cohort details

This section provides additional firm, job, and process details for each cohort. Table 1 summarizes details of each cohort's recruitment, randomization, and grant implementation.

II.A Beverage Producer

The beverage plant is located in a town of roughly 200,000 people in the Oromia Region, around 20 km outside Ethiopia's capital Addis Ababa. The plant manufactures bottled spring water as well as flavored water in various bottle sizes, mainly for domestic consumption. In 2010, the plant was more than a decade old, had approximately 150 employees in total, and shared the site with three non-beverage firms owned by the same parent company, a domestically owned investment firm. We learned of the firm and the opening through personal contacts of the authors.

The firm operated six days a week, 24 hours a day, with three 8-hour shifts, and workers rotate through shifts over time. The nightshift is unpopular. The firm had a reputation for being quite lenient with personal leave, personal breaks, or lateness, and some workers reported this is one reason they did not leave for other factories. About three-quarters of production staff are women. Women typically engaged in washing, labeling and bottling, whereas men performed more labor-intensive work such as packaging, loading, and operating heavy machinery.

Ownership changed several times between 2009 and 2014. In 2014, upon visiting the factory, we learned that it had filed for bankruptcy, had been closed for some months, but had just reopened.

Workers were organized in a local union, which mainly advocated for small changes to working conditions (e.g. reassigning pregnant women to physically undemanding tasks), advocating for benefits (such as maternity leave), and on rare occasion organizing walkouts in the event of late pay.

Compensation In April 2010, the plant offered starting salaries for 350 Birr a month to unskilled workers, with wages rising up to 600 Birr for more experienced workers. Managers and workers all agreed that pay is based mainly on seniority rather than productivity and ability, although ability and experience is one factor in promotion to more complex and higher paid tasks. Inexperienced workers begin with simpler jobs, in the bottle washing department for instance, but can graduate to higher skilled jobs in the firm. There are no incentive programs or bonus schemes. The cohort we study was not eligible for benefits, though in later years the firm introduced three months of maternity leave and transportation services for local commuters.

Firm managers were aware that turnover was high in part because other factories in Burayu were paying higher wages, in some cases twice the wages of Burayu, and because seasonal construction work also offered men higher wages. They increased starting wages several times from 2010–13, in part to keep pace with inflation and in part to reduce turnover, but their wages remained at the lower end of the scale compared to other factories in the town. When asked why wages were not increased further managers noted that they were uncertain whether this was profitable, or how much it would reduce turnover. One manager felt that turnover had only a modest impact on the firm because experienced workers were not required for the work, though it meant they seldom operated at full capacity as a result. Managers were also aware that the work flexibility and leniency allowed them to pay a lower wage (which some workers confirmed). They explained they were also cash flow constrained, and were facing increasing competition and falling real prices from new beverage producers, and so raising wages was not financially possible.

Health and hazards Most of the issues reported were concerning the chemicals used for washing bottles. In interviews, workers attributed respiratory issues, skin rashes, fainting, and in one case a lost pregnancy to these chemicals. From 2010–14, one serious accident could be recalled, when a new trainee lost three fingers in a machine. In general, moreover, the work could be physically demanding, especially the lifting and carrying of heavy water

bottles and packages, and standing a full shift at bottling machines. Also, the factory was not heated and could become quite cold at night (especially if wet), to which many employees attributed common respiratory illnesses.

Recruitment and randomization, first cohort (March 2010) For the first cohort, the firm sought 15 workers to work on an expansion project for producing 5 liter bottled water. They also planned to move some excess workers out of other jobs to staff this new line in addition to the 15 new hires. Firm managers expressed a preference for a specific number of females and males.

We assisted the firm in advertising the factory jobs in the greater Burayu area in 5-6 different sites between Burayu town and the next nearest town. Approximately 100 advertisements were posted for a period of 4 days.

This resulted in more applicants than expected: 327. The firm screened and deemed eligible just 60 eligible partly on qualifications (at least eight years of education and who lived in the town where the firm is located, since the firm pays transport costs to and from work) and partly on a first come first served basis. Prior factory experience and age did not influence eligibility. 7 of the 60 could not be located for the baseline or randomization and were dropped from eligibility before randomization. There were 19 men and 34 women.

The randomization of the 53 to the job offer or pure control group was not stratified. We conducted the randomization by public draw, for transparency and buy-in by the sample.

Recruitment and randomization, second cohort (March 2011) In the second wave of hiring, the firm sought 19 workers to work on a further expansion project replace workers who had left other lines. They expressed a preference for seven females and 12 males. Females are typically preferred for assembly line works such as packing, labeling and quality checking, while males are typically preferred for jobs that require physical strength, such as loading and unloading products.

We assisted the firm in advertising the factory jobs in the greater Burayu area in 5–6 different sites between Burayu town and the next nearest town. Approximately 100 advertisements were posted for a period of 4 days.

101 applications were received. Factory staff screened the applicants according to the understanding of working conditions and shift work, prior work experience, education, salary expectations, and proximity to the site. Consequently, 68 eligible applicants were identified by the firm and we surveyed all of them.

The 101 was sufficient but lower than expected and so two enumerators conducted informal qualitative interviews to assess the relative lack of interest in the job compared to the

previous year. Major reasons included low pay relative to construction and public works day labor, as well as higher wages in other Burayu firms. The factory notice also requested that each applicant have a personal reference; even though this was never used in screening, it may have deterred some applicants.

We randomized using computer algorithm, stratified by gender. 23 (not 19) were assigned to the job offer, anticipating some refusals. (This is the only time we offered excess jobs to the sample. Refusals in future firms/cohorts would be offered to people outside the study sample.)

Grant intervention No cash grant program was conducted for the first cohort. The second cohort was the first time the cash grant program was conducted. We could not find an Ethiopian non-profit organization willing to disburse cash grants with only basic training, and so we hired a private consultancy to disburse cash and provide training. The training commenced at the end of April 2011, roughly three weeks after the jobs began. We disbursed the grant in two tranches, roughly a month apart.

II.B Vegetable farm

The horticultural farm is one of the main Ethiopian exporters of fruits and vegetables. Using open fields and greenhouses with modern irrigation technology, the firm produces various types of vegetables, fruits and flowers for domestic and foreign consumption. It is comprised of six farms located in different parts of the country, with headquarters in Addis Ababa. The firm is foreign owned and managed. We first established contact with the farm through a national horticultural association, via local research managers.

We worked in a one-year old site roughly 300 kilometers south of the capital, just outside a local capital city of roughly 200,000 people. It operated several greenhouses producing vegetables primarily for export. It employed nearly 250 production workers. There was one daily shift, and workers were required to work 8 hour days, 6 days a week. In practice shifts could last 10 or 12 hours, workers being required to complete their daily tasks, and there would not be paid for these extra hours. In busy seasons workers would work the seventh day of the week, typically for double pay, but receive no days off that month.

Eighty percent of workers were female, due to a preference of the company to hire women, and all were permanent rather than part-time or seasonal employees. Workers performed a range of activities including land preparation, harvesting, planting, greenhouse maintenance, transporting products, cutting, and chemical spraying. The majority of workers lived near the farm and had their own crops to cultivate. Work at home was a major source of absenteeism.

The study firm is the largest commercial farm in the area. Its competitors tend to hire short term labor rather than offer permanent contracts, but also pay slightly higher wages as a result.

Workers established a local labor union shortly after the study cohort began working (one did not exist before because the firm was so new). The union was semi-active, and tended to inform workers of their rights and responsibilities, intervene if there was a disagreement between workers and supervisors, advocate for higher wages, inquire as to the reasons workers were fired, and intervene if the reasons were deemed insufficient. A strike was threatened in 2014 for the first time.

Compensation In 2011-12, wages varied from 480 Birr to 600 Birr a month (in 2011 Birr) depending on position. Harvesting and crop culture paid lower salaries, and breeding and chemical spraying paid higher salaries. Chemical spraying wages were partly to compensate for unpleasantness and risk, so those in the chemical department earned higher wages than others. Wages increased annually by about 10-15 percent (inflation was roughly 10-25 percent over the period). Managers and workers generally agreed that pay was tied to seniority, absences, and ability. The highest performing workers were recognized twice annually with prizes, and workers can receive end-of-season bonuses based on performance and attendance. Bonuses can be as high as 280 Birr per month.

Shortly after the study cohort began working, the farm began offering some transportation services to workers. Workers also had access to a clinic free of charge. Women received three months of maternity leave, and all received two weeks of annual leave, plus time off for emergencies.

Despite relatively high turnover, it was not a major management concern, in part because they were easily replaced and skills and experience were not deemed essential. It did mean that the farm was always running slightly below capacity however, and this was the chief disadvantage cited.

Health and hazards The workers we interviewed described chemicals and dust in the workplace as a major health risk, though many didn't specify how they were directly affected by it, and their responses overall didn't seem to indicate high anxiety about their occupational hazards in the workplace compared to other study firms. Some workers described having eye and skin irritation from contact with the chemicals sprayed on plants, and one woman attributed a lost pregnancy to the chemicals. Chemical spraying staff were equipped with masks and were tested for chemical toxicity in their blood every three months. Those with elevated toxicity were reassigned to another department for 6 months before returning

to chemical spraying.

There is no piped water at the factory, thus workers reported they sometimes get sick when drinking from stagnant water jugs provided by the firm. Others complained of eye issues resulting from the intense reflection in the greenhouse. The region is malarial, leading to high illness, but it is not clear the risk is elevated in the farm.

Recruitment and randomization We worked with the firm to post 20 advertisements at the farm premises and the furthest distance the farm allowed workers to come from (based on walking distance and public transport). The firm's human resource office registered 101 eligible applicants.

The HR officer deemed 90 of the applicants eligible, in that they were (visually) in good physical condition and between the ages of roughly 18 and 35. There was no educational requirement, unlike manufacturing firms. the firm preferred to hire 90 percent women, so the majority of the sample was female. We found and surveyed 89 of the 90. Some Amharic enumerators used local translators to deliver the survey to respondents who spoke only a local language. In future surveys we made sure to have local-language trained enumerators, for all cohorts.

We randomized the 89 via a computer algorithm: 30 to receive the job offer, 29 the grant, and 30 the pure control group. Randomization was stratified by gender.

Grant intervention The training commenced roughly two weeks after the jobs began. Grants were disbursed in two tranches, roughly a month apart. the same private consultancy ran the grant intervention.

II.C Flower farm

The flower farm is located roughly 100 km south of Addis Ababa in the Oromia region. It is foreign-owned and had been established almost a decade before. The farm grows two species of cut flowers for export to Europe, and employs anywhere from 700 to 3,000 workers, depending on the season. As of December 2011 the firm employed over 2,000 people, a majority of whom were permanent production workers. Field research managers established contact with the firm through the national horticultural association.

The firm operates seven days a week, and workers work 5.5 days a week, in one shift a day. Three quarters of production workers are women. Production workers perform several tasks including plant breeding, propagation, crop culture, harvesting, cooling, and "elite" (i.e. preparing the mother plants for propagation). Most workers are from the surrounding

area, or have migrated from the south and southeast regions of Ethiopia. They typically live with family members or other factory workers to minimize the cost of living.

The firm has an unusually active labor union, which established a collective bargaining agreement with management. This agreement details the benefits, leave, bonus, materials and protective gear provided to workers, and is negotiated each year. Additionally, the union is responsible for informing workers of their rights and responsibilities, chemical re-entry scheduling (i.e. determining when workers may re-enter the greenhouse after spraying), and intervening if workers are fired unjustly or have disagreements with management. Indeed, there have been a few instances in which workers who management had intended to fire were kept on after the labor union intervened. There have been three strikes at the company, in 2011, 2012 and 2013, over pay, national pension contributions, and the expiration of contracts, and all strikes resulted in many of the worker demands being met.

Compensation In 2012, wages varied by department, from 422 ETB to 726 ETB ($24-41) a month. Those in the chemical department earned higher wages than others. Wages increased annually by 25 percent (inflation was roughly 10-25 percent over the period). There are 20 promotion levels, and each worker was promoted one level a year. Workers could also move up levels based on ability, according to supervisor evaluations. Workers generally agreed that pay was tied to both seniority and ability. There are no bonuses or incentive pay schemes.

Workers commonly work seven days a week or other overtime and receive 2.5 times hourly pay for these extra hours.

Shortly after the study cohort began working, the farm began offering some transportation services to workers. Workers also had access to a clinic free of charge. Women received three months of maternity leave, and all received two weeks of annual leave, plus time off for emergencies.

Management were aware of the high turnover issue, and felt that turnover negatively affects the firm because new workers must be trained for one month, thereby increasing costs and reducing productivity. Supervisors also agreed that turnover results in significant loses for the firm since new workers must be trained and remaining workers often need to work overtime to cover the increased work burden. In general this was one reason that the firm aimed to keep wages competitive with other farm jobs in the area, and also for the bonus scheme.

Health and hazards Workers complained of the excessive heat in the greenhouses, the chemicals being sprayed, and not being given sufficient water. Several workers complained the

chemicals used cause skin irritation and respiratory issues. Workers are provided protective clothing, including masks, gowns, gloves, and closed-toed plastic shoes. The firm performs a chemical toxicity test on production workers every three months. If test results are below a certain threshold (which indicates one has been exposed to toxic chemicals), workers are moved to another department and tested monthly. When their levels return to normal, they are returned to their previous posts.

Regarding water, one jerry can is brought to each greenhouse in the morning. Everyone in the greenhouse drinks from this jerry can and once it's gone, workers are not permitted to drink additional water. Workers attributed kidney problems, urinary tract infections, swelling of the legs, and frequent fainting due to the excessive heat and inadequate water. The region is malarial, leading to high illness, but it is not clear the risk is elevated in the farm. The firm conducted an internal absenteeism study in 2012, which reported that 27 percent of workers interviewed self-reported that they became sick at least once as a result of the firm's working conditions.

Recruitment and randomization Advertisement by word of mouth was deemed sufficient to attract a large pool of applicants. The firm required applicants to be female and at least 18 years old. Registration and screening occurred concurrently. 190 applicants were registered, and a small but unknown number were turned away. The baseline survey and randomization took place the following day, and 152 appeared for the survey. The firm preferred to limit randomization to these 152 since they displayed enough interest in the job to attend the survey.

We randomized the 152 via a computer algorithm: 50 to receive the job offer, 50 the grant, and 52 the pure control group.

Grant intervention The training commenced roughly two weeks after the jobs began. Grants were disbursed in two tranches, roughly a month apart. The same private consultancy ran the grant intervention.

II.D Garment and textile factory

The firm has two main plants on the same site: one that produces and dyes textiles from raw materials, and another that produces garments, principally for export to the United States and Europe, including a large number of major retail brands. The firm is located just outside the capital of the Tigray region, Mekelle, about 775km north of the capital. It is domestically, owned, and had been in operation nearly a decade. In 2012 the firm employed

over 1,400 people, a majority of whom were permanent production workers. Field research managers established contact with the firm through a firm visit.

The firm operates six days a week and workers work the full six days, eight hours a day. There were three overlapping shifts a day, with no night shift. 85 percent of production workers are women, and jobs are not officially segregated by gender. Production workers operated heavy machinery in the spinning and weaving and dyeing processes, and operated small machinery (such as sewing or cutting machines) in garment production.

The firm had an active labor union, which mainly advocated for small changes to working conditions and advocating for worker's rights and benefits. We were not aware of any organized labor actions or collective bargaining.

Compensation In 2012, the starting salary for production workers was 417 Birr per month, and management reported that after four to six months, depending on the job, workers could earn between 100 to 200 Birr more per month. The textile plant was typically staffed with the more experienced and higher paid workers, because of the skill required to operate the machinery. There were no other major textile or garment manufacturers in the area, and so most of this experienced was accumulated in-house. Workers could increase their pay principally by demonstrating ability and moving to more high skilled positions. Our study sample generally started in the garment manufacturing (lowest skilled) side of the business. There were no bonuses or incentive pay schemes during the study period, though one was introduced in 2014. Double overtime pay was offered for working a seventh day or holidays.

The firm offered some transportation services to workers. Workers also had access to a clinic free of charge. Women received three months of maternity leave, and all received three weeks of annual leave, plus time off for family events and emergencies.

Management were more concerned about turnover at this firm than the other study firms, in large part because the new workers must be trained. Losing workers diminished productivity and led them to incur direct training costs. Some managers attributed high turnover to the practice of hiring workers with a 10th grade education or more, who would quit the firm to pursue higher-paying opportunities outside the manufacturing sector, or to continue their education. In 2014 the firm was considering lowering their minimum education level to sixth grade.

Health and hazards The most common health issue reported was respiratory infections (difficulty breathing, coughing, and congestion) from exposure to dust particles and chemicals in the factory. A couple of workers also maintained they had kidney infections from not being

permitted to use the washroom or drink water throughout the day. One worker explained that there are only four or five toilets for over 1,000 workers; therefore, it is difficult to use the washroom in the allotted 15-minute breaks.

Recruitment and randomization (three cohorts in 2012 and 2013) This was a period of expansion for the firm, and workers needed to be replaced because of turnover, and so the firm sought to hire 30 people in May 2012, 45 in May 2013, and 60 in June 2013. All three cohorts proceeded similarly.

Jobs were advertised on the front gate, and we assisted the firm in posting advertisements within a few kilometers of the firm, including the capital city. Each hiring round advertised to a slightly wider area.

The firm required applicants to at least 18 years old within a specific education range: 8 to 12 years in the first cohort, and 6 to 12 in the second and third cohorts. Applicants with higher or lower qualifications were rejected. Staff then gave applicants basic physical tests: (i) for minimum height (to be able to reach necessary parts of the machinery); (ii) an eye exam; (iii) ability to walk back and forth rapidly; and (iv) a threading test (passing a thread through ten needles on a piece of wood). Ignoring applicants who did not meet the basic gender and education criteria (on whom we do not have data), 90 of 114 applicants passed the physical examination and were deemed eligible in the first cohort, 197 of 210 in the second, and 226 of 263 in the third cohort.

We randomized eligible applicants via a computer algorithm, only including those who re-appeared for a baseline survey. In the first cohort, a large number quit within the first few weeks, and the firm had trouble replacing them rapidly. Thus in the second and third cohorts we randomly selected about 40 applicants as a reserve list for the firm to draw from in the coming months, and excluded them from the study sample and initial job/grant randomization. In the first cohort, 30 received the job offer, 29 the grant offer, and 30 neither (no gender stratification). In the second cohort, 45 received the job offer, 45 the grant offer, and 50 neither (all were women). In the second cohort, 60 received the job offer, 60 the grant offer, and 68 neither (all were women). We did not survey or follow the reserve list individuals.

Grant intervention The training commenced roughly two weeks after the jobs began. Grants were disbursed in one tranche. This time we ran the grant intervention through a parastatal organization with the field research managers overseeing much of the activity, to reduce overall implementation costs (since the private firm was subject to taxation, which increased implementation cost by about a third).

II.E Shoe factory

The firm has two manufacturing plants in Addis Ababa and 28 retail outlets, and manufactures leather shoes for both domestic and international markets. About 90 percent of sales are domestic, with the balance mainly to Italy and China. It was a parastatal in operation for more than 75 years and was privatized in 2011, being bought by an Ethiopian national. We worked in their largest plant, with over 700 production workers in 2013. We established contact with the firm through a survey enumerator's professional contacts.

The firm operates 5.5 days a week, in one shift a day, but managers and workers explained that there is effectively mandatory overtime evenings and weekends—about 1–2 hours a day when production demands it, plus Sunday. Production workers are both male and female and perform several tasks including leather cutter, sewer, sole adhering (gluing), stitching, packaging, and assistant or "helper" positions for several of these manufacturing tasks. The firm is centrally located in Addis Ababa and draws workers from around the city. Shoemaking is a longstanding and traditional enterprise in Ethiopia, and there are many large and small firms in the capital.

The firm has a labor union that bargains on behalf of workers and is involved when workers are fired (due to misbehavior and other issues). Additionally, shortly after the baseline survey, a few workers went on strike because they disagreed with their supervisors and asked that the supervisors be shifted to another section. They were partly successful.

Compensation This was the firm with the most sophisticated compensation scheme, and also the one firm where workers had the most upward mobility inside and outside the firm.

In 2013, compensation varied depending on the duties assigned, and appeared competitive for low-medium skilled labor in the area. The average monthly salary for helper positions (those our cohort was hired for) was around 715 Birr a month. Workers were promoted based on ability and experience (especially the operation of technical machinery and specialized tasks), and fast learners or those with previous experience may begin earning anywhere from 1,200 to 1,500 Birr a month within six months to a year of being hired. The firm would pay more skilled workers within a level a higher wage than others, even if this caused disgruntlement. There was a 300 Birr bonus for every employee after a year of work plus other bonus schemes contingent on the firm's profitability. Low-level workers could easily earn another 250 Birr per month in overtime pay per month.

The firm did not offer transportation assistance, but the salary was said to include a "transportation allowance". Workers also had access to a clinic free of charge. Women received three months of maternity leave, and all received two weeks of annual leave, plus time off for emergencies.

When asked to explain the low starting wage level, managers explained that new workers are typically unskilled and therefore require training. During this training period, the firm incurs additional expenses (e.g., in extra materials needed for training) and the trainee does not produce at full capacity. He further noted that because a regular employee must assist the newcomer, this experienced worker is also slowed down, thereby negatively impacting the firm's production and justifying the low wages new and unskilled laborers receive.

Unlike other study firms, turnover at the shoe manufacturer commonly came from (i) urban students taking temporary work until returning to school, and (ii) people going to work for other shoe firms. Because of the training investment, the firm viewed turnover as a major problem. This is one reason given for its complicated compensation scheme. Nonetheless, managers admitted that the cost of hiring and retraining a new unskilled worker was not that high.

Health and hazards According to a 2013 firm-led survey, 94 of the 103 workers polled (91 percent) believed working conditions at the factory were unfavorable to one's health. Specifically, workers cited a (i) lack of sanitation in the office and toilet, (ii) lack of safety equipment to mitigate the inhalation of fumes (such as glues), (iii) lack of skilled medical personnel on-site, iv) standing the entire day while at work, (v) high temperatures in the factory, and (vi) chemical fumes and dust particles. All of the factory jobs, with the exception of sewing, require workers to stand the entire day, causing health issues such as swelling in the legs. Because of the equipment, there were previous experiences with serious injuries to fingers and hands. Many workers also complained of kidney problems.

Recruitment and randomization Advertisement by word of mouth, and a notice on the plant was deemed sufficient to attract a large pool of applicants. There were no education or gender requirements, though the firm prioritized candidates aged 18 to 38 and disqualified applicants who suffered from a history of epilepsy, kidney, heart, or leg problems. Of 230 applicants, 190 were deemed eligible and were registered, and 158 appeared for the survey.

We randomized them via a computer algorithm: 50 to receive the job offer, 50 the grant, and 58 the pure control group.

Grant intervention The training commenced roughly two weeks after the jobs began. Grants were disbursed in one tranche. The intervention was handled by the parastatal partner.

III Tables

IV Comparison of study firms

Table 1: Cohort recruitment, randomization, and implementation details

Characteristic	Beverage producer		Horticulture farm	Flower farm	Shoe factory	Garment & Textile factory		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Job start date	5/4/2010	5/4/2010	3/10/2011	2/11/2011	28/1/2013	21/5/2012	11/5/2013	24/6/2013
Number of openings	15	19	30	50	50	30	45	65
Minimum education	8	8	n/a	n/a	n/a	8	6	6
Applicants	288	101	101	~170	230	114	210	263
Eligible applicants	60	68	90	152	190	90	197	226
Surveyed and randomized	53	68	89	152	158	89	140	188
Randomization strata	None	Gender	Gender	None (all female)	None	None	None (all female)	None (all female)
Assigned to job offer	15	23	30	50	59	30	45	60
Assigned to control	38	27	30	52	58	30	50	68
Assigned to grant	0	22	29	50	50	29	45	60
Grant tranches		2	2	2	1	1	1	1

Table 2: Impacts on job formality

Outcome	Control mean (1)	N (2)	ITT Estimate: Job offer (3)	ITT Estimate: Start-up grant (4)
Member of any union	0.106	1,388	0.017	0.020
			[0.021]	[0.022]
Member of a labor union	0.053	1,388	-0.002	0.005
			[0.016]	[0.018]
Member of a civic union	0.053	1,390	0.019	0.015
			[0.015]	[0.015]
Primay job provides any non-wage benefits	0.147	1,390	0.014	-0.005
			[0.027]	[0.026]
Count of non-wage benefits (0-5)	0.244	1,390	0.037	0.017
			[0.051]	[0.052]
Free or subsidized housing	0.002	1,390	0.010*	0.023***
			[0.006]	[0.008]
Free or subsidized transport	0.083	1,390	0.012	-0.001
			[0.021]	[0.019]
Free or subsidized food	0.041	1,390	0.005	-0.000
			[0.014]	[0.015]
Free or subsidized health care	0.083	1,390	0.007	0.004
			[0.021]	[0.021]
Free or subsidized health insurance	0.035	1,390	0.003	-0.008
			[0.013]	[0.011]
Works for a firm with over 100 employees	0.138	1,390	0.037	-0.044
			[0.031]	[0.027]
Nature of primary job				
Has a permanent job and written agreement	0.193	1,390	0.033	-0.017
			[0.033]	[0.030]
Has a permanent job	0.240	1,390	0.042	-0.006
			[0.037]	[0.033]
Has a written agreement	0.269	1,390	0.002	-0.042
			[0.035]	[0.034]
Primary job is temporary	0.240	1,390	0.042	-0.006
			[0.037]	[0.033]
Primary job is freelance / on contract	0.090	1,390	0.010	0.014
			[0.021]	[0.023]
Primary job is casual work	0.067	1,390	-0.031**	-0.018
			[0.015]	[0.017]
Primary job is self employed	0.041	1,390	0.003	-0.002
			[0.013]	[0.013]
with employees	0.022	1,390	0.002	-0.002
			[0.010]	[0.009]
without employees	0.020	1,390	0.000	0.000
			[0.007]	[0.010]
Primary job is working for family	0.120	1,390	-0.036	0.005
			[0.025]	[0.027]
Primary job is working for a cooperative	0.000	1,390	0.003	0.000
			[0.002]	[0.001]
Type of of primary job				
Primary job is on a farm	0.024	1,390	0.016	0.010
			[0.014]	[0.011]
Primary job is small vending	0.096	1,390	-0.039*	0.016
			[0.023]	[0.025]
Primary job is a skilled trade	0.045	1,390	-0.011	-0.014
			[0.012]	[0.015]
Primary job is in a factory	0.118	1,390	0.014	-0.069***
			[0.027]	[0.024]
Primary job is casual labor	0.024	1,390	0.018	0.005
			[0.012]	[0.012]
Primary job is domestic servent or security guard	0.047	1,390	-0.000	-0.005
			[0.016]	[0.015]
Primary job is office work	0.037	1,390	0.022	0.041**
			[0.016]	[0.018]
Primary job is a waiter	0.020	1,390	-0.001	0.009
			[0.010]	[0.011]
Primary job is teacher or health worker	0.016	1,390	0.007	0.002
			[0.011]	[0.010]
Primary job is other	0.112	1,390	-0.023	0.001
			[0.020]	[0.021]

Table 3: Impacts on child outcomes

Outcome	Control mean (1)	N (2)	ITT Estimate: Job offer (3)	ITT Estimate: Start-up grant (4)
Panel A: Fertility outcomes				
Number of pregnancies	0.409	1,390	-0.015	0.017
			[0.040]	[0.040]
Number of children alive	0.354	1,390	-0.005	-0.007
			[0.038]	[0.036]
Fraction of pregnancies ending in a live birth	0.864	336	0.015	-0.058
			[0.041]	[0.047]
Franction of pregnancies where the child is still alive	0.862	336	0.015	-0.058
			[0.041]	[0.047]
Panel B: Health outcomes				
Child age-normalized health index of child	-0.040	243	0.106	0.187
			[0.196]	[0.195]
Age-normalized subjective parent health assessment of child	-0.065	309	0.168	0.168
			[0.123]	[0.142]
Child age-normalized number of times with malaria in past year	-0.118	304	0.188	0.371**
			[0.141]	[0.180]
Child age-normalized Activities of Daily Life index	-0.064	244	0.146	0.265
			[0.196]	[0.196]
Ability to dress themselves	0.010	264	0.059	0.080
			[0.182]	[0.168]
Ability to feed themselves	-0.039	264	0.095	0.142
			[0.192]	[0.211]
Ability to use the toilet	0.012	256	-0.043	-0.177
			[0.180]	[0.201]
Ability to wash themselves	-0.039	278	0.115	0.155
			[0.156]	[0.164]
Aility to bend over	-0.042	286	0.132	0.196
			[0.157]	[0.170]
Ability to say their name	-0.143	244	0.117	0.411*
			[0.201]	[0.240]
Ability to walk	-0.014	268	0.105	0.206
			[0.179]	[0.180]
Ability to run	-0.022	246	0.030	0.274
			[0.184]	[0.187]
Panel C: Education outcomes				
Child age-normalized school and daycare enrollment	-0.066	250	0.057	0.484**
			[0.157]	[0.205]
Child age-normalized educational attainment	-0.017	226	-0.043	-0.126
			[0.151]	[0.180]