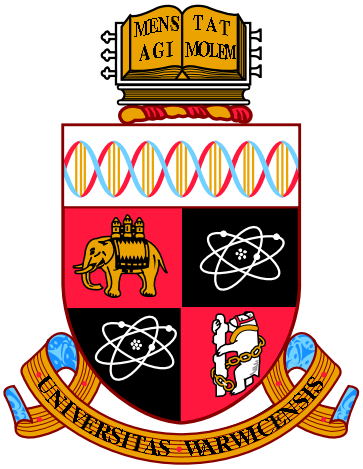


# Essays in Development Economics

by

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# Acknowledgments

I am indebted to my thesis advisors Christopher Woodruff, Anandi Mani and James Fenske for their guidance and support. I want to extend my thanks to everyone who provided comments during and after the presentation of my work at seminars in Warwick, Oxford and the Paris School of Economics. I also want to thank the Innovations for Poverty Actions team for their continuous support and for making my stay in Bangladesh highly rewarding and enjoyable. Finally, I want to thank my parents, without whose encouragement this thesis would not have been possible.

# Declarations

All three chapters of this thesis contain original research based on novel data used for the first time in this research. Chapter one has been written solely by me, incorporating many comments from my thesis supervisors and others with whom I discussed my research. Chapters two and three resulted from joint research projects with Atonu Rabbani and Christopher Woodruff, in which we jointly planned and implemented the field work and analyzed the data. These chapters were written by me, under the supervision of Christopher Woodruff and James Fenske. All errors in the thesis are mine.

# Abstract

This thesis consists of three chapters, which address different but related research questions, using original data collected during extensive field work in Bangladesh.

Chapter one studies the impact of training in stress management on firm outcomes in Bangladesh. 310 female owners were recruited and one-half was randomly offered a 10-week training based on Cognitive Behavioral Therapy, the current best practice treatment for chronic stress. The other half was assigned to an active control group and received empathetic listening. Initially, CBT reduces stress levels but does not affect profits and sales. For owners in sectors with a high concentration of women, predominantly clothing and handicrafts shops, the effect of CBT on stress dissipates within six months and it has no effect on profits and sales. For owners in sectors with a lower concentration of women, such as electronics or interior design, the effect of CBT on stress persists six months after the treatment, and profits and sales grow over time.

Chapter two uses a reverse Becker-DeGroot-Marschak (BDM) mechanism to elicit the willingness to accept a one-time subsidy to try formal childcare in 17 low-income communities in Bangladesh. We visited 635 households with preschool-age children and invited the 415 that were not using childcare to participate in the BDM. The median and modal amounts demanded to try the service are 500 Bangladeshi Taka, approximately 6 US dollars. Households where the head owns a business or does not work demand significantly lower subsidies, compared to those where the head is in wage employment. Respondents living in low-quality dwellings,

or in communities where daycare use is low, also demand smaller subsidies. One month after receiving the subsidy, only 17 parents had visited the centre and 9 enrolled their child. These results suggest that a single cash transfer might not be an effective policy for increasing preschool enrollment and regular attendance in low-income urban areas.

Chapter three studies correlations between physical and mental health outcomes, employment and household infrastructure in a sample of 1,778 low-income households in Greater Dhaka, Bangladesh. Women and urban dwellers have lower well-being levels than men and residents of peri-urban areas, even after controlling for occupation, consumption and household infrastructure. Participation in paid employment is associated with higher levels of stress for women, but the effects are concentrated on women who own a business or work as domestic helpers. Female garment workers, the largest occupational group among women, fare no worse than women who do not work. Proximity to central Dhaka is associated with higher access to improved sanitation but worse health. Peri-urban dwellers spend less days sick and with fever than those living in the city.

# Chapter 1

# Stress Management Practices, Owner Wellbeing and Firm Outcomes in Bangladesh

## 1.1 Introduction

Small firm owners, particularly those in developing countries, routinely confront daily demands that compete for time and effort needed to address vital, overarching managerial tasks. An emerging theme in the business training literature suggests that nudging owners to direct attention toward long-term business goals, and away from day-to-day operations, can lead to firm growth (Bruhn et al. [2017]; Field et al. [2016]. Furthermore, teaching entrepreneurial attitudes, such as proactiveness and persistence in the pursuit of goals, has been shown to have large positive effects on sales and profits compared to standard business training (Campos et al. [2017]). Identifying interventions and mechanisms conducive to increases in profits of entrepreneurs has implications for economic growth (Berge et al. [2015]), with particular implications for emerging economies, where small and medium-sized enterprises (SMEs) account for approximately 45 percent of total employment and 33 percent of GDP (OECD [2017]).

A dimension of the entrepreneurial outlook that has received little attention so far is the ability to stay focused on goals, and to perform well in times of stress or adversity. Exposure to high levels of stress over long periods of time interferes with

information processing and decision making, and has deleterious effects on health (Calvo and Gutierrez-Garcia [2016]; Schneiderman et al. [2005]). The management science literature has documented that firm owners often operate under conditions of high arousal and that their ability to endure stress is strongly correlated with firm revenue and growth (Baron et al. [2016]; Roche et al. [2014]; Baron et al. [2012]). Nonetheless, evidence on causal links in lacking.

In this paper, I test the hypothesis that teaching stress-management skills can lead to increased profits and sales among SMEs in a low-income setting. To investigate this, I evaluate the impact of a 10-week course of Cognitive Behavioral Therapy (CBT) that was provided to female business owners in Bangladesh.

A sample of 310 female owners of SMEs affiliated with the Bangladesh Women Chamber of Commerce and Industry participated in the experiment. Nearly 58 percent of the women owned handicrafts or clothing shops (also known as "boutiques"). These are by far the two most popular entrepreneurial choices among women in Bangladesh (Asian Development Bank [2015]). The remaining owners were engaged in a wide range of sectors, including electronics, interior design and food processing. These have a very low concentration of women, and are considered "less traditionally female" (Shamim [2008]).

All participants were told that the purpose of the study was to understand what type of intervention could help improve well-being levels among businesswomen. Half of the sample was randomly offered CBT, which is considered to be the current best practice treatment for stress and anxiety-related disorders (Hofmann et al. [2012]; Butler et al. [2006]). CBT is a talking therapy that teaches strategies to change habits associated with negative health outcomes.[1] In each session, the CBT therapist guides the trainee through written and physical exercises that facilitate the adoption and maintenance of new behaviors (Schmidt and Woolaway-Bickel [2000]). For example, CBT encourages practicing muscle-relaxation techniques[2] instead of using medication for anxiety. The CBT exercises, which included priority-setting and relaxation techniques, were adapted to the local context for the purposes of this study by the Department of Clinical Psychology of the University of Dhaka. An

[1] For instance, stress can induce changes in eating patterns and is considered a common risk factor for obesity and drug addiction (Sinha and Jastreboff [2013].

[2] Muscle relaxation has been shown to reduce salivary cortisol and heart rate. See Varvogli and Darviri [2011] for a review of relaxation strategies and their associated health benefits.

independent clinical supervisor was hired to ensure adherence to the standard CBT intervention protocol by the therapists.

The other half of the sample consisted of an active control group that was offered Empathic Listening (EL), a form of non-directive counseling often used as a comparison for CBT in studies of clinical effectiveness (Stain et al. [2016]; Kahn et al. [2017]). EL provides emotional support but no direct advice (Rautalinko et al. [2007]).

Immediately after the 10-week-long treatment, measurements of an aggregate index of symptoms of stress showed a 0.33-standard-deviation decrease for the group that had received CBT compared to the group that had received EL. The stress reduction did not translate into immediate increases in profits or sales at that point in time. Six months after the treatment, CBT continued to lead to lower levels of stress but to a smaller degree (0.12 standard deviations and not significant for the average owner), and the effect on profits and sales was positive but statistically insignificant.

These average effects, however, mask large differences across participants. Owners in sectors with a low concentration of women (e.g., electronics, food processing) experience large and persistent improvements in well-being, and their profits and sales increase over time. Owners in female-dominated industries (e.g., handicrafts, shops) experience only short-lived reductions in stress levels after receiving CBT, and the impact on profits and sales is null. Looking at the differences in effects of CBT on these two groups of businesswomen shows that less than a month after receiving CBT, owners in sectors with a low concentration of women had stress levels between 0.25 and 0.32 standard deviations lower than owners in female-dominated industries in the CBT group.

Six months after the treatment, owners in sectors with a low concentration of women continue to show larger effects of CBT than women who had also received CBT but whose businesses are in female-dominated sectors. Measurements of stress for women in sectors with a low concentration of women are between 0.46 and 0.48 standard deviations lower than those of their counterparts who received CBT but work in female-dominated industries - and approximately 0.40 standard deviations lower than those of the average owner in the group that received EL. The treatment effect on profits and sales is positive and increases over time for owners in sectors with few women. The effect is roughly USD 193.15 six months post-treatment, relative

to a control mean of USD 407.76. The effect immediately after the treatment was small and negative (USD 39.67 lower than the control group, which had sales of USD 395.27). I find no significant changes in owner working hours or the number of employees. This is consistent with the hypothesis that the treatment improves decision making and time management, and that skill formation takes time before translating into improved business outcomes.

Taken together, my findings suggest that teaching priority setting and stress-management techniques using CBT could help to improve well-being and firm outcomes for female owners in sectors with a low concentration of women. This is in line with previous studies showing that selection into less female-dominated industries proxies for personality traits and skills that affect the returns to capital (De Mel et al. [2009a]). In my context, owners in women-dominated industries have more years of education and business experience, and implement better managerial practices than others. In addition, they spend a similar amount of time doing household chores and caring for family members. These patterns suggest that industry choice reflects entrepreneurial abilities, such as opportunity recognition[3], that are difficult to measure but likely to explain why some owners - namely, those who can identify situations where applying new and existing skills can be valuable - benefit from training and others do not.

This paper is closely related to a growing body of literature studying the influence of soft skills (also called "non-cognitive" or "socio-emotional" skills) on labor market outcomes (Heckman and Corbin [2016]; Glewwe et al. [2013]; Heckman and Kautz [2013]; Heckman and Kautz [2012]) and their malleability in adults (Kautz et al. [2014]). Promising evidence has emerged on the efficacy of CBT-based interventions to teach a wide range of socio-emotional skills - including self-control, effective communication and decision making - and to increase the labor supply and productivity of different sub-populations in developing countries (Blattman et al. [2017]; Adhvaryu et al. [2016]). The present study is distinct in that it focuses on the importance of a narrow set of "entrepreneurial skills," and its design allows me to identify the effect of skill formation by minimizing social desirability bias[4] and

[3] Baron [2006] provides an overview of cognitive skills involved in the process of recognizing business opportunities and mobilizing resources to seize them. See Calderon et al. [2015] and Gielnik et al. [2012] for recent evidence on the importance of opportunity recognition in developing countries.

[4] The tendency of respondents to provide answers that are likely to be viewed favorably by the implementer of an intervention or survey.

Hawthorne effects.

My results also add to a growing literature studying sources of heterogeneity in the effects of business programs. A recurrent finding is that small firms in developing countries differ in the obstacles they face, and, hence, standard business approaches often fail to benefit all (Fischer and Karlan [2015]; Bruhn et al. [2017]). Recent studies have found that the impact of providing training and access to finance is moderated by the existence of social constraints. For example, Field et al. [2010] show that inviting women to attend business counseling with a female friend makes them more likely to borrow capital, and to expand their business, but the effects are concentrated on those whose mobility is neither severely restricted nor completely unrestricted. Gine and Mansuri [2017] find that providing training and loans improve business outcomes only for women who own large firms, and who have enough bargaining power within their households to make most of the managerial decisions by themselves. My results suggest that industry choice is indicative of entrepreneurial traits that are not captured by proxies for intra-household bargaining, such as time-use patterns among women.

The rest of the paper is organized as follows. Section 2 describes the conceptual framework and the interventions. Section 3 provides details on the sample and experimental design. Section 3 explains the empirical strategy. Section 4 presents the main results. Section 5 discusses sources of heterogeneity in treatment effects. Section 6 concludes.

## 1.2 The Stress Management Intervention

### 1.2.1 Conceptual Framework: Owner Stress and Firm Performance

The correlation between owner stress levels and firm performance has been well documented in the management literature. A growing number of studies indicate that differences between entrepreneurs, CEOs and high-level managers in "psychological capital" levels - especially, an ability to endure stress, and to maintain confidence in one's ability to succeed, even in face of adversity - explain a large portion of the variance in firm revenue and employment growth (Roche et al. [2014]; Hmieleski and Carr [2008]). The topic has also been covered in the popular and business press, with most articles pointing at feelings of lack of control over external challenges

and not having enough time to complete all tasks as important sources of stress.[5] Nonetheless, these articles refer to firms in high-income economies. Evidence from low-income settings is limited.

Owners in developing countries are routinely confronted with complex situations that escape their control. Arduous regulatory processes, inadequate access to finance, and the absence of high-quality infrastructure cause workflow disruptions, and demand time and attention (The Asia Foundation [2010]). The World Bank's Doing Business initiative documents large differences between countries in the time and effort required to comply with relevant regulations at different stages of the business life cycle. For example, getting electricity takes four procedures and 79 days in the United Kingdom, and nine procedures and 428.9 days in Bangladesh. Similar patterns have been documented in other developing countries.

In addition, female business owners face social barriers that limit their ability to expand their firms, and these barriers can become a source of stress (Asian Development Bank [2015]). Among the most frequently cited is the behavioral prescription that women should spend a larger portion of the day than men doing household chores and caring for family members. It has also been documented that women face restrictions in their mobility and social interactions (Field et al. [2016]) that make selling products or purchasing inputs difficult (Gine and Mansuri [2017]).

Exposure to multiple stressful events makes individuals more likely to experience symptoms of anxiety and depression, such as persistent negative thoughts, unpleasant physical sensations (including exhaustion, aches and muscular tension), and changes in sleep and appetite (Liu et al. [2017]; Sinha and Jastreboff [2013]). These symptoms can be worsened by habits adopted by individuals, such as consuming caffeinated drinks to tackle fatigue, or taking sleeping tablets to ease insomnia, which can affect cognitive performance and mood (Lieberman et al. [2002]; Mitchell et al. [2012]).

The negative effects on motivation and decision making of stress, a condition characterized by high levels of anxiety and depressive mood, have been recently documented in the economics literature (De Quidt and Haushofer [2017]; Riis-Vestergaard et al. [2017]; Haushofer et al. [2015]). While most studies to date

[5] To mention just two examples, Forbes published an article titled "Common Stresses and Reliefs of Small Business Owners" on October 13, 2014, and The Huffington Post published one titled "Small-Business Owners Most Stressed by Running Business" on January 1, 2012.

have focused on the health and cognitive effects of financial worries among the poor, it is increasingly being recognized that stress can affect economic outcomes in the general population and at levels that are not considered clinically significant. In particular, it has been shown that moderate levels of stress are positively correlated with performance, but chronically high stress levels deplete cognitive resources and have deleterious effects on health and everyday functioning (Calvo and Gutierrez-Garcia [2016]; Schneiderman et al. [2005]).

Because of the high number of difficulties they face, female SME owners are at increased risk of experiencing stress. However, character and socio-emotional skills are malleable in adults, and they can be taught through mentoring-based interventions (Kautz et al. [2014]). Hence, I ask whether training in stress management can help them improve their health and professional performance, and, thereby, improve their productivity and their firms' prospects over time. The intervention is expected to operate through two channels. The first is by helping participants identify crucial tasks through priority-setting exercises, and allocate an optimal amount of time to these tasks. The second is by teaching participants strategies to deal effectively with symptoms of stress that may draw attention away from the task at hand.

### 1.2.2 The CBT and Empathic Listening Interventions

CBT is a psychological intervention that has been proven to be effective in modifying a broad range of behaviors conducive to negative health outcomes, such as using hypnotic drugs to treat insomnia (Morgan et al. [2004]; Gonzalez and McCarl [2010]; Hofmann et al. [2012]; Weck et al. [2015]). Currently it is considered to be the best practice for treatment of anxiety-related disorders and depression. Evidence suggests that its effects persist over time and can be detected six months, one year and even two years after treatment (DiMauro et al. [2013]). CBT is increasingly being used as a general skill-building approach outside of clinical settings because it has been shown to produce persistent reductions in anger, aggression, criminal activities, and sleep and eating disorders (see Butler et al. [2006] for a comprehensive review of applications).

CBT promotes skill development through homework assignments, in addition to talking through problems and discussing solutions during therapy. These exercises are designed to challenge thinking patterns and behaviors that have harmful effects on well-being and cognitive functioning (Wells and Simons [2009]; Heimberg

et al. [2004]). For example, deep breathing is presented as a more positive way of reducing feelings of anxiety than prescription drugs, alcohol or smoking, which can have deleterious side effects. Other hallmark techniques of CBT are scheduling a "worry time" each day, keeping a written log of problems that come to mind while performing a task, and looking for solutions only during the pre-established worry time, instead of engaging in unplanned problem solving throughout the day (Saulsman et al. [2015]).

The skills learned during the sessions are meant to be immediately transferrable to everyday life situations. Participants are told that mastering them requires regular practice, and that this is the mechanism through which the treatment effect is expected to last following its termination. New habits are developed primarily through learning by doing, although informational handouts and exercises are provided, discussed and practiced during the sessions (Blattman et al. [2017]).

The program was designed jointly with the Department of Clinical Psychology of Dhaka University and received Insitutional Review Board (IRB) approval from Innovations for Poverty Action and the University of Warwick. Both the CBT and EL interventions consisted of five individual, face-to-face, two-hour sessions. The sessions were delivered over a period of 10 weeks and took place in the Bangladesh Women Chamber of Commerce and Industry's training center (BWCCI), in central Dhaka. Six clinical psychologists trained in Cognitive Behavioral Therapy and six counselors trained in Empathic Listening delivered the CBT and EL interventions, respectively.

Participants in the CBT group received short follow-up phone calls between sessions in order to offer additional coaching, and to ensure adherence to the intervention protocol. These calls lasted between five and 10 minutes. The intervention featured strategies to manage time efficiently, and to deal with thoughts and physical sensations that could draw attention away from the task at hand. The time management component teaches participants to prioritize activities that are important and urgent, and to delegate or postpone those that require immediate attention but are not important. The second component tries to minimize symptoms of stress (anxiety and depression) that result in divided attention by teaching attention training and relaxation techniques, including progressive muscle relaxation and deep breathing.

We conducted a series of in-depth interviews to test the relevance of the topics and the specific choice of CBT materials. All handouts and exercises were translated

to Bangla from templates published by the Centre for Clinical Interventions and the National Health Service (NHS). (These are publicly available on their websites.) For internal monitoring purposes, we collected a small sample of handouts from participants at the end of the program.

Following the Ethical Framework for Good Practice of Counseling and Psychotherapy of the British Association for Counseling and Psychotherapy (BACP (2013)), we hired an external clinical supervisor to take charge of the oversight of the intervention, and to ensure that the therapists adhered to the clinical protocol and the BACP Ethical Framework. The clinical supervisor evaluated the therapists' conduct, and determined whether they needed further training. In addition, he performed patients' risk assessments, and undertook caseload risk management[6]. Weekly supervision meetings were held with the CBT therapists to discuss progress, the participants' responsiveness to exercises, and any difficulties encountered during the sessions.

The EL intervention provided an equal number of therapy sessions. This type of non-directive counseling consists of listening and repeating the situations and feelings shared by the patient in different words, both factual and emotional, without providing an interpretation, explanations or suggesting techniques to help the client make a decision (Rautalinko et al. [2007]). Participants in the EL group received handouts with general health information. The topics included a diet pyramid displaying types of food that should be consumed several times per week (such as fruits and vegetables) and those that should be limited to once or twice per week (e.g., processed meats and desserts), in addition to press articles on the potential health and mood benefits of developing new hobbies.

Due to financial constraints, it was not feasible to have both an active control and a pure control group. An active control group was preferred because receiving professional counseling could affect response rates, and introduce both recall bias and social desirability bias in the answers. Thus, EL was designed to provide emotional support but no specific guidance, with a view to identifying the effect of teaching skills. Providing a small dose of treatment to a comparison group, rather than using a pure control, has the additional advantage of decreasing the risk of differential attrition between treatment and control groups. Indeed, "light-treatment"

[6] The clinical supervisor is a clinical psychologist (BSc Psychology, MSc and MPhil in Clinical Psychology) with over 20 years of experience providing psychological support, counseling and education in Bangladesh.

comparison groups have been used in recent evaluations of business programs in the economics literature (Bloom et al. [2013]; Field et al. [2016]).

Both the CBT and EL interventions provided social support and were therefore expected to have positive effects on well-being in the short run. Recent clinical studies assessing the efficacy of CBT have used active control groups based on EL (Stain et al. [2016]; Kahn et al. [2017]). This design allows me to ascertain whether the effect of teaching coping skills is distinguishable from that of offering a non-judgmental environment to discuss problems and express emotions.

## 1.3 The Sample and Experimental Design

### 1.3.1 Target Population and Recruitment

To gain access to a large network of female business owners, I partnered with the Bangladesh Women Chamber of Commerce and Industry. The BWCCI is a non-profit organization established in 2001 to provide training and access to support services to women-owned SMEs.

The Chamber disseminated information about the program among its members. A staff member contacted them by phone and email, and explained that the purpose of the study was to understand whether training in stress management could increase the well-being levels of businesswomen in the country. After scheduling all sessions, the Chamber sent reminders to reduce program dropout and survey attrition. The intervention took place between December 2016 and March 2017. All participants received a travel allowance of a maximum of 400 Bangladeshi Taka (BDT) (equivalent at the time to USD 4.90) and BDT 200 (USD 2.40) per survey round, to compensate them for their time. No other payments were made to encourage participation.

Participants could select a suitable day and time to receive the first session, but many did not show up at the agreed time. Since more than one-third of the sample dropped out of the study in the week prior to the training, we replaced them and used a pure randomization strategy at the time-slot level. A research assistant conducted the randomization by assigning a random number to each participant in Excel, and allocating those above or below the median value to each group. Participants chose the time slot between 9 a.m. and 6 p.m. that suited them best.

Among those selecting a given slot, half were randomly assigned to CBT, and the other half to EL. Hence, I do not have any reason to believe that the treatment-allocation strategy caused non-random differences in characteristics between CBT and EL recipients. In total, 159 participants were offered CBT, and 151 were offered EL.

### 1.3.2 Data and Randomization Balance

The baseline survey was conducted on the first day of training, before the session started. Two follow-up surveys were conducted over the phone. The first took place immediately after the training was completed. Some participants were able to attend all sessions within 10 weeks, and finished the training in February. Others requested to reschedule one or more sessions, and received the last one in March. Therefore, the first follow-up survey was conducted between February and March 2017. The second was conducted six months after completion, between July and August 2017. Attrition rates were low and similar across groups. The group of participants who either refused to take part in a survey or who could not be reached consisted of four EL and five CBT participants in the first follow-up survey, and 14 EL and 16 CBT participants in the second survey. These rates are equivalent to approximately 2 percent and 9 percent of the sample in each group, for the first and second follow-up surveys respectively.

Basic business information was collected in each survey round, including profits, sales and inventories in the previous month, daily hours worked by the owner on average and the number of formal and casual employees. We also measured self-reported symptoms of anxiety and depression using the seven-item Generalized Anxiety Disorder (GAD-7) scale and the nine-item Patient Health Questionnaire (PHQ-9), and the number days lost to physical illness in the two weeks prior to the survey.

Following De Mel et al. [2009b], profits were measured by asking owners directly to report profits in the previous month, excluding wage payments to themselves. This eliciting method presents advantages over alternative measures. It reduces recall bias and, for instance, errors related to a timing mismatch between revenues and expenses. Recent micro-enterprise experiments rely on this construct as the main measure for profits (Atkin et al. [2017]; Blattman et al. [2014]). Managerial ability is measured using the Business Practices questionnaire developed by

McKenzie and Woodruff [2017] for small firms.

I construct a Stress Index by standardizing the unweighted sum of the GAD-7 anxiety score (Spitzer et al. [2006]) and the PHQ-9 depression score ((Kroenke et al. [2010] using the control group mean and standard deviation. These scales have been extensively used to measure stress and monitor symptoms of anxiety and depression by mental health practitioners across the world, and have shown good levels of reliability and validity (Moriarty et al. [2015]; Löwe et al. [2008]; Spitzer et al. [2006]; Kroenke et al. [2010]). Aggregating variables that are conceptually related and move in the same direction into standardized indices has become common practice in the economics literature, because it helps to address concerns over multiple hypothesis testing (Kling et al. [2007]; Karlan and Valdivia [2011]; Drexler et al. [2014]).

Stress levels, profits and sales have long right tails, even after winsorizing the last two at the 99th percentile. To reduce the influence of observations on the top tail, I compare the effects of CBT on the stress index, profits and sales in levels and the inverse hyperbolic sine transformation of each of these variables.

In addition, more detailed owner and firm characteristics were measured at the baseline and second follow-up surveys. 24-hour recall time use questionnaires were included in both surveys[7], but they were modified to capture different dimensions. The baseline time use survey followed the same structure as the Bangladesh (2012) Time Use Survey Pilot and recorded every primary and secondary activity performed in the 24 hours prior to the survey, and the time spent on each of them. The purpose of using this questionnaire was to obtain a first estimate of the number of hours spent daily on household chores, providing unpaid care services to family members, engaging in a wide range of self-care, entertainment and social activities, and working in the business. The time use section used in the second follow-up survey was a modified version of the Executive Time Use Project questionnaire (Bandiera et al. [2012]), and focused on measuring the amount of time spent on managerial and non-managerial activities during working hours.

Table 1 shows baseline characteristics and balance across treatment and

[7] The use of 24-hour recall methods has limitations, because it might not be representative of an average day (see Jackson et al. [2008]). I chose it over the more accurate 72-hour recall method for convenience. In my setting, participants were reluctant to answer long questionnaires, and hence, there was a trade-off between precision and survey attrition. Despite its arguable inaccuracy, the elicited number of hours of work shows good correlations with direct measures of daily working hours as reported by the respondent.

active control individuals. It reports regressions of each variable on a treatment dummy, whose coefficient captures the difference between group means, and a constant (the control group mean). For most variables, including stress levels and profits, differences in the mean value across experimental groups are not significant. Average monthly profits are winsorized at the 99th percentile to trim outliers, yielding an average of BDT 18,780 (USD 229) in the control group.

Despite randomization, the treatment group has a higher number of firms in sectors with a high concentration of women (clothing and handicrafts) and higher sales. Owners in the CBT group also report working longer hours (0.76 additional hours per day). However, when using the time use survey to calculate the number of hours worked in the 24 hours prior to the survey, the number of hours members of the two different groups spent working on the business and doing household chores does not differ to a statistically significant degree.

The Stress Index and several measures of managerial ability are balanced. The mean age among owners in the control group is 36 years, and the average household size is 4.28. Only 7 percent of firm owners did not complete class V, which was the last year of primary school until 2016, when a reform to extend primary school until class VIII was approved. Approximately 70 percent of the owners are married, and 46 percent have a bachelor's degree.

The average number of sessions completed is also balanced across groups. Around 13 percent attended one session only (18 participants in the EL and 22 in the CBT group), and around 74 percent of the EL participants and 77 percent of the CBT participants attended all the sessions.

## 1.4 Effects on Stress and Firm Outcomes

### 1.4.1 Empirical Specification

I estimate the causal effects of the CBT training on profits and sales at the time of the first and second follow-up surveys separately, and then combine them to increase precision. McKenzie [2012] shows that the analysis of covariance estimator outperforms the fixed effects estimator when the outcome variable is measured with noise and autocorrelation across survey rounds is low. Therefore I use a regression

of the form

$$Y_{it} = \beta_0 + \beta_1 CBT_i + \beta_2 Y_{i,t=0} + \beta_3 X_{h,i} + \tau_t + \epsilon_{it} \tag{1.1}$$

where $Y_{\text{it}}$ is an outcome for firm $i$ in period $t$, $CBT_{\text{i}}$ is the treatment dummy and takes value 1 if the owner was assigned to CBT and $\beta_1$ is the treatment effect. $Y_{\text{i,t=0}}$ is the lagged outcome variable, $X_{h,i}$ controls for baseline covariates (firm years, the number of workers and a sector dummy, demeaned using the control group mean), and $\tau_t$ is a survey round fixed effect. In my sample, 10 owners run more than one type of business. Hence, standard errors are clustered at the owner level for the specification combining the two rounds of data. Because not everyone who was invited and attended the first session completed the training, these are intent-to-treat estimates.

Participants in my sample had many opportunities to make up for missed sessions. Therefore I expect that failing to attend even one session can affect treatment outcomes, in part because it might indicate low engagement and poor adherence to the CBT protocol. A recent meta-analysis of clinical evaluations showed that interventions that require treatment completion have larger ITT effects on therapy outcomes than those in which completion is not required (Hans and Hiller [2013]). For this reason, I also estimate treatment effects on the treated (TOT) by creating a dummy for those who attended all five sessions and running the following regression

$$Y_{it} = \beta_0 + \beta_1 CBTcomplete_i + \beta_2 Y_{i,t=0} + \beta_3 X_{h,i} + \tau_t + \epsilon_{it} \tag{1.2}$$

where $CBTcomplete_{\text{i,t=1}}$ takes the value 1 if an owner assigned to CBT attended all five sessions. I instrument $CBTcomplete_{\text{i,t=1}}$ with the variable $CBT_{\text{i}}$.

### 1.4.2 CBT Impact on Stress Levels

Immediately after finishing the treatment, the effect is large and significant for all owners (Table 2, columns 1 and 2). CBT leads to a reduction of 0.33 standard deviations in the aggregate index of stress symptoms. The effect of CBT on the hyperbolic sine transformation of the index is also large and significant. Since this transformation places less weight on observations at the upper tail of the distribution, these results suggest that the CBT does not only benefit those with very high levels of stress before the program starts.

The TOT estimates show that the positive effect of CBT on well-being is stronger among those who attended all the sessions (228 participants, or 75 percent of the sample). As a robustness check, I run a regression where TOT compares those

who attended at least four sessions (around 80 percent) with those who attended three or less, and the results remain qualitatively unchanged. The point estimates are smaller but significant at the 1 percent level.

Six months after the treatment, the effect of CBT on stress is no longer significantly different from zero, although it enters with a negative sign. The coefficient is minus 0.12 for stress index. Likewise, the effect among those who completed the program is negative but insignificant.

Figure 1 shows changes in the distribution of stress levels over time for owners in the CBT and EL groups. The evidence does not reject the hypothesis of equality of distribution in initial stress levels between the CBT and EL groups (Graph (a)). Graphs (b) and (c) show a shift to the left in the distribution of stress for owners in the CBT group compared to the EL group. However, the Kolmogorov-Smirnov test only rejects the hypothesis of equality of distributions immediately after treatment (Graph (b)), at the 5 percent level.

### 1.4.3 CBT Impact on Profits and Sales

I first examine whether the large reduction in stress levels observed immediately after the intervention affected profits and sales. Table 3 reports intent-to-treat estimates for winsorized profits in levels and the inverse-hyperbolic sine transformation of non-winsorized profits. Immediately after the program, the point estimate for profits in levels is BDT 4,980 (USD 60.33) and statistically insignificant. This is relative to a control mean of BDT 33,610 (USD 404.21). The coefficient in the regression using the hyperbolic sine transformation of profits is negative but also insignificant. The coefficient of the treatment dummy in the regression for sales in levels indicates an effect close to zero (BDT 12, less than USD 0.15), while that in the regression using the hyperbolic sine transformation of sales is small but positive. These results suggest that the average effect of CBT is measured with noise, and the effect might be different for firms at the top and bottom of the distributions of sales and profits.

Six months after the treatment, the effect of CBT on profits and sales increases in magnitude and is positive for firms at the upper and lower tails of the distribution of sales and profits. However, all coefficients are insignificant. The point estimate for profits is BDT 3,600 (USD 43.61), relative to a control mean of BDT 32,580 (USD 396.50). The effect on sales is BDT 20,340 (USD 246.40), relative to

a mean of BDT 139,770 BDT (USD 1,693.16) in the control group.

Combining the two rounds of data increases power, but all effects remain statistically insignificant. Overall, these results suggest that the positive effects of receiving CBT might be increasing over time for some owners, but are estimated with noise. All TOT coefficients follow a similar pattern to those of the ITT regressions, and are only marginally larger in size.

I next examine the treatment effects on the distribution of profits. Consistent with the results from the regression analysis, Figure 2 shows a slight shift towards the right in the distribution of profits between the first and second follow-up surveys.

Average profits were similar between treatment groups at the time of the baseline. Figure 2 shows that the distribution of the hyperbolic sine transformation of profits had a higher standard deviation in the EL group before the treatment started, but looked similar to that of the CBT group after the treatment ended. My data suggest that, conditional on taking part in the survey, participants provided more accurate answers during the first and second endlines compared to the baseline. No one reported negative profits at the time of the baseline, but some did in the second endline. This could be because we asked them in advance to suggest a time to complete the survey, and they were better prepared to answer our questions (which they knew from previous rounds); or because the intervention helped to build rapport, and they reported more truthfully.

To rule out the possibility that the CBT and EL groups differed in their tendency to trust us with information on profits, and that this may be driving my results, I use two approaches that correct for imbalances in covariates and differences in the probability to be assigned to each treatment group (section 4.5). I find no support for the hypothesis that my results are sensitive to differences in the distribution of baseline profits.

### 1.4.4 Effects on Inputs

Next, I study whether CBT affected inputs that could lead to changes in profits and sales. Table 4 shows that CBT reduces average investment in inventories. The magnitude must be interpreted with caution for the regressions in levels (columns 1 and 5). The size of the ITT estimates is large relative to the average value of inventories of the median firm. This is caused by a small number of observations

(between eight or nine observations, or around three percent in each survey round) which have values above BDT 5,000,000 (USD 60,587.85), fluctuate across rounds, and are not trimmed after winsorizing. Columns 2 and 6 suggest that the treatment had a small, negative and statistically insignificant effect on inventories.

The impact of CBT on the number of working hours and the number of formal employees is not significantly different from zero. Columns 3 and 4 in Table 4 show that the point estimates are positive in the first follow-up but small in size (0.12 hours and 0.03 workers). Columns 7 and 8 show negative point estimates at the time of the second follow-up (minus 0.15 hours and minus 0.18 workers respectively). The effect of CBT on those who attended all five sessions is similar in sign and magnitude for most of these inputs, with the exception of the sine transformation of inventories, which is negative and significant when combining the two rounds of data.

In addition, I find suggestive evidence that the CBT training did not affect the amount of time allocated to managerial on non-managerial tasks. Using cross-sectional data from the second follow-up, I study changes in time use patterns six months after the treatment by aggregating activities into four categories. The first is essential daily functions that could be delegated to employees, such as providing aesthetic services (facials and haircuts) or selling clothes to customers directly. The second is human resources management, and includes training employees and supervising them while they are attending to customers or keeping records. The third is strategic planning and includes tasks as varied as revising the business plan or checking sales and profits. The fourth aggregates all other activities, including attending business fairs or training programs. I find no differences between owners in the treatment and control groups in the amount of time they spend in each activity type.

### 1.4.5 Robustness to Baseline Imbalance

To investigate whether the observed differences in baseline characteristics between the CBT and EL group are driving the results, I compare them with those obtained using alternative matched control groups. I find no evidence that differences in baseline characteristics are driving the main results (Appendix, Table A1).

Firstly, following Austin [2011] and Austin [2014], I use caliper matching on the logit of the propensity score, with a caliper of 0.2 standard deviations. This

method has recently been used to address baseline imbalances in the evaluation of a business consulting program (Bruhn et al. [2017]). Table A1 shows similar results to those reported in tables 2 and 3. CBT leads to a 0.35 reduction (significant at the 1 percent level) in the stress index immediately after treatment. The effect disappears within six months. The impact on profits in levels is positive and increases from BDT 10,200 (USD 122.67) in immediately post-treatment to BDT 18,100 (USD 217.68) six months later, with respect to a control group mean of BDT 33,600 (USD 404.09) and BDT 32,600 (USD 392.07) in the first and second follow-up surveys respectively.

Secondly, I use randomization inference, which can be employed to test for the sharp null hypothesis of no treatment effect even if the probability of being assigned to the treatment group is not the same for all units (Imbens and Wooldridge [2009]). I follow Hennessy et al. [2016] and use a conditional randomization test to account for covariate imbalance. The results are shown in Table 9 (Appendix A.1). The estimated effect of CBT on stress and profits remains qualitatively unchanged when using randomization inference. The estimated effect of CBT on sales becomes negative but is measured with noise, and hence the treatment effect coefficient is not statistically significantly different from zero.

Lastly, I use inverse probability weighting (IPW) estimators, which calculate propensity scores (logit estimation) using flexible functions of the covariates of interest (Imbens and Wooldridge [2009]). Each weight is the inverse of the estimated probability that an individual is assigned to CBT. Table 9 (Appendix A.1) shows that the main results do not change qualitatively when using IPW. I verify that the four covariates are balanced across groups. The overidentification test does not reject the null hypothesis that the IPW model balanced firm years, sales, daily hours and industry choice ("female-dominated" dummy). The regression for profits (panel B) includes baseline profits as a covariate - although its mean value was similar between treatment groups - because it had a higher standard deviation. As a robustness check, I ran the same regression with and without including baseline profits, and verify that the main results remain largely unchanged.

## 1.5 Heterogeneity Analysis: Who Benefits from Learning Stress Management Techniques?

To understand the mechanisms through which CBT is likely to operate and why its effect on mental health decreases sharply within six months, I examine whether its impact varies across owners. For this, I focus on the most important sources of heterogeneity documented in the business training literature.

### 1.5.1 Differences in Treatment Effects Across Sectors

A leading explanation for heterogeneity in the effects of business programs among women is self-selection into a female-dominated industry (De Mel et al. [2009a]). In my sample, nearly 58 percent of the firms are boutiques and handicrafts shops, with some selling both clothes and handicrafts. The rest of the firms are scattered across various sectors, including electronics, food processing and education. I aggregate boutiques and handicrafts shops into a single category (hereafter, I refer to all of them as "boutiques"), which indicates that the owner operates a firm in an industry with a high concentration of women. All others are pooled into a category representing industries with a low concentration of women. Although data on male- to-female ratios in firm ownership at the sub-sector level (within retail or services) are limited, this division has been documented in previous reports on female entrepreneurship in Bangladesh (Shamim [2008]).

First, I document differences in firm and owner characteristics between industries (Table 5). It is important to note that, by many measures, women in female-concentrated sectors have better managerial skills. They have been in business three more years, on average, and they implement more managerial practices (both differences are significant at the 1 percent level). In addition, their educational attainment and the number of hours devoted to their businesses are slightly higher. I aggregate the four measures into a standardized index of managerial ability, and confirm that the new variable is, on average, higher for owners in female-concentrated sectors at the 1 percent level.

Second, I study whether the effect of CBT on owner stress and firm outcomes varies across industries. To investigate this, and to examine whether differences in household liquidity and entrepreneurial ability could explain differences in treatment

effects across industries, I follow (De Mel et al. [2009a] and use a regression of the form

$$\begin{aligned} Y_{it} = \beta_0 + \beta_1 CBT_i + \beta_2 CBT_i * LowFemale_i + \sum_{h=1}^{H} \beta_3 CBT_i * X_{h,i} \\ + \sum_{h=1}^{H} \beta_4 CBT_i * X_{h,i} * LowFemale_i + \sum_{h=1}^{H} \beta_5 X_{h,i} * LowFemale_i \\ + \beta_6 LowFemale_i + \beta_7 Y_{i,t=0} + \epsilon_{it} \end{aligned} \tag{1.3}$$

where $Y_{\text{it}}$ is an outcome (e.g. stress index, profits or sales) for owner $i$ in period $t$, $CBT_{\text{i}}$ is the treatment dummy, $LowFemale_1$ takes value one if the owner operates in an industry with a low concentration of women, $X_{h,i}$ controls for entrepreneurial ability (standardized index of business practices, education, firm years and daily working hours) and household liquidity[8]. $Y_{\text{i,t=0}}$ is the baseline outcome variable. Robust standard errors are estimated. To address concerns over multiple hypothesis testing and sample splitting, I report Sidak-adjusted p-values (Table A.4).

Tables 6 and 7 show that self-selection into a sector with a high concentration of female-owned businesses is strongly correlated with treatment effects. After receiving CBT, owners in less female-dominated industries have lower stress levels, relative to their EL counterparts and to those in the CBT group who operate in female-dominated sectors. In addition, their profits and sales increase over time when compared to those two groups. Table 6 shows that, immediately after the treatment, the stress index is between 0.25 and 0.32 standard deviations lower than for those who received CBT but own a boutique. Six months after the end of the intervention, the impact of CBT on stress levels remains large and statistically significant for owners in low-female-concentration sectors. The stress index is between 0.46 and 0.48 standard deviations lower than that for boutique owners in the CBT group (Table 6, column 3). The p-value of the sum of the treatment and the interaction effect is also significant, indicating that owners of firms in non-female-concentrated sectors have statistically significantly lower stress levels than the average owner in the EL group. The difference is approximately 0.4 standard deviations six months after treatment.

Table 7 shows that, immediately after the treatment ends, the effect of CBT

[8] The index is the sum of monthly expenditures in food, electricity, gas, water, mobile phone and rent or mortgage, standardized using the control group mean and standard deviation.

on profits and sales is not significantly different for owners in different sectors. The interaction of the treatment and low-female-concentration dummies enters most specifications with a negative sign, but standard errors are large. Six months after the treatment, profits are between BDT 20,000 (USD 240.53) and BDT 22,620 (USD 272.04) higher for owners in the CBT group who operate in a sector with a low concentration of women, relative to boutique owners in the CBT group (Table 7, column 5). The average effect of CBT on profits for non-boutique owners ranges from BDT 14,860 and BDT 18,600, an increase of between USD 180.01 and USD 225.31 with respect to their baseline levels of USD 440.89. The sum of the CBT treatment and the interaction of the treatment and the low female concentration dummies is significant for the sine transformation at the 10 percent level (column 6) in most specifications. The point estimates are also positive but non-significant for sales, with sizes ranging from BDT 61,990 (USD 745.53) to BDT 116,710 (USD 1,403.63) with respect to owners in the CBT group operating in a female-dominated sector.

I find no differential treatment effects on any source of change in profits between industries (Table 8). Immediately after the program ends, CBT has a negative effect on inventories on average, but owners in low-female-concentration industries have higher inventories after receiving CBT than their control group counterparts (columns 1 and 2). The negative effect of CBT on inventories for the average owner increases in magnitude over time (columns 5 and 6), but owners in sectors with a low concentration of women have higher values of inventories than their EL counterparts and other owners in the CBT group. The sum of the treatment dummy and the interaction of the treatment and industry type is not significantly different from zero. Reducing inventories is generally considered a best practice in manufacturing settings, and is a key dimension of the "lean production" system (see, for example, Bloom et al. [2010]). However, I do not have information to confirm that reducing inventories is the optimal decision for all firms in my predominantly retail context. I find no differences in treatment effects on other inputs. The impact on the number of hours worked or the number of employees between sectors is close to zero.

In sum, my results are in line with those from previous studies showing that self-selecting into a sector with a high concentration of women is an important source of heterogeneity in treatment effects. These results are robust to the inclusion of several variables that could confound the effect of industry choice. My data do not support the hypothesis that high-ability business owners are more likely to benefit from training, or the hypothesis that they increase their effort after the treatment, as

previous studies have documented in other low-income settings (Gine and Mansuri [2017]).

An alternative mechanism could be that, by encouraging participants to think about the payoffs of spending time on competing personal and professional activities, the CBT treatment prompted some participants to adjust their business-related efforts downwards. This might be the optimal decision for those who perceive their returns to investing in personal and social networks to be higher than the return to investing in their business. However, this is not borne out by the data on time-use patterns. Women in different industries spend similar amounts of time on business and household production activities.

### 1.5.2 Alternative Mechanisms

In this section I examine mechanisms that could explain the observed heterogeneity in the effects of CBT and have received little attention by economists. I focus on factors that have been identified as key drivers of therapy success and firm outcomes in the clinical psychology and management science literatures respectively.

#### Traits Affecting Therapy Outcomes

Despite strong evidence of efficacy of CBT for improving mental health outcomes, some people do not fully respond to treatment (Flynn [2011]). Most clinical studies suggest that treatment success depends primarily on certain personality traits and non-cognitive skills that are difficult to measure, such as the client's capacity to identify and share thoughts and feelings (Renaud et al. [2014]). It is then plausible that CBT works best for individuals who have high levels of self-awareness and self-discipline because these make it easier for them to engage in the therapy and comply with homework assignments. As a proxy for these variables, I use data on educational achievement. Having a bachelor's degree indicates that the individual has the ability to process abstract information. In addition, holding a university degree is an indicator of self-discipline, for this trait has been shown to outperform IQ in predicting academic achievement (Duckworth and Seligman [2005]).

I examine whether participants with a Bachelor's degree, who are almost 50 percent of my sample, experience larger reductions in stress levels than those who

do not have a university degree. I find no evidence that those with higher education benefit more from CBT in terms of improved mental health (Online Appendix). The coefficient associated with the interaction of being assigned to CBT and having a Bachelor's degree is not statistically different from zero, and it enters with a positive sign in all specifications for stress. Furthermore, the interaction term enters with a negative sign in many of the regressions for profits and sales, although it is never significant. Similarly, it has no effect on any inputs.

Compliance with treatment, as measured by the level of completion of homework assignments, has also been shown to predict therapy outcomes (Mausbach et al. [2010]; LeBeau et al. [2013]). The CBT intervention for this study was designed to encourage compliance through follow-up phone calls. In addition, a high percentage of participants attended all five sessions, which is likely to be an indicator of engagement and motivation. This is because of the high time and effort costs associated with travel within central Dhaka, where the sessions took place. However, my TOT estimates suggest that completion does not make owners more likely to benefit from CBT six months after the treatment. Neither does completion of treatment significantly increase profits, sales or any intermediate outcomes, such as inventories, time-use patterns, or the number of employees.

**Entrepreneurial Traits and Success in Developing Countries**

Skills gaps are among the most important constraints to firm growth in developing countries (Bruhn et al. [2017]). However, specific skills deficits and training needs vary across firms (Fischer and Karlan [2015]). In my context, a possible explanation for the observed heterogeneity is that owners in female-dominated industries lack essential entrepreneurial skills that impede the CBT treatment from having an effect on mental health and profits.

The management literature has long regarded "opportunity recognition" as the foremost ability of entrepreneurs because all other skills become relevant only after a source of profits is identified (Kirzner [1979]; Baron and Ensley [2006]; Ozgen and Baron [2007]; Tang et al. [2012]; Tumasjan and Braun [2012]; Prandelli et al. [2016]). For instance, compared to managers, entrepreneurs are more likely to actively search for new business ventures and ways of turning them into sources of revenue (Baron [2006]). If self-selecting into a sector with a low concentration of women - or a less-competitive sector in general - is indicative of having this at-

titude, the question becomes whether owners in female-dominated sectors (who, in my setting, have better managerial skills than the others) are unable to turn new skills into increased profits because they do not grasp when and how to apply them.

Testing this mechanism is challenging in practice. Multiple cognitive and non-cognitive abilities are involved in the process of finding and exploiting opportunities. Moreover, there is, to date, no consensus on which specific traits, skills, alone or in combination, are necessary for owners to benefit from training and capital, or to succeed in absence of support. For example, Bhagavatula et al. [2010] provide a comprehensive list of human and social capital dimensions correlated with entrepreneurial success in India, while Gielnik et al. [2012] focus on the role of creativity in explaining new venture success in Uganda. Furthermore, recent evidence from Mexico shows that female SME owners who enter self-employment driven by opportunity, as opposed to necessity, run more profitable firms. However, there is a large overlap in personality traits between "necessity" and "opportunity" entrepreneurs, including self-control, imagination, attitudes towards risk and the big five (Calderon et al. [2015]).

## 1.6 Conclusion

This paper investigates the effects of using Cognitive Behavioral Therapy (CBT) to teach stress-management skills to female business owners in Bangladesh. The intervention offered CBT, featuring priority setting and relaxation techniques, to one group of business owners and Empathic Listening (EL), which provides emotional support but no specific guidance on how to develop new skills, to the other group. I compare the impact of CBT and EL on owner stress levels, and firms' profits and sales.

In the short run, CBT leads to a large reduction in stress levels, but profits and sales do not increase. Six months after the treatment, owners in the CBT group still have lower levels of stress relative to baseline, but the effect is smaller than immediately after treatment; profits and sales remain unchanged. I document large differences in how owners in different industries respond to CBT. For owners in sectors with a low concentration of women, such as electronics or food processing, CBT has large negative effects on stress immediately after treatment and six months later; firm profits increase over time. For owners of firms in female-dominated sectors

(58 percent of my sample), the reduction in stress levels is short lived - the effect almost disappears after six months - and the impact on sales and profits is close to zero.

Despite compelling evidence that high-ability owners in developing countries are more likely to benefit from training (Gine and Mansuri [2017]), I find no support for this hypothesis in my setting. Owners in female-dominated industries have slightly higher levels of education than owners in other sectors, their firms are three years older on average and their managerial practices are better.

My results support the hypotheses that non-cognitive skills are malleable and can be taught to adults (Kautz et al. [2014]), and that nudging small business owners to devote more attention to long-term goals and less to day-to-day operations can foster firm growth in many industries (Bruhn et al. [2017]). In my context, the effects are concentrated on women who run firms in sectors with a lower concentration of women. This is in line with previous studies showing that self-selection into female-dominated industries is indicative of traits that moderate the returns to capital (De Mel et al. [2009a]).

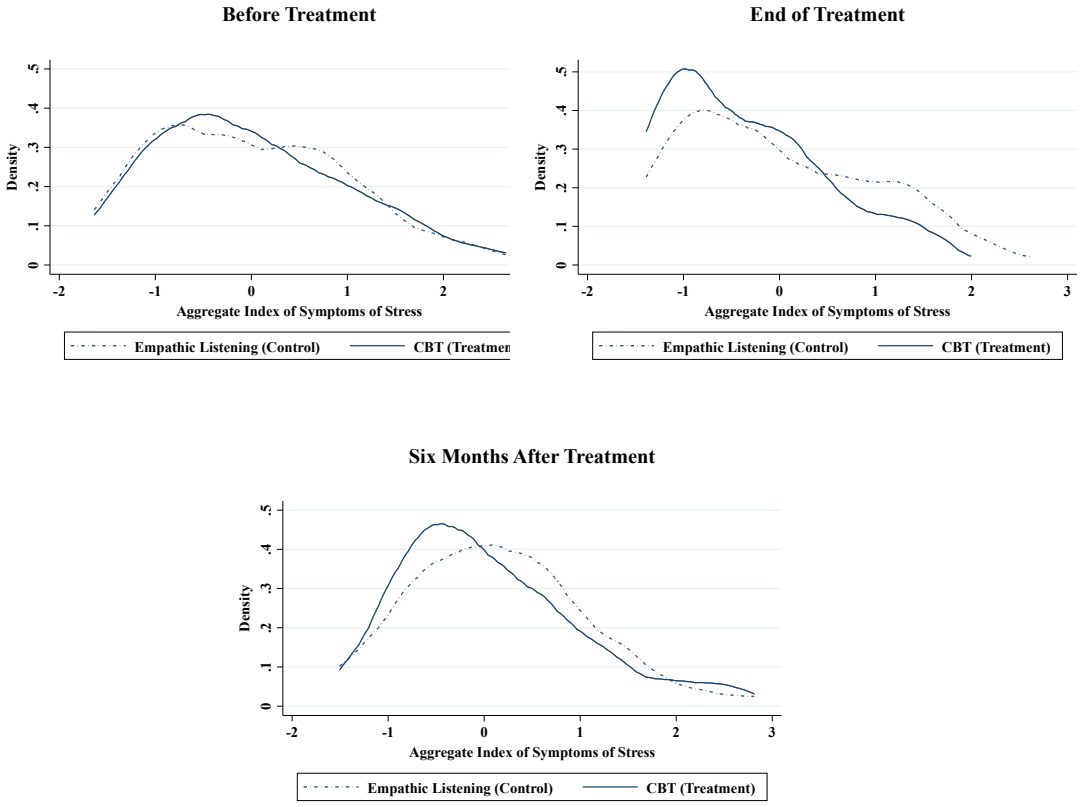
Understanding what makes some owners more likely to benefit from business support programs remains one of the most important gaps in the literature (Fischer and Karlan [2015]). Existing evidence does not allow to identify specific combinations of traits affecting returns to capital and training among women. However, several cognitive and non-cognitive skills involved in recognizing new business ventures show a strong correlation with entrepreneurial success in developing countries (Gielnik et al. [2012]; Calderon et al. [2015]; Bhagavatula et al. [2010]). Owners choosing less conventional sectors might be better able to identify and mobilize resources to seize profitable opportunities, including newly-acquired skills and capital injections. Testing this hypothesis will require improved measures of entrepreneurial traits and experimental designs that stratify on entrepreneurial aptitude or industry choice.

Table 1.1: Baseline Balance

| | Control group mean | Difference in treatment | N |
|---|---|---|---|
| Profits | 20.52 | 9.53 | 287 |
| | (4.33) | (7.15) | |
| Sales | 83.76 | 133.75** | 229 |
| | (16.58) | (62.03) | |
| Inventories | 420.89 | 353.07 | 264 |
| | (109.20) | (219.92) | |
| Formal Employees | 2.54 | 0.54 | 307 |
| | (0.39) | (0.64) | |
| Elicited Working Hours | 6.52 | 0.02 | 310 |
| (Time Use Survey) | (0.35) | (0.50) | |
| Average Hours | 6.17 | 0.76** | 307 |
| (Direct Reporting) | (0.27) | (0.36) | |
| Chores & Caregiving Hours | 4.90 | -0.31 | 310 |
| (Time Use Survey) | (0.30) | (0.41) | |
| Business Score | 13.25 | 0.50 | 310 |
| | (0.35) | (0.51) | |
| Boutique | 0.54 | 0.10* | 310 |
| | (0.04) | (0.06) | |
| Age | 36.08 | 1.05 | 310 |
| | (0.84) | (1.20) | |
| Stress Index | 0.00 | -0.01 | 310 |
| | (0.08) | (0.11) | |
| Bachelor's | 0.46 | -0.02 | 310 |
| | (0.04) | (0.06) | |
| HH size | 4.28 | 0.02 | 310 |
| | (0.14) | (0.21) | |
| Sessions completed | 4.17 | 0.04 | 309 |
| | (0.12) | (0.17) | |

Notes: Table reports a regression of the named variable on a constant and treatment dummy. The coefficients in column 2 are the control group mean, and those in column 3 report the difference with respect to the treatment group. Robust standard errors in parenthesis. Profits and sales are winsorized at the 99th percentile to trim outliers. Without winsorizing, profits and inventories remain statistically balanced between treatment and control groups, and sales are imbalanced at the five percent level. Profits, sales and inventories are expressed in thousands of Bangladeshi Taka (1,000 BDT ≈10 GBP). The Business Score is the number of good business practices implemented by the owner and takes values from 0 to 26. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The final rows report session attendance. Significance: *** p<0.01, ** p<0.05, * p<0.1

Figure 1.1: Kernel Density of Standardized Index of Stress Symptoms




Notes: Figure shows the distribution of stress levels before the intervention, immediately after and six months later. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The Kolmogorov-Smirnov test does not reject the null hypothesis of equality of distributions in (a) and (c), and it does reject the hypothesis of equality of distributions in (b) at the 5% level.

Table 1.2: Impact of Training on the Stress Index

| | End of Treatment | | 6 Months After End | |
|---|---|---|---|---|
| | (1) Stress Index | (2) IHS Stress | (3) Stress Index | (4) IHS Stress |
| ITT | -0.33*** | -0.26*** | -0.12 | -0.11 |
| | (0.09) | (0.08) | (0.10) | (0.08) |
| Adj R-squared | 0.31 | 0.32 | 0.26 | 0.26 |
| TOT | -0.44*** | -0.35*** | -0.16 | -0.15 |
| | (0.12) | (0.10) | (0.13) | (0.11) |
| First stage F-stat | 419.80 | 419.90 | 395.05 | 395.36 |
| Control Mean | 0.00 | -0.03 | 0.15 | 0.11 |
| Observations | 297 | 297 | 277 | 277 |

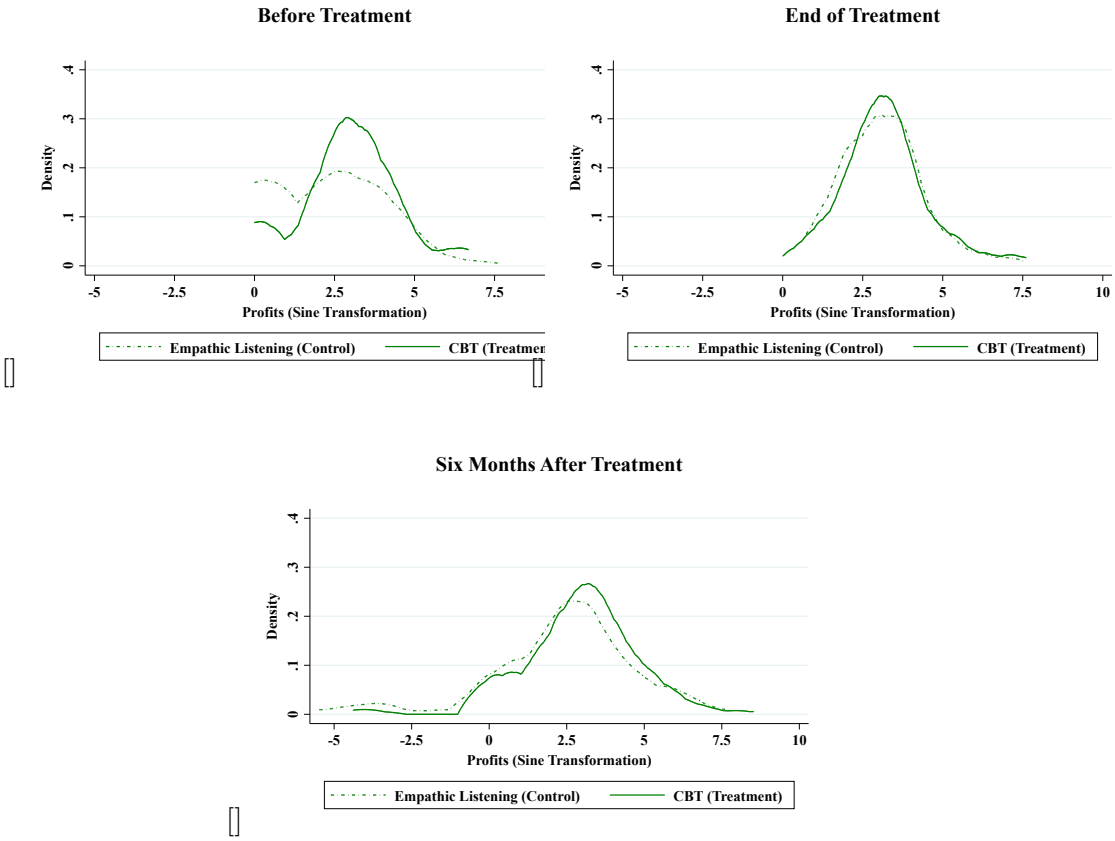
Notes: Table reports treatment effects on stress levels. The Stress Index is the standardized sum of the 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) for depression. IHS is the hyperbolic sine transformation of the stress index. The intent-to-treat estimates report the coefficient of a dummy that takes value one if the participant was originally assigned to the CBT group. The treatment-on-the-treated estimates use treatment assignment as an instrumental variable for treatment completion; a dummy that takes value one when the participant attends all five sessions. All regressions control for the baseline outcome variable. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table 1.3: Impact of CBT on Profits and Sales

| | End of Treatment | | | | 6 Months After End | | | | Combined | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Profit | (2) IHS Profit | (3) Sales | (4) IHS Sales | (5) Profit | (6) IHS Profit | (7) Sales | (8) IHS Sales | (9) Profit | (10) IHS Profit | (11) Sales | (12) IHS Sales |
| ITT | 4.98 | -0.16 | -0.12 | 0.03 | 3.60 | 0.35 | 20.34 | 0.04 | 4.14 | 0.10 | 7.79 | 0.02 |
| | (10.70) | (0.14) | (64.25) | (0.16) | (9.56) | (0.26) | (56.88) | (0.21) | (8.74) | (0.16) | (55.74) | (0.15) |
| Adj R-squared | 0.47 | 0.43 | 0.62 | 0.63 | 0.51 | 0.24 | 0.38 | 0.46 | 0.49 | 0.29 | 0.47 | 0.53 |
| TOT | 6.24 | -0.20 | -0.15 | 0.03 | 4.68 | 0.46 | 26.64 | 0.06 | 5.30 | 0.13 | 10.14 | 0.03 |
| | (13.21) | (0.17) | (81.79) | (0.20) | (12.29) | (0.33) | (73.36) | (0.27) | (11.07) | (0.20) | (71.86) | (0.20) |
| First stage F-stat | 418.63 | 405.31 | 296.58 | 316.10 | 375.83 | 362.86 | 278.89 | 287.11 | 439.43 | 428.96 | 318.24 | 336.33 |
| Control Mean | 33.61 | 3.14 | 170.49 | 4.38 | 32.58 | 2.37 | 139.77 | 3.95 | 33.08 | 2.74 | 154.50 | 4.16 |
| Observations | 224 | 224 | 197 | 197 | 239 | 239 | 205 | 205 | 463 | 463 | 402 | 402 |

Notes: Table reports treatment effects on profits and sales. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. The intent-to-treat estimates report the coefficient of a dummy that takes value one if the participant was originally assigned to the CBT group. The treatment-on-the-treated estimates use treatment assignment as an instrumental variable for treatment completion; a dummy that takes value one when the participant attends all five sessions. Standard errors are clustered at the owner level in the specifications combining both data rounds, and robust when the specification includes a follow-up and the baseline only. All regressions control for the baseline outcome variable. Significance:*** p<0.01, ** p<0.05, * p<0.1

Figure 1.2: Kernel Density of Monthly Profits (Hyperbolic Sine Transformation)




Notes: Figure shows the distribution of the hyperbolic sine transformation of monthly profits. The Kolmogorov-Smirnov test rejects the null hypothesis of equality of distributions at the 1% level in (a) and at the 10% level in (c). It does not reject the hypothesis of equality of distributions in (b).

Table 1.4: Impact of Training on Inputs

| | End of Treatment | | | | 6 Months After End | | | | Combined | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Invent. | (2) IHS Invent. | (3) Hours | (4) Workers | (5) Invent. | (6) IHS Invent. | (7) Hours | (8) Workers | (9) Invent. | (10) IHS Invent. | (11) Hours | (12) Workers |
| ITT | 30.36 | -0.18 | -0.12 | 0.03 | -190.42 | -0.26 | -0.19 | -0.40 | -57.93 | -0.22 | -0.15 | -0.18 |
| | (172.20) | (0.16) | (0.28) | (0.46) | (317.21) | (0.19) | (0.35) | (0.55) | (182.89) | (0.15) | (0.26) | (0.41) |
| Adj R-squared | 0.54 | 0.51 | 0.27 | 0.38 | 0.37 | 0.48 | 0.26 | 0.53 | 0.41 | 0.50 | 0.29 | 0.46 |
| TOT | 38.33 | -0.23 | -0.16 | 0.03 | -234.73 | -0.32 | -0.25 | -0.54 | -72.29 | -0.27 | -0.20 | -0.23 |
| | (214.75) | (0.20) | (0.37) | (0.61) | (385.50) | (0.23) | (0.46) | (0.74) | (226.18) | (0.19) | (0.35) | (0.52) |
| First stage F-stat | 415.44 | 423.29 | 404.60 | 401.12 | 418.79 | 431.37 | 369.30 | 369.30 | 440.44 | 452.72 | 394.83 | 424.74 |
| Control Mean | 713.96 | 5.36 | 6.64 | 2.51 | 1084.63 | 5.66 | 5.67 | 2.55 | 1085.89 | 5.51 | 6.17 | 2.53 |
| Observations | 241 | 241 | 293 | 292 | 223 | 223 | 274 | 274 | 464 | 464 | 567 | 566 |

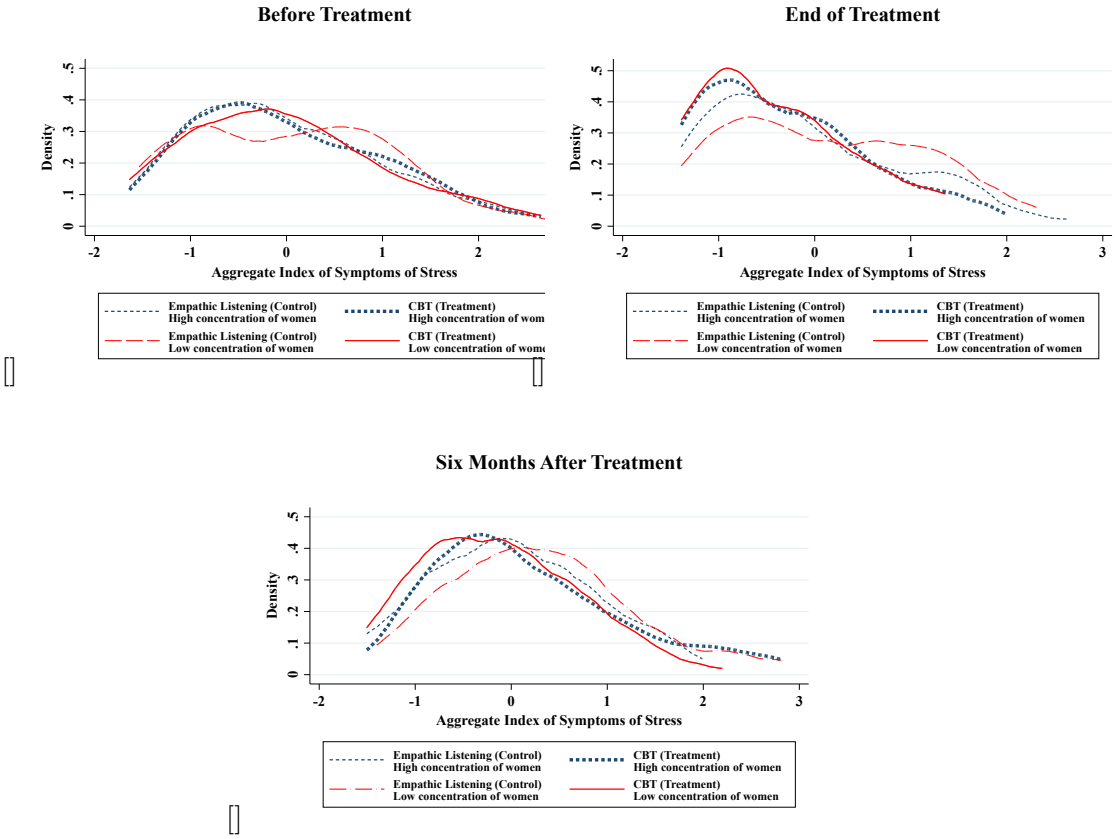
Notes: Table reports heterogeneous treatment effects on inventories, the number of daily hours spent by the owner on the business on an average day, and the number of formal employees at the time of the survey. Inventories are expressed in thousands of Bangladeshi Taka and are winsorized at the 99th percentile to trim outliers. The inverse hyperbolic sine transformation (IHS) uses non-winsorized inventories. The intent-to-treat estimates report the coefficient of a dummy that takes value one if the participant was originally assigned to the CBT group. The treatment-on-the-treated estimates use treatment assignment as an instrumental variable for treatment completion; a dummy that takes value one when the participant attends all five sessions. Standard errors are clustered at the owner level in the specifications combining both data rounds, and robust when the specification includes a follow-up and the baseline only. All regressions control for the baseline outcome variable. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table 1.5: Differences in Firm and Owner Characteristics by Industry

| | High Women Concentration | Low Women Concentration | P-Value Difference (High-Low) |
|---|---|---|---|
| Consumption Index | 0.10 | 0.16 | 0.6430 |
| | (0.98) | (1.16) | |
| Domestic Helper | 0.58 | 0.50 | 0.1632 |
| | (0.50) | (0.50) | |
| Household Chores | 4.56 | 5.07 | 0.2249 |
| (Hours) | (3.45) | (3.88) | |
| Initial Stress Index | 0.03 | 0.01 | 0.9028 |
| | (0.98) | (1.01) | |
| Entrepreneurial Ability | 0.38 | -0.10 | 0.0002 |
| Index | (1.19) | (1.04) | |
| Firm Years | 9.01 | 6.38 | 0.0033 |
| | (8.07) | 7.24 | |
| Business Score | 13.98 | 12.81 | 0.0226 |
| | (4.21) | (4.77) | |
| Daily Hours | 6.68 | 6.36 | 0.3826 |
| | (3.20) | (3.21) | |
| Education | 15.54 | 15.09 | 0.1428 |
| | (2.53) | (2.82) | |
| No Competitor | 0.07 | 0.12 | 0.0731 |
| | (0.25) | (0.33) | |
| Initial Profits | 21.29 | 30.49 | 0.2030 |
| | (46.65) | (75.60) | |
| Initial Sales | 144.58 | 159.01 | 0.8206 |
| | (489.32) | (491.50) | |
| Initial Number of Workers | 2.47 | 3.27 | 0.2136 |
| | (4.80) | (6.59) | |

Notes: Table reports mean, standard deviation and the p-value of the difference in means in observable characteristics between owners in different industries. The consumption index aggregates expenditures in food, rent, water, electricity, gas and mobile phone, and is standardized using the control group mean and standard deviation. "Domestic helper" is a dummy that takes value one if the owner has a maid. The entrepreneurial index is the standardized sum of firm years, business score, daily hours spent by the owner on the business and her education. Profits and sales are in winsorized at the 99th percentile to trim outliers and expressed in thousands Bangladeshi Taka. Significance:*** p<0.01, ** p<0.05, * p<0.1

Figure 1.3: Kernel Density of Standardized Index of Stress Symptoms. Heterogeneous Treatment Effects by Industry



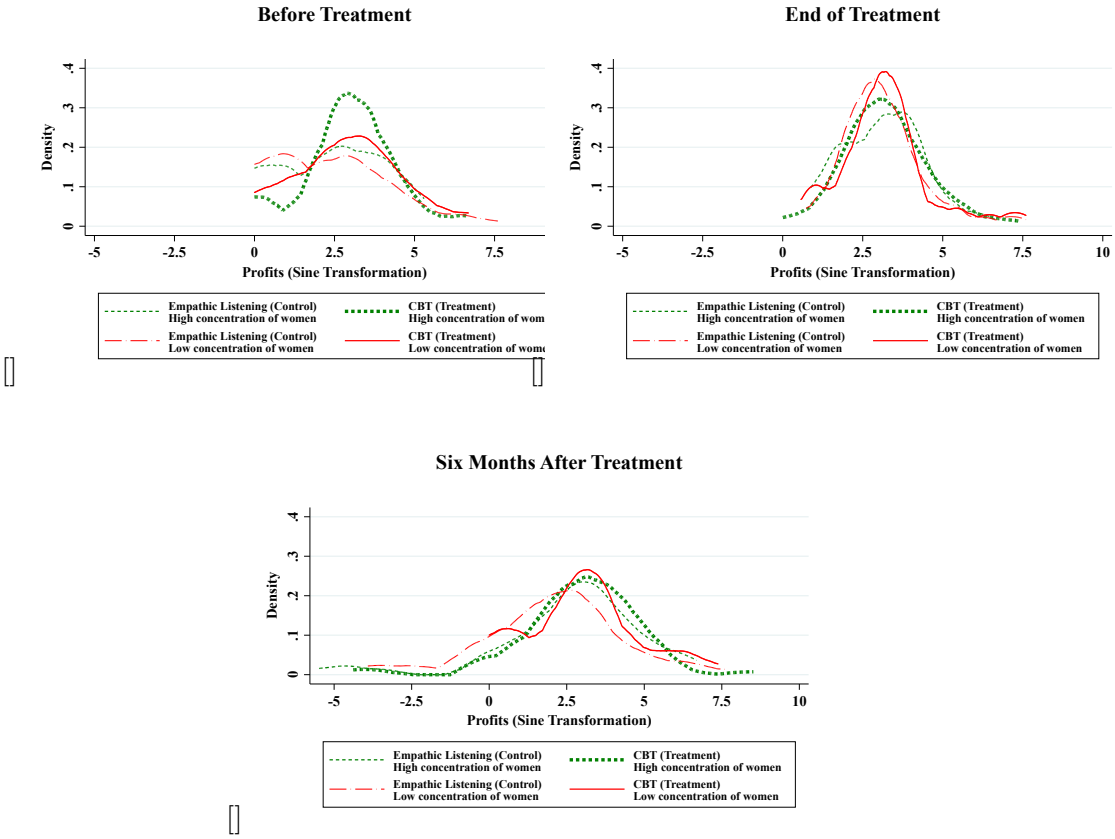

Notes: Figure shows the distribution of stress levels before the intervention, immediately after and six months later. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. In figure (a), the Kolmogorov-Smirnov test does not reject equality of distribution of any of the pairwise distributions; in figure (b) the test rejects the hypothesis of equality of distribution between treatment and control group for owners in sectors with a low concentration of women (at the 10 % level), but not for owners in female-dominated sectors. When studying pairwise differences within each experimental group, the test does not reject the hypothesis of equality of distribution by sector (high versus low concentration of women) for owners in either experimental group. In figure (c), the test does not reject equality of distribution of any of the pairwise distributions.

Table 1.6: Heterogeneous Effects on Stress by Industry

| | End of Treatment | | 6 Months After End | |
|---|---|---|---|---|
| | (1) Stress | (2) IHS Stress | (3) Stress | (4) IHS Stress |
| **Panel A. Controlling for treatment heterogeneity with: entrepreneurial ability** | | | | |
| CBT* Low Female Concentration | -0.30 | -0.25 | -0.48** | -0.35** |
| | (0.19) | (0.16) | (0.20) | (0.16) |
| CBT | -0.18 | -0.14 | 0.08 | 0.03 |
| | (0.13) | (0.10) | (0.13) | (0.10) |
| LowFem | 0.17 | 0.15 | 0.25* | 0.18 |
| | (0.14) | (0.11) | (0.14) | (0.11) |
| CBT*LowCon+CBT | -0.48*** | -0.39*** | -0.40*** | -0.32*** |
| P-value: CBT*LowCon+CBT | 0.001 | 0.001 | 0.01 | 0.012 |
| **Panel B. Controlling for treatment heterogeneity with: household liquidity** | | | | |
| CBT* Low Female Concentration | -0.25 | -0.20 | -0.46** | -0.33** |
| | (0.19) | (0.15) | (0.19) | (0.16) |
| CBT | -0.23** | -0.18* | 0.07 | 0.02 |
| | (0.12) | (0.10) | (0.12) | (0.10) |
| LowFem | 0.19 | 0.16 | 0.25* | 0.18 |
| | (0.14) | (0.11) | (0.14) | (0.11) |
| CBT*LowCon+CBT | -0.48*** | -0.38*** | -0.39*** | -0.30*** |
| P-value: CBT*LowCon+CBT | 0.001 | 0.002 | 0.009 | 0.014 |
| **Panel C. Controlling for treatment heterogeneity with: all factors** | | | | |
| CBT* Low Female Concentration | -0.32* | -0.27* | -0.47** | -0.33** |
| | (0.19) | (0.16) | (0.20) | (0.16) |
| CBT | -0.17 | -0.13 | 0.07 | 0.02 |
| | (0.12) | (0.10) | (0.13) | (0.10) |
| LowFem | 0.21 | 0.17 | 0.24* | 0.17 |
| | (0.14) | (0.11) | (0.15) | (0.12) |
| CBT*LowCon+CBT | -0.50*** | -0.40*** | -0.40*** | -0.31*** |
| P-value: CBT*LowCon+CBT | 0.001 | 0.001 | 0.009 | 0.013 |

Notes: Table reports heterogeneous treatment effects. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. IHS is the hyperbolic sine transformation of the stress index. All regressions control for the baseline outcome; a triple interaction of the treatment dummy, self-selection into an industry with a low concentration of women and additional confounders (as specified in each panel); as well as pairwise interactions of the treatment dummy, the sector type and each confounder. Confounders are entrepreneurial ability and household liquidity. Entrepreneurial ability is the standardized sum of firm years, business score, daily hours spent by the owner on the business and her education. Household liquidity is measured using an index that aggregates expenditures in food, rent, water, electricity, gas and mobile phone, and is standardized using the control mean and standard deviation. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Figure 1.4: Kernel Density of Monthly Profits (Hyperbolic Sine Transformation)




Notes: Figure shows the distribution of the hyperbolic sine transformation of monthly profits. In Graph (a), the Kolmogorov-Smirnov test does not reject the null hypothesis of equality of all pairwise distributions in (a), except for differences between CBT and EL for owners in sectors with a high concentration of women. In Graph (b), the test does not reject any pairwise distributions. In Graph (c), the test only rejects the null hypothesis that owners in the CBT and EL groups have a similar distribution of stress for those who operate in a sector with a low concentration of women.

Table 1.7: Heterogeneous Treatment Effects on Profits and Sales

| | End of Treatment | | | | 6 Months After End | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) Profit | (2) IHS Profit | (3) Sales | (4) IHS Sales | (5) Profit | (6) IHS Profit | (7) Sales | (8) IHS Sales |
| **Panel A. Controlling for treatment effect heterogeneity with: entrepreneurial ability** | | | | | | | | |
| CBT* Low Female Concentration | -4.94 | -0.14 | -0.47 | -0.06 | 20.06 | 0.84 | 116.71 | 0.47 |
| | (27.91) | (0.32) | (168.73) | (0.35) | (22.30) | (0.53) | (138.20) | (0.44) |
| CBT | 1.68 | -0.17 | -11.26 | 0.00 | -4.14 | -0.02 | -44.39 | -0.14 |
| | (10.94) | (0.22) | (41.14) | (0.22) | (9.10) | (0.33) | (46.81) | (0.27) |
| LowFem | 0.33 | 0.21 | 67.33 | 0.00 | -10.33 | -0.49 | 42.81 | -0.22 |
| | (20.51) | (0.23) | (127.03) | (0.25) | (13.56) | (0.42) | (87.73) | (0.30) |
| CBT*LowCon+CBT | -3.27 | -0.31 | -11.72 | -0.06 | 15.92 | 0.82*** | 72.33 | 0.33 |
| P-value: CBT*LowCon+CBT | 0.90 | 0.17 | 0.94 | 0.82 | 0.43 | 0.05 | 0.57 | 0.34 |
| **Panel B. Controlling for treatment effect heterogeneity with: household liquidity** | | | | | | | | |
| CBT* Low Female Concentration | 0.08 | -0.03 | 18.68 | -0.13 | 20.95 | 0.77 | 60.99 | 0.45 |
| | (24.34) | (0.29) | (144.78) | (0.32) | (18.61) | (0.49) | (135.53) | (0.43) |
| CBT | -0.98 | -0.19 | -1.19 | 0.13 | -6.09 | -0.02 | 1.47 | -0.08 |
| | (10.33) | (0.20) | (44.63) | (0.20) | (8.88) | (0.31) | (68.57) | (0.26) |
| LowFem | -2.86 | 0.02 | 39.73 | -0.05 | -10.03 | -0.47 | 25.6 | -0.33 |
| | (15.85) | (0.22) | (99.48) | (0.24) | (11.37) | (0.39) | (79.89) | (0.31) |
| CBT*LowCon+CBT | -0.90 | -0.22 | 17.49 | -0.01 | 14.86 | 0.75*** | 62.46 | 0.38 |
| P-value: CBT*LowCon+CBT | 0.97 | 0.28 | 0.90 | 0.98 | 0.38 | 0.05 | 0.56 | 0.29 |
| **Panel C. Controlling for treatment effect heterogeneity with: all factors** | | | | | | | | |
| CBT* Low Female Concentration | -3.61 | -0.08 | 0.51 | -0.06 | 22.62 | 0.88 | 95.78 | 0.44 |
| | (27.82) | (0.31) | (153.53) | (0.34) | (19.72) | (0.53) | (130.29) | (0.43) |
| CBT | -1.12 | -0.23 | -8.37 | 0.01 | -4.02 | -0.06 | -37.81 | -0.14 |
| | (11.37) | (0.21) | (41.24) | (0.22) | (8.97) | (0.33) | (49.97) | (0.27) |
| LowFem | -0.97 | 0.16 | 60.88 | -0.03 | -12.20 | -0.51 | 43.73 | -0.23 |
| | (20.78) | (0.23) | (115.28) | (0.24) | (12.87) | (0.43) | (88.27) | (0.30) |
| CBT*LowCon+CBT | -4.72 | -0.31 | -7.86 | -0.05 | 18.60 | 0.82*** | 57.97 | 0.30 |
| P-value: CBT*LowCon+CBT | 0.86 | 0.16 | 0.96 | 0.84 | 0.30 | 0.05 | 0.62 | 0.38 |

Notes: Table reports heterogeneous treatment effects. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. All regressions control for the baseline outcome; a triple interaction of the treatment dummy, self-selection into an industry with a low concentration of women and additional confounders (as specified in each panel); as well as pairwise interactions of the treatment dummy, the sector type and each confounder. Confounders are entrepreneurial ability and household liquidity. Entrepreneurial ability is the standardized sum of firm years, business score, daily hours spent by the owner on the business and her education. Household liquidity is measured using an index that aggregates expenditures in food, rent, water, electricity, gas and mobile phone, and is standardized using the control mean and standard deviation. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table 1.8: Heterogeneous Treatment Effects on Inputs

| | End of Treatment | | | | 6 Months After End | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) Inventories | (2) IHS Inventories | (3) Workers | (4) Hours | (5) Inventories | (6) IHS Inventories | (7) Workers | (8) Hours |
| **Panel A. Controlling for treatment effect heterogeneity with: entrepreneurial ability** | | | | | | | | |
| CBT*Low Female Concentration | 464.52 | 0.51 | 0.97 | 0.44 | 556.85 | 0.28 | 0.42 | 0.07 |
| | (442.40) | (0.37) | (0.94) | (0.62) | (913.50) | (0.42) | (0.87) | (0.78) |
| CBT | -222.4 | -0.43* | -0.50 | -0.14 | -392.48 | -0.29 | -0.43 | 0.02 |
| | (333.48) | (0.24) | (0.64) | (0.43) | (265.28) | (0.26) | (0.53) | (0.52) |
| LowFem | -221.05 | -0.47* | -0.51 | -0.77* | 555.77 | -0.03 | -0.59 | -0.59 |
| | (338.29) | (0.29) | (0.72) | (0.41) | (659.59) | (0.30) | (0.68) | (0.55) |
| CBT*LowCon+CBT | 242.11 | 0.07 | 0.47 | 0.30 | 164.36 | -0.01 | -0.01 | 0.09 |
| P-value CBT*LowCon+CBT | 0.39 | 0.77 | 0.49 | 0.50 | 0.85 | 0.98 | 0.99 | 0.88 |
| **Panel B. Controlling for treatment effect heterogeneity with: household liquidity** | | | | | | | | |
| CBT*Low Female Concentration | 432.02 | 0.47 | 0.82 | 0.32 | 724.73 | 0.28 | 0.37 | 0.17 |
| | (430.51) | (0.37) | (0.94) | (0.61) | (932.89) | (0.42) | (0.91) | (0.77) |
| CBT | -195.3 | -0.44* | -0.40 | -0.02 | -710.70** | -0.41* | -0.41 | -0.04 |
| | (329.11) | (0.24) | (0.70) | (0.42) | (315.30) | (0.24) | (0.67) | (0.53) |
| LowFem | -227.6 | -0.60** | -0.74 | -0.94** | 582.85 | -0.07 | -0.92 | -0.89 |
| | (333.10) | (0.30) | (0.73) | (0.41) | (712.38) | (0.32) | (0.73) | (0.54) |
| CBT*LowCon+CBT | 236.72 | 0.03 | 0.41 | 0.30 | 14.04 | -0.13 | -0.04 | 0.14 |
| P-value CBT*LowCon+CBT | 0.38 | 0.91 | 0.50 | 0.50 | 0.99 | 0.71 | 0.95 | 0.81 |
| **Panel C. Controlling for treatment effect heterogeneity with: all factors** | | | | | | | | |
| CBT*Low Female Concentration | 432.95 | 0.53 | 1.25 | 0.5 | 415.6 | 0.33 | 0.52 | 0.04 |
| | (459.07) | (0.37) | (1.01) | (0.62) | (925.12) | (0.42) | (0.86) | (0.78) |
| CBT | -189.76 | -0.47* | -0.78 | -0.24 | -336.86 | -0.35 | -0.49 | -0.01 |
| | (361.09) | (0.25) | (0.74) | (0.43) | (266.67) | (0.26) | (0.54) | (0.52) |
| LowFem | -245.01 | -0.52* | -0.74 | -0.78* | 590.2 | -0.06 | -0.67 | -0.57 |
| | (366.53) | (0.29) | (0.80) | (0.40) | (707.95) | (0.30) | (0.67) | (0.54) |
| CBT*LowCon+CBT | 243.19 | 0.06 | 0.46 | 0.26 | 78.74 | -0.02 | 0.03 | 0.03 |
| P-value CBT*Otpar+CBT | 0.38 | 0.81 | 0.49 | 0.57 | 0.93 | 0.94 | 0.97 | 0.96 |

Notes: Table reports heterogeneous treatment effects. Inventories are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The inverse hyperbolic sine transformation (IHS) uses non-winsorized inventories. All regressions control for the baseline outcome; a triple interaction of the treatment dummy, self-selection into an industry with a low concentration of women and additional confounders (as specified in each panel); as well as pairwise interactions of the treatment dummy, the sector type and each confounder. Confounders are entrepreneurial ability and household liquidity. Entrepreneurial ability is the standardized sum of firm years, business score, daily hours spent by the owner on the business and her education. Household liquidity is measured using an index that aggregates expenditures in food, rent, water, electricity, gas and mobile phone, and is standardized using the control mean and standard deviation. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A1: Robustness of Main Results to Baseline Imbalance

| | End of Treatment | | 6 Months After End | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Panel A. Stress Index | Stress Index | IHS Stress | Stress Index | IHS Stress |
| ATE Propensity Score Matching | -0.35*** | -0.28*** | -0.02 | -0.03 |
| (Caliper=0.2) | (0.14) | (0.12) | (0.14) | (0.13) |
| ATE Fisher's Randomization Test | -0.34*** | -0.27*** | -0.12 | -0.11 |
| | (0.09) | (0.08) | (0.10) | (0.08) |
| ATE Inverse Prob. Weight. | -0.33*** | -0.27** | -0.05 | -0.06 |
| | (0.13) | (0.10) | (0.11) | (0.09) |
| Potential Outcome Mean (Treatment EL) | 0.05 | 0.14 | 0.11 | 0.02 |
| Overidentification test | 0.99 | 0.99 | 0.98 | 0.98 |
| (H0: Covariates are balanced) | | | | |
| | (1) | (2) | (3) | (4) |
| Panel B. Profits | Profit | IHS Profit | Profit | IHS Profit |
| ATE Propensity Score Matching | 10.20 | -0.02 | 18.10 | 0.52* |
| (Caliper=0.2) | (13.74) | (0.19) | (16.24) | (0.29) |
| ATE Fisher's Randomization Test | 5.00 | -0.28 | 16.37 | 0.37 |
| | (14.73) | (0.15) | (16.43) | (0.27) |
| ATE Inverse Prob. Weight. | -0.16 | -0.07 | 11.37 | 0.59* |
| | 14.61 | 0.16 | 19.15 | 0.33 |
| Potential Outcome Mean | 42.27 | 3.24 | 35.94 | 2.36 |
| Overidentification test | 0.98 | 0.98 | 1.00 | 1.00 |
| (H0: Covariates are balanced) | | | | |
| | (1) | (2) | (3) | (4) |
| Panel C. Sales | Sales | IHS Sales | Sales | IHS Sales |
| ATE Propensity Score Matching | -160.81 | -0.24 | -160.54 | 0.00 |
| (Caliper=0.2) | (227.15) | (0.24) | 0.58 | 0.26 |
| ATE Fisher's Randomization Test | -189.72 | -0.02 | -352.30 | 0.00 |
| | (240.39) | (0.16) | (469.73) | (0.21) |
| ATE Inverse Prob. Weight. | -174.06 | 0.16 | -405.52 | -0.01 |
| | (246.08) | (0.20) | (474.67) | (0.21) |
| Potential Outcome Mean | 416.05 | 4.54 | 631.20 | 4.29 |
| Overidentification test | 0.98 | 0.98 | 0.99 | 0.99 |
| (H0: Covariates are balanced) | | | | |

Notes: Table reports robustness of main results to baseline imbalance in firm characteristics. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. Inverse Probability Weighting (IPW) uses firm years, daily working hours, baseline sales and operating in a sector with a low concentration of women to calculate the inverse probability of being assigned to the treatment. Fischer's randomization test shows results for 10,000 replications. Using 1,000 and 100,000 replications does not affect these results. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A2: Robustness of Main Results to Difference-in-Difference Estimation

| | (1) Stress | (2) IHS Stress | (3) Profit | (4) IHS Profit | (5) Sales | (6) IHS Sales |
|---|---|---|---|---|---|---|
| **Panel A. End of Treatment** | | | | | | |
| CBT*Post | -0.34*** | -0.27*** | 6.49 | -0.47*** | 25.64 | -0.07 |
| | (0.10) | (0.08) | (10.39) | (0.16) | (65.34) | (0.16) |
| Observations | 603 | 603 | 507 | 507 | 440 | 440 |
| Adj R-squared | 0.62 | 0.62 | 0.62 | 0.72 | 0.75 | 0.84 |
| **Panel B. Six Months After Treatment** | | | | | | |
| CBT*Post | -0.13 | -0.11 | 4.96 | 0.14 | -35.56 | -0.11 |
| | (0.11) | (0.09) | (9.51) | (0.25) | (69.78) | (0.21) |
| Observations | 583 | 583 | 522 | 522 | 448 | 448 |
| Adj R-squared | 0.60 | 0.60 | 0.65 | 0.53 | 0.60 | 0.72 |

Notes: Table reports robustness of main results to difference-in-difference estimation. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness of Main Results to Multiple Testing Hypothesis (ANCOVA Specification with Sidak-Adjusted P-Values)

| | (1) Stress | (2) IHS Stress | (3) Profit | (4) IHS Profit | (5) Sales | (6) IHS Sales |
|---|---|---|---|---|---|---|
| **Panel A. End of Treatment** | | | | | | |
| CBT | -0.33*** | -0.27*** | 4.98 | -0.16 | -0.12 | 0.03 |
| | (0.09) | (0.08) | (10.53) | (0.14) | -66.34 | -0.16 |
| Observations | 297 | 297 | 224 | 224 | 197 | 197 |
| Adj R-squared | 0.31 | 0.32 | 0.47 | 0.43 | 0.62 | 0.63 |
| **Panel B. Six Months After Treatment** | | | | | | |
| CBT | -0.12 | -0.12 | 3.6 | 0.35 | 20.34 | 0.04 |
| | (0.10) | (0.08) | (9.75) | (0.25) | (71.11) | (0.21) |
| Observations | 277 | 277 | 239 | 239 | 205 | 205 |
| Adj R-squared | 0.26 | 0.26 | 0.51 | 0.24 | 0.38 | 0.46 |

Notes: Table reports robustness of main results to multiple hypothesis testing. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. Robust standard errors. Significance:*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A4: Robustness of Heterogeneity Analysis to Multiple Testing Hypothesis (Sidak-Adjusted P-Values)

| | End of Treatment | | | | Six Months After End | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) Stress | (2) IHS Stress | (3) Profit | (4) IHS Profit | (5) Stress | (6) IHS Stress | (7) Profit | (8) IHS Profit |
| **Panel A. Controlling for treatment effect heterogeneity with: entrepreneurial ability** | | | | | | | | |
| CBT* Low Female Concentration | -0.30 | -0.25 | -4.94 | -0.14 | -0.48** | -0.35** | 20.06 | 0.84 |
| | (0.19) | (0.16) | (23.37) | (0.31) | (0.20) | (0.16) | (20.15) | (0.52) |
| CBT | -0.18 | -0.14 | 1.68 | -0.17 | 0.08 | 0.03 | -4.14 | -0.02 |
| | (0.13) | (0.10) | (15.23) | (0.20) | (0.13) | (0.11) | (13.45) | (0.35) |
| CBT*LowCon+CBT | -0.48 | -0.39 | -3.27 | -0.31 | -0.40 | -0.32 | 15.92 | 0.82 |
| *P-value: CBT*LowCon+CBT* | 0.001 | 0.001 | 0.85 | 0.19 | 0.008 | 0.009 | 0.29 | 0.04 |
| **Panel B. Controlling for treatment effect heterogeneity with: household liquidity** | | | | | | | | |
| CBT* Low Female Concentration | -0.25 | -0.20 | 0.08 | -0.03 | -0.46** | -0.33** | 20.95 | 0.77 |
| | (0.18) | (0.15) | (22.27) | (0.30) | (0.20) | (0.16) | (19.48) | (0.50) |
| CBT | -0.23* | -0.18* | -0.98 | -0.19 | 0.07 | 0.02 | -6.09 | -0.02 |
| | (0.12) | (0.10) | -14.12 | -0.19 | (0.13) | (0.10) | -12.63 | -0.33 |
| CBT*LowCon+CBT | -0.48 | -0.38 | -0.90 | -0.22 | -0.39 | -0.30 | 14.86 | 0.75 |
| *P-value: CBT*LowCon+CBT* | 0.001 | 0.001 | 0.96 | 0.35 | 0.009 | 0.012 | 0.32 | 0.05 |
| **Panel C. Controlling for treatment effect heterogeneity with: all factors** | | | | | | | | |
| CBT* Low Female Concentration | -0.32* | -0.27* | -3.61 | -0.08 | -0.47** | -0.33** | 22.62 | 0.88* |
| | (0.19) | (0.16) | (23.31) | (0.31) | (0.20) | (0.16) | (20.25) | (0.52) |
| CBT | -0.17 | -0.13 | -1.12 | -0.23 | 0.07 | 0.02 | -4.02 | -0.06 |
| | (0.13) | (0.10) | (15.23) | (0.20) | (0.14) | (0.11) | (13.53) | (0.35) |
| CBT*LowCon+CBT | -0.50 | -0.40 | -4.72 | -0.31 | -0.40 | -0.31 | 18.60 | 0.82 |
| *P-value: CBT*LowCon+CBT* | 0.001 | 0.001 | 0.79 | 0.18 | 0.008 | 0.01 | 0.22 | 0.04 |

Notes: Table reports robustness of heterogeneity to multiple hypothesis testing. Profits and sales are expressed in thousands of Bangladeshi Taka and winsorized at the 99th percentile to trim outliers. The Stress Index is the standardized sum of symptoms of anxiety and depression, using the control group mean and standard deviation. The 7-item scale for Generalized Anxiety Disorders (GAD-7) and the 9-item scale Patient Health Questionnaire (PHQ-9) were used to measure symptoms of anxiety and depression, respectively. The inverse hyperbolic sine transformation (IHS) uses non-winsorized profits and sales. Robust standard errors. Significance:*** p<0.01, ** p<0.05, * p<0.1

# Chapter 2

# Willingness to Accept Preschool Incentives in Urban Bangladesh

## 2.1 Introduction

In developing countries, the adoption of many technologies and behaviors considered beneficial or profitable remains low. This is the case for improved health products (Luoto et al. [2014]), improved cook stoves (Miller and Mobarak [2014]), seasonal migration (Bryan et al. [2014]), agricultural technologies for farmers (Hanna et al. [2014] and Bold et al. [2015]) and consulting services for firms (Bloom et al. [2013]). Adoption can been encouraged by offering free trials or subsidies, but these can be wasteful if they fail to attract its intended beneficiaries or the product is offered at an infra-marginal price (Dupas and Miguel [2017]). Knowing the willingness to pay to try a novel product or service is therefore crucial to guide the targeting (and set the magnitude) of incentives intended to increase its adoption.

In this study, we use a reverse Becker-DeGroot-Marschak (BDM) mechanism to elicit the willingness to accept (WTA) a one-time, unconditional cash incentive to try a free daycare service for preschool children in a sample of low-income urban households in Bangladesh. Improving access to preschool has become a policy priority in many developing countries, but formal childcare is a relatively innovative concept for many poor urban dwellers and, despite increases in availability, use by low-income households remains low (Mateo Díaz and Rodriguez-Chamussy [2016] and World Bank [2015]); Mateo Díaz and Rodríguez Chamussy [2015]). Advancing our understanding of what drives the perceived value of this service could inform the design of interventions aimed at improving enrollment rates, and prevent having empty spaces in schools and daycare centers.

We invited 635 households with children between two and five years of age from 17 communities in Greater Dhaka to take part in a short survey about living conditions and their decision to use (or not) childcare. Among those, 415 households (around 60 percent of the sample) were not using formal childcare, and 18 were using it for some but not all their children. In total, 268 out of the 635 households participated in what we called "a lottery". All were located within walking distance of a daycare center. Since trust was essential for conducting the census survey and the BDM mechanism, we partnered with Phulki, an NGO providing childcare in more than 80 urban communities in the country which helped us to obtain the approval of local politicians and community leaders.

The BDM mechanism was implemented immediately after the survey, in two steps. First, we told participants that they could win a free educational book for

children if they told us how much they would pay for the book. We showed them a stack of cards and explained that there were numbers written on each of them. We then told them that they would win the book if their number matched or was lower than that written on a single card drawn at random from the stack.[1]

In the second step, we asked them how much money they would be willing to accept to try a free daycare service for their children. We explained that the daycare center was open from 8 am to 8 pm, six days per week, and children would be taken care of by a qualified teacher and would play with others of the same age. We showed them pictures of one of the centers and children engaging in educational activities. We told them that they would not be required to try the service if they won the prize. We then asked them to select a card from a second stack of cards and explained that they would receive an unconditional incentive in cash equal to the amount they bid if the number was equal or a lower than the amount written on the card[2].

Of the 262 households taking part in the second step of the BDM, 193 won the incentive. The payment was made immediately. A month later, we conducted a phone-based follow-up survey to ask parents whether they had visited the center and enrolled their children. Of the 193 winners, 16 had visited the center and nine enrolled at least one of their children. Among those who did not win the incentive, one visited the center and decided not to use the service. This indicates that providing information about the benefits of the service is not enough to increase enrollment, and that households underestimated the size of the incentive they would require to use it.

The median and modal bids for the book were 20 Bangladeshi Taka (BDT), approximately 0.25 US dollars - its true market price. The median and modal bids for the (monthly) childcare incentive were 500 BDT, around 6 US dollars. This amount is above that paid by previous income support programs in the country (the

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[1] The purpose of this exercise was to twofold. The first was to prepare participants for the second task, which was more difficult and ambiguous. The second was to signal - after turning the selected card - that the number would be drawn from an unknown distribution, but the range was close to the market price. We expected this would make households less likely to bid amounts much higher than what they knew a governmental agency or an NGO could possibly pay in the second step.

[2] In a standard BDM, participants would have been paid the amount on the card. Due to lack trust among respondents, we modified this aspect. We discuss the reasons in more detail in section 3.2.

average stipend in 2011 was 400 BDT per month per child) but below the amounts provided by cash transfer programs in countries as diverse as Mexico, Colombia and Nicaragua (with monthly transfers starting at 15 US dollars). This suggests that most households bid amounts they thought were realistic for an education incentive in Bangladesh, but only a minority were persuaded to even try the service after receiving the incentive. Furthermore, half of those who wanted to learn more about the service and visited the centre decided not to use it.

We find that living conditions are the most important determinant of the amount bid. Those residing in cheaper houses with no access to sanitary toilets demand significantly lower amounts of incentive to try the service. Households where the head is a garment worker spend significantly less food, are more likely to live in low-quality dwellings, and place significantly lower bids - between 158 and 190 BDT lower.

This study contributes to a growing literature on pricing and adoption of new technologies and behaviors in low-income countries. To date, most studies measuring demand rely on take-it-or-leave-it (TIOLI) offers, which are relatively simple to explain and implement in low-literacy settings but only provide information about the decision to buy at specific price points (see, for example, Dupas [2014]; Cohen and Dupas [2010]). A small number of studies use modified BDM methods to elicit willingness to pay (WTP). For example, Guiteras et al. [2014] use this mechanism to elicit the amount of compensation required by households to receive water filters at a later date than initially agreed. Similarly, BDM methods have been used to study WTP for water filters (Berry et al. [2015]), chlorine-based solutions (Luoto et al. [2012]), rainfall insurance (Cole et al. [2014]) and environmental conservation (Jack [2013]). Our study is distinct in that it estimates the willingness of households to receive an incentive to leave their pre-primary school children under the supervision of non-family members, a behavior that challenges the social norm that mothers should care for their children.

Finally, our results also add to a number of studies aimed to understand the determinants of the demand for childcare in developing countries (Martínez and Perticará [2017]; Mateo et al. [2016]); World Bank [2015]), most of which have focused on Latin American countries. It also adds to a large body of literature evaluating the effectiveness of conditional and unconditional cash transfers to increase enrollment rates among primary and secondary school age children, and the nutritional status of preschool children from low-income households (Behrman et al. [2010]; Ahmed

et al. [2009]; Schady and Araujo [2006]; Rawlings and Rubio [2005]).

The rest of the paper is organized as follows. Section 2 describes the supply of formal childcare services in urban Bangladesh. Section 3 describes the target population and experimental design. Section 4 presents results from the BDM mechanism. Section 5 discusses mechanisms that are likely to influence childcare use and WTA. Section 6 concludes.

## 2.2 The fragmented supply of childcare services in urban Bangladesh

Recent evidence from 53 low and middle-income countries suggests that one in three children under five years of age are left alone at home or under the care of a sibling under the age of ten for at least one hour per week, and often for as long as their parents work (Samman et al. [2016])[3]. In line with these statistics, our survey data indicate that approximately one in six households leave preschool children alone at home while both parents work. At the same time, 13.8 out of 40 spaces go unused in the average community daycare center in our context. Only seven out 40 Phulki centers were at or close to full capacity in April 2016. In eight centers, there were less than 15 children enrolled. This is high relative to countries for which national data is available; for example, nine percent of preschool spaces go unused in Chile (Mateo et al. [2016]).

Increasing access to pre-primary education was one of the priorities in the 2010 Bangladesh National Education Policy. And yet, there is a dearth of data on coverage by area and type of provider. Enrollment rates have increased from 21.6 in 1998 to 31.22 percent in 2015 (World Development Indicators), but these numbers are likely to mask differences across socioeconomic strata. Urban children with highly educated parents are more likely to have access to preschool education.

Some employers provide on-site childcare services to their workers, but this is far from being the norm and many parents choose not to take their children to these centers. Garment factories are increasingly offering this service, as it is required by law for plants with more than 40 workers. Nonetheless, compliance is not monitored

[3] The report used data collected from UNICEF global databases, based on the latest Demographic Health Survey and other nationally representative surveys.

and the low quality of the premises is often cited by female employees as a reason not to use them (UNICEF [2015]).

A number of privately-run preschools and daycare centers are available in low-income urban communities. The Bangladesh Rural Advancement Committee (BRAC, recently renamed as Building Resources Across Communities) and Phulki are among the largest service providers in the country. BRAC started a pre-primary school program in 1997 that offered a one-year course for children between five and six years of age, completely free of cost.

Phulki runs community-based centers in approximately 40 urban communities in Greater Dhaka, and its target beneficiaries are working mothers. The exact opening times and monthly fees vary across centres, but most centers offer a basic 9 am to 5 pm service - which can be extended to 8 am to 8 pm by mutual agreement between teachers and parents - six days a week, with rates ranging from 100 BDT to 400 BDT (1.20 to 4.84 US dollars) per month.

The monthly fee depends on whether the child stays after 5 pm. The price of the 9 am to 5 pm service ranges from 0 to 200 BDT per month, and the extra charge for extended hours is usually 300 BDT (3.60 US dollars). Most Phulki centers have capacity for 40 children, but many are operating below capacity while others have reached their limit. With the aim of homogeneizing prices, which depend on individual negotiations between parents and teachers and hence may vary within and across communities, we offered the extended 8 am to 8 pm service completely free of charge to all parents taking part in the BDM until their children turned six years old.

## 2.3 Target Population and Experimental Design

### 2.3.1 Household Census

To obtain a first estimate of the demand for childcare, we conducted a census survey in 17 out of the 40 communities in Dhaka Division (Dhaka and Gazipur districts) in which Phulki has daycare centers. We covered approximately 2,660 households in two waves. The first was conducted between November 2016 and January 2017 and covered six communities (917 households), and the second was done between June and July 2017 and covered 11 communities (1,754 households). We included

catchment areas for which we found community leaders and informants (mainly, schoolmasters, imams and local politicians) willing to endorse the survey.

Households within each community were selected by setting a community-specific sampling interval (proportional to the number of households in the area) and a starting point at random. A single member of the household answered all the questions. Respondents were told that the aim of the census was to understand what type of programs could improve their quality of life, and that their answers would be aggregated and shared with NGOs and policy makers to inform the design of future public programs. More than 93 percent of the households accepted to be interviewed and hence we completed 2,496 surveys.

We collected information about overall living conditions, including consumption, source of drinking water and sanitary facilities. We also asked a series of questions about physical health and illnesses experienced by the respondent and by other members of the household over the two weeks prior to the survey. I addition, we asked about self-reported symptoms of generalized anxiety and depression. Data from developed countries shows a strong correlation between participation in paid employment, earnings, time spent in household-related activities and well-being among women (Bertrand et al. [2015]; Bertrand [2011]). We are interested in understanding whether a correlation between well-being, participation in employment and childcare use can be found in our context. We use the seven-item Generalized Anxiety Disorder survey (GAD-7, Spitzer et al. [2006]) and the two-item version of the Patient Health Questionnaire (PHQ-2, Kroenke et al. [2003]) to measure anxiety and depression, respectively. We aggregate these nine mental health questions into a single measure, which we refer to as the Stress Index. The index is the unweighted sum of standardized GAD-7 and PHQ-2 scores in the full sample, and it has zero mean and a standard deviation of one by construction.

### 2.3.2 BDM mechanism design and implementation

Including the pilot, 635 households with children between two and five years of age were visited again and invited to take part in the lottery. An enumerator explained that the census had shown that there were many working mothers with preschool children, and we were offering a free 8 am to 8 pm daycare service to them. Two benefits were made salient. The first was that the centers offered a safe and friendly environment for children to play, and only the parents or a person

authorized by them could pick them up. The second was that children could interact with others and engage in educational activities. The enumerator explained that we were interested to know if parents would be willing to try the service if a stipend was offered. It was explicitly mentioned that stipends were commonly offered to help families to send children to primary school, and this was a similar initiative for younger children.

After the introductory speech, parents were asked if they would be interested in trying the service. We made a practice exercise with those who expressed an interest. We showed them an educational book for children and told them they could have it for free if they won a lottery. Then we show them a stack of cards and told them each card had an amount written of it. We explained that they would have to tell us how much they would pay for the book, and then pick a card at random. If the amount chosen by them was equal or lower than the amount in the card, they would win the lottery and we would give them the book. This exercise had two goals. The first was to prepare the respondent for the next task, which was more complex. After extensive piloting, we found that a large portion of respondents stopped answering questions when a long explanation was necessary to help them understand what we were asking. Simplifying contents and breaking sentences into short messages kept them interested and willing to make an effort to answer truthfully. The second goal was to reduce the amount of ambiguity involved in the process of drawing a number from an unknown distribution[4].

Following the mock exercise, we showed them a second stack of cards and told them that each of them had a number written on it. We asked them to tell us what would be the minimum amount of money they would need to receive to try the service. If the amount was equal or lower than the amount in the card, they would win the lottery and receive the desired stipend. Our approach was different from a standard BDM mechanism in that we paid the amount bid. Given the widespread lack of trust towards strangers and the difficulty of explaining the BDM mechanism to low literacy and numeracy populations, we expected this would make it easier to obtain truthful responses and to reduce opt-out rates. During the pilot study we found that understanding the rationale of the study was an important driver of participation and response patterns. Several parents were concerned that we were child traffickers. Some were angry that we went to their home after dark to ask

[4] Previous studies using a BDM mechanism in low-literacy settings revealed the full range of possible numbers and had an upper limit, which they describe as a limitation of the study, but one necessary to obtain responses (Guiteras et al. [2014]).

questions that did not make sense to them. Many refused to answer our questions or provided vague responses. There cases where our enumerators were subjected to verbal abuse or asked to leave at some point during the survey because it was not clear to the respondent (and sometimes, relatives and curious neighbours) how the research team would benefit from the study. Hence, we anticipated that, for this population, it would be difficult to understand that we expected them to report more truthfully if they were paid a reservation value chosen randomly from a distribution which was unknown to them.

This modification reduced the uncertainty over the amount of the cash transfer they could receive and effectively made the mechanism a first-price - rather than a second price - auction. This raises the concern that participants might have behaved strategically by underbidding their reservation price (or, in this case, overbidding the required incentive). However, in section 4.2 we show that take-up was low even when they were paid the amount they bid.

The enumerators explained that the goal of the lottery was to help us understand if providing stipends could help parents to send their preschool children to a daycare center, and that we would share this information with relevant policymakers and NGOs working in their area. Since it was not feasible for us to monitor the quality of the service in all centers, we did not require them to send their children to the daycare center if they won.

All the cards contained the same amount[5], which was chosen to be perceived as sensible by respondents during the pilot. In the case of the book, the amount was its exact market price (20 BDT, approximately 0.25 US dollars). For the second lottery, we set the amount at 500 BDT (around 6 US dollars). We conducted a series of in-depth interviews to estimate this reservation value. A pilot in a sample of 97 households suggested that this was a reasonable amount. The mode and median values given by households were exactly 500 BDT, suggesting this would be the stipend they would need to receive in exchange for trying a childcare service that was already being offered to them for free.

From the 635 households that were invited to participate in the lottery, 80 were absent and 18 refused to be interviewed a second time. Six participants dropped out after bidding for the book. Only two of those six had lost the lottery and did

[5] This was done to prevent a sense of unfairness among participants from the same community who bid similar amounts but did not win, even if by just chance

not win the book.

### 2.3.3 Living Conditions, Employment and Childcare Use

Recent evidence from developed countries has shown that well-being levels among working women have declined in the past decades. This has been partially attributed to a tendency to compensate for their increased earnings and labor supply (which challenges the norm that they should care for family members) by spending more time on household chores (Bertrand [2011]; Bertrand et al. [2015]). For this reason, we are interested in understanding whether the decision to use formal childcare is correlated with living conditions, the occupational choice of different household members and mental well-being in our context.

#### Household Characteristics and Use of Formal Childcare

Table 1 reports basic household characteristics as measured in the census survey. The average and median households have four members and spend around 2,000 BDT (roughly 25 US dollars) per week on food. Approximately 84.3 percent rent their home and 36.9 percent have a savings account. Around 70 percent of the households live in a one-bedroom unit, wall-to-wall or in close proximity to other families living in similar units (Figure 1). This form of accommodation is often found between residential buildings or in abandoned areas and alleys, and the average unit is of lower quality than rooms and apartments found inside buildings, regardless of their size. We call these groups of low-quality units "one-bedroom clusters".

Almost 80 percent of the respondents are women, most often the spouse or the daughter of the household head. Only 16 percent of our female respondents are the household head. Their average age is 31 years (only 10 percent are above 45) and the vast majority are married (around 91 percent). Almost half of them have not completed primary school, and only 13 percent completed secondary education. Nearly 36 percent have never worked, and among the 43.5 percent who are in paid employment, the most common occupational groups are domestic helpers (29.4 percent), home-based business owners (24.4 percent) and ready-made garment (RMG) workers (23.2 percent). Among men, the average age is 36 years of age and 80 percent are the household head. The distribution of education is similar to that of the female respondents but, unlike women, most men are currently working (87

percent) and they engage in a wider range of occupations. The most common forms of employment are business owner (17.4 percent), rickshaw puller (14 percent), other transport (12.2 percent), construction (11 percent) and garments (9.5 percent).

We asked households whether any children between two and five years old was attending a school or daycare centre, both in the census and the BDM surveys. The results are shown in Table 2. Although both surveys were collected within four weeks, 114 households changed their answer (from no to yes, or vice versa). During the census survey, 197 reported to be sending their preschool children to a school or a daycare centre. When we visited the households again to conduct the BDM mechanism, 217 reported to be using these services. 67 were using formal childcare at the time of the BDM but not when the census was collected, and 47 appeared to have stopped using it. We conducted back checks and found that, in many instances, different respondents provided different answers, and it was not clear why. A few cases were working mothers who started a different job between surveys and changed their choice of childcare arrangements. In most cases, however, the back checks suggest that respondents reported less accurately during the census. While we cannot be sure of why this happened, we speculate that the census survey helped to build rapport and that, conditional on being willing to participate, respondents were more likely to respond truthfully in the second survey. For example, women were more likely to report being a domestic helper during the second survey. There is some anecdotal evidence (mostly, off the record comments by respondents) that domestic work is perceived to be a low status job, compared to garments or self-employment.

We think it is unlikely that households changed their response in anticipation of a reward because the BDM mechanism took place after we completed the survey and, within in each area, most of the surveys were done in one day and in parallel. Indeed, while the correlations between the employment status of different household members and reported use of childcare during the BDM survey and at both surveys show very similar patterns, those at the time of the census do not. The only variable that is significantly correlated with childcare use at the time of the census is "respondent did not work in the last seven days", which enters with a negative sign.

Table 2 reports on the correlations between childcare use and the occupational choice of different household members. The probability of reporting that at least one child below the age of six attends formal daycare in both surveys is higher

among domestic helpers, and the effect is stronger among heads' spouses. Regardless of the occupational choice of the spouse, households where the head works in garments are more likely to report using formal childcare in both surveys, and those in which the head owns a business are less likely to be interested in trying the service. Few other household characteristics predict childcare use. Alternative specifications including the number of days that the respondent and all household members spent sick, self-reported symptoms of anxiety and depression by the respondent, access to a sanitary toilet, piped water or electricity show no significant correlations. Neither do specifications including the educational level of the head or the head's spouse, having savings, the amount of money spent on food and rent, or home ownership status.

### 2.3.4 Respondents' Well-being and Childcare Use

We next analyze the relationship between respondents' well-being levels, the occupational choice of different household members and the decision to use formal childcare. Table 3 shows that households using formal childcare at the time of the BDM survey and in both surveys have significantly lower levels of stress. The coefficient is close to 0.2 standard deviations for the full sample. Among spouses, the coefficient is also negative and close to 0.25 standard deviations.

The coefficient is still highly significant (although it drops to 0.12 and 0.15 respectively) when controlling for monthly rent, food expenditures and having a savings account, and it does not change when controlling for the educational level of the household head or the respondent. Indeed, none of these two variables is statistically significant. The frequency with which the respondents' daily life involves physical activity, such as vigorous household chores or physical work (e.g. pulling a rickshaw) is significantly positively correlated with stress; its coefficient is consistently close to 0.2 standard deviations across specifications.

Respondents working in garments have lower levels of stress than those in other forms of wage employment, excluding domestic helpers. The coefficient of the RMG dummy, which ranges from -0.35 and -0.43 standard deviations, is always significant for the full sample and not significant at conventional levels for two out of the three specifications for spouses only. Owning a business also enters with a negative sign and is significantly different from zero in the three regressions where all respondents are included. The coefficient is roughly 0.2 standard deviations.

These results remain largely unchanged when controlling for households characteristics that are statistically significantly correlated with stress levels, such as having access to sanitary toilets, which enters the stress regression with a negative coefficient (0.22 standard deviations, significant at the five percent level). The number of children below the age of six is not statistically significant after controlling for the number of days spent sick by the respondent and other household members. The last two measures enter with a negative sign and are significant at the one percent level but are small in size (below 0.05). The number of children enters with a negative sign. No other household or individual characteristics are significant.

## 2.4 Results

### 2.4.1 BDM Method Results

The median and modal bids are 500 BDT (roughly 6 US dollars). The average bid is approximately 686.83 BDT (8.40 USD). In total, 73 percent of the respondents demanded bids lower or equal to 6 US dollars and received the amount requested. Figure 2 shows the distribution of bids, which has a long right tail.

We find that poor living conditions are strongly, negatively correlated with the amount bid. Because living within a one-bedroom cluster is strongly negatively correlated with having access to a sanitary toilet and the amount paid for food and rent, we only include the dummy variable "lives in a one-bedroom cluster". In all specifications, respondents living in this type of dwelling demand statistically significantly lower stipends to try the service. The coefficient ranges from -347.14 to -158.24, and its magnitude is moderated by the inclusion of dummies reflecting the occupational status of non-head members. These results are not driven by observations at the upper tail of the distribution of bids (Figure 2, graph (a)). Rather, the whole distribution of bids is statistically significantly different between respondents living in one-bedroom clusters - who are more likely to place bids equal to or lower than 500 BDT - and those living in any other type of accommodation.

The average bid is also correlated with the occupational status of the household head. Compared to households in which the head is in wage employment, those in which the head is a business owner place lower average bids (Table 5). The coefficient oscillates between 200 and 267 BDT and is significant at the 10 percent in three

out of the four specifications. These results are robust to the inclusion of household characteristics that are strongly associated with the amount of stipend desired, including whether the family lives in a room within a cluster of one-bedroom units and the number of sick days spent by the respondent during the census (Table 6). Nonetheless, the distribution of bids placed by households in which the head owns a business is not statistically significantly different from that of other households (Figure 2, graph (b)). This suggests that the correlation between the occupation of the head and the average bid is driven by observations at the upper tail of the distribution of bids.

None of the variables reflecting the employment status of non-heads is significant, and including them does not improve the specification, as suggested by the adjusted R-squared and the large standard errors of their coefficients. Having a head working on garments enters with a negative sign but is only significant for spouses, and after controlling for their own employment status. The correlation between the head's occupation and the amount of stipend demanded is less clear when adding a dummy variable that captures whether the respondent lives in a community where Phulki's daycare center is operating at less than half its capacity (low-adoption area).

The average bid in communities with high adoption rates, where Phulki's centers are close to full capacity, is 704.57 BDT. Respondents living in low-adoption areas place lower bids (Table 7). The coefficient is negative and significant at the five percent level for non-heads (its size is 183.73). The coefficient is also negative and significant in the specification for spouses in which we do not control for the spouse's occupational choice. Overall, the evidence suggests that the distribution of bids does not differ between high and low adoption communities (Figure 2, graph (c)). We discuss these findings in section 5.

### 2.4.2 Subsequent Trial and Enrollment Rates

A phone-based survey was conducted one month after the BDM took place. We tracked 134 participants, 17 of which reported to have visited their community daycare center (16 of them had won the lottery). Phulki staff members confirmed this, although they did not keep accurate records of what happened during these visits. Only nine of those 17 decided to enroll their child (all of them had won the lottery). Another 41 said they were planning to visit the center closer to or

after Eid, which was to take place within two weeks of the follow-up survey. The remaining participants did not have a valid phone number or did not pick up the phone.

The uptake rate among those who visited the centre suggests that, even at zero or negative prices, the perceived usefulness and quality of the service is not uniform. The low number of participants visiting the centre also suggests that, for many, learning about alternative childcare arrangements is not a priority. We expect that garment workers and business owners might have been working longer hours in the weeks prior to Eid and that may have played a role in the low number of visits. However, taken together, our findings indicate that the service, in its current format, is not appealing to a substantial portion of households in these communities, even if offered at a negative price chosen by them.

## 2.5 Discussion

### 2.5.1 Did households bid strategically?

The low take up rates among winners suggest that, even if households bid strategically, the amount they asked for was not high enough to persuade most of them to even visit the center. We take this as suggestive evidence that participants were not able to estimate precisely how valuable or costly the service was in terms of effort, loss of utility derived from changing deep-rooted habits, or from not complying with traditional norms about childcare provision. This could have been exacerbated by the uncertainty over the quality of the service.

Evidence from the pilot study, in-depth interviews and the BDM exercise indicates that 500 BDT is perceived as a reasonable amount for education stipends among urban low-income households. It is plausible that previous exposure to education stipends contributed to create this expectation. Bangladesh was one the first countries to offer conditional cash transfers to poor households. The Female School Stipend Program (FSSP) started in the early 1990s and had as a goal closing the gender gap in secondary school enrollment. In 2011, the World Bank and the Government of Bangladesh started the Shombhob Program, which aimed at improving the nutritional status of children aged 0 to 36 months and children attending primary school. The program covered more than 14,000 poor households. Regardless

of the number of children in each age range, households could receive a transfer of 400 BDT (approximately 5 US dollars) if at least one household member was aged 0 to 36 months; 400 BDT if the family had one or more primary-school age children, or 800 BDT if they had at least a child under 36 months and another child attending primary school.

The modal bid of 500 BDT is higher than the amount paid by previous income support programs in the country. A possible explanation is that many households have a sense of what a government would be willing to pay to incentivize the service in 2017, based on what it was paying in 2011. We cannot be sure of why such a large fraction of households bided exactly 500 BDT but, regardless of whether they were expecting this to be the maximum amount they could receive, the evidence suggests that, unless payments are made monthly and regular attendance is monitored, giving cash is unlikely to increase adoption.

### 2.5.2 Did households underestimate the size of the incentive?

The average bid was higher than the amount offered by previous education programs in Bangladesh, but significantly lower than the stipends that have been proven effective to increase schooling in other developing countries. For example, in 2005, the Ecuadorian Bono de Desarrollo Humano program - which increased enrollments rates for school-age children by 9 to 13 percent - made unconditional monthly transfers to mothers of approximately 15 US dollars (Schady and Araujo [2006]).

It is plausible that households underestimated how much time and effort would cost them to visit the centre and learn about the service. Despite the small sample size, the fact that only nine of the 16 parents who visited the center enrolled their child in the centre indicates that they did not perceive the service to be beneficial, or at least not enough to compensate for the costs associated with using the service (for example, the time it takes to walk with their child to and from the center, or to prepare food for the day in advance). Our study does not allow us to test this hypothesis.

### 2.5.3 Could lack of information explain baseline differences in adoption?

There are several reasons that could explain the baseline differences in adoption rates across communities. One is lack of awareness about the existence of the service and its basic features, such as price, opening times and the type of activities in which the children engage during their stay. However, our results suggest that parents are not interested in learning more about the potential benefits of using service. In addition, we find that knowing Phulki does not significantly affect the probability of using the service or the amount of incentive requested. We repeated our analysis controlling for this variable and found that it's not significant.

In addition, between May and August 2016, we conducted a series of promotional campaigns in 10 communities to understand whether providing information about the service could increase the rate of adoption. We visited shops, factories and households and showed pictures, distributed brochures and registered expressions of interest from mothers interested in receiving additional information. We called all of them within two weeks to asked whether they had visited the center. Almost no one had, and uptake rates increased very slowly.

Since lack of trust proved to be a challenge, we modified our strategy to to rule out the possibility that households were reluctant to learn about the service from strangers. We approached local leaders - including imams, schoolmasters, local politicians, landlords, ward commissioners and representatives of other NGOs in the areas - and asked them to organize community meetings in four schools, a community health center and in the surroundings of Phulki's centers. During these meetings, a Phulki staff member and a research assistant hired through Innovations for Poverty Action talked about the educational activities children could engage in, and they introduced the teachers in charge of the center. Attendance rates varied across meetings, with those taking place in well-known schools and health centres being the most successful (some meetings were attended by 40 parents), and those taking place in newly established daycare centres being the least successful, with 15 attendees or less. Enrollment rates did not increase as a results of these meetings.

We take this as suggestive evidence that increasing access to information about the service alone is unlikely to produce large improvements in enrollemnt rates.

### 2.5.4 Pricing, location and opening times of the center

We found anecdotal evidence that some mothers started working before 8 am or finished after 8 pm, and did not have anyone who could take their child to the center. These mothers cited this as a reason for not using the service. Indeed, there is variation across communities in the opening times and pricing of the service offered by Phulki, as different centers are funded by different donors and the level of incentive depends on the amount of aid received for each specific center. Nevertheless, some of the centers where enrollment rates are high are among the most expensive in terms of registration and monthly fees, and they also charge a higher rate for extra hours.

The objective and perceived quality of the service are likely to play a crucial role in adoption, even at heavily subsidized or negative prices. However, we did not collect any such measures and hence we can neither prove nor disprove the importance of this mechanism. We conducted focus groups discussions with mothers who were using the service and asked them why they thought many parents in their community were reluctant to use it. They cited very different reasons, but most of them coincided in that a large portion of women prefer to take care of their children themselves - either because they do not think that education is valuable at such an early age, or because their husbands would disapprove - if they can afford staying at home.

#### Do social norms constraint adoption?

The behavioral prescription that women should take care of children is widespread in many developed and most developing countries. Our results suggest that preferences for formal care vary among working mothers. Two female respondents in our sample reported having changed occupations in the previous month in order to be able to provide a better quality of care for their children. There is also evidence that some parents prefer to leave their children alone at home while they work, instead of taking them to a daycare center. During the census and BDM surveys we found 88 households where a child had been left alone or under the supervision of a sibling under the age of 14. Because we could not find an adult in these cases, we were not able to investigate the reasons why they chose not to use Phulki's service.

We believe that traditional social norms are likely to play a role in explaining

why some households are reluctant to try the service at zero and even negative prices. However, we do not find a systematic significant correlation between childcare use and the employment status of women. Non-working mothers were more likely than women in paid employment to take part in the BDM. However, this might just mean that they had more time than working mothers to speak with us, or because they were expecting some form of compensation for taking part in the study, and their households are poorer.

The design of our study does not allow us to determine the extent to which social norms account for differences in adoption rates within and across communities. We do find suggestive evidence that poorer households are more likely to respond to incentives. Although we do not observe whether they would prefer to observe traditional norms over childrearing practices, we note that one-time transfers alone do not suffice to increase adoption even in this sub-population.

## 2.6 Conclusion

We use a modified Becker-DeGroot-Marshack mechanism in a sample of low-income urban households in Bangladesh to elicit their willingness to accept a one-time incentive to try formal childcare. Our data suggest that using formal childcare services is positively correlated with well-being. However, adoption remains low even after offering a cash incentive to try the service.

The mean amount of stipend required is approximately 686.83 BDT, roughly 8.40 USD. The modal and median incentives are 500 BDT, approximately 6 US dollars. The quality of the dwelling is the most important determinant of the amount of stipend required to try the service. Respondents living in relatively less expensive, low-quality dwellings with limited or no access to a sanitary toilet, demand statistically significantly lower stipends to try the service. Households where the head works in garments spend less on food, are more like to live in low-quality dwellings and demand significantly lower amounts of money to try the service. Conditional on being interested in trying childcare, households where the head did not work in the week previous to the survey or owns a business demand lower incentives compared to households where the head works in wage employment. However, uptake rates do not increase after making the payment, even among these sub-groups.

This is one of the first studies using a BDM mechanism to elicit the will-

ingness of low-income households to accept incentives to try a novel service. Our data suggest that households underestimated the amount of cash they would require to enroll their children in a daycare center. Few households want to learn more about its benefits after receiving the desired incentive, and even fewer enroll their child after visiting the centre. This indicates that a one-time cash transfer might not be an effective policy for increasing preschool enrollment and regular use among low-income households. Collecting information about the perceived usefulness and objective quality of the service is crucial for improving our understanding of what prevents households from learning about (and using) what could be a welfare-enhancing service.

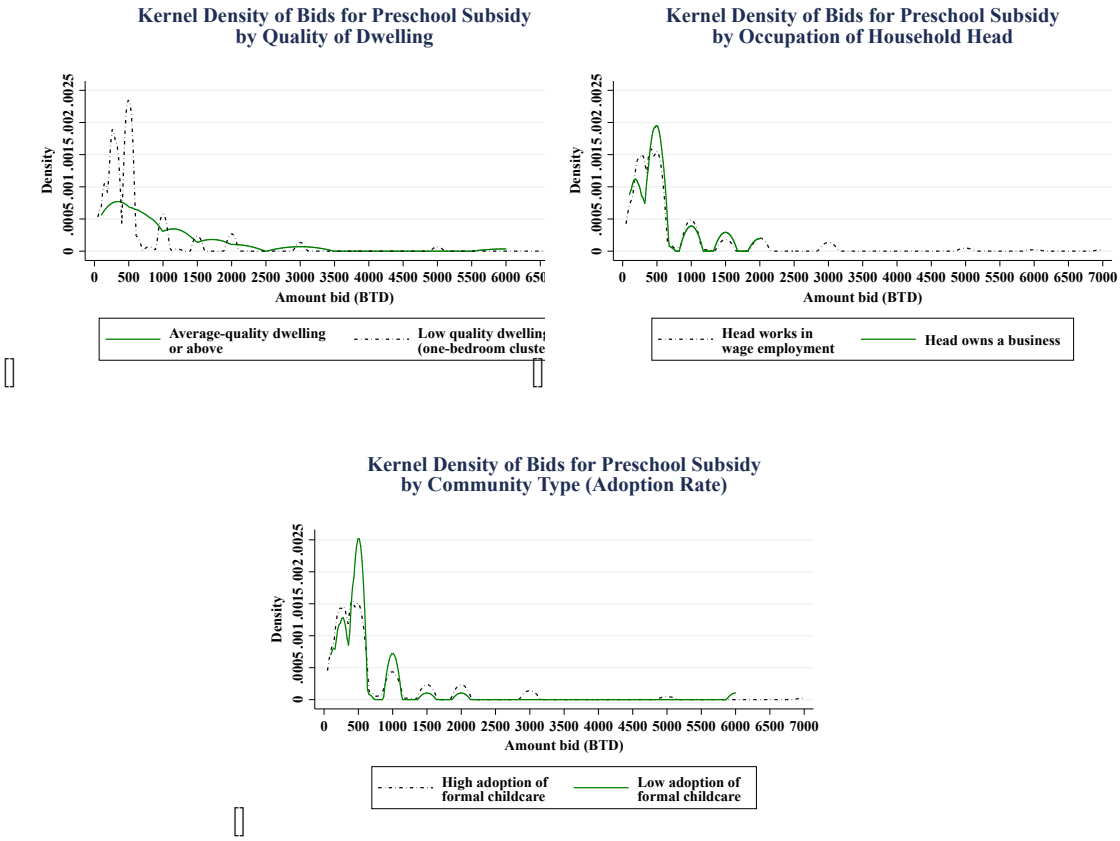
Figure 2.1: One-bedroom clusters with shared toilet

Table A1: Household Characteristics

| | All Areas | Low Use Areas | P-value Diff. (High-Low) | Eligible for BDM | P-value Diff. (All-Eligible) |
|---|---|---|---|---|---|
| Number of households | 2,665 | 579 | | 562 | |
| Household members | 4.12 | 4.05 | 0.2562 | 4.48 | 0.0000 |
| | (1.52) | (1.52) | | (1.46) | |
| Eligible children (2-5 yrs) | 0.40 | 0.35 | 0.0104 | 1.02 | 0.0000 |
| | (0.55) | (0.54) | | (0.36) | |
| Uses daycare | 0.13 | 0.11 | 0.1638 | 0.29 | 0.0000 |
| | (0.34) | (0.32) | | (0.45) | |
| Age Resp | 31.73 | 31.82 | 0.8379 | 30.03 | 0.0000 |
| | (11.06) | (11.24) | | (9.48) | |
| Age Head | 38.19 | 38.36 | 0.7268 | 35.44 | 0.0000 |
| | (11.92) | (12.32) | | (9.87) | |
| Female Resp | 0.80 | 0.70 | 0.0000 | 0.86 | 0.0000 |
| | (0.40) | (0.46) | | (0.35) | |
| Female Heads | 0.17 | 0.18 | 0.3258 | 0.18 | 0.3117 |
| | (0.37) | (0.39) | | (0.39) | |
| Illiterate Head | 0.35 | 0.29 | 0.0007 | 0.46 | 0.0000 |
| | (0.48) | (0.45) | | (0.50) | |
| Head RMG | 0.09 | 0.09 | 0.7350 | 0.12 | 0.0200 |
| | (0.29) | (0.29) | | (0.32) | |
| Head Business Owners | 0.18 | 0.21 | 0.0190 | 0.18 | 0.9596 |
| | (0.38) | (0.41) | | (0.38) | |
| Spouse RMG | 0.10 | 0.10 | 0.8747 | 0.16 | 0.0000 |
| | (0.30) | (0.30) | | (0.37) | |
| Spouse Business | 0.11 | 0.14 | 0.0029 | 0.30 | 0.0000 |
| | (0.31) | (0.35) | | (0.46) | |
| Spouse Maid | 0.08 | 0.04 | 0.0001 | 0.15 | 0.0000 |
| | (0.27) | (0.20) | | (0.36) | |
| Spouse Not Working | 0.36 | 0.32 | 0.0148 | 0.06 | 0.0000 |
| | (0.48) | (0.47) | | (0.24) | |
| Weekly food expenses | 2046.03 | 2132.66 | 0.0555 | 2014.12 | 0.4385 |
| | (1099.62) | (1074.07) | | (1016.95) | |
| Monthly rent | 3712.53 | 3732.56 | 0.8478 | 3252.60 | 0.0000 |
| | (2234.64) | (1994.86) | | (1756.42) | |
| Sanitary toilet | 0.68 | 0.76 | 0.0000 | 0.76 | 0.0102 |
| | (0.46) | (0.43) | | (0.43) | |
| Unit within one-bedroom cluster | 0.70 | 0.70 | 0.5958 | 0.78 | 0.0000 |
| | (0.46) | (0.46) | | (0.42) | |
| Sick days resp | 2.00 | 1.88 | 0.4054 | 2.21 | 0.1393 |
| | (3.93) | (3.85) | | (3.78) | |
| Sick days total | 5.88 | 4.98 | 0.0028 | 6.27 | 0.1994 |
| | (8.12) | (6.96) | | (8.20) | |
| Stress Index | 0.00 | -0.10 | 0.0091 | 0.07 | 0.0783 |
| | (1.00) | (1.03) | | (1.00) | |
| Years since moved to Dhaka | 14.81 | 15.59 | 0.0998 | 14.18 | 0.2160 |
| | (12.84) | (13.82) | | (11.52) | |

Notes: Table reports household characteristics for all households (column 1), households in communities where more than half of the slots in the community Phulki center were not filled, according to Phulki's records (column 2) and households where there was at least a child between 2 and 5 years old (column 4). The Stress Index is the standardized unweighthed sum of the anxiety and depression scores, measured using the GAD-7 and PHQ-2 scales. P-values for the difference in means across households in high and low adoption communities are shown in column 3, and differences across eligible and non-eligible households are shown in column 5. Significance:*** p<0.01, ** p<0.05, * p<0.1

Figure 2.2: Kernel Density of Bids (Bangladeshi Taka)




Notes: Figure shows the distribution of bids (incentive desired to try childcare). The Kolmogorov-Smirnov test rejects the null hypothesis of equality of distributions at the 5% level in (a). It does not reject the hypothesis of equality of distributions in (b) and (c).

Table A2: Reported Use and Interest in Trying Formal Childcare

| | Use (BDM) | | Use (Census) | | Use (Both) | | Not Interested (BDM) | |
|---|---|---|---|---|---|---|---|---|
| | (1) All | (2) Spouses | (3) All | (4) Spouses | (5) All | (6) Spouses | (7) All | (8) Spouses |
| Resp: RMG | 0.06 | 0.18 | 0.02 | 0.09 | 0.18 | 0.33 | -0.18 | -0.43 |
| | (0.21) | (0.31) | (0.16) | (0.24) | (0.19) | (0.32) | (0.23) | (0.35) |
| Resp: Domestic | 0.27** | 0.39* | -0.07 | 0.06 | 0.29** | 0.49** | 0.03 | 0.00 |
| | (0.14) | (0.23) | (0.12) | (0.21) | (0.14) | (0.23) | (0.27) | (0.28) |
| Resp: Business | 0.1 | 0.09 | 0.01 | 0.01 | 0.17 | 0.19 | 0.06 | -0.16 |
| | (0.13) | (0.21) | (0.12) | (0.27) | (0.16) | (0.29) | (0.19) | (0.24) |
| Resp: No work last week | 0.01 | 0.15 | -0.31** | -0.07 | -0.13 | 0.16 | -0.38* | -0.7 |
| | (0.21) | (0.31) | (0.14) | (0.27) | (0.20) | (0.37) | (0.23) | (0.43) |
| Head: RMG | | 0.28 | | 0.1 | | 0.35* | | -0.13 |
| | | (0.22) | | (0.20) | | (0.19) | | (0.27) |
| Head: Business | | 0.18 | | 0.03 | | 0.13 | | 0.41* |
| | | (0.13) | | (0.16) | | (0.16) | | (0.22) |
| Head: Transport (non rikshaw) | | -0.07 | | 0.00 | | 0.02 | | -0.05 |
| | | (0.15) | | (0.14) | | (0.19) | | (0.28) |
| Observations | 560 | 352 | 560 | 352 | 560 | 352 | 560 | 352 |
| Community FE | NO | NO | NO | NO | NO | NO | NO | NO |

Notes: Columns (1) to (6) report probit models for the decision to use formal childcare services at the time of the census, BDM survey and both, as reported by all respondents and heads' spouses. Columns (7) and (8) report the probability of being interested in trying childcare at the time of the BDM surveys, as reported by all respondents and heads' spouses. The base occupational group for heads and respondents is "other wage employment", which includes rickshaw pullers, employees of businesses other than garments and private guards, among many others. Among households that were using childcare during the census, only 8 had a head who was not working in the week prior to the survey, and hence this group is omitted. Because the majority of household heads are male, and the majority of domestic helpers are women, this occupational group is included as part of the base group for heads, but is a separate category for all respondents. The quality of the average dwelling varies across communities and hence, standard errors are clustered at the community level. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A3: Correlates of the Stress Index

| | (1) All | (2) Spouses | (3) All | (4) Spouses | (5) All | (6) Spouses |
|---|---|---|---|---|---|---|
| Formal care (BDM) | -0.20** | -0.27** | | | | |
| | (0.08) | (0.10) | | | | |
| Formal care (census) | | | -0.07 | -0.08 | | |
| | | | (0.09) | (0.14) | | |
| Formal care (both) | | | | | -0.17* | -0.25* |
| | | | | | (0.08) | (0.13) |
| Resp RMG | -0.36** | -0.42* | -0.36** | -0.43 | -0.35** | -0.41 |
| | (0.14) | (0.24) | (0.14) | (0.26) | (0.14) | (0.25) |
| Resp domestic help | 0.03 | -0.21 | 0.01 | -0.24 | 0.03 | -0.21 |
| | (0.14) | (0.18) | (0.15) | (0.19) | (0.14) | (0.19) |
| Resp business | -0.21* | -0.25 | -0.21* | -0.26 | -0.20* | -0.24 |
| | (0.10) | (0.24) | (0.10) | (0.26) | (0.10) | (0.25) |
| Resp not working | 0.05 | -0.15 | 0.04 | -0.16 | 0.04 | -0.15 |
| | (0.24) | (0.25) | (0.24) | (0.24) | (0.24) | (0.24) |
| Physical work frequency | 0.19*** | 0.22*** | 0.19*** | 0.22*** | 0.19*** | 0.23*** |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.06) | (0.06) |
| Other member worked | -0.21 | | -0.21 | | -0.22 | |
| | (0.30) | | (0.30) | | (0.30) | |
| Head worked | | -0.63 | | -0.68 | | -0.65 |
| | | (0.74) | | (0.77) | | (0.76) |
| Observations | 560 | 350 | 560 | 350 | 560 | 350 |
| R-squared | 0.112 | 0.141 | 0.104 | 0.126 | 0.109 | 0.135 |
| Community FE | YES | YES | YES | YES | YES | YES |
| Adj R-squared | 0.074 | 0.080 | 0.066 | 0.064 | 0.070 | 0.074 |

Notes: Table reports OLS regressions for the Stress Index (standardized unweighthed sum of the anxiety and depression scores, measured using the GAD7 and PHQ2 scales) on childcare use and the occupational choice of different household members. Columns 1, 3 and 5 report regressions for all respondents, and columns 2, 4 and 6, for spouses, who are the majority of respondents. We measured mental health for respondents only. The variable "physical work" measures the frequency with which the respondent engaged in vigorous household chores or physical activity (as part of work or leisure) at least one hour per day in the previous 2 weeks. Answers for the frequency of physical activity are classified using the same scale as the GAD7 and PHQ2, which is "Not at all (0 days)", "Sometimes (1-5 days)", "More than half the days (6-10 days)" and "Nearly every day (11-14 days)". The results remain unchanged when running the same regression for female spouses only (N=350). Standard errors clustered at the community level in parentheses. Significance: Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A4: Correlates of the Stress Index by Head and Spouse's Occupational Status

| | (1) All | (2) All Female | (3) Female Spouses | (4) Male Heads | (5) Female Heads | (6) Female Maids | (7) Female Business | (8) Female RMG |
|---|---|---|---|---|---|---|---|---|
| Childcare (BDM) | -0.19** | -0.20* | -0.27** | 0.17 | -0.16 | -0.22 | -0.13 | -0.02 |
| | (0.08) | (0.10) | (0.11) | (0.10) | (0.19) | (0.22) | (0.14) | (0.12) |
| Head: RMG | -0.15 | -0.14 | -0.12 | -0.11 | -0.15 | -0.53*** | 0.1 | 0.04 |
| | (0.10) | (0.12) | (0.14) | (0.56) | (0.64) | (0.13) | (0.21) | (0.21) |
| Head: Business owner | -0.01 | 0.11 | 0.09 | -0.51 | 0.22 | -0.05 | 0.15 | 0.43 |
| | (0.12) | (0.10) | (0.10) | (0.32) | (0.32) | (0.49) | (0.19) | (0.92) |
| Head: no work | 0.2 | 0.2 | 0.74 | 0.68* | -0.2 | 0.05 | -0.55*** | |
| | (0.34) | (0.34) | (0.73) | (0.37) | (0.49) | (1.11) | (0.18) | |
| Head spouse: no work | 0.11 | 0.00 | -0.05 | 0.77*** | | | | |
| | (0.16) | (0.20) | (0.19) | (0.13) | | | | |
| Physical work frequency | 0.22*** | 0.22*** | 0.22*** | 0.32*** | 0.13 | 0.25 | 0.21* | 0.08 |
| | (0.05) | (0.06) | (0.06) | (0.07) | (0.12) | (0.17) | (0.10) | (0.11) |
| Observations | 560 | 481 | 350 | 72 | 87 | 107 | 166 | 75 |
| R-squared | 0.099 | 0.105 | 0.134 | 0.402 | 0.225 | 0.224 | 0.138 | 0.274 |
| Community FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Adj R-squared | 0.062 | 0.062 | 0.075 | 0.18 | -0.01 | 0.033 | 0.019 | 0.041 |

Notes: Each column reports on an OLS regression of the Stress Index (standardized unweighthed sum of the anxiety and depression scores, measured using the GAD7 and PHQ2 scales) on childcare use and the occupational choice of different household members. We measured mental health for respondents only. The base group for the employment status of the household head is "other wage employment", which aggregates a large number of occupations, including rickshaw pullers, construction workers and other day labourers. In columns (5) to (7) we omit the employment status of the head's spouse because the majority of respondents are female spouses. The variable "physical work" measures the frequency with which the respondent engaged in vigorous household chores or physical activity (as part of work or leisure) at least one hour per day in the previous 2 weeks. Answers for the frequency of physical activity are classified using the same scale as the GAD7 and PHQ2, which is "Not at all (0 days)", "Sometimes (1-5 days)", "More than half the days (6-10 days)" and "Nearly every day (11-14 days). Standard errors clustered at the community level in parentheses. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A5: Amount of Stipend (BDT)

| | (1) All | (2) Spouses | (3) Non-heads | (4) Spouses |
|---|---|---|---|---|
| Head: RMG | -166.27 | -133.48 | -173.93 | -158.06* |
| | (128.42) | (111.18) | (107.22) | (80.25) |
| Head: Business | -200.08* | -267.72* | -220.77* | -255.35 |
| | (104.94) | (142.99) | (116.64) | (171.15) |
| Head: No work last week | -81.63 | -311.12* | -214.20** | -260.74** |
| | (153.27) | (160.94) | (99.75) | (112.32) |
| BDM resp: RMG | | | 252.85 | 360.79 |
| | | | (461.02) | (502.89) |
| BDM resp: Domestic | | | 85.34 | 142.88 |
| | | | (177.49) | (157.64) |
| BDM resp: Business | | | -16.77 | 4.19 |
| | | | (115.70) | (131.03) |
| BDM resp: No work last week | | | -89.92 | 10.04 |
| | | | (165.94) | (170.00) |
| Observations | 261 | 186 | 213 | 186 |
| Mean | 686.83 | 680.65 | 688.97 | 680.65 |
| (Std. Dev) | (859.84) | (853.56) | (843.71) | (853.56) |
| Median | 500 | 500 | 500 | 500 |
| Community FE | YES | YES | YES | YES |
| Adj R-squared | 0.035 | 0.029 | 0.035 | 0.037 |

Notes: Table reports OLS regressions of the amount bid (in Bangladeshi Taka) on the occupational choice of different household members. The base group is "other wage employment", which includes rickshaw puller, other transport driver, employees of businesses other than garments and private guards, among many others. Because the majority of household heads are male, and the majority of domestic helpers are women, this occupational group was included as part of the base group for heads. Standard errors clustered at the community level in parenthesis. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A6: Amount of Stipend (BDT) with Additional Household Controls

| | (1) All | (2) Spouses | (3) Non-heads | (4) Spouses |
|---|---|---|---|---|
| Head: RMG | -93.46 | -116.95 | -135.76 | -161.68 |
| | (108.21) | (112.29) | (89.31) | (98.71) |
| Head: Business | -177.71* | -227.84 | -204.81* | -228.18 |
| | (98.93) | (136.57) | (114.18) | (163.27) |
| Head: No work last week | -155.06 | -241.56** | -141.53 | -170.30* |
| | (107.00) | (108.36) | (81.29) | (86.67) |
| BDM resp: RMG | | | 359.98 | 451.74 |
| | | | (451.08) | (471.90) |
| BDM resp: Domestic | | | 97.05 | 118.97 |
| | | | (132.24) | (123.06) |
| BDM resp: Business | | | 36.9 | 46.39 |
| | | | (129.77) | (147.47) |
| BDM resp: No work last week | | | -50.46 | -60.07 |
| | | | (172.64) | (163.03) |
| Bedroom within cluster | -347.14*** | -158.24 | -212.68** | -195.04* |
| | (107.92) | (96.34) | (74.41) | (100.31) |
| Resp Sick Days | 26.81 | 50.40* | 41.49* | 48.34 |
| | (16.98) | (28.57) | (21.04) | (28.40) |
| Others Sick Days | 16.8 | 5.49 | 7.89 | 8.75 |
| | (11.21) | (5.50) | (6.92) | (6.70) |
| Observations | 261 | 186 | 213 | 186 |
| Community FE | NO | NO | NO | NO |
| Adj R-squared | 0.035 | 0.026 | 0.025 | 0.032 |

Notes: Table reports OLS regressions of the amount bid (in Bangladeshi Taka) on the occupational choice of different household members. The base group is "other wage employment", which includes rickshaw puller, other transport driver, employees of businesses other than garments and private guards, among many others. Because the majority of household heads are male, and the majority of domestic helpers are women, this occupational group was included as part of the base group for heads. Standard errors clustered at the community level in parenthesis. Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A7: Amount of Stipend (BDT) Controlling for Low-Adoption Areas

| | (1) All | (2) Spouses | (3) Non-heads | (4) Spouses |
|---|---|---|---|---|
| Head: RMG | -118.27 | -141.69 | -163.83 | -181.19* |
| | (106.63) | (84.78) | (114.79) | (100.76) |
| Head: Business | -147.53 | -230.95 | -191.40* | -224.1 |
| | (101.41) | (142.32) | (102.26) | (151.39) |
| Head: No work last week | -44.94 | -191.25 | -137.60* | -130.41 |
| | (136.70) | (121.21) | (76.45) | (95.91) |
| BDM resp: RMG | | | 274.87 | 387.76 |
| | | | (442.93) | (470.72) |
| BDM resp: Domestic | | | 51.86 | 119.46 |
| | | | (149.33) | (105.55) |
| BDM resp: Business | | | 17.31 | 48.1 |
| | | | (130.99) | (131.25) |
| BDM resp: No work last week | | | -55.14 | -22.05 |
| | | | (154.14) | (133.32) |
| Book bid | -4.08 | -6.72** | -4.54 | -6.41** |
| | (2.48) | (3.05) | (2.77) | (2.93) |
| Low adoption community | -72.41 | -170.85* | -183.73** | -126.63 |
| | (128.96) | (92.59) | (86.15) | (96.21) |
| Observations | 261 | 186 | 213 | 186 |
| High Adoption Areas Mean | 704.57 | 722.92 | 737.43 | 722.92 |
| (Std. Dev) | (869.74) | (945.03) | (927.57) | (945.03) |
| Community FE | NO | NO | NO | NO |
| Adj R-squared | 0.004 | 0.017 | 0.005 | 0.014 |

Notes: Table reports OLS regressions of the amount bid in Bangladeshi Taka (BDT) on the occupational choice of different household members, with additional controls for the amount bid for the book and whether the respondent lives in a low-adoption community. The base group is "other wage employment", which includes rickshaw pullers, other transport driver, employees of businesses other than garments and private guards, among many others. Because the majority of household heads are male, and the majority of domestic helpers are women, this occupational group was included as part of the base group for heads. Standard errors clustered at the community level in parenthesis. Significance:*** p<0.01, ** p<0.05, * p<0.1

# Chapter 3

# Urban Life, Employment and Well-Being in Bangladesh

## 3.1 Introduction

The latest projections suggest that 66 percent of the world's population will be living in cities by 2050 (of Economic and Nations [2014]). Urban areas can create agglomeration economies and offer a wide range of employment opportunities and amenities to their citizens (Duranton [2015]; Glaeser and Gottlieb [2009]). However, population survey studies show that city dwellers tend to report lower levels of subjective well-being than residents of rural areas (see Peen et al. [2010] for a review). For those living in low-income areas and slums, these differences have been attributed to overcrowding, high consumer prices relative to salaries, poor housing conditions and insufficient access to basic services (Ellis and Roberts [2015]). In addition, many have migrated from other parts of the country and lost access to social support (Li and Rose [2017]).

This paper examines the correlations between urban life, employment and well-being levels among low-income residents of Greater Dhaka, Bangladesh. There is growing evidence that anxiety and depression have negative effects on health and labor market outcomes in high-income countries (Bubonya et al. [2017]; Dong et al. [2017]; Rudolph and Eaton [2015]). Hence, we ask whether these conditions are correlated with employment and livings standards in our setting.

We compare well-being (symptoms of anxiety and depression, which we aggregate into a stress index) and physical health outcomes across individuals living in households varying in their proximity to central Dhaka, and the occupational status of its members. To this end, we use an integrated household survey covering 1,778 residents from 11 communities in Greater Dhaka (Dhaka and Gazipur districts). Our sampling was designed to obtain a representative sample of households in each area, although the areas were not chosen to be nationally representative. Women were more likely to be at home at the time of the survey and are therefore overrepresented in our sample. Hence, we focus much of our analysis on female respondents.

Our findings confirm those of previous studies showing that prevalence rates of anxiety and depression are higher for women (Platt et al. [2016]). They also suggest that stress levels in our sample communities are, on average, higher than in the rest of Bangladesh and other South Asian countries, with lifetime prevalence rates of depressive and anxiety-related disorders estimated at 4.1 and 4.4 percent in Bangladesh, 4.5 and 3.0 percent in India, 3.3 and 3.7 percent in Myanmar and

3.2 and 3.6 percent in Nepal (WHO [2017])[1]. In our sample, 25.3 percent of the respondents reported clinically significant levels of anxiety (scores above 8 in the GAD-7 scale).

Our data suggest that occupational choice plays an important role in the stress levels and physical health of respondents, specially among females, but a relatively minor role in the physical health of other household members. In particular, domestic helpers (individuals who provide household services for an individual or a family) report higher stress levels than those who are not currently working or are employed in other sectors. Garment workers, by far the largest occupational group among female respondents, report stress levels not significantly different from women who are not working and lower than women working as domestics helpers.

This study contributes to the literature studying the correlates of mental well-being in low and middle income countries (Lund et al. [2010]; Srivastava [2009]; Trivedi et al. [2008]). It is also closely related to recent studies on the relationship between individual well-being and different aspects of city life and neighbourhood characteristics (Airaksinen et al. [2015]) and the availability of social support in small and large urban centers (Chadwick and Collins [2015]). To date, most of these studies rely on data from high-income countries (see Maselko [2017] for a recent review). We use data on the occupational status of different household members and how isolated the household is, in terms of the distance from other households and public spaces, as indicative of the availability of social support.

The rest of the paper is organized as follows. Section 2 describes the setting and sampling frame of the study. Section 3 provides details of the outcomes and relationships of interest. Section 4 describes individual and household characteristics. Section 5 presents differences in well-being levels and Section 6 discusses differences in physical health. Section 7 concludes.

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[1] These nationally representative estimates of anxiety-related disorders and depression were obtained using the Self-Reporting Questionnaire (SRQ). The SRQ is a 20-item questionnaire developed by the World Health Organization. It measures several symptoms captured by the GAD-7 and PHQ-2 scales using a larger number of (shorter) questions. The main difference is that the SRQ contains more questions about depression than our questionnaire, which focuses on generalized anxiety. We avoided asking questions about suicidal ideation and other symptoms of severe depression because our pilot study showed that they were particularly upsetting for respondents in our setting, where suicide and self-harm are seen as sins.

## 3.2 Context and Sampling Frame

### 3.2.1 Bangladesh: A Rapidly Urbanizing Country

Bangladesh has made remarkable social and economic progress in the past three decades. The economy has grown at six percent annually since the early 2000s, which is above the average growth rate for lower-middle-income countries (World Bank [2016]). The country has been acclaimed for successfully reducing the proportion of people living below the poverty line, fertility rates, and child and maternal mortality, and for increasing enrollment rates in both primary and secondary school (Hossain [2017]; Ahmed and McGillivray [2015]; Headey et al. [2015]; Asadullah et al. [2014]; Chowdhury et al. [2013]).

Poverty rates have fallen fast, both in urban and rural areas. From 1991 to 2010, urban poverty was reduced by half, reaching 21.3 percent in 2010, and rural poverty decreased from 58.1 to 35.2 percent during the same period (Muzzini and Aparicio [2013]). In urban areas, the reduction in poverty has been associated with the rise of manufacturing and services and with substantial rural to urban migration (ILO [2013]). The urban population grew by more than 3.5 percent from 2000 to 2014, compared with an average growth of 0.45 percent in rural areas (World Bank [2016]). It is projected that the urban population in the country will grow from 58.7 millions in 2017 to 112.4 millions by 2050 (of Economic and Nations [2014]).

This study looks at the relationship between well-being, different aspects of urban life and household characteristics in Dhaka city and its expanding peri-urban areas. The ready-made garment industry (RMG), which currently accounts for 82 percent of Bangladesh's total merchandise exports and around one-eighth of its GDP (BGMEA [2016] and), is one of largest employers of unskilled and semi-skilled workers in urban areas. While Dhaka city is still home to many manufacturing factories and supporting services, the garment industry is moving towards its periphery. Urban Dhaka's share of formal jobs in the apparel industry fell from 50 percent in 2001 to 30 percent in 2009, whereas the share of formal garment jobs located in peri-urban areas of Dhaka and Gazipur cities, increased from 20 percent to 38 percent during this period (Muzzini and Aparicio [2013]).

### 3.2.2 Sampling Frame

We use data from household surveys conducted in two areas of greater Dhaka between January 2016 and January 2017. The first survey covers 861 households in 5 communities in Banglabazar, a peri-urban area north of Dhaka in the Gazipur District. Banglabazar is a rapidly growing area surrounding several large RMG factories. The second sample covers 917 households from six communities in the Mirpur and Mohammadpur neighborhoods of urban Dhaka. Mohammadpur and Mirpur are typically urban in terms of density and access to basic services and infrastructure. There are paid waste collection systems and the majority of households have access to piped water and sanitary toilets.

Our sampling was designed to obtain a representative sample of households in each area, but the areas were not chosen to be nationally representative. Households within communities were selected through systematic sampling, after setting a community-specific sampling interval and a starting point at random. The questionnaires were largely overlapping, with some questions unique to each area. All respondents were told that their answers would be shared in aggregated form with national and international development agencies, as well as NGOs, with the goal of helping these policymakers understand what interventions could improve the living standards in their community. A single member of the household answered all of the questions. In the majority of cases (66 percent in Banglabazar and 91 percent in urban Dhaka), the respondent was female, most often the spouse of the household head.

## 3.3 Outcomes and Correlates of Interest

We are most interested in the correlates of mental well-being and physical health. We measure well-being with an aggregate of the nine mental health questions, which we refer to as the Stress Index. The Index is the unweighted sum of symptoms of anxiety and depression, which are measured using the seven-item Generalized Anxiety Disorder scale (GAD-7, Spitzer et al. [2006]) and the two-item version of the Patient Health Questionnaire (PHQ-2, Löwe et al. [2005]; Kroenke et al. [2003]). The index has a mean of zero and a standard deviation of one by construction. Its density distribution is positively skewed for the full sample and for the urban/peri-urban, male/female and garment/non-garment respondent subsamples. Aggregating stan-

dardized measures of the same condition has become increasingly common among studies considering many possible outcome variables to address concerns over multiple hypothesis testing (Anderson [2008]; Kling et al. [2007]). Our main results are robust to using the clinically significant anxiety level from the GAD-7.

We measure physical health in the full sample with the total number of days the respondent or, alternatively, all other household members, are reported to have been sick during the two weeks leading up to the survey. In the urban Dhaka sample, we have two additional measures of physical health. First, we used open-ended questions to gather more details about the nature of illnesses reported in the two weeks previous to the survey. We record whether the illness involved fever in addition to any form of body pain or a chronic disease. Second, for the urban Dhaka sample, the enumerators took direct measurements of the height and weight of the respondents. Weight was measured twice and the average was used to calculate a BMI for each respondent. We create an indicator of distance to a healthy body mass index (BMI)[2] to measure weight and health risk among individuals with overweight, since only a very fraction of our sample is underweight (7 percent) and almost half (51 percent) is overweight.

Finally, we gathered basic demographic information (age, schooling, employment and physical health) for other household members, and the characteristics of the housing and surrounding area - for example, the source of water, sanitary facilities and street lighting - in the full sample.

We examine the role of occupation in well-being, with a focus on garment workers (around 48 percent of employed respondents in our sample). The rapid growth of the garment sector generated higher rates of female participation in paid employment. Indeed, women comprise the majority of its workforce, with recent estimates suggesting that at least 65 percent of its 4 million workers are female (BGMEA [2016]; Menzel and Woodruff [2015]). Both the Bangladeshi garment sector and factory work generally are widely viewed as causes of stress and physical illness (Blattman and Dercon [2016] and Steinisch et al. [2014]; ILO [2013]).

Recent evidence has linked the expansion of the apparel industry to delayed marriage and childbearing, and increased schooling and employment rates

[2] We calculate this distance by subtracting 23 from an individual's BMI. The World Health Organization considers that 23 is an appropriate cut-off point for overweight in South Asian populations (Stegenga et al. [2014]).

among young women (Heath and Mobarak [2015]). Nonetheless, the social norm that women should be the primary caregiver in the household, in addition to being income-earners, can place a high burden on them. Data from developed countries shows that working women spend more time doing household chores than men. This phenomenon, known as the "double burden" or "second shift", has been linked to a decline in their well-being levels - despite large gains in educational attainment and labor market outcomes - over the past four decades (Bertrand [2011]; Bertrand [2013]). Because we are interested in learning whether a similar relationship between paid employment and well-being is observed in our context, we focus particular attention on the correlations between occupational status and well-being for female respondents.

## 3.4 Individual and Household Characteristics

Employment rates and infrastructure in our urban sample seem fairly representative of urban households across Bangladesh, and close to those of Dhaka Division. In the 2014 Demographic and Health Survey, 35 percent of the female respondents in urban areas in Dhaka Division participated in paid employment. Across the country, urban women in the lowest wealth quintile were significantly more likely to work than those in the highest quintile (41 percent and 25 percent, respectively). In our Dhaka and Gazipur samples, the portion of female respondents who were working at the time of the survey was close to 39 percent[3]. The difference in employment rates between Dhaka and Gazipur was larger for males (84 and 92 percent, respectively). The estimated rate of employment for male household heads in urban areas in Bangladesh is 80 percent (Demographic and Health Survey (2014)).

Occupations are concentrated in the garment sector in Gazipur, but are more diverse in urban Dhaka. A majority of household heads in the Banglabazar sample (56 percent) work in the garment sector. Among those not working in garment factories, the largest number (14 percent of the sample) runs a small business. The rest are spread across a range of occupations. In urban Dhaka, only 14 percent of household heads work in the garment sector, while 19.5 percent own a small business, 13 percent are rickshaw pullers and 10 percent work in construction.

[3] Neither the nationally representative estimates nor those based on our own survey data allow us to differentiate formal from informal, nor full-time from part-time employment.

In our sample, 19 percent of the households in Dhaka and 63 percent of those in Gazipur have at least one member working in the garment sector. Although the minimum entry-level wage for garment workers in Bangladesh is much lower than in neighboring countries (US dollars 65 per month, compared to US dollars 71 in India, US dollars 79 in Pakistan or US dollars 73 in Sri Lanka (ILO [2013]), employment in the sector provides a higher and more stable source of income than other forms of urban employment. The percentage of respondents working in the garment sector is much higher in Gazipur than in Dhaka (40 and nine percent respectively). The portion of households in which a member other than the respondent was a garment worker showed a similar pattern (48 and 14 percent in Gazipur and Dhaka, respectively). The proportion of respondents who were working at the time of the survey was lower in Dhaka (43, versus 58 percent in Gazipur).

Urban and peri-urban households also differ in key individual characteristics and infrastructure. Although the average age of respondents and the probability of being married is similar in urban and peri-urban areas, the average household size is larger in Dhaka. This is driven by a higher number of children between two and 14 years of age in Dhaka. Differences in means are small but significant for the number of children below the ages six and below 14, but not for the number of children below two. In both urban and peri-urban areas, the median household is represented by a family of three members who share a room, but the average number of people per room is higher on average in Dhaka, with percentiles 75th and 90th having four and five members, respectively, compared with three and four, respectively, in Gazipur.

Average housing-related costs, measured as monthly rent or mortgage, were twice as high in Dhaka District (4,270 Bangladeshi Taka (BDT), around 52 US dollars) than in Gazipur (2,015 BDT, roughly 24.5 US dollars). The average number of people per room is higher in Dhaka than in Gazipur (3.3 and 2.7 respectively). Households in Gazipur were twice as likely to own the homestead as those in the city. Per capita consumption, which includes monthly food expenses and utilities, was higher in urban areas but the difference was small (2,655 and 2,408 BDT respectively). The probability of having a savings account was lower in Dhaka (39 compared to 52 percent in Gazipur).

Electricity as a lighting source and concrete floors were widespread both in urban and peri-urban areas, but access to piped water was significantly higher in Dhaka. Compared to the 2014 nationally representative demographic survey, our sample has higher levels of electricity adoption (99 percent in our data, compared

to 90 percent for all urban areas in Bangladesh, and 95 percent for urban areas in Dhaka Division) and concrete floors (89 percent in our data, compared to 62 percent for all urban areas and 71 percent in urban Dhaka).

Our sample has lower educational levels than the national average, with 33 percent having no schooling, 28 percent having some schooling but less than primary school and 21 percent with some secondary schooling but no Secondary School Certificate. The national average rates for each of these attainment levels in urban areas are 22, 24 and 27 percent respectively.

## 3.5 Differences in Mental Health

We begin by examining the correlates of the stress index. The analysis relies on cross-section data and we do not have instruments to study causal relationships between variables. These limitations should be kept in mind, but given the dearth of data on well-being of urban working-class households, we believe the descriptive data should be of interest.

On Table 2, we report the results of OLS regressions that use the standardized stress index as the dependent variable. We are particularly interested in the correlation between occupation and stress. We run a basic regression using a minimal set of individual and household characteristics. We then run OLS regressions on these and additional variables to account for a broader set of household characteristics and elements from the environment associated with personal safety. In addition to regressions using the full sample, we run separate regressions for households where the respondent works in the garment sector (column 2) and does not (column 3), for households in peri-urban (column 4) and urban (column 5) areas, and for female respondents only (column 6). Communities from Gazipur district were classified as peri-urban, and those from Dhaka were classified as urban. Standard errors are clustered at the community level for all regressions.

Our data suggest that mental health outcomes in our sample are worse than the national and global averages[4]. In addition, differences in mean health outcomes

[4] We compare our estimates with those from the World Health Organization, which are based on the 20-item Self-Reporting Questionnaire (SRQ, van der Westhuizen et al. [2016]). Many of the questions in the SRQ overlap with those in the GAD-7 and PHQ-2 scales, although they are phrased differently.

across urban and peri-urban households are stark. In spite of some evidence that urban households have higher income levels (for example, they pay higher rent and have slightly higher levels of consumption), stress levels are significantly higher in the urban neighborhoods compared with peri-urban neighborhoods. A test of differences in means shows that the Stress Index is lower in the peri-urban sample by 0.43 standard deviations. In contrast, evidence from developed countries suggest that low levels of household income and negative shocks to income are correlated with a higher probability of developing several lifetime mental disorders and suicide attempts (Sareen et al. [2011]).

Compared with respondents who are not working, we find that respondents working as domestic helpers report significantly higher levels of stress. Nonetheless, the self-reported stress levels of those employed in the garment sector, those owning a small business, or those employed in other sectors are not statistically significantly higher than those of respondents who are not working. Among women, almost half (48 percent) of those working are employed in garments, with another 26 percent working as a domestic helper and 10 percent owning a small business. A similar proportion of men (49 percent) work in garments, while 13 percent own a business and the rest are spread across various occupations.

In line with international statistics, females report significantly higher stress levels than men (Rosenfield and Mouzon [2013]; Van de Velde et al. [2010]; Seedat et al. [2009]). The aggregate index of symptoms of stress is 0.56 standard higher for women in the full sample. This, combined with the fact that men do not work as domestic helpers, raises the question of whether this occupation effect is picking up a female effect. The regression in column 2 limits the sample to female respondents only and shows this is not the case. Those working as domestic helpers continue to show higher levels of reported stress. Moreover, among women, those owning a small business also show higher reported stress levels compared with those not working. The gender effect is stronger among urban respondents and those who have never worked or are not currently working on garments. But, conditional on being a woman, being married reduces stress, and the coefficient is larger for urban women and non-garment respondents.

The other control variables offer some reassurance that the self-reported stress measures are picking up actual differences in stress. In particular, reported stress is lower among women who are married and respondents with a savings account, and is marginally higher among those with young children in the household

(column 1). Respondents in households where another household member is employed in the garment sector report marginally lower levels of stress. We speculate that the steady income from work in the garment sector reduces stress, even if long hours and factory conditions may by themselves increase stress. Having another household member working in the garment sector appears is more highly correlated with stress for respondents who are themselves employed in the garment sector (column 4).

These results are robust to alternative specifications controlling for household infrastructure and environmental elements associated with crime (Crime Prevention through Environmental Design, or CPTED, see Table 7). Having access to sanitary toilets is associated with statistically significantly lower stress levels, with coefficients ranging from 0.14 to 0.21 standard deviations of the stress index across subsamples. Concrete floors, which are believed to be an improvement over mud or tin floors, enter with an unexpected positive sign. This does not appear to be the result of concrete floors being correlated with some other characteristic, because there is variance in the type of floor in each of the communities and across occupations. The average rate of adoption varies from 81 percent in Nayapara (Gazipur) to 95 percent in Purbo Bahadurpur (Gazipur), and is moderately lower among respondents working as domestic helpers than other type of workers (around 84 and 89 percent respectively). Concrete floors are also more common in households where the head is either a garment worker or a business owner (between 91 and 92 percent) than any other occupation (86.8 percent).

Although CPTED theories suggest that living in lighted areas might increase well-being via perceptions of safety, living in an unlighted street is associated with lower stress levels for most subsamples. The correlation is higher among females, non-garment workers and urban respondents. Garment workers are less likely to live on an unlighted street than business owners and domestic helpers and (62, 89 and 85 percent of these occupational groups do so, respectively), so this variable could also be picking up the effect of differences in the choice of location within a community, or simply the increased likelihood of finding business owners and domestic helpers in urban areas, which are more likely to be lit at night.

More in line with the CPTED theory predictions, living in a house far away from others (isolated homestead) seems to increase stress levels for all subsamples, with varying coefficient sizes and significance levels. This is also consistent with previous evidence suggesting that social support from friends - an important stress

buffer - is more widely available in large urban centers, where population density is typically higher than in small cities (Chadwick and Collins 2015). The effect is stronger among female and urban respondents (columns 2 and 6 of Table 7). The coefficient associated with the number of people sharing a room enters with positive sign but is relatively small and non-significant for all but the urban subsample.

These results are robust to replacing the total number of children below the ages of 14 with that of children below two and six, winsorizing per capita consumption at the 95th percentile and to controlling for the presence grandparents. We also run a regression controlling for missing values in commuting time and savings (Table 8), and two more using alternative stress indexes as dependent variables. The first is the standardized sum of the nine items corresponding to the combined GAD7 and PHQ2 scales (Table 5). The second is the original Stress Index, as reported in Table 2, but winsorized at the 95th percentile (Table 6). The results remain largely unchanged.

In sum, we find that women working as domestic helpers or owning a small business report significantly higher levels of stress compared with women who do not work. Those working in the garment sector or in other miscellaneous occupations report stress levels comparable to those not working, and lower than domestic helpers and business owners. Given the image of the garment sector in Bangladesh, we find this somewhat surprising. Moreover, there is some evidence that having another household member employed in the garment sector reduces stress levels, especially among respondents who are themselves employed in the garment sector. Previous research has documented the protective effects of having a source of employment that provides financial stability and social networks, and the negative effects of temporary employment on health (see Badland et al. [2014] for a review). A possible is explanation is that, relative to the number and types of jobs available locally, working in garments is seen as a good option, and gives access to social networks that would not be available otherwise (particularly for women).

## 3.6 Differences in Physical Health

### 3.6.1 Number of Days Spent Sick or with Fever

We next turn to indicators of physical health. As with stress, we asked the respondent to report indicators of her/his own physical health. We also asked the respondent to report on indicators of physical health of other household members. We examine these two measures separately, starting with the respondent's own physical health. The results are presented in Table 3.

Our first measure is the total number of days over the two weeks preceding the survey the respondent was sick. The number of days spent sick by all household members is significantly lower in Gazipur (1.86 days, compared to 6.87 in Dhaka) as it is the number of days spent with fever (2.48 and 3.82 days respectively). We find that this is significantly higher among respondents who work in any of the four occupation categories relative to respondents who do not work (column 1). Whether this reflects increased exposure to illnesses, a reduction in sleep, or simply a lower threshold for what constitutes illness is difficult to say. We note that those who work as domestic workers or own a business report more days being sick than those working in garments or other occupations. A test of differences in means indicates that the difference in sick days between respondents working in the garment sector and those working as domestic helpers is statistically significant (p=0.01), while the difference between garment workers and business owners is not (p=0.26). A similar pattern holds for female respondents (column 2), and in the urban sample (column 4). The levels of illness reported in the urban Dhaka are much higher than in Gazipur, and the Gazipur data show no pattern of physical illness with respect to employment (column 3).

Among the other control variables, we find that older respondents report a higher number of days of illness. There are no other robust patterns among the other control variables, though female respondents report more physical illness in the urban Dhaka subsample, where only 9 percent of respondents are male.

The right-hand side of table 3 shows illness reported for other household members. Here, the coefficients on employment are generally negative, but only rarely significant. Household size is the best predictor of illness of other household members, with the number of days of illness increase by just over one day per adult member. Conditional on household size, having more young children reduces the

incidence of physical illness. That is, the data suggest that young children are ill less often than adults. The physical health of other household members is better when someone other than the respondent works in the garment sector in the urban sample, but somewhat worse in the peri-urban sample.

These results remain largely unchanged when accounting for household infrastructure (Table 9). Access to sanitary toilets enter with the expected negative sign in most regressions. There are three main types of floor materials: concrete, tin and mud. Concrete enters with a positive sign, which we find difficult to interpret but is consistent with our earlier findings. The effect of owning the homestead is negative for the full sample, but the effect seems to be concentrated among urban households.

Tables 10 and 11 report on the total number of days spent with fever by respondents and all household members. The number of days spent with fever by the respondent is higher when she works as a domestic helper with respect to not being employed, or working in any other occupation, although these differences are not significant. Being a garment worker is associated with lower stress levels in urban areas and higher in peri-urban areas, but the coefficient is insignificant in all regressions. Having a household member other than the respondent working on garments and on other sectors does not enter with the same sign across regressions and all the coefficients are insignificant. The results hold even after controlling for the extended set of household characteristics.

The number of children below the age of 14 is only marginally associated with a higher number of days spent with fever, with and without household infrastructure controls. Access to sanitary and pucca toilets reduces the number of days with fever by the respondent and having a concrete floor appears to increase it. The coefficient associated with the number of people sharing a room does not enter with same sign in all regressions.

The number of days spent with fever by all household members is higher in urban households where the respondent works as a domestic helper (Column 7) although the coefficient is not significant. The number of domestic helpers in peri-urban areas is too small to draw conclusions. Having another household member employed in garments or any other occupation enters with negative sign for the urban sample and with a positive sign for the peri-urban household, but none is significant. Both the number of household members and the number of children are

statistically significantly associated with a higher number of days spent with fever, but the effect seems to be concentrated among urban households. The effect of all remaining variables is similar to that reported for the number of fever days among respondents.

### 3.6.2 BMI and Illness Sources in Dhaka City

Out of 917 respondents, 250 (24 percent approximately) reported having spent at least one day sick (222 with fever) in the previous two weeks, and 130 (14 percent) cited some form of body ache (including joint, limb, eye, headaches, but excluding gastric pain, which was a different category) as the main source of illness. 41 out of the 130 reporting some form of pain had a cold or were running a fever and felt pain at the same time.

Overweight is becoming increasingly prevalent in adults in developing countries and has been associated with increased risk for type-2 diabetes and cardiovascular diseases. Even those suffering from malnutrition can be overweight. In line with the latest figures from the Demographic and Health Survey 2014, our data confirms that overweight and obesity rates are on the increase. Using the global cut-off points for obesity we found that 27 percent of the urban respondents in our sample were overweight (BMI between 25 and 29.99) and six percent were obese (BMI above 30). At the national level, overweight or obesity (BMI above 25) among ever-married women aged 15-49 increased from nine to 24 percent in the period 2010-2014 (17 to 39 percent using the lower cut-off point for South Asian populations (Demographic and Health Survey (2014)).

Using the Asian-specific cut-off points proposed by the World Health Organization (BMI scores over 23 are considered above the optimal range, and below 18 are considered underweight) we found that 51 percent of the urban respondents in our sample were overweight. The rate is higher among women who have never worked than those who are currently working or have worked in the past (59, 48 and 54 percent respectively, with sample sizes of 319, 324 and 516). The prevalence of underweight is very low, between six and seven percent regardless of the occupational choice of the respondent. Since our sample of female garment respondents is small (10 percent of the female respondents in the Dhaka city sample), any differences in means might be misleading. A simple test of difference in means shows that the prevalence of overweight is statistically significantly higher among non-garment

respondents (53 percent, compared to 40 percent among garment workers), whereas the prevalence of underweight is not (7 and 9 percent respectively).

We run two alternative OLS regressions for the distance from an optimal BMI for those who are overweight according to the South Asian-specific cut-off point (Table 4). The results suggest that, compared to those who have never worked, being a garment worker is associated with a lower distance to an optimal BMI among those who are overweight, although the coefficient is not significant. Business owners are the only occupational group showing a statistically significantly larger distance to the optimal BMI relative to those who are not employed. Compared to that base group, being employed appears to increase the distance to an optimal BMI and being unemployed after having worked in the past appears to decrease it, but the coefficients are not significant.

The coefficients associated with age, being female and the number of children are positive and significant for both regressions. The number of hours spent on household chores or work involving physical activity appear to be significantly correlated with BMI. The data also suggest, although none of the coefficients are significant, that being female, owning a house and having another household member working are positively correlated with BMI for those who are overweight.

Our data suggest that the occupational choice of households and, importantly, that of women, is not systematically associated with the increase in overweight rates, as the most frequent occupations among female workers (garments and paid domestic work outside the household) are not statistically associated with distance to an optimal BMI. Measurement error could be hiding the role played by physical activity, but it seems that accurate data on other lifestyle aspects, such as dietary patterns, might be key to understand what is driving differences in BMI among respondents which are similar in basic observables characteristics.

## 3.7 Discussion

The world's population is increasingly urban. Movement to a city has a complex effect on the well-being of individuals, which is moderated by a combination of household and community-specific features (Badland et al. [2014]). The availability of jobs tends to be greater and incomes are higher. Infrastructure and housing stock are often better. Improved housing conditions and stable sources of income

are expected to have well-being enhancing effects. However, moving to urban areas can also have negative effects. Social support, a major stress buffer, might be lower among those migrating to large cities looking for better-paid jobs. In addition, proximity to a large city might come at the expense of long commuting times, pollution, noise, high prices and insufficient access to basic social services. The net effects of agglomeration on welfare and health are therefore uncertain, and the negative effects may predominate for the working class.

This study contributes to the literature studying which particular dimensions of poverty are more strongly associated with health in low and middle income countries. For this, we exploit across and within community variation in mental and physical health in urban and peri-urban areas in Greater Dhaka, Bangladesh. Previous studies have focused on the role of housing and community liveability (Badland et al. [2014] and Butala et al. [2010]). We center our analysis on the well-being of women and the role of their occupational status, for which the amount of evidence coming from developing countries is limited.

Overall, stress levels in the communities we sample are very high, with 34 percent of urban and 15 percent of peri-urban respondents reporting clinically significantly levels of anxiety. These rates compare to around four percent rates found in nationally representative samples in Bangladesh. The number of days spent sick or with fever are also notable, and are higher in areas closer to central Dhaka, where access to piped water, sanitary toilets and a variety of jobs is higher, but so is commuting time and the number of people sharing a room.

In our sample six out of 10 women have not completed primary school. Among all female respondents, 39 percent are employed, but they are concentrated in three occupations. More than 85 percent of those employed work in garments (49 percent), as a domestic helper (28 percent) or own a small business (10 percent). Among these three occupations, our data suggest that women employed in the garment sector exhibit lower levels of stress and better levels of physical health. This is not to say that working conditions for workers in garment factories could not be improved, but that, relative to alternatives currently available to women with secondary schooling or less, the garment sector is a relatively healthy place to work.

Moreover, regardless of the occupational choice of the respondent, the coefficient associated with having another household member working in garments is negative for all subsamples and significant for respondents who work in garments

and those in peri-urban areas, where there is a higher concentration of garment jobs.

Most of the variation across individuals in distance from an optimal BMI remains unexplained. We hypothesized that hours spent on physically demanding jobs or household chores would contribute to explain differences in BMI. The data suggest otherwise, indicating that important lifestyle choices, such as dietary patterns, need to be measured and accounted for in future studies.

Our study has two main limitations. The first is that we cannot determine the direction of the relationships between health, mental health and other socioeconomic outcomes, such as labor supply or choice of geographical location. The second is that our sample is not nationally representative, although we chose households to be representative of the areas in which they are located. An additional limitation is that we only have data on BMI and physical activity for the urban Dhaka sample.

Future studies measuring similar outcomes at different points of time for the same sample of households would provide a window into how different households cope with seasonal and unexpected variations in local employment, weather shocks and changes in migration flows. In addition, including measures of social support and additional indicators of lifestyle choices would allow us to improve our understanding of social determinants of health and mental health of workers living in impoverished urban areas in low and middle income countries. Recent evidence from the US suggests that, compared to part-time or unemployment, full-time employment is associated with lower levels of stress and depression, healthier dietary patterns, more physical activity and less unhealthy coping styles, such as smoking or consuming alcohol (Rosenthal et al. [2012]). Data for developing countries is limited. Further studies documenting increases in unhealthy coping strategies and their social determinants are essential for designing policies that help prevent potential increases in chronic diseases and the prevalence of common mental health disorders.

Table A1: Summary Statistics

| | Peri-Urban (N=861) | Urban (N=917) | P-Value Difference (Urban=Peri) |
|---|---|---|---|
| **Panel A. Household Data** | | | |
| Household size | 3.54 | 4.06 | 0.0000*** |
| | (1.51) | (1.57) | |
| Head completed primary | 0.63 | 0.59 | 0.0802* |
| | (0.48) | (0.49) | |
| Consumption p/c | 8168.19 | 9413.07 | 0.0000*** |
| (Bangladeshi Taka) | (3971.62) | (6217.42) | |
| Consumption p/c | 2499.10 | 2434.53 | 0.3182 |
| (Bangladeshi Taka) | (1251.95) | (1328.07) | |
| Savings (Y/N) | 0.52 | 0.39 | 0.0000*** |
| | (0.50) | (0.49) | |
| Own house | 0.20 | 0.10 | 0.0000*** |
| | (0.40) | (0.30) | |
| Rent (BDT) | 2015.60 | 4270.23 | 0.0000*** |
| | (1226.84) | (2652.87) | |
| Electricity | 0.98 | 1.00 | 0.0003*** |
| | (0.13) | (0.03) | |
| Concrete floor | 0.89 | 0.90 | 0.5944 |
| | (0.31) | (0.30) | |
| Sanitary toilet | 0.21 | 0.63 | 0.0000*** |
| | (0.41) | (0.48) | |
| Piped water | 0.12 | 0.90 | 0.0000*** |
| | (0.32) | (0.30) | |
| **Panel B. Occupation Data** | | | |
| Head works in garments | 0.50 | 0.10 | 0.0000*** |
| | (0.50) | (0.30) | |
| Head owns a business | 0.12 | 0.15 | 0.1532 |
| | (0.33) | (0.35) | |
| Respondent works in | 0.40 | 0.09 | 0.000*** |
| garments | (0.49) | (0.29) | |
| Respondent works as | 0.01 | 0.15 | 0.000*** |
| domestic helper | (0.08) | (0.36) | |
| Another HH member | 0.48 | 0.14 | 0.000*** |
| works in garments | (0.50) | (0.34) | |
| Commuting time in minutes | 20.26 | 14.82 | 0.000*** |
| (Respondent, currently working) | (20.95) | (9.88) | |
| **Panel C. Health data** | | | |
| Stress Index | -0.22 | 0.21 | 0.000*** |
| | (0.74) | (1.16) | |
| Sick Days, all household members | 1.86 | 6.87 | 0.000*** |
| | (3.82) | (8.98) | |
| Fever Days, all household members | 2.48 | 3.82 | 0.000*** |
| | (4.11) | (5.79) | |

Notes: Table reports individual and household characteristics for respondents in peri-urban and urban households (Columns 1 and 2 respectively) and the p-value of the difference between them (Column 3). The Stress Index is the unweighthed sum of the standardized anxiety and depression scores, measured using the GAD-7 and PHQ-2 scales. Consumption includes monthly per capita expenditures in food and utilities, in thousands of Bangladeshi Taka (winsorized at the 95th percentile to trim outliers). Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A2: OLS Stress Index on Individual Characteristics

| | (1) All | (2) Female | (3) RMG | (4) Non-RMG | (5) Peri-urban | (6) Urban |
|---|---|---|---|---|---|---|
| Respondent works: | 0.051 | 0.045 | | | 0.037 | 0.002 |
| RMG | (0.05) | (0.05) | | | (0.07) | (0.06) |
| Respondent works: | 0.246** | 0.221* | | | 0.058 | 0.254* |
| Domestic helper | (0.10) | (0.11) | | | (0.12) | (0.12) |
| Respondent works: | 0.064 | 0.266** | | | 0.044 | 0.132 |
| Business | (0.08) | (0.11) | | | (0.05) | (0.14) |
| Respondent works: | -0.10 | -0.065 | | | -0.111 | 0.019 |
| Other wage | (0.06) | (0.10) | | | (0.06) | (0.12) |
| Another HH member | -0.196** | -0.148 | -0.250** | -0.15 | -0.139 | -0.305 |
| works (RMG) | (0.08) | (0.11) | (0.09) | (0.11) | (0.09) | (0.20) |
| Another HH member | -0.139 | -0.124 | -0.003 | -0.151 | -0.05 | -0.229 |
| works (non-RMG) | (0.10) | (0.12) | (0.18) | (0.13) | (0.12) | (0.18) |
| Age of respondent | 0.010** | 0.011** | 0.003 | 0.012*** | 0.002 | 0.017*** |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Education of | -0.004 | -0.005 | -0.016* | -0.005 | -0.016* | 0.006 |
| respondent | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Female respondent | 0.545*** | | 0.462*** | 0.640** | 0.410** | 0.859** |
| | (0.13) | | (0.13) | (0.21) | (0.13) | (0.22) |
| Married respondent | 0.110* | -0.233* | 0.13 | 0.16 | 0.133** | 0.089 |
| | (0.05) | (0.11) | (0.09) | (0.16) | (0.04) | (0.16) |
| Female*Married | -0.350** | | -0.355** | -0.378 | -0.376* | -0.313 |
| | (0.13) | | (0.13) | (0.23) | (0.16) | (0.24) |
| Number children | 0.047** | 0.039 | 0.055 | 0.047* | 0.054 | 0.041 |
| under 14 | (0.02) | (0.02) | (0.03) | (0.03) | (0.03) | (0.03) |
| Has savings (Y/N) | -0.095** | -0.139** | -0.149* | -0.066 | -0.101 | -0.096 |
| | (0.04) | (0.05) | (0.07) | (0.05) | (0.06) | (0.07) |
| Observations | 1,772 | 1,399 | 428 | 1,350 | 858 | 914 |
| R-squared | 0.121 | 0.111 | 0.164 | 0.104 | 0.099 | 0.087 |
| Community FE | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the Stress Index I. The index is sum of standardized GAD-7 and PHQ-2 scores. Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 4 report correlates for households where the respondent works in the ready-made garment industry (RMG) and where he or she does not, respectively. Columns 5 and 6 report correlates for peri-urban and urban households respectively. Consumption includes monthly per capita expenditures in food and utilities, in thousands of Bangladeshi Taka (winsorized at the 95th percentile to trim outliers). Standard errors clustered at the community level. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A3: Respondent and Other Household Members' Sick Days

| | Respondents' Sick Days | | | | Other HH Members' Sick Days | | |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) Female | (3) Peri-Urban | (4) Urban) | (5) All | (6) Peri-Urban | (7) Urban |
| Respondent works: RMG | 0.848** | 1.056*** | 0.582 | 1.170* | -0.437 | -0.532 | -0.061 |
| | (0.29) | (0.26) | (0.33) | (0.53) | (0.41) | (0.45) | (0.76) |
| Respondent works: Domestic helper | 1.783*** | 1.841*** | 0.791 | 1.902*** | -0.041 | -1.623* | 0.108 |
| | (0.20) | (0.18) | (1.73) | (0.19) | (0.65) | (0.69) | (0.71) |
| Respondent works: Business | 1.418** | 2.074** | 0.634 | 1.842* | -0.967 | -0.814 | -0.1 |
| | (0.53) | (0.82) | (0.35) | (0.86) | (1.03) | (0.56) | (1.53) |
| Respondent works: Other wage | 0.670** | 1.076*** | 0.398 | 0.744 | -1.219*** | -0.478 | -0.936 |
| | (0.25) | (0.29) | (0.33) | (0.41) | (0.36) | (0.34) | (0.48) |
| Another HH member works (RMG) | 0.026 | 0.459 | -0.118 | 0.41 | -0.62 | 0.338** | -2.339* |
| | (0.28) | (0.47) | (0.26) | (0.73) | (0.57) | (0.10) | (0.97) |
| Another HH member works (non-RMG) | -0.253 | -0.08 | 0.026 | -0.481 | -0.592 | 0.293 | -1.477 |
| | (0.33) | (0.38) | (0.42) | (0.52) | (0.65) | (0.27) | (1.04) |
| Age of respondent | 0.032** | 0.029** | 0.013 | 0.048* | 0.048** | 0.019* | 0.069* |
| | (0.01) | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) |
| Education of respondent | -0.012 | -0.012 | -0.026 | 0.005 | 0.067 | -0.033 | 0.119 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.06) | (0.03) | (0.10) |
| Female respondent | 0.703 | | 0.369 | 1.400* | 0.382 | -0.771** | 1.739 |
| | (0.42) | | (0.40) | (0.68) | (0.91) | (0.25) | (1.70) |
| Married respondent | -0.094 | -0.433* | -0.230* | 0.689 | -0.432 | -0.704 | -0.358 |
| | (0.22) | (0.24) | (0.10) | (0.77) | (0.50) | (0.49) | (1.54) |
| Female*Married | -0.335 | | -0.366 | -1.036 | 0.807 | 0.854** | 1.118 |
| | (0.33) | | (0.39) | (0.92) | (1.18) | (0.28) | (2.15) |
| Number children under 14 | 0.07 | -0.015 | 0.094 | 0.061 | -0.611** | -0.134 | -0.572* |
| | (0.10) | (0.12) | (0.23) | (0.11) | (0.21) | (0.11) | (0.28) |
| Household size | -0.05 | | 0.014 | -0.114 | 1.240*** | 0.255** | 1.628*** |
| | (0.09) | | (0.13) | (0.13) | (0.27) | (0.09) | (0.30) |
| Has savings (Y/N) | -0.007 | -0.015 | -0.262* | 0.26 | -0.017 | 0.191 | -0.244 |
| | (0.22) | (0.26) | (0.11) | (0.39) | (0.27) | (0.11) | (0.40) |
| Observations | 1,772 | 1,399 | 858 | 914 | 1,508 | 594 | 914 |
| R-squared | 0.078 | 0.095 | 0.054 | 0.067 | 0.187 | 0.078 | 0.149 |
| Community FE | YES | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the number of days spent sick by the respondent (columns 1 to 4) and by all household members (columns 5 to 7). Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 6 report correlates for peri-urban households, and columns 4 and 7 for urban households. Standard errors clustered at the community level. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A4: Distance from optimal BMI for Overweight Respondents in Urban Areas

| | (1) BMI - 23 | (2) BMI -23 |
|---|---|---|
| Respondent works: RMG | -0.194 | |
| | (0.38) | |
| Respondent works: Domestic helper | 0.058 | |
| | (0.70) | |
| Respondent works: Business | 0.412* | |
| | (0.20) | |
| Respondent works: Other wage | 0.809 | |
| | (0.67) | |
| Another HH member works in RMG | 0.175 | 0.155 |
| | (0.56) | (0.54) |
| Another HH member works (Non- RMG) | 0.364 | 0.361 |
| | (0.44) | (0.44) |
| Age of respondent | 0.040* | 0.039* |
| | (0.02) | (0.02) |
| Education of respondent | 0.064 | 0.063 |
| | (0.04) | (0.04) |
| Female respondent | 2.052* | 1.921* |
| | (0.86) | (0.89) |
| Respondent married | 1.042 | 1.289 |
| | (0.70) | (0.72) |
| Female*Married | -1.278 | -1.573 |
| | (1.11) | (1.14) |
| Number Children under 14 | 0.265* | 0.278* |
| | (0.12) | (0.13) |
| Daily hours of physical activity (Vigorous HH chores or work) | 0.059 | 0.043 |
| | (0.10) | (0.10) |
| Owns house | 0.45 | 0.442 |
| | (0.29) | (0.29) |
| Sanitary toilet | 0.097 | 0.109 |
| | (0.36) | (0.36) |
| Concrete floor | 0.047 | 0.063 |
| | (0.62) | (0.61) |
| Respondent works | | 0.511 |
| | | (0.53) |
| Respondent worked in the past | | -0.398 |
| | | (0.23) |
| Observations | 456 | 456 |
| R-squared | 0.076 | 0.073 |
| Community FE | YES | YES |

Notes: Table reports correlates of the distance between the respondent's BMI and the cut-off point for determining overweight in South Asian populations (BMI above 23). Standard errors clustered at the community level. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A5: Correlates of Stress Index II (Standardized Sum of the Nine Mental Health Questions)

| | (1) All | (2) Female | (3) RMG | (4) Non-RMG | (5) Peri-urban | (6) Urban |
|---|---|---|---|---|---|---|
| Respondent works: | 0.055 | 0.043 | | | 0.04 | -0.012 |
| RMG | (0.06) | (0.05) | | | (0.08) | (0.09) |
| Respondent works: | 0.260** | 0.232** | | | 0.011 | 0.255* |
| Domestic helper | (0.09) | (0.09) | | | (0.14) | (0.10) |
| Respondent works: | 0.057 | 0.287*** | | | 0.007 | 0.141 |
| Business | (0.07) | (0.09) | | | (0.04) | (0.12) |
| Respondent works: | -0.124* | -0.088 | | | -0.112 | -0.019 |
| Other wage | (0.07) | (0.10) | | | (0.08) | (0.12) |
| Another HH member | -0.189** | -0.146 | -0.231** | -0.15 | -0.123 | -0.303 |
| works in RMG | (0.08) | (0.12) | (0.08) | (0.12) | (0.07) | (0.22) |
| Another HH member | -0.138 | -0.134 | 0.004 | -0.155 | -0.033 | -0.249 |
| works (non-RMG) | (0.10) | (0.12) | (0.17) | (0.12) | (0.11) | (0.17) |
| Age of respondent | 0.011** | 0.012** | 0.003 | 0.013*** | 0.001 | 0.019*** |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Education of | -0.003 | -0.004 | -0.016* | -0.004 | -0.015* | 0.006 |
| respondent | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Female respondent | 0.536*** | | 0.499*** | 0.628** | 0.434** | 0.820** |
| | (0.12) | | (0.12) | (0.22) | (0.12) | (0.22) |
| Married respondent | 0.08 | -0.233* | 0.141 | 0.107 | 0.138** | -0.023 |
| | (0.06) | (0.11) | (0.09) | (0.16) | (0.04) | (0.14) |
| Female*Married | -0.324** | | -0.413** | -0.312 | -0.417* | -0.181 |
| | (0.13) | | (0.14) | (0.24) | (0.15) | (0.21) |
| Number children | 0.064** | 0.062** | 0.053* | 0.071** | 0.057* | 0.069 |
| under 14 | (0.02) | (0.03) | (0.03) | (0.03) | (0.03) | (0.04) |
| Has savings (Y/N) | -0.080* | -0.123** | -0.136* | -0.053 | -0.115 | -0.055 |
| | (0.04) | (0.05) | (0.06) | (0.05) | (0.06) | (0.07) |
| Observations | 1,772 | 1,399 | 428 | 1,350 | 858 | 914 |
| R-squared | 0.123 | 0.114 | 0.16 | 0.108 | 0.101 | 0.094 |
| Community FE | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the Stress Index II. The index is standardized sum of the nine mental health questions: the seven-item generalized anxiety scale, GAD-7, and the two-item depression scale, PHQ-2. Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 4 report correlates for households where the respondent works in the ready-made garment industry (RMG) and where he or she does not, respectively. Columns 5 and 6 report correlates for peri-urban and urban households respectively. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A6: Correlates of Stress Index Winsorized (95th percentile)

| | (1) All | (2) Female | (3) RMG | (4) Non-RMG | (5) Peri-urban | (6) Urban |
|---|---|---|---|---|---|---|
| Respondent works: RMG | 0.055 | 0.051 | | | 0.042 | 0.003 |
| | (0.05) | (0.04) | | | (0.08) | (0.06) |
| Respondent works: Domestic helper | 0.226* | 0.203 | | | 0.066 | 0.238 |
| | (0.11) | (0.12) | | | (0.12) | (0.13) |
| Respondent works: Business | 0.065 | 0.276** | | | 0.016 | 0.141 |
| | (0.08) | (0.11) | | | (0.07) | (0.14) |
| Respondent works: Other wage | -0.099 | -0.094 | | | -0.101 | -0.004 |
| | (0.06) | (0.09) | | | (0.07) | (0.11) |
| Another HH member works in RMG | -0.182** | -0.134* | -0.247** | -0.13 | -0.14 | -0.269 |
| | (0.06) | (0.07) | (0.09) | (0.08) | (0.08) | (0.14) |
| Another HH member works (non-RMG) | -0.115 | -0.094 | 0.002 | -0.122 | -0.058 | -0.179 |
| | (0.08) | (0.08) | (0.18) | (0.10) | (0.11) | (0.13) |
| Age of respondent | 0.009** | 0.010** | 0.001 | 0.011*** | 0.001 | 0.016*** |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Education of respondent | -0.004 | -0.005 | -0.015* | -0.004 | -0.016** | 0.007 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Female respondent | 0.514*** | | 0.455*** | 0.587** | 0.410** | 0.776** |
| | (0.11) | | (0.12) | (0.19) | (0.13) | (0.21) |
| Married respondent | 0.106* | -0.219** | 0.136 | 0.143 | 0.125** | 0.088 |
| | (0.05) | (0.08) | (0.08) | (0.15) | (0.04) | (0.16) |
| Female*Married | -0.328*** | | -0.356** | -0.338 | -0.369* | -0.283 |
| | (0.10) | | (0.12) | (0.20) | (0.16) | (0.17) |
| Number children under 14 | 0.051** | 0.041 | 0.063** | 0.050* | 0.059 | 0.042 |
| | (0.02) | (0.02) | (0.03) | (0.02) | (0.03) | (0.03) |
| Has savings (Y/N) | -0.091** | -0.128** | -0.136* | -0.063 | -0.105 | -0.084 |
| | (0.04) | (0.05) | (0.07) | (0.05) | (0.05) | (0.06) |
| Observations | 1,772 | 1,399 | 428 | 1,350 | 858 | 914 |
| R-squared | 0.121 | 0.111 | 0.166 | 0.104 | 0.103 | 0.09 |
| Community FE | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the Stress Index I, winsorized at the 95th percentile to trim outliers. The index is sum of standardized GAD-7 and PHQ-2 scores. Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 4 report correlates for households where the respondent works in the ready-made garment industry (RMG) and where he or she does not, respectively. Columns 5 and 6 report correlates for peri-urban and urban households respectively. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A7: OLS Stress Index (I) with Infrastructure and Safety Controls

| | (1) All | (2) Female | (3) RMG | (4) Non-RMG | (5) Peri-urban | (6) Urban |
|---|---|---|---|---|---|---|
| Respondent works: | -0.005 | 0.018 | | | -0.128 | 0.024 |
| RMG | (0.06) | (0.07) | | | (0.06) | (0.08) |
| Respondent works: | 0.16 | 0.175 | | | -0.029 | 0.227 |
| Domestic helper | (0.14) | (0.14) | | | (0.12) | (0.15) |
| Respondent works: | 0.074 | 0.274** | | | -0.017 | 0.144 |
| Business | (0.09) | (0.12) | | | (0.08) | (0.16) |
| Respondent works: | -0.138 | -0.087 | | | -0.204** | -0.018 |
| Other wage | (0.09) | (0.13) | | | (0.07) | (0.15) |
| Another HH member | -0.239** | -0.196 | -0.272*** | -0.202 | -0.148* | -0.358 |
| works in RMG | (0.10) | (0.13) | (0.08) | (0.14) | (0.07) | (0.21) |
| Another HH member | -0.156 | -0.144 | -0.053 | -0.178 | -0.055 | -0.264 |
| works (non-RMG) | (0.10) | (0.12) | (0.18) | (0.13) | (0.10) | (0.17) |
| Commuting time | 0.003 | 0.001 | 0.010* | 0.003 | 0.009*** | 0.001 |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Age of respondent | 0.011** | 0.012** | 0.004 | 0.013*** | 0.002 | 0.019** |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.01) |
| Education of | -0.003 | -0.004 | -0.017** | -0.002 | -0.016* | 0.009 |
| respondent | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Female respondent | 0.547*** | | 0.436** | 0.649*** | 0.420** | 0.812*** |
| | (0.12) | | (0.14) | (0.20) | (0.13) | (0.19) |
| Married respondent | 0.119** | -0.224* | 0.123 | 0.183 | 0.098* | 0.058 |
| | (0.05) | (0.11) | (0.09) | (0.16) | (0.04) | (0.09) |
| Female*Married | -0.352** | | -0.326* | -0.377 | -0.364* | -0.228 |
| | (0.12) | | (0.15) | (0.22) | (0.15) | (0.20) |
| Number children | 0.029 | 0.018 | -0.002 | 0.029 | 0.046 | 0.009 |
| under 14 | (0.02) | (0.02) | (0.05) | (0.03) | (0.04) | (0.03) |
| Has savings (Y/N) | -0.100** | -0.154** | -0.148* | -0.081 | -0.085 | -0.132* |
| | (0.05) | (0.05) | (0.07) | (0.05) | (0.07) | (0.06) |
| Own house | -0.065 | -0.07 | -0.011 | -0.061 | -0.029 | -0.166 |
| | (0.07) | (0.09) | (0.17) | (0.08) | (0.05) | (0.16) |
| People/Rooms | 0.024 | 0.028 | 0.065 | 0.024 | 0.012 | 0.036** |
| | (0.02) | (0.02) | (0.04) | (0.03) | (0.03) | (0.01) |
| Sanitary toilet | -0.152 | -0.176* | -0.207*** | -0.153 | -0.14 | -0.236 |
| | (0.09) | (0.09) | (0.06) | (0.11) | (0.13) | (0.15) |
| Concrete floor | 0.166** | 0.187** | 0.06 | 0.197** | 0.117 | 0.165 |
| | (0.07) | (0.07) | (0.16) | (0.07) | (0.09) | (0.11) |
| Isolated household | 0.184 | 0.216* | 0.299 | 0.168 | 0.262 | 0.410* |
| | (0.12) | (0.12) | (0.18) | (0.12) | (0.16) | (0.20) |
| Reduced visibility | 0.08 | 0.031 | 0.217 | 0.029 | 0.139 | -0.223 |
| around entrance | (0.09) | (0.12) | (0.17) | (0.09) | (0.10) | (0.12) |
| Unlighted street | -0.195 | -0.263** | -0.05 | -0.225* | 0.039 | -0.429** |
| | (0.12) | (0.11) | (0.14) | (0.11) | (0.13) | (0.13) |
| Entrapment spots | -0.025 | -0.026 | 0.028 | -0.057 | 0.027 | -0.312* |
| nearby | (0.06) | (0.08) | (0.09) | (0.09) | (0.03) | (0.13) |
| Observations | 1,772 | 1,399 | 428 | 1,350 | 858 | 914 |
| R-squared | 0.142 | 0.14 | 0.218 | 0.127 | 0.136 | 0.132 |
| Community FE | YES | YES | YES | YES | YES | YES |
| Indiv. Charact. | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the Stress Index I. The index is sum of standardized GAD-7 and PHQ-2 scores. Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 4 report correlates for households where the respondent works in the ready-made garment industry (RMG) and where he or she does not, respectively. Columns 5 and 6 report correlates for peri-urban and urban households respectively. A household is isolated if it is more than five minutes away from the closest building. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A8: OLS Stress Index (I) with Missing Data Dummies

| | (1) All | (2) Female | (3) RMG | (4) Non-RMG | (5) Peri-urban | (6) Urban |
|---|---|---|---|---|---|---|
| Respondent works: | 0.353 | 0.24 | | | 0.106* | 0.3 |
| RMG | (0.36) | (0.32) | | | (0.05) | (0.63) |
| Respondent works: | 0.551 | 0.412 | | | 0.147 | 0.562 |
| Domestic helper | (0.35) | (0.30) | | | (0.14) | (0.56) |
| Respondent works: | 0.351 | 0.425 | | | 0.119 | 0.409 |
| Business | (0.34) | (0.33) | | | (0.07) | (0.57) |
| Respondent works: | 0.202 | 0.111 | | | -0.032 | 0.313 |
| Other wage | (0.34) | (0.31) | | | (0.07) | (0.61) |
| Another HH member | -0.204** | -0.167 | -0.264** | -0.157 | -0.144 | -0.31 |
| works in RMG | (0.08) | (0.11) | (0.10) | (0.12) | (0.09) | (0.20) |
| Another HH member | -0.145 | -0.137 | 0.02 | -0.157 | -0.049 | -0.242 |
| works (non-RMG) | (0.11) | (0.12) | (0.18) | (0.13) | (0.12) | (0.18) |
| Age of respondent | 0.010** | 0.010** | 0.001 | 0.012*** | 0.001 | 0.017*** |
| | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | (0.00) |
| Education of | -0.006 | -0.008 | -0.017* | -0.005 | -0.017* | 0.004 |
| respondent | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Female respondent | 0.547*** | | 0.480*** | 0.671** | 0.415** | 0.847** |
| | (0.13) | | (0.14) | (0.24) | (0.13) | (0.23) |
| Married respondent | 0.106* | -0.246** | 0.126 | 0.151 | 0.125** | 0.076 |
| | (0.06) | (0.11) | (0.09) | (0.16) | (0.04) | (0.15) |
| Female*Married | -0.356** | | -0.365** | -0.363 | -0.378* | -0.304 |
| | (0.13) | | (0.15) | (0.23) | (0.16) | (0.23) |
| Number children | 0.044* | 0.031 | 0.062* | 0.041 | 0.053 | 0.034 |
| under 14 | (0.02) | (0.02) | (0.03) | (0.03) | (0.03) | (0.03) |
| Commuting (missing) | 0.316 | 0.204 | | -0.06 | 0.072 | 0.326 |
| | (0.34) | (0.30) | | (0.06) | (0.04) | (0.58) |
| Savings (missing) | -0.094 | -0.4 | 0.05 | -0.241 | 0.114 | -0.233 |
| | (0.35) | (0.37) | (0.66) | (0.41) | (0.52) | (0.45) |
| Consumption (missing) | -0.164** | -0.170** | -0.396** | -0.136** | | -0.175** |
| | (0.06) | (0.06) | (0.17) | (0.06) | | (0.06) |
| Observations | 1,772 | 1,399 | 428 | 1,350 | 858 | 914 |
| R-squared | 0.121 | 0.11 | 0.162 | 0.106 | 0.095 | 0.09 |
| Community FE | YES | YES | YES | YES | YES | YES |
| Indiv. Charact. | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the Stress Index I. The index is sum of standardized GAD-7 and PHQ-2 scores. Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 4 report correlates for households where the respondent works in the ready-made garment industry (RMG) and where he or she does not, respectively. Columns 5 and 6 report correlates for peri-urban and urban households respectively. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A9: Respondent and Other Household Members' Sick Days, with Infrastructure and Safety Controls

| | Respondents | | | | Other HH Members | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | All | Female | Peri-Urban | Urban | All | Peri-Urban | Urban |
| Respondent works: | 0.792** | 1.007*** | 0.594 | 1.123* | -0.437 | -0.532 | -0.061 |
| RMG | (0.29) | (0.26) | (0.37) | (0.48) | (0.41) | (0.45) | (0.76) |
| Respondent works: | 1.752*** | 1.820*** | 0.829 | 1.865*** | -0.041 | -1.623* | 0.108 |
| Domestic helper | (0.25) | (0.24) | (1.80) | (0.26) | (0.65) | (0.69) | (0.71) |
| Respondent works: | 1.438** | 2.038** | 0.731* | 1.830* | -0.967 | -0.814 | -0.1 |
| Business | (0.52) | (0.83) | (0.30) | (0.85) | (1.03) | (0.56) | (1.53) |
| Respondent works: | 0.600** | 1.042*** | 0.397 | 0.76 | -1.219*** | -0.478 | -0.936 |
| Other wage | (0.26) | (0.32) | (0.42) | (0.41) | (0.36) | (0.34) | (0.48) |
| Another HH member | -0.087 | 0.329 | -0.153 | 0.191 | -0.62 | 0.338** | -2.339* |
| works in RMG | (0.28) | (0.45) | (0.26) | (0.77) | (0.57) | (0.10) | (0.97) |
| Another HH member | -0.298 | -0.135 | 0.035 | -0.641 | -0.592 | 0.293 | -1.477 |
| works (Non-RMG) | (0.34) | (0.39) | (0.42) | (0.54) | (0.65) | (0.27) | (1.04) |
| Age of respondent | 0.033** | 0.032* | 0.013* | 0.053* | 0.048** | 0.019* | 0.069* |
| | (0.01) | (0.02) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) |
| Education of | -0.011 | -0.014 | -0.024 | 0.017 | 0.067 | -0.033 | 0.119 |
| respondent | (0.02) | (0.02) | (0.02) | (0.04) | (0.06) | (0.03) | (0.10) |
| Female respondent | 0.719 | | 0.45 | 1.587* | 0.382 | -0.771** | 1.739 |
| | (0.43) | | (0.45) | (0.66) | (0.91) | (0.25) | (1.70) |
| Married respondent | -0.091 | -0.444* | -0.255* | 0.849 | -0.432 | -0.704 | -0.358 |
| | (0.23) | (0.24) | (0.11) | (0.73) | (0.50) | (0.49) | (1.54) |
| Female*Married | -0.348 | | -0.396 | -1.172 | 0.807 | 0.854** | 1.118 |
| | (0.33) | | (0.43) | (0.89) | (1.18) | (0.28) | (2.15) |
| Number children | 0.046 | 0.015 | 0.03 | 0.04 | -0.611** | -0.134 | -0.572* |
| under 14 | (0.13) | (0.14) | (0.29) | (0.16) | (0.21) | (0.11) | (0.28) |
| Household size | -0.05 | -0.027 | 0.004 | -0.124 | 1.240*** | 0.255** | 1.628*** |
| | (0.09) | (0.10) | (0.13) | (0.15) | (0.27) | (0.09) | (0.30) |
| Savings | 0.012 | -0.014 | -0.238 | 0.279 | -0.017 | 0.191 | -0.244 |
| | (0.22) | (0.25) | (0.11) | (0.36) | (0.27) | (0.11) | (0.40) |
| Own house | -0.384 | -0.420** | 0.06 | -1.126* | | | |
| | (0.23) | (0.16) | (0.15) | (0.45) | 1508.00 | 594.00 | 914.00 |
| People/Rooms | 0.043 | 0.007 | 0.09 | 0.09 | 0.187 | 0.078 | 0.149 |
| | (0.07) | (0.08) | (0.13) | (0.12) | YES | YES | YES |
| Sanitary toilet | -0.637* | -0.22 | -0.837* | -0.867 | | | |
| | (0.30) | (0.31) | (0.37) | (0.88) | (0.85) | (0.98) | (0.55) |
| Pucca Toilet | -0.931** | -0.54 | -0.663 | -1.513 | -1.607** | -1.990* | |
| (non-sanitary) | (0.32) | (0.31) | (0.37) | (0.90) | (0.62) | (0.77) | |
| Concrete floor | 0.216 | 0.413* | 0.319* | -0.065 | 0.736 | -0.051 | -1.764* |
| | (0.20) | (0.20) | (0.14) | (1.08) | (0.71) | (0.53) | (0.71) |
| Tin Floor | -0.131 | 0.021 | -0.467 | -0.424 | 2.967** | -0.322 | -0.954 |
| | (0.42) | (0.50) | (0.26) | (1.19) | (1.03) | (0.42) | (0.50) |
| Observations | 1,772 | 1,399 | 858 | 914 | 1,508 | 594 | 914 |
| R-squared | 0.083 | 0.099 | 0.061 | 0.079 | 0.203 | 0.113 | 0.168 |
| Community FE | YES | YES | YES | YES | YES | YES | YES |
| Indiv. Charact. | YES | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the number of days spent sick by the respondent (columns 1 to 4) and by all household members (columns 5 to 7). Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 6 report correlates for peri-urban households, and columns 4 and 7 for urban households. Standard errors clustered at the community level. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

Table A10: Respondent and Other Household Members' Fever Days

| | Respondents | | | | Other HH Members | | |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) Female | (3) Peri-Urban | (4) Urban | (5) All | (6) Peri-Urban | (7) Urban |
| Respondent works: RMG | 0.013 | 0.122 | 0.07 | -0.11 | 0.069 | 0.069 | 0.13 |
| | (0.19) | (0.21) | (0.24) | (0.37) | (0.49) | (0.61) | (0.61) |
| Respondent works: Domestic helper | 0.305 | 0.272 | -0.058 | 0.311 | 1.074 | -1.382 | 1.085 |
| | (0.23) | (0.24) | (1.37) | (0.27) | (0.84) | (1.06) | (0.89) |
| Respondent works: Business | 0.119 | -0.113 | 0.171 | 0.135 | 0.113 | 3.824 | -0.085 |
| | (0.31) | (0.47) | (0.34) | (0.48) | (0.39) | (3.15) | (0.37) |
| Respondent works: Other wage | -0.195 | -0.26 | 0.003 | -0.268 | -0.104 | 0.082 | 0.017 |
| | (0.28) | (0.35) | (0.30) | (0.47) | (0.29) | (0.59) | (0.30) |
| Another HH member works in RMG | -0.038 | 0.107 | 0.005 | -0.038 | 0.106 | 1.094 | -0.096 |
| | (0.15) | (0.22) | (0.21) | (0.36) | (0.45) | (0.64) | (0.61) |
| Another HH member works (non-RMG) | -0.119 | -0.127 | -0.01 | -0.208 | -0.156 | 0.993 | -0.341 |
| | (0.16) | (0.19) | (0.25) | (0.23) | (0.53) | (1.25) | (0.62) |
| Age of respondent | 0.023*** | 0.025*** | 0.022** | 0.023*** | -0.005 | -0.026 | -0.002 |
| | (0.00) | (0.01) | (0.01) | (0.00) | (0.02) | (0.04) | (0.02) |
| Education of respondent | -0.01 | -0.009 | -0.02 | -0.001 | -0.009 | -0.096 | 0.004 |
| | (0.01) | (0.01) | (0.02) | (0.01) | (0.04) | (0.09) | (0.05) |
| Female respondent | 0.238 | | 0.134 | 0.685 | 0.32 | -1.797 | 1.06 |
| | (0.21) | | (0.25) | (0.34) | (0.85) | (1.13) | (0.84) |
| Married respondent | -0.366** | -0.309* | -0.569*** | -0.051 | 0.043 | -0.773 | 0.259 |
| | (0.12) | (0.14) | (0.06) | (0.33) | (0.67) | (1.35) | (0.80) |
| Female*Married | 0.038 | | 0.076 | -0.155 | -0.676 | 0.839 | -1.034 |
| | (0.16) | | (0.33) | (0.28) | (0.71) | (1.54) | (0.68) |
| Number children under 14 | 0.052 | 0.07 | 0.088 | 0.013 | 0.436** | 0.5 | 0.475** |
| | (0.12) | (0.13) | (0.25) | (0.14) | (0.15) | (0.62) | (0.17) |
| Household size | 0.008 | 0.011 | 0.005 | 0.006 | 0.586*** | 0.177 | 0.620*** |
| | (0.04) | (0.03) | (0.12) | (0.03) | (0.12) | (0.33) | (0.14) |
| Has savings (Y/N) | -0.18 | -0.166* | -0.063 | -0.286* | -0.38 | -0.302 | -0.421 |
| | (0.10) | (0.09) | (0.16) | (0.12) | (0.23) | (0.54) | (0.25) |
| Observations | 1,772 | 1,399 | 858 | 914 | 1,052 | 138 | 914 |
| R-squared | 0.035 | 0.036 | 0.041 | 0.032 | 0.085 | 0.143 | 0.088 |
| Community FE | YES | YES | YES | YES | YES | YES | YES |

Notes: Table reports correlates of the number of days spent with fever by the respondent (columns 1 to 4) and by all household members (columns 5 to 7). Column 1 reports correlates for the full sample. Column 2 reports correlates for women. Columns 3 and 6 report correlates for peri-urban households, and columns 4 and 7 for urban households. Standard errors clustered at the community level. Significance levels *** p<0.01, ** p<0.05, * p<0.1 Significance:*** p<0.01, ** p<0.05, * p<0.1

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