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# Sexual Exploitation of Trafficked Children: Evidence from Bangladesh<sup>\*</sup>

Masahiro Shoji<sup>†</sup> and Kenmei Tsubota<sup>‡</sup>

## Abstract

Although human trafficking is a serious humanitarian problem of global scale, there is very little knowledge about the issue. Using a nationally representative survey of child sex workers in Bangladesh, this study examines the extent to which trafficking victims are forced to expend more effort than non-trafficked sex workers. To control for endogeneity of trafficking victimization, we use frequency of natural disasters occurred in their hometown as an instrumental variable. We find that the victims face higher exposure to violence and drug use, and lower freedom to quit the job. They also trade sex with more clients at a lower wage. However, victimization is not associated with condom use or prevalence of sexually transmitted diseases. These results suggest that while owners commit violence to extract the victims' efforts, some of them also maintain the victims' productivity.

**Keywords:** human trafficking; commercial sex worker; worst form of child labor; forced labor; Bangladesh

**JEL Classification:** J47; J31; J22; O15; I15; K42

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## 1. Introduction

Human trafficking—recruitment and transportation of individuals most often by force, coercion, or deception, for the purpose of exploitation—is a serious humanitarian problem of global scale.<sup>1</sup> The ILO estimates the number of trafficked forced laborers to be up to 2.5 million, and they account for 20 percent of forced laborers in the world (Belser et al. 2005). Further, 54 percent of victims are exploited in the sex industry (UNODC 2016). Given the significance of the issue, eradication of human trafficking is included in the policy targets of the Sustainable Development Goals.<sup>2</sup> Nonetheless, there is little knowledge about working conditions of trafficking victims.

To the best of our knowledge, this study is the first to examine the extent to which trafficking victims are forced to expend more effort than non-trafficked workers in the same occupation. This study specifically investigates child sex workers in Bangladesh. Although existing studies document working conditions of trafficking victims (Di Tommaso et al. 2009; Oram et al. 2012; Tsutsumi et al. 2008), they do not argue their causes. The poor working conditions of the victims could occur through two stages: forced occupational choice (that is, forced to engage in sex work) and forced effort extraction (that is, forced to trade sex with more clients at a lower wage than comparable non-trafficked sex workers). It is important for policymakers to uncover the severity of exploitation in each stage. In particular, a study exploring the latter is required, given that a growing number of studies have examined the

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<sup>1</sup> The definition of human trafficking follows the United Nations (2000). In this definition, “exploitation” includes *forced labor or services, slavery, or practices similar to slavery as well as other things like the removal of organs*. Forced labor is defined in the 1930 ILO Convention as *all work or service which is extracted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily*. Therefore, trafficked sex workers are by definition forced laborers and sexually exploited.

<sup>2</sup> See Targets 5.2, 8.7, and 16.2.

working conditions of sex workers (Cunningham and Shah 2016; Edlund and Korn 2002; Gertler et al. 2005; Li et al. 2018; Manian 2017; Rao et al. 2003). In this study, using non-trafficked sex workers as the control group rules out the effect of occupational choice, and identifies the forced effort extraction.<sup>3</sup>

It is theoretically ambiguous whether the victims are subject to more oppressive conditions than other sex workers. On the one hand, principal-agent models predict that extremely low outside options (impossibility of escape) for the victims leads to higher risk of violence by their owners, longer work-time, and lower wages (Acemoglu and Wolitzky 2011; Chwe 1990). On the other hand, owners can mitigate coercion by clients against the workers (Lee and Persson 2016) and eliminate the asymmetric information between clients and workers (Farmer and Horowitz 2013). The owners also have incentive to care about the health conditions of workers in order to maintain their productivity (Chwe 1990, 1113). In fact, forced laborers often receive income close to that of voluntary laborers (ILO 2009).

Bangladesh has suitable features to examine the relationship between trafficking victimization and working conditions of sex workers. First, human trafficking and the sex industry are policy-relevant; Bangladesh is a rare Muslim country in which prostitution is partly legalized, and there is a high risk of human trafficking.<sup>4</sup> However, the available information concerning the trafficking in this country is limited (UNODC 2016). Second, although sex trafficking happens all over the world, those working in countries such as Mideast and developed countries tend to be trafficked from other regions such as South Asia and Eastern Europe. Analyzing such victims of cross-border trafficking makes it difficult to isolate the

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<sup>3</sup> An alternative control group could be the children who successfully find a decent job or the children who stay in their village, but this does not allow us to isolate the forced occupational choice and forced effort extraction.

<sup>4</sup> Bangladesh was downgraded from the Tier 2 to the Tier 2 Watch List in *Trafficking in Persons Report 2017* (US State Department 2017).

trafficking-victim effect and foreigner effect. By contrast, this problem is less likely to occur in our setting, where both trafficked and non-trafficked workers share the same nationality. Finally, related to the second feature, our setting allows us to uncover the victimization patterns of internal trafficking. This is important because a majority of existing studies argue inflow/outflow of cross-border trafficking,<sup>5</sup> even though more than 40 percent of victims in the world are trafficked domestically (UNODC 2016).<sup>6</sup>

There are, however, two technical challenges in the empirical analysis. First, since the sex industry is informal and illegal, it is difficult to collect reliable survey data. Hence, we use the *Commercial Sexual Exploitation of Children (CSEC) Pilot Survey*, a nationally representative survey for sex workers aged 17 and under. A key feature of the dataset is that the survey team includes local sex workers and NGOs who are familiar with the local background, mitigating this problem.

The second challenge is endogeneity of trafficking victimization. This study employs the frequency of natural disasters occurring in the hometown of sex workers as an instrumental variable. It has been reported in many countries that disasters are associated with a high risk of human trafficking (ECPAT International 2011; Kara 2010; Poncelet et al. 2010; Singh 2012; UNODC 2008); disaster-affected individuals seek better job opportunities outside their hometowns, and therefore it is easier for trafficking brokers to lure them into trafficking by promising well-paid job opportunities. While disasters may directly affect the working conditions by influencing the regional economy of the working area, controlling for working-district fixed effects rules out this possibility. Given that our instrument may not strictly satisfy the exclusion restriction, we conduct the sensitivity analyses proposed by Conley et al. (2012) and Nevo and Rosen (2012).

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<sup>5</sup> See Cho et al. (2013), Danailova-Trainor and Belser (2006), Jacobsson and Kotsadam (2013), and Mahmoud and Trebesch (2010).

<sup>6</sup> The proportion of internal trafficking increases up to 88 percent in South Asia.

The results show that an increase in the frequency of natural disasters in the home district is associated with a 9.8 percentage point increase in the probability for sex workers to enter the industry through human trafficking. The victims are more likely to experience violence by senior workers and pimps, take drugs, and face difficulty in quitting the job voluntarily. Further, we find evidence on forced effort extraction: the victims trade sex with 177 percent more clients and earn 64 percent less money per client than non-trafficked workers.<sup>7</sup> However, we do not find a systematic difference in the use of condoms, prevalence of sexually transmitted diseases (STDs), or other health problems, suggesting that some of the owners may care about the health conditions of victims to maintain their productivity.

This study also contributes to the literature of commercial sex workers. Sex workers earn higher wages than other female workers, while they are exposed to serious harms, such as HIV/AIDs and violence (Cunningham and Shah 2016; Rekart 2006). Existing studies have shown that the higher wages can be explained by the compensation for the loss of future utility, such as marriage and health.<sup>8</sup> By contrast, while the trafficked workers' future lives are completely ruined, they earn lower wages. This contrast suggests that ignoring the trafficked workers leads to misunderstandings of the market structure.

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<sup>7</sup> This cannot be explained by unobserved heterogeneity in worker characteristics, such as attractiveness. More important, this bias would work against our central findings. We also conduct various robustness checks and show evidence counter to alternative interpretations.

<sup>8</sup> Edlund and Korn (2002) and Edlund et al. (2009) interpret the high wage of sex workers as a compensation for exit from marriage market, while Della Giusta et al. (2009a, 2009b) focus on the role of stigma. The other studies investigate the wage difference across sex workers and find that risk premium plays a central role; trading condom-free sex has a positive effect on wages (Adriaenssens and Hendrickx 2012; Gertler et al. 2005; Rao et al. 2003; Robinson and Yeh 2011; Shah 2013). In particular, the wage premium of condom-free sex is higher in areas with a higher risk of STDs and increases with the worker's attractiveness and knowledge about HIV risk, while it decreases with the worker's drug use, alcohol consumption, and poor financial situation (Arunachalam and Shah 2013; de la Torre et al. 2010; Gertler et al. 2005).

Another contribution to the literature is the focus on child sex workers. Child prostitution is among the worst forms of child labor, and the importance of its eradication has long been claimed (Edmonds 2007). Yet, rigorous empirical study on this issue does not exist. To the best of our knowledge, this study is the first to examine the working conditions of child sex workers.

The rest of this study is organized as follows: Section 2 describes human trafficking and the sex industry in Bangladesh. Section 3 documents our dataset. Section 4 develops our identification strategy and Section 5 presents the estimation results. Section 6 tests the robustness of the findings and Section 7 examines alternative interpretations. Finally, Section 8 concludes.

## **2. Background**

### **2.1 Human Trafficking in Bangladesh**

Human trafficking is a serious issue in Bangladesh, as in the other developing countries; it is estimated that 10,000 to 20,000 women and children are trafficked each year (ADB 2005). Human trafficking is carried out by well-organized crime syndicates that have various links with law enforcement agencies, local elite, transportation agencies, hotel management, and brothel owners (ILO 2002). The actors of human trafficking can be classified into four roles: organizer, recruiter, transporter, and final abuser. The primary actor of the initial step is the organizer. The roles include arranging the whole processes of trafficking in order to maximize their profits and placing the initial order with the recruiters and transporters. The organizers could be brothel owners, local elite, or members of a trafficking syndicate.

The second actor is the recruiter. They lure the children, such as street children and attractive young girls, into trafficking by providing false promises of better jobs, or marriage



proposals (Gazi et al. 2001; Bangladesh Institute of Peace and Security Studies 2011).<sup>9</sup> The recruiters, mainly professional brokers, commit trafficking in regions with a high probability of success.<sup>10</sup> In particular, poor regions affected by natural disasters are exposed to higher risk, since more people seek jobs and marriage opportunities (ECPAT International 2011; Poncelet et al. 2010). The trafficking risk may also be high in regions with developed transportation infrastructure and regions adjacent to national borders, because it is easier for the recruiters to transport the victims to their final destination. Isolated or impoverished regions are also more attractive to them because it is both harder for parents to seek law enforcement while also easier to sell the idea of “lucrative jobs” to impoverished parents.

The third agent, the transporter, is responsible for arranging safe passage of the victims to the destination region. Such agents include transport workers, illegal immigration actors, cross border traders, hotel management, and corrupt police and border security force (Paul and Hasnath 2000).<sup>11</sup> In order to control the victims during the transportation, they commit various modes of abuse, such as injecting sedatives, physical/sexual/verbal abuse, house arrest, starvation, forced use of drugs and alcohol, and threats (ILO 2002, 30; Kara 2010).

After arriving at the destination region in or outside Bangladesh, the victims are sold to the last actor of trafficking chain, the final abuser, at an underground auction or through bilateral

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<sup>9</sup> Therefore, the victims’ parents do not only lose their child but also sometimes lose their assets, since they pay the brokers a job-placement fee or dowry (Joarder and Miller 2014).

<sup>10</sup> In addition to the professional brokers, victim’s friends, relatives, and even her family could be recruiters. They sell the victim to local gangs who can contact the trafficking syndicate. This case is likely to occur when the family/relative suffers from poverty, or when victim cannot get along with her (step)parents. The other mode of recruitment includes kidnapping and recruitment by former trafficking victims.

<sup>11</sup> The recruiter and the transporter may be the same if the victim is recruited by a professional broker. ILO (2002, 28) shows that, based on interviews with 100 trafficking victims in Bangladesh, around 60 percent of victims were directly transported by the recruiter, while some victims were handed over five times before reaching their final destination.

bargaining.<sup>12</sup> A majority of trafficking victims are sold to brothel/hotel owners, senior sex workers, or pimps, and they are forced to engage in prostitution. The destinations and the prices of victims vary with their age, beauty, skin color, and virginity. In case of victims sold in Bangladesh, the price ranges from 15,000 to 30,000 Bangladesh Taka (BDT) (Terre des hommes Italia 2005). The owner first makes local gangs rape the victim or puts a symbol of sex workers on her arms, so that she gives up returning home and accepts engaging in sex work (ILO 2002). If the victim is a virgin, clients rape her instead because virginity has additional value.

## **2.2 Child Sex Workers in Bangladesh**

Sex workers suffer from extremely low social status and severe discrimination. For example, although their retirement age is as early as around 30, they cannot marry or return to their hometown after their retirement. Since they have the symbol of sex workers on their arms and other parts of their body, it is difficult to suppress their occupation. Hence, it is also difficult to find a different job other than housekeeping, which is another type of worst form of child labor. If they die, their bodies are thrown into the nearby river or buried without proper ceremonies (Mondal and Islam 2006). Therefore, children only enter the sex industry for compelling reasons. The major reasons include poverty, escape from abusive family members, and victimization to human trafficking (Islam and Smyth 2016).

The economic status of sex workers depends on their own and the client characteristics, since the price and sexual practices offered are determined via bargaining between them. It is generally higher for female, young, and attractive workers who provide condom-free sex (Islam and Smyth 2012). It also depends on client's characteristics such as their occupation. Rickshaw pullers are charged the lowest price, while businessmen and service employees among the highest (Bloem et al. 1999). Further, the price increases during the daytime, given the scarcity of

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<sup>12</sup> The organizer and the final abuser could be the same.

supply. Consequently, the price varies across transactions and across workers, ranging from BDT 50 to 500 (Karim et al. 2008).

This pricing mechanism increases the risk of violence against sex workers by clients who do not agree with the offered price (Willman 2008). This is exacerbated by the fact that a majority of sex workers trade sex in unsecured places, such as on the street or the client's or worker's residence, in order to avoid the risk of detection by police.<sup>13</sup> Further, local gangs and corrupt police occasionally commit violence against the workers and take away their money (Terre des hommes Italia 2005).

Sex workers are also exposed to high risk of STDs, despite their efforts to convince clients to use condoms.<sup>14</sup> Specifically, they first take the money upfront from the client, and then start working. This is important because if a client refuses to use a condom, they can throw him out of the room without returning the money. They also convince the client by showing him graphic depictions of STDs from books that were given to the workers by NGOs (Karim et al. 2008). A likely explanation for the high STD prevalence despite these efforts is the decreases in the unit price with the age of the worker. Given the lower price, the older workers have to take more clients and allow condom-free sex to compensate for the loss (Karim et al. 2008).

While the working conditions vary across the workers, this study particularly classifies them into trafficked and non-trafficked workers. A significant distinction between the two is their outside options. The trafficked workers are always watched by their owners, such as senior sex workers and pimps. If they attempt to escape or refuse to work, the owner commits violence and forces them to take drugs and alcohol. Eventually, they realize the impossibility of escaping

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<sup>13</sup> Bangladesh has 14 registered brothels, where only adult prostitution is legalized. Thus, child workers in the brothels take steroids to make them look mature (ECPAT International 2011).

<sup>14</sup> In laboratory examinations of street-based sex workers in Bangladesh, TPHA tests (test for syphilis) were positive for 52 percent of workers and VDRL (test for active syphilis) positive for 29 percent; 53 percent were PCR positive for gonorrhoeae and 49 percent for chlamydia. None of the tested women were found to be HIV-positive (CARE 1998).

(decreased outside options) and accept their job (ILO 2002, 31; Terre des hommes Italia 2005). By contrast, non-trafficked workers are mainly self-employed, and have relatively more freedom over their job.<sup>15</sup>

The decreased outside options of trafficked workers could cause them to work in even poorer conditions (Acemoglu and Wolitzky 2011; Chwe 1990). On the one hand, the non-trafficked workers can choose the number of clients to take per day and whether to use condoms.<sup>16</sup> They can also earn all the payments from the client for their wage. On the other hand, trafficked workers' owners bargain with the clients. Therefore, the workers have no choice over clients, sexual practices, or condom use (ILO 2002). The owners take away a part of the payment from the clients, and the workers receive the remaining for their wage. Furthermore, some owners/pimps do not allow the workers to use condoms, so that they can charge more money, increasing the risk of STD infection (Karim et al. 2008).

### **3. Dataset**

#### **3.1 CSEC Survey**

This study employs two types of data: survey data collected from child sex workers and administrative datasets at the district level. First, we use *Commercial Sexual Exploitation of Children (CSEC) Pilot Survey*, a nationally representative survey for child sex workers. This survey was conducted in 2008 by Bangladesh Bureau of Statistics with technical assistance from ILO. The survey covers rural and urban areas in 54 out of 64 Bangladeshi districts, and all types

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<sup>15</sup> However, it should also be mentioned that some non-trafficked workers suffer from exploitation by others. For example, some workers are coerced to engage in sex work by their parents. The others initially start sex work voluntarily but end up working with pimps and brothel owners who take away the earnings of workers.

<sup>16</sup> In fact, sex workers in general can physically tolerate 4 to 5 clients per day (Karim et al. 2008). Therefore, it is common for the non-trafficked workers to take 2 or 3 clients per day and not to work every day.

of sex workers were interviewed, such as those based in brothels, hotels, their own residences, and the street, and those who work as call girls. Distinctive features of this dataset include that it exclusively sampled child sex workers aged 17 or under, and it covers detailed information about human trafficking. A drawback of this dataset is, however, the lack of information at the sexual-act level, making it impossible to control for the worker fixed effects.

In general, a challenge in conducting a survey on sex workers arises from the difficulty in the sampling methodology. Given the informality and illegality of the industry, it may be difficult to list all child sex workers in the study area. Further, low response rate could be another concern. In order to mitigate these issues, the CSEC survey team concealed their official identity during the interview, and the team members included local NGOs and sex workers who are familiar with the study area and local sex workers. The details about the sampling methodology are documented in Online Appendix A1.

Using this sampling framework, 1418 responses were obtained including 133 brothel-based girls, 198 hotel-based girls, 264 residence-based girls, 499 street-based girls, 141 boys, and 183 eunuchs.<sup>17</sup> Finally, sampling weight of each respondent was computed based on the obtained sample and the estimated number of total sex workers in the country. Figures A1 and A2 in the online appendix depict the age and schooling years of respondents, respectively. It appears that the youngest respondent is eight years old, and around a half of sex workers have zero years of schooling.

It should be emphasized that the trafficking victims in particularly exploitive conditions—such as those who are addicted to drugs, frequently tortured by their owners, or who do not receive wages—may be hidden by their owners and excluded from the sample list. However, this sample-selection problem should attenuate the estimated impact of trafficking

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<sup>17</sup> Although the detailed information on the response rate is unavailable, Bangladesh Bureau of Statistics (2009) reports that almost all the sampled workers participated in the survey.

victimization on working conditions. Therefore, this should not affect the interpretation of results qualitatively.

In addition to the CSEC survey, we use administrative data at the district level, such as the 2001 population census and the 2011 district statistics (Bangladesh Bureau of Statistics 2007, 2013). We also employ information on the natural disasters that occurred before the survey. Since the CSEC survey includes the data on the home district of respondents, we combine these datasets to explore the role of home district characteristics—such as the socio-economic status and frequency of disasters—in the propensity to entering the sex industry through human trafficking.

### **3.2 Variables and Summary Statistics**

Our main independent variable is the indicator of human trafficking victims. In the CSEC survey the respondents were asked whether they were victims of human trafficking, and 101 respondents reported their victimization.<sup>18</sup> This accounts for 12.5 percent of the sex workers after adjusting the sampling weight.<sup>19</sup> We use this self-reported variable for the indicator of a trafficking victim. An obvious issue is that this variable may contain reporting errors. Some respondents may not report their victimization accurately due to the fear of violence by their owners, and due to the poor understanding of the meaning of human trafficking. We employ an instrumental variable to address this concern. We also conduct a robustness check by examining an alternative definition in Section 6.

To the self-reported victims, additional questions were asked, such as the perpetrator and approach. Tables 1 and 2 summarize the results. Table 1 reports that brokers were involved

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<sup>18</sup> Specifically, the following question was asked: *Are you a victim of trafficking?* The answer options include *yes* and *no*.

<sup>19</sup> Figure A3 depicts the geographic distribution of trafficked and non-trafficked workers by home district.

with 58.3 percent of trafficking. This proportion may, however, actually be even higher, because 21.1 percent of victims reported that they were trafficked by strangers, and these may include brokers. It also appears that 26.8 percent of victims were trafficked by a lover or friends. Table 2 presents that the major lure of trafficking is the assurance of a job (49.4 percent), followed by the promise to marry (19.6 percent), consistent with the argument in Section 2.

[Table 1]

[Table 2]

Panels A and B of Table 3 present the individual and home district characteristics between trafficked and non-trafficked workers, respectively. It appears that trafficked workers are more likely to be females from a rural area, and they were students before engaging in sex work. The proportion of hotel-based sex workers is higher among them. This is presumably attributed to the ease of confining the victim for the owner; street-based workers might be able to escape more easily than hotel-based workers. Finally, Panel B shows that the home district characteristics do not significantly differ based on whether the worker is trafficked or not, except for the relatively higher proportion of poor-quality housing material.

[Table 3]

Figure 1 depicts the cumulative distribution function of the main outcome variables: the number of clients per week, wage per client, and daily wage.<sup>20</sup> It appears that trafficked workers trade sex with more clients. Regarding the wage per client, the median wage is around BDT 100 and this is comparable with the amount reported in the other studies on Bangladeshi sex workers (Islam and Smyth 2012; Karim et al. 2008; Terre des hommes Italia 2005, 70). However, we also

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<sup>20</sup> We compute the number of clients per week by multiplying the average working days per week and the average number of clients per day. In contrast, it is a challenge to obtain reliable data on the wage of child laborers. While the wage level varies across clients, the data on the wage from each transaction is unavailable. Therefore, we compute this variable by dividing the average daily wage in cash by the average number of clients per day.

find a large variation across individuals; the lower 20 percent of workers earn approximately BDT 50 or less, and the top 20 percent earn more than BDT 150.<sup>21</sup> Intriguingly, the wage of trafficked workers is higher than non-trafficked workers. This counterintuitive pattern could be attributed to differences in the working place and unobserved heterogeneity of attractiveness. Finally, the daily wage exhibits a consistent pattern with the other two figures.

[Figure 1]

Panel C of Table 3 summarizes the other outcome variables, such as exposure to violence and health issues. It appears that the victims are 21 percentage points more likely to take drugs, and 16 percentage points more likely to experience violence by senior workers and pimps. They are also more likely to suffer from violence by gangs and clients, and experience arrest. Further, 91 percent of trafficked workers experienced some health problem such as fever and headache within six months.

Intriguingly, in contrast to the harsh working conditions, around a half of trafficked workers use condoms consistently, and this proportion is higher than that of non-trafficked workers. They also have knowledges about HIV and the other types of STDs. Consistently, although the prevalence of STDs within six months is as high as 49 percent, this is not significantly higher than the non-trafficked workers.

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<sup>21</sup> In order to compare the wage from sex work with the other occupations, Table A1 in the online appendix reports the daily wage from sex work and the daily wage from agricultural and non-agricultural work in their home districts. The mean wage for child labor in the home districts is 130 Taka for non-agricultural work and 140 Taka for agricultural work. This implies that if the sex workers had not entered the sex industry and worked in their home district, they could have earned only 40 percent less.



## 4. Identification Strategy

### 4.1 Estimation Model

A key issue in estimating the impact of trafficking victimization on the working conditions is sample selection driven by unobserved worker characteristics, such as attractiveness, health status, and outside options. This is likely if the brokers target children with high profitability. Another source of bias is that our measure of trafficking victim relies on self-reported information.

We, therefore, mitigate these issues by estimating the following weighted 2SLS model;

$$Traf_{hdi} = \alpha_0 + \alpha_1 IV_h + \alpha_2 X_{hdi} + \alpha_3 H_h + \mu_d + \varepsilon_{hdi} \quad (1)$$

$$Y_{hdi} = \beta_0 + \beta_1 Traf_{hdi} + \beta_2 X_{hdi} + \beta_3 H_h + \mu_d + \varepsilon_{hdi} \quad (2)$$

where  $Traf_{hdi}$  takes unity if sex worker  $i$  from district  $h$  who engages in sex work in district  $d$  is a victim of human trafficking, and zero, otherwise;  $Y$  denotes the working conditions, such as experiencing violence, drug use, and the logarithm of the number of clients per week and wage per client;  $IV$  denotes instrumental variable;  $X$  denotes the set of individual characteristics, such as demographics, education, previous occupation, and the type of sex work (e.g., hotel-based and brothel-based);  $H$  denotes the characteristics of the home district that could be correlated with the probability of success in trafficking, and the victims' productivity from sex work, such as the socio-economic status and access to transportation and sanitation infrastructure;  $\mu$  denotes the working-district fixed effects; and finally  $\varepsilon$  is the residual. We conduct the weighted least squares to adjust the heterogeneity of sampling weight driven in the process of survey (see Online Appendix A1 for details). We employ the standard error clustered at the working-district level.

## 4.2 Instrumental Variable

For the instrument, we employ the frequency of natural disasters that occurred in the respondent's home district before the survey, specifically between 2004 and 2007. Disasters increase the risk of human trafficking, as mentioned in Section 2; since job opportunities are scarce in the affected districts, children attempt to find jobs in urban areas. Therefore, it is easier for brokers who promise well-paid job opportunities to lure children into trafficking, even though children are aware of the trafficking risk. Knowing this, the brokers intensively commit trafficking in disaster-affected and impoverished districts (ECPAT International 2011; Kara 2010; Poncelet et al. 2010; Singh 2012; UNODC 2008). We employ this feature; between 2004 and 2007, Bangladesh was attacked by three nationwide disasters—the 2004 flood, 2007 flood, and 2007 cyclone—and 1016 of 1418 survey respondents entered the sex industry.<sup>22</sup>

However, disasters also cause impoverished children to voluntarily enter the sex industry. Therefore, the net impact of natural disasters on the propensity for sex workers to enter through human trafficking may be ambiguous. Nonetheless, we expect a positive net effect for two reasons. First, Bangladesh Bureau of Statistics (2011, 152) demonstrates that while the poor adopt various risk coping strategies in the face of negative shocks, it is rare to send their children to work in another place. Making the decision to engage in sex work might be triggered by the other factors like permanent poverty. Therefore, after controlling for the socio-economic status such as housing materials, the frequency of disasters should have a positive effect on the proportion of trafficking victims. Second, since the trafficking recruiters are members of crime syndicates who maximize their profit, they should move across districts to find potential victims with higher probability of success. Therefore, the incentive for them to look intensively for children in disaster-affected districts should be large.

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<sup>22</sup> It may be insightful to exploit the variations in rainfall for robustness, but unfortunately the data on rainfall are not available for all the districts.

Table A2 in the online appendix provides results supporting this argument. Columns (1) to (3) show that the frequency of disasters in the home district is positively correlated with the number and the proportion of trafficked sex workers from the district, while the other district characteristics are not.<sup>23</sup> The number of non-trafficked workers is correlated only with the population.

Finally, it should be mentioned that our specification controlling for the working-district fixed effects identifies the within-working-district correlation between the working conditions and disaster frequency.<sup>24</sup> We assume that the correlation is attributed to the incidence of human trafficking. Controlling for the fixed effects is important for two reasons. First, natural disasters in a hometown may affect the working conditions of sex workers directly through the influence on the economy in the working district, if these are located close to each other. Second, the disaster frequency in a hometown may be correlated with the frequency in the working district, which, in turn, affects the working conditions of sex workers. These violate the exclusion restriction. The fixed effects capture the heterogeneity in the regional economy of the working district, addressing these issues.

### **4.3 Threats to Identification**

#### **4.3.1 Unobserved Heterogeneity**

Our identification strategy is subject to the following issues. First, unobserved worker characteristics, such as attractiveness, health status, and outside options, may differ between the sex workers from disaster-affected and non-affected districts. This is likely if disasters are more likely to occur mainly in particular districts, such as the districts with poor and unhealthy populations. Another possibility is selective entry into the sex industry; even if there is no

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<sup>23</sup> The number of sex workers is computed by the summation of sample weight for each home district.

<sup>24</sup> In our dataset, the average district includes sex workers from 5.5 different home districts.

correlation between the disaster frequency and the district characteristics, experiencing disasters can cause those who do not normally enter the sex industry, such as attractive and educated girls, to engage in sex work. This also causes a sample selection problem.

We take two approaches to assess these possibilities. First, we conduct a falsification test using the respondents who started sex work between 2004 and 2006. Given that the nationwide disasters occurred in 2004 and 2007, the trafficking indicator and working conditions of these workers could be affected by the 2004 disaster but should not be affected by the 2007 disasters, since they had already started sex work by the time. We test this by regressing the working conditions on the frequency of disasters that occurred in 2007 and between 2004 and 2006 as follows:

$$Y_{hdi} = \gamma_0 + \gamma_1 Dis2007_h + \gamma_2 Dis2004\_2006_h + \gamma_3 X_{hdi} + \gamma_4 H_h + \mu_d + \varepsilon_{hdi}, \quad (3)$$

where  $Dis2007$  and  $Dis2004\_2006$  denote the frequency of natural disasters occurred in 2007 and between 2004 and 2006, respectively. Thus, our instrument is the summation of these variables. Significant coefficients of the 2007 disasters imply the violation of exclusion restriction, but Table 4 demonstrates that none of the outcomes are significantly correlated at the 10 percent level.

[Table 4]

Second, we regress the unemployment rate and female literacy rate of the home district in the pre-disaster period (in 2001) on the instrument and the other district characteristics. The results in Columns (4) and (5) of Table A2 show that the coefficients of the disaster frequency are statistically insignificant for both models. We also test the possibility of selective entry in Columns (6) to (8) by regressing the number of educated and uneducated sex workers from the district as well as the proportion of the educated sex workers. Likewise, Columns (9) to (11) present the results relative to the age to start sex work. The coefficients of disaster frequency are

insignificant for all the columns, suggesting that disaster shocks do not affect the distribution of age or education level among sex workers.

#### **4.3.2 The Persistent Effect of Disasters and Selective Exit from Sex Industry**

The second issue is that disasters may negatively affect the attractiveness and health status of children in the district, which in turn lower the wage of sex workers. Likewise, if disasters persistently aggravate the job opportunities of home district, the sex workers from severely affected districts may have no option to return to their hometown. This increases the willingness to stay in the sex industry, and therefore the effort level. To test these possibilities, we regress the unemployment rate and the proportion of disabled individuals of the district at the post-disaster period (in 2011) on the home district characteristics.<sup>25</sup> The results are reported in Table A2 (Columns (12) and (13)). The estimated coefficients of disasters are statistically insignificant.

In addition, experiencing a disaster might also affect the children's preference such as social trust (Cassar, et al., 2017), risk (Cameron and Shah 2015), and time preference (Hanaoka, et al., 2018). In the context of Bangladesh, Ahsan (2014) shows that disasters make people more risk averse, while trusting behavior does not change. This concern could be crucial if the disaster-affected and risk averse workers hesitate to trade condom-free sex and earn lower wages. However, as shown in Section 6 we do not find a systematic difference in the condom use between the workers from disaster-affected and non-affected districts.

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<sup>25</sup> Although ideally the dependent variables should be the data in 2008 when the survey was conducted, the official statistics from that year are not available.

## **5. Results**

### **5.1 First Stage Result**

Table 5 presents the determinants of trafficking victimization for the full sample and subsample (age $\leq$ 15) estimations. The sampling weight is adjusted throughout the empirical analyses. Our main finding from the table is that the disasters in the home district are positively related to trafficking victimization. Column (1) demonstrates that an increase in the frequency of disasters increases the probability for sex workers to enter the industry through human trafficking by 9.8 percentage points. The association increases up to 21.5 percentage points for the young subsample (Column (3)). The Probit results in Columns (2) and (4) also show positive and significant coefficients, but the magnitude is unstable due to the small sample size particularly in Column (4).

Regarding the other characteristics, the trafficked workers are more likely to be from the rural areas of less populated districts, and they used to reside in a poor housing. These are consistent with the fact that the recruiters lure vulnerable children into trafficking by offering well-paid jobs. It also appears from the Probit results that they used to be in school before starting sex work. However, the remaining home-district characteristics as well as the age and schooling years of the respondents are uncorrelated with victimization.

[Table 5]

### **5.2 Main Results**

Table 6 shows the association between trafficking victimization and working conditions. Given that younger workers are more profitable for the owner but more likely to refuse to work (see Section 2), they may face different working conditions than elder workers. Therefore, we also present the results from the workers aged 15 or younger.

First, to ensure that the trafficking victims we study are involuntarily engaging in sex work under the menace of punishment, we examine the effect on the freedom to quit the job voluntarily, drug use, and violence committed by senior sex workers and pimps, who are generally the owners of trafficking victims. It is shown that the victims are over 80 percent more likely to report that they cannot leave the job voluntarily (Columns (1) and (2)). Furthermore, the results from young workers suggest that the victims are more likely to take drugs and experience violence by senior workers and pimps than non-trafficked young workers (Columns (4) and (6)). These results are consistent with the argument in Section 2; the trafficking victims initially refuse to work and therefore are exposed to more violence and drugs. However, they eventually realize the impossibility of escaping and accept the job with the age. Thus, even elder workers still believe that they cannot quit. Finally, girls are more likely to experience violence than boys and eunuchs.

Second, we examine the victimization effects on the number of clients and wage. The full sample results in Columns (7), (9), and (11) are in line with the forced effort extraction by owners. Column (7) shows that the number of clients per week is 177 percent larger;<sup>26</sup> the trafficked workers with the sample-mean characteristics trade sex with 35.7 clients per week, while the non-trafficked workers take only 12.9 clients. The workload for trafficked workers is higher than workers in general can physically tolerate.<sup>27</sup> Further, Column (9) suggests that the trafficked workers earn a lower wage per client by 64.2 percent. In line with these results we do not find a systematic difference in the daily wage, despite the difference in the workload (Column (11)).

Intriguingly, contrary to the significant victimization effects on the experience of violence and drug use among young workers, the impact of victimization on the number of

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<sup>26</sup> The average treatment effect is computed by:  $\exp(1.046)-1=1.85$ .

<sup>27</sup> According to Karim et al.'s (2008, p.19) field interviews with sex workers in Bangladesh, even adult workers can physically tolerate at most 4 to 5 clients per day and they do not work every day.

clients among young workers is smaller than that of whole workers, and it is statistically insignificant. Similarly, the wage per client still demonstrates a statistically significant coefficient in Column (10), but the estimated wage gap is reduced to -49.8 percent. If the owners commit violence and force drug use as a tool to force the trafficked workers to trade sex with more clients at a lower wage, we should expect an even larger impact among the young workers. However, this is not necessarily counter to the prediction of forced effort extraction. These results can be explained by the owner's incentive to maintain the victim's human capital; if the owners treat their victims arbitrarily badly, they cannot work hard or cannot be resold (Chwe 1990, 1113). Further, the brothels/hotels employing unhealthy workers may get a bad reputation of high STD risks, losing risk-averse clients. Thus, the owners have incentives to care about the health condition of the workers. We elaborate on this possibility in Section 5.3.

Regarding the other worker characteristics, the number of clients and daily wages increase with the age of workers. This is consistent with the argument that elder workers can tolerate trading sex with more clients (Karim et al. 2008). Counterintuitively, the wage per client in our data does not change presumably because our sample includes only child sex workers. The educated and female workers earn higher wages per client and a higher daily wage. We also find significant differences across work places: the brothel-based workers trade sex with more clients than the other types of workers. Further, the hotel-based workers earn higher wages per client, possibly reflecting the difference in the socio-economic status of clients.

[Table 6]

### **5.3 Health Consequences of Victimization**

The previous section suggests that the owners control the extent of forced effort extraction in order to maintain the productivity (health condition) of victims. This section elaborates on this possibility by examining condom use, experience of STDs, and other health problems such as fevers, headaches, and injuries. Table 7 presents that the coefficients of trafficking victim are



unstable across specifications and statistically insignificant for all the columns. This is consistent with the argument on human capital maintenance. It is rather found that health conditions are determined by the types of sex workers; the brothel-based workers are more likely to use condoms, but at the same time more likely to be infected by STDs. The high diffusion rate of condoms in the brothels could be a result of NGO activities to distribute condoms at a subsidized price at the brothels (Karim et al. 2008). Nonetheless, the STD prevalence is still high, given the larger number of clients, as shown in the previous section.

[Table 7]

## **6. Robustness**

First, our benchmark definition of trafficked workers relies on self-reported information. However, some respondents may not report their victimization accurately due to fear of violence by their owners or a poor understanding of human trafficking. Therefore, while our instrument mitigates this problem, this section additionally uses the survey question asking the reason for entering the sex industry to alternatively define victimization. The details about the definition are provided in Online Appendix A2. The estimation results are reported in Panel A of Table A4 and are qualitatively the same as the benchmark results.

Second, in Panel B we report the result from reduced form estimation that regresses the working conditions on the frequency of natural disasters. We find the result consistent with the benchmark result.

Third, 2SLS assumes a zero-correlation between the instrument and the error term in the second-stage equation. However, this may not hold strictly if the disaster frequency is correlated with the workers' unobserved characteristics, such as attractiveness, health conditions, and outside options. Therefore, for the third and fourth robustness checks, we employ the methods proposed by Conley et al. (2012) and Nevo and Rosen (2012), respectively. They provide

bounds on an endogenous variable of interest with one instrument which does not necessarily have zero correlation with the unobserved error term. The details about the methods are provided in Online Appendix A3. The results are reported in Panels C to F of the table. They show that the main findings do not change qualitatively even without the zero-correlation assumption.

Fourth, some sex workers may leave the job after working for a few years, either because they escape, are freed, or perish; Kara (2010, 265) estimates that the average duration of enslavement of a sex slave in South Asia is approximately 3.3 years. Therefore, our sample includes only those who cannot leave the job, causing a sample selection problem. This problem should be particularly critical for those who have been long working as a sex worker. Therefore, we use the subsample of workers who entered the sex industry in 2004 or later. Panel G of the table demonstrates that the results do not change qualitatively.

Fifth, the brothel-based workers may face different working conditions, since adult prostitution at the brothels is legal. Hence, we drop the samples of these workers in Panel H. Again, we find qualitatively the same results.

Sixth, since our respondents are young and uneducated, the data might be subject to reporting errors. Thus, we drop the respondents aged 10 or under. Panel I of the table presents that our findings are robust to the change in the sample.

Finally, we also report the OLS results in Panel J of the table.

## **7. Alternative Interpretations**

### **7.1 Alternative Interpretations for More Clients and Lower Wage**

This section tests four alternative interpretations for more clients and lower wages for trafficked workers: (1) poor quality of service, (2) secret use of condoms, (3) receipt of in-kind supports, and (4) coercion by clients. First, the literature shows that non-attractive sex workers and the workers trading protected sex earn lower wage (Arunachalam and Shah 2012). It suggests that

the trafficked workers may earn lower wages because they use condoms more frequently and look unhealthier than the non-trafficked workers. Then, they have to take more clients voluntarily to earn a subsistence level of income. Likewise, the trafficked workers may be so unmotivated for the work that the clients' willingness to pay for their service is low. However, these hypotheses do not fit the data; Section 5.3 presents insignificant differences in condom use and health conditions. Further, if poor motivation drives lower wages, we should find even larger negative effects on the wage of young victims. This is counter to our finding in Table 6.

Second, trafficked workers may use condoms in secret as frequently as non-trafficked workers, even though their owners may order them not to use them. Therefore, they receive payment from the clients as much as the non-trafficked workers and less than the amount the owner anticipates. This decreases the wage for trafficked workers, since the owner still takes away the amount corresponding to the condom-free sex. This potentially causes the lower wages and comparable frequency of condom use. However, it is not realistic to assume that the trafficked workers can purchase and use condoms in secret, given that they are always watched by the owners.

Third, the trafficked workers may alternatively receive in-kind supports from the owner, such as food, clothing, and accommodations. The owners might also protect their workers from violence and abuse by clients, local gangs, and police. We test these hypotheses by examining the receipt of in-kind supports—such as indicators of food support, clothing support, and accommodation support—as well as the coercion by the other agents (e.g., police detection, and violence by local gangs and clients). As shown in Columns (1)–(12) of Table A5, the data do not fit the hypothesis; only one specification (Column (5)) is statistically significant with the expected sign. It rather shows that young victims are less likely to receive food and clothing supports, and more likely to experience police detection.

Finally, for sex workers in Bangladesh, the most unwelcome clients are police and pimps. They threaten the workers, commit violence, and pay less or nothing. The trafficked

workers may encounter these clients more frequently, and therefore have to take more clients in order to earn a certain level of income. We test this hypothesis by regressing a dummy if the main clients include police or pimps. Columns (13) and (14) demonstrate that this is unlikely; the coefficient of trafficking victims is negative and statistically insignificant.

## 7.2 Alternative Interpretations for Health Conditions

If the victims do not have knowledge about STDs or access to medical services, they would not notice an infection. This could be the main cause of comparable health conditions. It should, however, be emphasized that this cannot fully explain the benchmark result; we do not find a systematic difference even in the experience of headache or fever which does not require knowledge or a medical test to assess their symptoms. Nonetheless, we additionally test this possibility by examining the workers' knowledge about HIV, awareness of STDs, and access to hospitals/clinics.<sup>28</sup> Negative coefficients are consistent with the hypothesis. The results are, however, counter to the expectation (Columns (15) to (22) of Table A5). We rather find that the victims are more aware of the HIV risk through unprotected sex than other sex workers.

## 8. Conclusions

We employed a survey data collected from child sex workers in Bangladesh and uncovered the economically and statistically significant gaps in the working conditions between trafficked and

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<sup>28</sup> Data on the knowledge about HIV/AIDS are elicited from the following questions. *How do you think HIV/AIDS is transmitted?* Multiple answers are allowed. The answer options include (1) mother to child, (2) blood transfer, (3) use of the same needle, (4) unprotected sex work, and (5) others. We generate two binary indicators for whether the respondent knows that it is infected through unprotected sex, and through sharing injection needles with someone. Awareness of STDs is elicited from: *Are you aware of sexual diseases? Yes / No.* Finally, access to hospitals/clinics is elicited from: *Whom do you generally get medical treatment?* The answer options are (1) no consultation, (2) doctor, (3) pharmacy, (4) nurse, (5) Kabiraj, (6) clinic, and (7) others.

non-trafficked workers. Trafficking victims are more likely to suffer from violence, take drugs, and engage in sex work involuntarily than the non-trafficked workers. Furthermore, they trade sex with 177 percent more clients and earn 64 percent lower wages per client. These results provide evidence on the forced effort extraction. This suggests that the consequence of victimization to human trafficking is not only to become a commercial sex worker. Their working conditions are even more exploitive than those of other sex workers.

By contrast, we do not find systematic differences in their health conditions. This is presumably because some of the owners still care about the victims' health conditions in order to maintain their productivity. Although the existing studies report poor mental/physical health of trafficking victims (Oram et al. 2012; Tsutsumi et al. 2008), our results suggest that this is a common issue for the sex workers regardless of the trafficking victimization.

The following policy implication can be derived. First, the risk of trafficking increases for disaster-affected individuals who attempt to find job and marriage opportunities. Hence, the provision of effective disaster relief and rehabilitation programs does not only reduce poverty, but also protects the affected children from the risk of human trafficking. Second, if the relationship between the owner and trafficked worker is characterized by the principal-agent framework, as argued by Acemoglu and Wolitzky (2011) and Chwe (1990), their working conditions may improve with their outside options. Such interventions could include programs to rescue the victims and to support their rehabilitation. However, these implications must be interpreted with caution, since they hinge on the validity of our identification strategy and the dataset. Further studies are required to draw conclusions.

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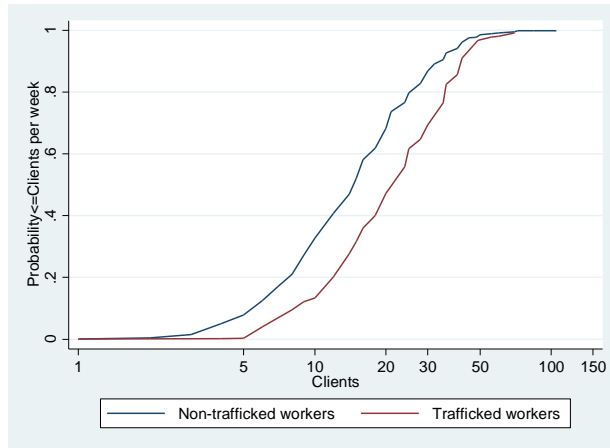
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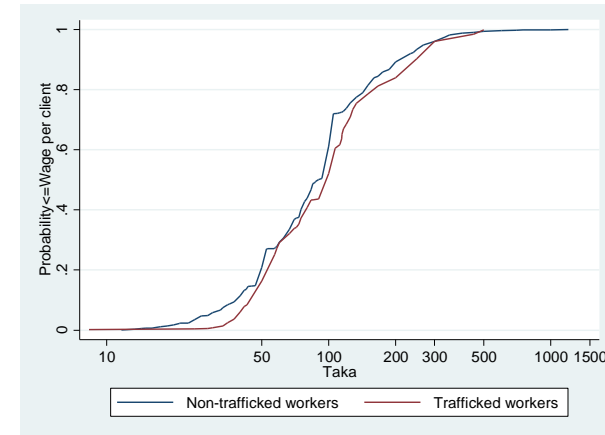
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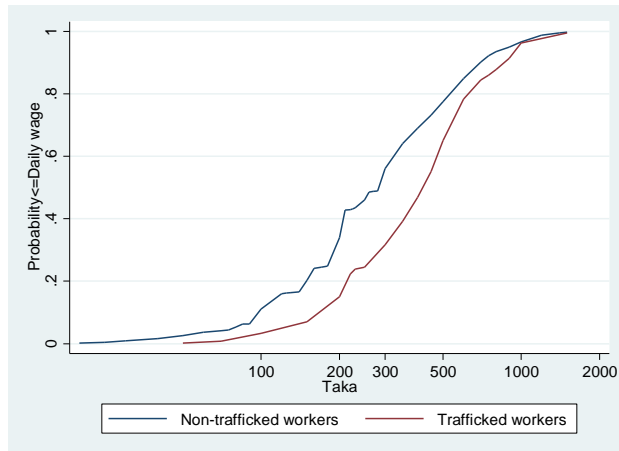
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(a) Clients per week



(b) Wage per client



(c) Daily wage

The statistics are adjusted by the sample weight.

**Figure 1 Cumulative Distribution Function of Working Conditions**

**Table 1 Perpetrator of Human Trafficking**

	%
Broker	58.3
Lover/friend	26.8
Stranger	21.1
Neighbor	12.3
Relative	10.4
Husband	3.7

The data were collected from 101 self-reported victims of human trafficking. Multiple answers are allowed. The statistics are adjusted by the sample weight.

**Table 2 Approach of Human Trafficking**

	%
Assurance of job	49.4
Promise to marry	19.6
Sold by family, relatives, lover, friend	17.3
Kidnapping	7.4
Others	6.4

The data were collected from 101 self-reported victims of human trafficking. The statistics are adjusted by the sample weight.

**Table 3 Summary Statistics**

	Trafficked N=101		Non-trafficked N=1317		
	Mean	S.D.	Mean	S.D.	
<b>Panel A: Worker Characteristics</b>					
Age	15.58	1.30	15.46	1.68	
Schooling years	2.95	2.90	2.50	2.88	
1 if boy	0.04	0.20	0.08	0.28	**
1 if eunuch	0.03	0.18	0.10	0.30	**
1 if earlier occupation is student <sup>#</sup>	0.23	0.42	0.12	0.32	*
1 if earlier occupation is wage worker <sup>#</sup>	0.21	0.41	0.23	0.42	
1 if earlier occupation is sex work <sup>#</sup>	0.05	0.22	0.06	0.23	
1 if earlier occupation is others <sup>#</sup>	0.02	0.15	0.09	0.29	***
1 if Muslim	0.96	0.20	0.92	0.26	
1 if original residence is better-quality material	0.48	0.50	0.36	0.48	
1 if hometown is rural	0.90	0.31	0.66	0.47	***
1 if hotel-based worker <sup>##</sup>	0.24	0.43	0.14	0.34	*
1 if call girl <sup>##</sup>	0.13	0.34	0.05	0.22	
1 if street-based worker <sup>##</sup>	0.42	0.50	0.50	0.50	
1 if residence-based worker <sup>##</sup>	0.19	0.40	0.26	0.44	
1 if other type of sex worker <sup>##</sup>	0.00	0.04	0.03	0.18	***
<b>Panel B: Home District Characteristics</b>					
Frequency of disasters: 2004-2007	1.99	0.90	1.84	0.91	
Log (Population)	14.45	0.63	14.48	0.63	
Number of train stations	7.39	8.42	8.94	11.18	
Log (Number of migrants)	11.40	1.17	11.51	1.01	
Daily wage for children in agricultural sector	141.4	40.1	138.7	66.9	
Proportion of housings with poor-quality material	10.69	7.88	8.77	5.27	*
Proportion of households with access to tap water	4.13	9.91	4.13	8.47	

Panel C: Outcome Variables

1 if able to quit voluntarily	0.67	0.47	0.78	0.41	
1 if use drugs	0.37	0.49	0.16	0.36	***
1 if experience violence by senior workers and pimps within a year	0.24	0.43	0.08	0.28	**
Clients per week	23.78	13.36	17.27	11.87	***
Wage per client	119.21	88.45	107.18	84.22	
Wage per day	453.10	259.81	346.26	257.19	***
1 if always use condom	0.54	0.50	0.38	0.48	**
1 if experience STDs within 6 months	0.49	0.50	0.43	0.50	
1 if experience other health problems within 6 months	0.91	0.29	0.65	0.48	***
1 if receive food support	0.44	0.50	0.23	0.42	***
1 if receive clothing support	0.23	0.42	0.21	0.41	
1 if receive accommodation support	0.20	0.40	0.10	0.30	
1 if arrested within a year	0.64	0.48	0.23	0.42	***
1 if experience violence by gang within a year	0.46	0.50	0.16	0.36	***
1 if experience violence by client within a year	0.26	0.44	0.12	0.32	**
1 if clients include police or pimps	0.32	0.47	0.32	0.47	
1 if know HIV can be infected through unprotected sex	0.91	0.28	0.76	0.43	***
1 if know HIV can be infected through sharing injection needle	0.75	0.44	0.54	0.50	***
1 if aware of any sexual diseases	0.95	0.21	0.81	0.40	***
1 if have access to hospital/clinic	0.75	0.43	0.51	0.50	***

The statistics are adjusted by the sample weight. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level, # reference is girl; ## reference is no job; ### reference is brothel-based.

**Table 4 Falsification Test**

		Frequency of disasters in 2007		
		Coef	S.E.	N
(1)	1 if Trafficking victim	0.094	(0.142)	645
(2)	1 if able to quit voluntarily	-0.022	(0.047)	645
(3)	1 if use drugs	-0.021	(0.058)	645
(4)	1 if experience violence by senior workers and pimps within a year	0.023	(0.030)	645
(5)	Log clients per week	0.044	(0.100)	645
(6)	Log wage per client	-0.120	(0.086)	642
(7)	Log wage per day	-0.059	(0.047)	642
(8)	1 if always use condom	0.077	(0.065)	645
(9)	1 if experience STDs within 6 months	0.001	(0.087)	645
(10)	1 if experience other health problems within 6 months	-0.008	(0.041)	645
(11)	1 if receive food support	-0.008	(0.086)	645
(12)	1 if receive clothing support	-0.160	(0.103)	645
(13)	1 if receive accommodation support	0.021	(0.049)	645
(14)	1 if arrested within a year	0.068	(0.108)	645
(15)	1 if experience violence by gang within a year	0.036	(0.079)	645
(16)	1 if experience violence by client within a year	0.069	(0.060)	645
(17)	1 if clients include police or pimps	-0.015	(0.084)	645
(18)	1 if know HIV can be infected through unprotected sex	0.089	(0.054)	645
(19)	1 if know HIV can be infected through sharing injection needle	-0.036	(0.115)	645
(20)	1 if aware of any sexual diseases	0.004	(0.055)	645
(21)	1 if have access to hospital/clinic	0.053	(0.034)	645

The other independent variables and working-district fixed effects are included. The estimation result is adjusted by the sample weight. OLS coefficients are reported. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level.

**Table 5 Determinants of Trafficking Victims**

	Sample:		Age<=15	
	OLS (1)	Probit (2)	OLS (3)	Probit (4)
Frequency of disasters: 2004-2007	0.098*** (0.035)	0.091*** (0.030)	0.215*** (0.058)	0.457*** (0.086)
<b>Worker Characteristics</b>				
Age	0.002 (0.005)	0.004 (0.007)	0.001 (0.016)	0.018 (0.046)
Schooling years	0.004 (0.006)	0.004 (0.007)	0.001 (0.011)	-0.004 (0.025)
Boy	-0.087 (0.075)	-0.089 (0.117)	-0.121 (0.077)	-0.318* (0.182)
Eunuch	-0.054 (0.033)	-0.100** (0.049)	0.042 (0.056)	0.223** (0.111)
Earlier occupation is student	0.037 (0.037)	0.059** (0.027)	-0.007 (0.034)	0.103*** (0.040)
Earlier occupation is wage worker	-0.010 (0.026)	0.004 (0.037)	-0.068 (0.065)	-0.107 (0.140)
Earlier occupation is sex work	-0.080* (0.043)	-0.045 (0.076)	-0.203** (0.087)	
Earlier occupation is others	-0.142*** (0.047)	-0.202*** (0.063)	-0.231*** (0.046)	
Muslim	0.033 (0.031)	0.014 (0.070)	0.155*** (0.054)	0.464* (0.242)
Original residence is better-quality material	-0.047** (0.018)	-0.057*** (0.017)	-0.051 (0.052)	-0.129 (0.130)
Hometown is rural	0.112** (0.047)	0.187*** (0.049)	0.116* (0.064)	0.218** (0.103)
Hotel-based worker	-0.038 (0.105)	0.001 (0.091)	-0.125 (0.164)	0.244 (0.233)
Call girl	0.130 (0.131)	0.214** (0.108)	0.222 (0.165)	0.789** (0.379)
Street-based worker	-0.047 (0.116)	-0.004 (0.111)	-0.073 (0.151)	0.277 (0.355)
Residence-based worker	-0.045 (0.110)	0.011 (0.109)	-0.056 (0.140)	0.406 (0.291)
Other types of sex worker	-0.049 (0.126)	-0.140 (0.179)	-0.100 (0.093)	
<b>Home district Characteristics</b>				
Log (Population)	-0.234*** (0.057)	-0.196*** (0.046)	-0.310*** (0.068)	-0.665*** (0.130)
Number of train stations	0.004 (0.003)	0.000 (0.003)	0.004 (0.009)	0.003 (0.012)
Log (Number of migrants)	0.005 (0.019)	0.023 (0.023)	-0.015 (0.076)	0.137 (0.151)
Daily wage for children in agricultural sector	-0.000 (0.001)	0.000 (0.000)	-0.000 (0.001)	-0.001 (0.002)
Proportion of housing with poor-quality material	-0.000 (0.005)	0.002 (0.005)	0.011 (0.009)	0.034* (0.019)
Proportion of households with access to tap water	0.004 (0.003)	0.002 (0.003)	0.008 (0.007)	0.007 (0.010)

Observations	1,302	797	468	162
Working-district fixed effects	Yes	Yes	Yes	Yes
F statistics of the excluded instrument #	27.7		43.2	
Proportion of negative fitted value (%)	22.7		28.7	
Proportion of fitted value greater than 1 (%)	0.0		0.0	
R-squared	0.254		0.428	

The estimation result is adjusted by the sample weight. Marginal effects at the mean are reported in Columns (2) and (4). Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level. The sample size is smaller in the Probit results due to collinearity of working-district fixed effects. # Effective F statistics for Montiel-Pflueger robust weak instrument test are reported in Columns (1) and (3) (Montiel Olea and Pflueger 2013). The critical value for  $\tau=10\%$  is 19.7 for both columns.



**Table 6 The Impact of Trafficking Victimization on Coercion and Working Conditions**

	1 if able to quit		1 if use drugs		Violence by senior worker and pimps		Log clients per week		Log wage per client		Log wage per day	
	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trafficking victim	-0.823*	-0.884***	0.424	0.264*	0.174	0.471***	1.019***	0.262	-1.028***	-0.689***	-0.267	-0.627**
	(0.456)	(0.152)	(0.344)	(0.157)	(0.210)	(0.054)	(0.251)	(0.241)	(0.300)	(0.149)	(0.278)	(0.253)
<b>Worker Characteristics</b>												
Age	0.014*	0.001	-0.001	-0.016	-0.013	-0.022	0.033***	0.028	0.004	-0.039	0.034***	-0.009
	(0.008)	(0.024)	(0.005)	(0.013)	(0.014)	(0.015)	(0.013)	(0.027)	(0.012)	(0.031)	(0.008)	(0.032)
Schooling years	0.010	0.015	-0.002	-0.001	-0.003	-0.005	-0.004	0.016	0.026**	0.004	0.025***	0.021
	(0.008)	(0.014)	(0.006)	(0.012)	(0.005)	(0.009)	(0.009)	(0.019)	(0.012)	(0.029)	(0.007)	(0.021)
Boy	-0.173***	-0.090	0.156***	0.087	-0.085**	-0.120**	-0.267***	-0.447***	-0.446***	-0.352***	-0.646***	-0.646***
	(0.052)	(0.065)	(0.058)	(0.079)	(0.038)	(0.053)	(0.088)	(0.070)	(0.080)	(0.123)	(0.090)	(0.143)
Eunuch	-0.529***	-0.467***	0.058	0.082	-0.088**	-0.162**	0.027	0.245***	-0.387***	-0.090	-0.387***	0.044
	(0.084)	(0.169)	(0.073)	(0.084)	(0.040)	(0.063)	(0.117)	(0.084)	(0.121)	(0.193)	(0.081)	(0.216)
Earlier occupation is student	0.088***	0.017	0.005	-0.057	-0.021	-0.006	0.012	-0.141	0.038	0.185	0.061	0.101
	(0.032)	(0.052)	(0.053)	(0.090)	(0.047)	(0.040)	(0.048)	(0.104)	(0.056)	(0.206)	(0.047)	(0.115)
Earlier occupation is wage worker	-0.000	-0.084	0.025	0.113	0.014	0.087	0.038	-0.021	0.033	-0.020	0.043	-0.056
	(0.058)	(0.090)	(0.038)	(0.086)	(0.042)	(0.068)	(0.086)	(0.066)	(0.114)	(0.159)	(0.079)	(0.154)
Earlier occupation is sex work	-0.020	-0.067	-0.037	-0.146	0.016	-0.031	0.110	0.004	0.015	0.057	0.081	-0.001
	(0.078)	(0.097)	(0.079)	(0.142)	(0.045)	(0.028)	(0.113)	(0.113)	(0.107)	(0.141)	(0.068)	(0.094)
Earlier occupation is others	-0.119	-0.230***	0.026	-0.146**	-0.035	-0.008	0.187	0.081	-0.041	-0.198	0.127	-0.127
	(0.100)	(0.078)	(0.082)	(0.059)	(0.046)	(0.083)	(0.119)	(0.127)	(0.173)	(0.161)	(0.130)	(0.142)
Muslim	-0.042	-0.143	0.004	0.133	-0.014	0.009	-0.140**	0.086	0.042	0.156	-0.047	0.253
	(0.074)	(0.118)	(0.081)	(0.084)	(0.039)	(0.051)	(0.069)	(0.076)	(0.085)	(0.096)	(0.106)	(0.168)
Original residence is better-quality material	-0.066	-0.030	-0.009	-0.038	0.030	0.071**	0.098	0.004	0.101	0.081	0.164***	0.034
	(0.041)	(0.064)	(0.058)	(0.058)	(0.040)	(0.032)	(0.072)	(0.069)	(0.063)	(0.109)	(0.041)	(0.093)
Hometown is rural	0.126*	0.128**	-0.093*	-0.070*	-0.025	-0.017	-0.020	0.074	0.082	0.149	0.042	0.140
	(0.070)	(0.054)	(0.055)	(0.036)	(0.061)	(0.036)	(0.099)	(0.075)	(0.122)	(0.106)	(0.076)	(0.100)
Hotel-based worker	0.184	0.151	-0.093	-0.271	0.049	-0.045	-0.756***	-0.897***	0.303*	0.240*	-0.017	-0.259
	(0.177)	(0.236)	(0.077)	(0.193)	(0.064)	(0.051)	(0.170)	(0.320)	(0.172)	(0.141)	(0.222)	(0.265)

Call girl	0.114 (0.179)	0.124 (0.213)	-0.312*** (0.113)	-0.324 (0.216)	0.146* (0.081)	0.068 (0.091)	-0.790*** (0.166)	-0.721** (0.336)	0.292 (0.198)	0.243 (0.203)	-0.190 (0.215)	-0.258 (0.283)
Street-based worker	0.234 (0.142)	0.209 (0.184)	-0.135** (0.064)	-0.273 (0.174)	0.063 (0.061)	0.006 (0.046)	-0.656*** (0.162)	-0.858*** (0.328)	-0.122 (0.165)	-0.187 (0.163)	-0.441** (0.215)	-0.772*** (0.279)
Residence-based worker	0.166 (0.153)	0.142 (0.199)	-0.139** (0.063)	-0.273 (0.178)	0.075 (0.062)	0.036 (0.094)	-0.688*** (0.176)	-0.662* (0.346)	0.067 (0.173)	-0.074 (0.201)	-0.245 (0.213)	-0.483* (0.272)
Other types of sex worker	0.323** (0.133)	0.353* (0.187)	-0.216*** (0.075)	-0.222 (0.186)	0.099* (0.058)	0.095 (0.083)	-0.801*** (0.229)	-0.904*** (0.306)	0.129 (0.175)	-0.080 (0.184)	-0.354 (0.259)	-0.761*** (0.281)
<u>Home District Characteristics</u>												
Log (Population)	-0.117* (0.068)	-0.068 (0.138)	-0.083 (0.121)	-0.107 (0.088)	-0.083 (0.069)	-0.078** (0.034)	0.164** (0.073)	-0.081 (0.131)	-0.263** (0.114)	-0.228*** (0.078)	-0.162 (0.106)	-0.336*** (0.109)
Number of train stations	0.005 (0.003)	0.002 (0.005)	0.013*** (0.004)	0.015*** (0.003)	0.011*** (0.003)	0.016*** (0.003)	-0.003 (0.005)	0.014 (0.009)	0.007* (0.004)	0.005 (0.004)	0.008* (0.004)	0.013 (0.011)
Log (Number of migrants)	-0.051* (0.027)	-0.068 (0.049)	-0.031* (0.018)	-0.033** (0.016)	-0.004 (0.013)	0.014 (0.027)	0.016 (0.023)	-0.041 (0.092)	-0.043* (0.022)	-0.052 (0.038)	-0.066** (0.026)	-0.097 (0.079)
Daily wage for children in agricultural sector	-0.000 (0.001)	-0.000 (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.000)	-0.002*** (0.000)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001* (0.001)	0.001 (0.001)
Proportion of housings with poor-quality material	-0.003 (0.005)	0.008 (0.013)	0.004 (0.005)	0.006 (0.007)	0.005 (0.003)	0.003 (0.008)	0.001 (0.006)	0.001 (0.016)	-0.005 (0.007)	-0.008 (0.012)	-0.004 (0.006)	-0.002 (0.008)
Proportion of households with access to tap water	0.005 (0.004)	0.009* (0.005)	0.002 (0.004)	0.006* (0.003)	0.001 (0.001)	-0.002 (0.002)	-0.007** (0.004)	0.002 (0.009)	0.010** (0.004)	0.012*** (0.004)	0.010*** (0.004)	0.016** (0.008)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,297	466	1,297	466

The estimation result is adjusted by the sample weight. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level.

**Table 7 Health Consequence of Victimization**

	Always use condom		STDs		Other health problems	
	Full (1)	Age<=15 (2)	Full (3)	Age<=15 (4)	Full (5)	Age<=15 (6)
Trafficking victim	0.563 (0.368)	-0.040 (0.334)	-0.105 (0.447)	0.472 (0.330)	-0.194 (0.195)	0.152 (0.155)
<b>Worker Characteristics</b>						
Age	0.001 (0.010)	-0.021 (0.021)	0.017* (0.010)	0.031* (0.019)	0.011 (0.011)	0.013 (0.017)
Schooling years	0.010 (0.006)	0.005 (0.015)	0.012 (0.009)	-0.011 (0.011)	0.004 (0.007)	-0.003 (0.011)
Boy	-0.082 (0.067)	-0.290*** (0.077)	-0.200*** (0.073)	-0.182** (0.084)	-0.125* (0.071)	-0.132** (0.062)
Eunuch	-0.218** (0.089)	-0.350*** (0.097)	-0.119 (0.128)	-0.060 (0.117)	-0.148 (0.100)	-0.105 (0.095)
Earlier occupation is student	-0.050 (0.052)	-0.078 (0.105)	-0.049 (0.061)	0.106 (0.078)	0.073 (0.053)	0.074 (0.066)
Earlier occupation is wage worker	-0.034 (0.046)	-0.034 (0.079)	-0.036 (0.042)	-0.012 (0.079)	0.071** (0.029)	-0.002 (0.036)
Earlier occupation is sex work	0.126 (0.122)	0.002 (0.190)	0.114 (0.090)	0.448*** (0.118)	0.046 (0.061)	0.225** (0.107)
Earlier occupation is others	0.223* (0.115)	0.130 (0.116)	-0.069 (0.072)	0.136 (0.090)	-0.067 (0.050)	0.140** (0.066)
Muslim	-0.022 (0.113)	0.208* (0.117)	0.055 (0.090)	0.196** (0.093)	-0.051 (0.092)	0.187* (0.100)
Original residence is better-quality material	0.014 (0.054)	0.063 (0.056)	-0.039 (0.054)	-0.081 (0.088)	0.035 (0.064)	0.089** (0.041)
Hometown is rural	-0.013 (0.075)	0.025 (0.107)	-0.033 (0.062)	-0.020 (0.064)	0.008 (0.058)	-0.049 (0.075)
Hotel-based worker	-0.304*** (0.109)	-0.528*** (0.126)	-0.351*** (0.109)	-0.419** (0.194)	-0.036 (0.201)	0.054 (0.266)

Call girl	-0.532*** (0.165)	-0.695*** (0.146)	-0.268*** (0.104)	-0.338** (0.144)	0.117 (0.196)	0.231 (0.264)
Street-based worker	-0.418*** (0.100)	-0.534*** (0.118)	-0.272*** (0.102)	-0.331* (0.178)	0.051 (0.204)	0.113 (0.264)
Residence-based worker	-0.468*** (0.110)	-0.526*** (0.081)	-0.331*** (0.099)	-0.484*** (0.154)	-0.022 (0.202)	0.026 (0.264)
Other types of sex worker	-0.225 (0.147)	-0.661*** (0.103)	-0.169 (0.111)	-0.120 (0.160)	0.091 (0.251)	-0.010 (0.325)
<b>Home District Characteristics</b>						
Log (Population)	0.219*** (0.077)	0.175** (0.086)	-0.137 (0.101)	0.070 (0.100)	-0.075 (0.089)	-0.136* (0.081)
Number of train stations	-0.012*** (0.003)	-0.010** (0.005)	0.005 (0.003)	0.004 (0.006)	0.005 (0.003)	0.008*** (0.002)
Log (Number of migrants)	0.038** (0.019)	-0.081*** (0.031)	0.032 (0.059)	0.096*** (0.032)	-0.082** (0.038)	-0.012 (0.074)
Daily wage for children in agricultural sector	0.001 (0.000)	0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Proportion of housings with poor-quality material	-0.006 (0.005)	-0.024** (0.012)	0.002 (0.004)	-0.003 (0.009)	-0.000 (0.004)	0.008 (0.007)
Proportion of households with access to tap water	-0.007** (0.003)	0.004 (0.003)	-0.001 (0.004)	-0.012*** (0.004)	0.009*** (0.002)	0.004 (0.004)
Observations	1,302	468	1,302	468	1,302	468

The estimation result is adjusted by the sample weight. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level.

## **Online Appendix**

### **A1. Sampling Methodology**

The sampling methodology of the CSEC survey is as follows. Considering the geographical variation in concentration of sex workers, the sampling was implemented separately in six strata: (1) brothels, (2) divisional cities, (3) cities with the population of over 100,000, (4) district headquarters, (5) sub-district headquarters, and (6) remaining towns. The survey respondents were selected based on the stratified random sampling. In the first stage, a total of 143 primary sampling units (PSU) were randomly selected, including 12 brothels, 19 divisional cities, 22 cities with the population of over 100,000, 40 district headquarters, 10 sub-district headquarters, and 40 remaining towns. Then, a list of all child sex workers in each PSU was created with a help of local sex workers and NGOs. The survey team obtained a list of a total of 5239 child workers through this process. This implies that the number of child sex workers all over the country is estimated to be 18,902.

In the second stage of the sampling procedure, 12 girls were randomly selected in the PSU of brothel stratum, while in the remaining strata 12 girls, 4 boys, and 4 eunuchs were selected. In selecting the girls from the PSUs of brothel stratum, if the number of girls on the list is fewer than 12, all the girls in the list were sampled. In selecting the girls in the other strata, they were sampled from three categories: street-based, hotel-based, and residence-based workers. If the number of girls exceeds 4 in all categories, the survey team randomly selected 4 girls from each category. If the total number of girls in the PSU exceeds 12 but the number in a category is fewer than 4, the survey team selected all workers from the category with a shortage and more than 4 from the others, so that a total of 12 girls were interviewed in the PSU. Thus, the number of sampled girls was fewer than 12 only if there were fewer than 12 girls in the PSU. Regarding the sampling of boys and eunuchs, the survey team randomly selected at most 4 workers regardless of the categories.

### **A2. Alternative Definition of Trafficking Victims**

Our benchmark definition of trafficked workers relies on the self-reported information. Although it is informative, some respondents may not report their victimization accurately due to the fear of violence by owners or poor understanding of human trafficking. Therefore, while our instrument mitigates this problem, this section additionally uses the survey question regarding the reason for entering the sex industry. Table A3 summarizes their responses relative to the indicator of self-reported trafficking victimization. Admittedly, the answer options are not ideally designed unfortunately, because they do not include human trafficking and they are not

mutually exclusive.\* Nonetheless, given the findings in Tables 1 and 2, we believe that those who reported that the reasons were either “deceived” or “through broker” may include some trafficking victims. Therefore, this section alternatively defines the respondent as a victim if she self-reports that she is a victim, or the reason for starting sex work is “deceived” or “through broker”; i.e., the shaded regions in Table A3. As a result, we consider 231 of 1418 respondents to be trafficking victims. The proportion of victims is 23.3 per cent after adjusting the sample weight.

The estimation results are reported in Panel A of Table A4 and are qualitatively the same as the benchmark results. It should be noted that the point estimates in the panel are larger in absolute value than the benchmark result. This is consistent with the expectation; in the benchmark definition, some victims are included in the control group, causing the estimated gap in the working conditions to be smaller.

### A3. Sensitivity to Violation of Exclusion Restriction

2SLS assumes a zero-correlation between the instrument and the error term in the second-stage equation. In other words, it requires  $\gamma=0$  in the following equation:

$$Y_{hdi} = \beta_0 + \beta_1 Traf_{hdi} + \beta_2 X_{hdi} + \beta_3 H_h + \mu_d + \gamma IV_h + \varepsilon_{hdi} \quad (A1)$$

However, this may not hold strictly if the disaster frequency is correlated with the workers’ unobserved characteristics, such as attractiveness, health condition, and outside options. Therefore, we employ two methods to provide bounds on an endogenous variable of interest with one instrument which does not necessarily have zero correlation with the unobserved error term.

The first method proposed by Conley et al. (2012) allows  $\gamma$  to be nonzero, but it requires the information on the support of  $\gamma$ ,  $[\gamma_{\min}, \gamma_{\max}]$ . If the support is known, regressing  $Y_{hdi} - \gamma_0 IV_h$  using the 2SLS for all  $\gamma_0 \in [\gamma_{\min}, \gamma_{\max}]$  provides the bounds of  $\beta_1$ . Existing studies have employed various criteria to determine the support (Coşar and Demir 2016; Fatas and Mihov 2013; Nunn and Wantchekon 2011). In this study, we assume that the effect of disaster frequency on the working conditions through the trafficking victimization is comparable with or larger than the effect through the other channels. More specifically, we allow  $\gamma$  to take 30 to 50 percent of the total effect of disaster frequency on the working conditions. We therefore employ three potential supports of  $\gamma$ : between zero and 0.3 multiplied

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\* For example, one can enter the sex industry because her family is poor and therefore she asks a broker, who is in fact a broker of human trafficking, to assure a decent and well-paid job. In this case, her response could be either “poverty”, “through broker”, or “deceived”.

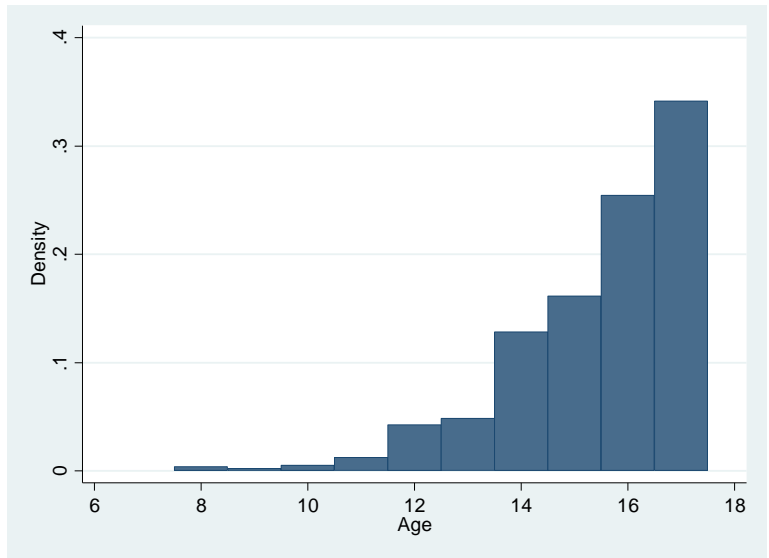
by the coefficient in the reduced form results (Panel B of the table), between zero and 0.4 multiplied by the coefficient, and between zero and 0.5 multiplied by the coefficient. We conduct these tests only for the specifications with a significant coefficient of trafficking victimization in Tables 6 and 7.

The results are reported in Panels C, D, and E of the table, respectively. They show that the bounds do not include zero, as long as the effects of disaster frequency through the other channels account for less than 40 percent of total effects. Further, the results for freedom to leave the job, exposure to violence, and wage per client are robust even when 50 percent of disaster frequency effect is attributed to the other channels.

Although the method of Conley et al. (2012) is insightful, it is a challenge to determine the support. Therefore, we also conduct the second method proposed by Nevo and Rosen (2012). It does not require the information on the support of  $\gamma$ , but it does require the following two assumptions to hold. First, the indicator of trafficking victim and disaster frequency have the same direction of correlation with the error term. Second, the absolute value correlation between disaster frequency and the error term is not greater than the absolute value correlation between the indicator of trafficking victimization and the error term. The latter assumption is intuitive as claimed by Nevo and Rosen (2012). Regarding the former assumption, we exploit the result of the falsification test in Table 4. The coefficient of disaster in 2007 in the specification should capture the correlation between the error term and the instrument. Thus, the endogenous regressor is required to be negatively correlated with the error term in the equations of freedom to quit and wage per client, and positively correlated with that of the number of clients. However, the trafficked workers, who are expected to be more attractive and educated, should demonstrate the opposite patterns; they have higher outside options, earn higher wages, and therefore do not have to trade sex with many clients. Thus, in order to satisfy the first assumption, we estimate the bounds for the effect of non-trafficked workers, i.e.,  $1 - Traf_{hdi}$ .<sup>†</sup> Regarding the drug use and violence by the owners, it is difficult to predict the sign of correlation with the trafficking victimization. Thus, we do not estimate the bounds of these variables. The results reported in Panel F show that the bounds do not include zero for the three dependent variables.

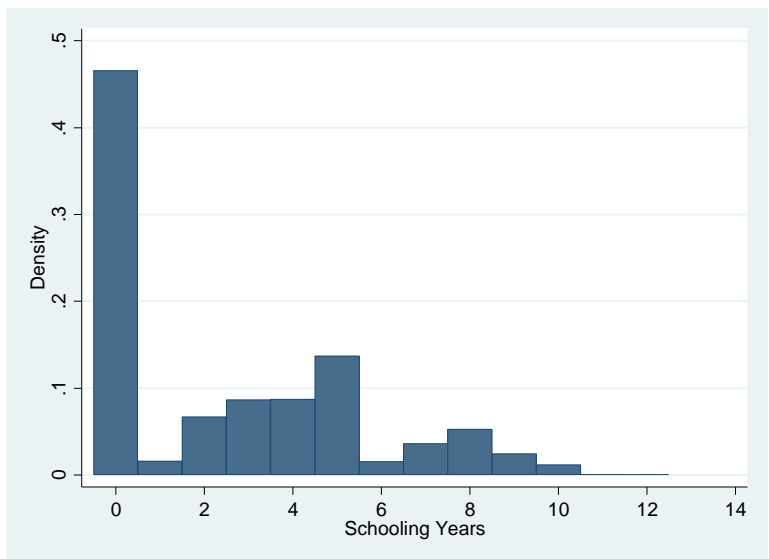
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<sup>†</sup> Fitzsimons and Malde (2014) also transform the endogenous variable to estimate the bounds.



The statistics are adjusted by the sample weight.

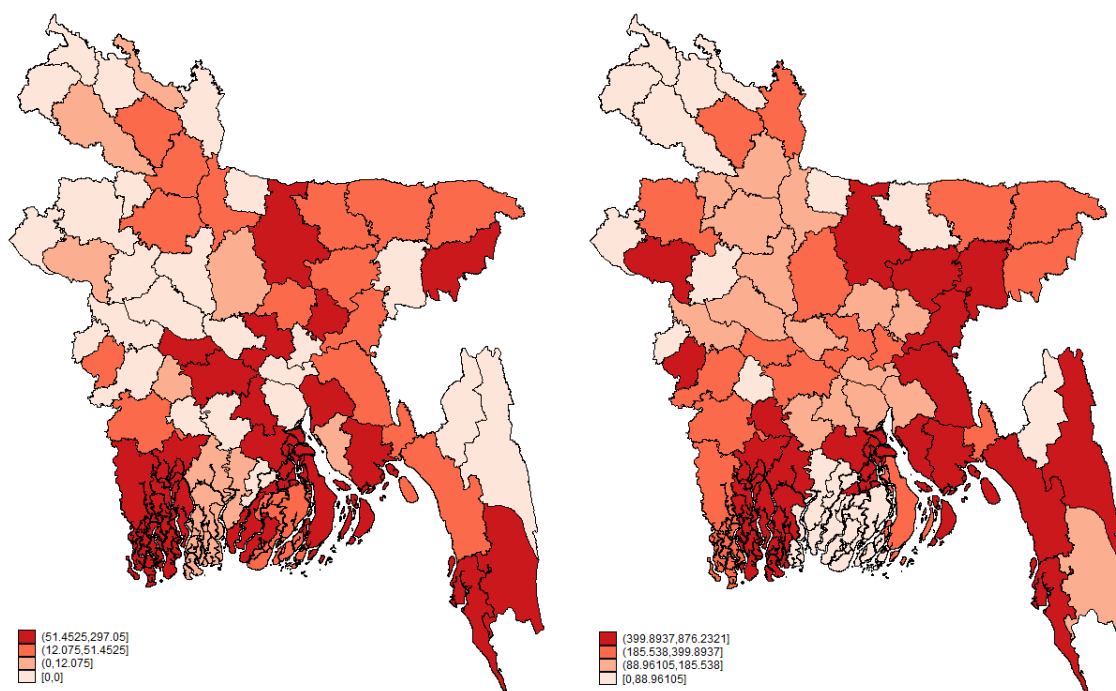
**Figure A1 Age Distribution**



The statistics are adjusted by the sample weight.

**Figure A2 Distribution of Schooling Years**





(a) Trafficked Sex Workers

(b) Non-Trafficked Sex Workers

The statistics are adjusted by the sample weight.

**Figure A3 Geographical Distribution of Sex Workers by Home District**

**Table A1 Comparison of Daily Wage (Taka)**

	Mean	S.D.
Commercial Sex work	359.7	259.8
<hr/>		
Average wage level in the home district of sex workers		
Agricultural wage for males	253.1	58.9
Agricultural wage for females	181.0	37.0
Agricultural wage for children	139.0	63.9
Non-agricultural wage for children	130.4	34.2

The statistics are adjusted by the sample weight.

**Table A2 Disaster Frequency and Socio-Economic District Characteristics**

	Number of trafficked workers (1)	Number of non-trafficked workers (2)	Proportion of trafficked workers (3)	Female literacy rate in 2001 (4)	Unemployment rate in 2001 (5)	Number of educated workers (6)	Number of uneducated workers (7)
Frequency of disasters: 2004-2007	17.473** (7.766)	18.796 (32.539)	5.175** (2.397)	-1.026 (0.987)	0.035 (0.053)	5.602 (21.769)	30.668 (19.057)
Log (Population)	7.410 (19.280)	133.886* (78.261)	-5.505 (4.524)	1.999 (2.718)	0.165 (0.120)	89.664* (52.212)	51.631 (49.454)
Number of train stations	-1.126 (1.592)	-0.607 (5.683)	-0.011 (0.322)	-0.463*** (0.172)	-0.019** (0.009)	-3.641 (3.774)	1.907 (3.475)
Log (Number of migrants)	-2.562 (13.381)	4.977 (49.730)	-0.577 (4.241)	3.148*** (1.013)	0.143* (0.082)	12.405 (36.789)	-9.989 (24.720)
Daily wage for children in agricultural sector	0.186 (0.185)	0.541 (0.697)	0.040 (0.046)	0.064** (0.026)	0.004*** (0.001)	0.600 (0.430)	0.127 (0.414)
Proportion of housings with poor-quality material	3.459 (2.536)	0.607 (5.661)	0.388 (0.571)	-0.576*** (0.198)	0.013 (0.010)	1.239 (3.933)	2.828 (4.210)
Proportion of households with access to tap water	0.183 (1.070)	-1.611 (4.661)	0.165 (0.327)	0.098 (0.112)	0.007 (0.007)	-0.266 (3.417)	-1.162 (2.159)
Constant	-112.159 (280.679)	-1,816.372 (1,189.149)	80.032 (70.083)	-22.408 (36.980)	-2.694 (1.796)	-1,339.359 (832.652)	-589.173 (681.172)
Observations	57	57	57	57	56	57	57
R-squared	0.188	0.176	0.117	0.343	0.383	0.176	0.181

\* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level. OLS coefficients are reported. Robust standard errors are in parentheses.

**Table A2 Continued**

	Proportion of educated workers (8)	Number of workers starting sex work at the age<=15 (9)	Number of workers starting sex work at the age>15 (10)	Proportion of workers starting sex work at the age<=15 (11)	Unemployment rate in 2011 (12)	Proportion of the disabled in 2011 (13)
Frequency of disasters: 2004-2007	-4.488 (4.895)	32.743 (32.415)	3.526 (6.418)	1.989 (3.163)	-0.278 (1.705)	0.114 (1.671)
Log (Population)	10.851 (10.477)	112.221 (82.889)	29.075** (13.786)	-0.023 (5.195)	-0.816 (1.446)	-19.320 (14.052)
Number of train stations	-1.186* (0.603)	-1.725 (6.055)	-0.009 (1.246)	-0.422 (0.406)	-0.264* (0.150)	0.351 (0.340)
Log (Number of migrants)	1.284 (5.175)	7.414 (51.121)	-4.999 (9.581)	6.749 (4.264)	3.140 (2.888)	0.068 (2.278)
Daily wage for children in agricultural sector	0.145* (0.076)	0.429 (0.721)	0.298* (0.153)	0.019 (0.052)	0.035 (0.021)	-0.003 (0.033)
Proportion of housings with poor-quality material	-0.133 (0.745)	-0.817 (5.918)	4.884** (2.139)	-0.537 (0.536)	-0.133 (0.156)	0.887 (0.778)
Proportion of households with access to tap water	-0.064 (0.469)	-0.890 (4.858)	-0.538 (0.787)	-0.505 (0.482)	-0.270 (0.215)	0.551 (0.440)
Constant	-117.412 (144.016)	-1,524.791 (1,260.411)	-403.740** (190.610)	10.941 (108.129)	-21.339 (27.717)	281.036 (181.467)
Observations	57	57	57	57	56	56
R-squared	0.091	0.146	0.432	0.133	0.097	0.340

\* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level. OLS coefficients are reported. Robust standard errors are in parentheses.

**Table A3 Measurement of Human Trafficking Victims**

Reason for starting sex work	Self-reported victim		Total
	Yes	No	
Poverty	29	727	756
Harassment from family	15	141	156
Own interest	4	114	118
Deceived (marriage, job etc.)	16	84	100
Victim of circumstance	4	99	103
Through broker	31	46	77
Others	2	106	108
N	101	1,317	1,418

The statistics are not adjusted by the sample weight.

**Table A4 Summary of Robustness Checks**

	1 if able to quit		1 if use drugs		Violence by senior worker and pimps		Log clients per week		Log wage per client		Log wage per day	
	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15
<i>Panel A: Definition of Victim</i>												
Trafficking victim	-1.399**	-0.921***	0.720	0.275**	0.296	0.491***	1.731***	0.273	-1.745***	-0.718***	-0.454	-0.654***
	(0.650)	(0.216)	(0.683)	(0.139)	(0.368)	(0.090)	(0.635)	(0.266)	(0.604)	(0.122)	(0.453)	(0.215)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,297	466	1,297	466
<i>Panel B: Reduced Form</i>												
Frequency of disasters: 2004-2007	-0.081***	-0.190***	0.042	0.057	0.017	0.101***	0.100***	0.056	-0.101***	-0.148***	-0.026	-0.135***
	(0.030)	(0.035)	(0.043)	(0.037)	(0.024)	(0.034)	(0.032)	(0.062)	(0.020)	(0.033)	(0.023)	(0.045)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,297	466	1,297	466
<i>Panel C: Conley et al. (2012) 30%</i>												
Trafficking victim: upper bound	-0.191	-0.291	-	0.539	-	0.698	1.631	-	-0.198	-0.063	-	-0.037
: lower bound	-1.238	-1.241	-	-0.090	-	0.109	0.134	-	-1.591	-1.124	-	-1.044
Observations	1,302	468	-	468	-	468	1,302	-	1,297	466	-	466
<i>Panel D: Conley et al. (2012) 40%</i>												
Trafficking victim: upper bound	-0.115	-0.210	-	0.539	-	0.698	1.631	-	-0.109	0.001	-	0.022
: lower bound	-1.238	-1.241	-	-0.117	-	0.065	0.040	-	-1.591	-1.124	-	-1.044
Observations	1,302	468	-	468	-	468	1,302	-	1,297	466	-	466
<i>Panel E: Conley et al. (2012) 50%</i>												
Trafficking victim: upper bound	-0.039	-0.128	-	0.539	-	0.698	1.631	-	-0.016	0.067	-	0.082
: lower bound	-1.238	-1.241	-	-0.144	-	0.019	-0.055	-	-1.591	-1.124	-	-1.044
Observations	1,302	468	-	468	-	468	1,302	-	1,297	466	-	466

*Panel F: Nevo and Rosen (2012)*

Non-trafficked worker: upper bound	-	-	-	-	-	-	-1.019	-	-	-	-	-
: lower bound	0.823	0.884	-	-	-	-	-	-	1.028	0.689	-	-
Observations	1,302	468	-	-	-	-	1,302	-	1,297	466	-	-

*Panel G: Selective Exit*

Trafficking victim	-0.842*	-0.961***	0.557*	0.283**	0.250	0.483***	1.270***	0.292	-1.173**	-0.817***	-0.278	-0.704**
	(0.497)	(0.170)	(0.300)	(0.143)	(0.221)	(0.047)	(0.266)	(0.328)	(0.461)	(0.222)	(0.399)	(0.349)
Observations	1,127	438	1,127	438	1,127	438	1,127	438	1,122	436	1,122	436

*Panel H: Exclusion of Brothel Workers*

Trafficking victim	-0.680	-0.814***	0.479	0.318**	0.176	0.474***	1.199***	0.390	-1.039***	-0.680***	-0.125	-0.514**
	(0.447)	(0.141)	(0.315)	(0.159)	(0.188)	(0.046)	(0.236)	(0.274)	(0.292)	(0.138)	(0.242)	(0.224)
Observations	1,179	428	1,179	428	1,179	428	1,179	428	1,178	427	1,178	427

*Panel I: Age Restriction*

Trafficking victim	-0.822*	-0.881***	0.426	0.267*	0.175	0.474***	1.017***	0.266	-1.026***	-0.682***	-0.265	-0.622**
	(0.456)	(0.151)	(0.344)	(0.157)	(0.209)	(0.053)	(0.251)	(0.240)	(0.300)	(0.149)	(0.278)	(0.253)
Observations	1,293	459	1,293	459	1,293	459	1,293	459	1,288	457	1,288	457

*Panel J: OLS*

Trafficking victim	-0.178***	-0.117	0.238***	0.206**	0.112**	0.246**	0.173**	0.152	-0.125	-0.054	-0.047	0.000
	(0.045)	(0.105)	(0.045)	(0.101)	(0.051)	(0.105)	(0.070)	(0.150)	(0.091)	(0.082)	(0.072)	(0.086)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,297	466	1,297	466

The other independent variables and working-district fixed effects are included. The estimation results are adjusted by the sample weight. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level

**Table A4 Continued**

	Always use condom		STDs		Other health problems	
	Full	Age<=15	Full	Age<=15	Full	Age<=15
<i>Panel A: Definition of Victim</i>						
Trafficking victim	0.957 (0.595)	-0.042 (0.350)	-0.178 (0.797)	0.491 (0.364)	-0.330 (0.381)	0.159 (0.161)
Observations	1,302	468	1,302	468	1,302	468
<i>Panel B: Reduced Form</i>						
Frequency of disasters: 2004-2007	0.055 (0.038)	-0.009 (0.079)	-0.010 (0.048)	0.101 (0.072)	-0.019 (0.020)	0.033 (0.042)
Observations	1,302	468	1,302	468	1,302	468
<i>Panel G: Selective Exit</i>						
Trafficking victim	0.487 (0.367)	-0.224 (0.361)	-0.003 (0.389)	0.519 (0.346)	-0.281 (0.247)	0.098 (0.180)
Observations	1,127	438	1,127	438	1,127	438
<i>Panel H: Exclusion of Brothel Workers</i>						
Trafficking victim	0.539 (0.341)	-0.049 (0.326)	-0.000 (0.425)	0.492 (0.323)	-0.069 (0.117)	0.192 (0.131)
Observations	1,179	428	1,179	428	1,179	428
<i>Panel I: Age Restriction</i>						
Trafficking victim	0.564 (0.368)	-0.040 (0.333)	-0.103 (0.447)	0.473 (0.329)	-0.191 (0.194)	0.153 (0.154)
Observations	1,293	459	1,293	459	1,293	459

<i>Panel J: OLS</i>						
Trafficking victim	0.004	-0.013	-0.034	0.050	0.180***	0.257***
	(0.058)	(0.090)	(0.155)	(0.202)	(0.033)	(0.032)
Observations	1,302	468	1,302	468	1,302	468

The other independent variables and working-district fixed effects are included. The estimation result is adjusted by the sample weight. Coefficients are reported. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level



**Table A5 Tests for Alternative Interpretations**

	Food support		Clothing support		Accommodation support		Arrested		Violence by gang		Violence by client	
	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trafficking victim	-0.238 (0.358)	-0.555*** (0.134)	-0.244 (0.288)	-0.366* (0.214)	0.654*** (0.142)	0.145 (0.182)	0.262 (0.353)	0.699** (0.274)	0.206 (0.214)	0.375 (0.286)	0.018 (0.244)	0.226 (0.199)
<b>Worker Characteristics</b>												
Age	-0.016 (0.011)	-0.026 (0.022)	-0.002 (0.011)	-0.018 (0.028)	-0.019** (0.008)	-0.041** (0.018)	0.018 (0.012)	0.013 (0.031)	0.021*** (0.007)	0.052*** (0.020)	0.007 (0.009)	-0.003 (0.010)
Schooling years	-0.003 (0.009)	-0.017 (0.011)	-0.003 (0.006)	-0.016 (0.013)	-0.011 (0.008)	-0.009 (0.008)	-0.003 (0.006)	-0.009 (0.016)	-0.009 (0.008)	-0.015 (0.012)	0.005 (0.006)	0.005 (0.006)
Boy	-0.086** (0.043)	0.029 (0.065)	-0.080*** (0.030)	0.041 (0.078)	-0.054 (0.054)	-0.024 (0.054)	-0.111 (0.095)	-0.057 (0.081)	-0.098*** (0.024)	-0.105* (0.059)	-0.128*** (0.031)	-0.154*** (0.054)
Eunuch	-0.045 (0.046)	0.146 (0.122)	-0.063* (0.036)	0.062 (0.087)	-0.042* (0.022)	-0.041 (0.078)	-0.176*** (0.061)	-0.101 (0.118)	-0.057 (0.046)	-0.119 (0.086)	-0.051* (0.031)	-0.067 (0.084)
Earlier occupation is student	0.081 (0.063)	0.118* (0.062)	0.091 (0.057)	0.133* (0.076)	-0.013 (0.066)	-0.036 (0.034)	0.014 (0.056)	-0.064 (0.104)	-0.096 (0.066)	-0.149 (0.106)	0.038 (0.036)	0.034 (0.092)
Earlier occupation is wage worker	0.047 (0.030)	-0.026 (0.042)	-0.015 (0.039)	-0.068* (0.038)	0.051 (0.046)	-0.037 (0.040)	0.085** (0.043)	0.184** (0.093)	-0.087** (0.038)	-0.019 (0.073)	0.053 (0.034)	0.118** (0.056)
Earlier occupation is sex work	-0.028 (0.050)	0.001 (0.079)	0.035 (0.086)	-0.062 (0.043)	-0.008 (0.051)	-0.080 (0.051)	0.105 (0.065)	0.270* (0.140)	0.033 (0.081)	-0.019 (0.089)	0.038 (0.053)	0.126*** (0.049)
Earlier occupation is others	-0.044 (0.092)	-0.117 (0.087)	-0.075 (0.066)	-0.032 (0.053)	0.161* (0.087)	0.116 (0.080)	-0.039 (0.065)	0.095 (0.098)	-0.011 (0.083)	-0.033 (0.113)	-0.055 (0.072)	-0.056 (0.153)
Muslim	0.002 (0.056)	-0.102 (0.132)	0.081* (0.042)	0.121 (0.080)	0.014 (0.038)	-0.002 (0.062)	0.035 (0.064)	0.152** (0.064)	-0.053 (0.070)	-0.055 (0.125)	-0.034 (0.060)	-0.091 (0.158)
Original residence is better-quality material	0.096 (0.059)	0.034 (0.094)	0.109** (0.043)	0.082 (0.077)	0.227*** (0.037)	0.170*** (0.028)	-0.024 (0.030)	-0.064 (0.057)	0.020 (0.037)	0.090 (0.101)	-0.013 (0.048)	0.038 (0.039)
Hometown is rural	0.038 (0.060)	0.111 (0.075)	0.024 (0.042)	0.127*** (0.038)	-0.023 (0.030)	0.025 (0.035)	-0.031 (0.062)	0.007 (0.058)	-0.036 (0.026)	-0.045 (0.038)	0.036 (0.032)	0.013 (0.034)
Hotel-based worker	-0.180 (0.162)	-0.571*** (0.220)	-0.282* (0.162)	-0.399 (0.268)	-0.099 (0.161)	-0.127 (0.167)	0.276*** (0.079)	0.145 (0.108)	0.147** (0.064)	0.117 (0.153)	0.100 (0.063)	0.054 (0.056)

Call girl	-0.197 (0.147)	-0.363* (0.218)	-0.301* (0.173)	-0.319 (0.269)	-0.149 (0.158)	0.012 (0.140)	0.140 (0.132)	-0.128 (0.243)	0.316*** (0.107)	0.269 (0.179)	0.091 (0.076)	-0.060 (0.077)
Street worker	-0.200 (0.173)	-0.583*** (0.225)	-0.273* (0.163)	-0.471* (0.278)	-0.079 (0.160)	-0.150 (0.129)	0.221*** (0.050)	0.074 (0.097)	0.261*** (0.055)	0.300** (0.135)	0.181*** (0.052)	0.116** (0.057)
Residence worker	-0.148 (0.168)	-0.393* (0.211)	-0.148 (0.167)	-0.344 (0.292)	-0.034 (0.162)	-0.069 (0.145)	0.075 (0.058)	-0.112 (0.097)	0.101** (0.051)	0.156 (0.105)	0.117 (0.071)	0.084 (0.077)
Other types of sex worker	-0.388** (0.186)	-0.647** (0.266)	-0.475*** (0.146)	-0.814*** (0.230)	-0.174 (0.164)	-0.172 (0.143)	0.151 (0.102)	-0.003 (0.175)	0.169*** (0.065)	0.317* (0.172)	0.156** (0.063)	0.159* (0.085)
<b>Home District Characteristics</b>												
Log (Population)	-0.066 (0.061)	-0.165** (0.069)	-0.092 (0.084)	-0.206** (0.086)	0.208*** (0.042)	0.139** (0.062)	-0.038 (0.083)	0.037 (0.076)	-0.042 (0.079)	-0.002 (0.074)	0.022 (0.049)	0.116*** (0.043)
Number of train stations	0.002 (0.005)	-0.006 (0.006)	0.005 (0.005)	-0.003 (0.006)	-0.004 (0.003)	-0.007 (0.006)	0.001 (0.005)	-0.003 (0.008)	0.003 (0.006)	0.011 (0.007)	-0.003 (0.002)	-0.007* (0.004)
Log (# migrants)	-0.013 (0.017)	-0.015 (0.085)	0.022 (0.031)	0.077 (0.077)	-0.014 (0.017)	-0.028 (0.042)	-0.051 (0.048)	-0.003 (0.104)	-0.063 (0.052)	-0.070 (0.087)	-0.031 (0.025)	0.054 (0.044)
Daily wage for children in agricultural sector	0.001 (0.001)	0.002*** (0.001)	-0.000 (0.001)	0.001 (0.001)	0.001 (0.000)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	-0.001* (0.001)	-0.002*** (0.001)	-0.000 (0.000)	0.000 (0.001)
Proportion of housings with poor-quality material	0.000 (0.007)	-0.008 (0.008)	0.000 (0.008)	-0.005 (0.007)	0.003 (0.005)	-0.011*** (0.004)	-0.003 (0.002)	0.002 (0.004)	0.012*** (0.003)	0.018*** (0.006)	0.004 (0.004)	0.000 (0.005)
Proportion of households with access to tap water	0.006*** (0.002)	0.015* (0.008)	-0.002 (0.004)	-0.001 (0.008)	-0.005*** (0.001)	-0.002 (0.005)	0.001 (0.003)	-0.003 (0.010)	0.007* (0.004)	0.006 (0.008)	0.005*** (0.002)	-0.002 (0.003)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,302	468	1,302	468

The estimation result is adjusted by the sample weight. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level.

**Table A5 Continued**

	Clients include police or pimps		Know HIV can be infected through unprotected sex		Know HIV can be infected through sharing injection needle		Aware of any sexual diseases		Have access to hospital/clinic	
	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15	Full	Age<=15
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Trafficking victim	-0.143 (0.367)	-0.170 (0.224)	0.633* (0.328)	0.485** (0.223)	-0.323 (0.576)	-0.518 (0.380)	-0.188 (0.161)	-0.159 (0.177)	0.428 (0.278)	0.365 (0.269)
<b>Worker Characteristics</b>										
Age	0.017 (0.013)	0.012 (0.025)	0.024* (0.014)	0.075*** (0.029)	0.039*** (0.011)	0.040* (0.023)	0.024* (0.013)	0.033 (0.032)	0.020** (0.009)	0.025 (0.024)
Schooling years	0.010 (0.007)	0.008 (0.015)	0.017** (0.007)	0.013 (0.013)	0.009* (0.005)	0.006 (0.014)	0.021*** (0.004)	0.024*** (0.006)	0.011 (0.011)	0.018 (0.012)
Boy	0.009 (0.081)	0.055 (0.096)	-0.045 (0.082)	-0.041 (0.069)	-0.040 (0.107)	-0.118 (0.114)	-0.106* (0.054)	-0.122* (0.066)	-0.059 (0.039)	-0.080 (0.053)
Eunuch	-0.137** (0.057)	-0.127** (0.057)	0.028 (0.066)	-0.022 (0.057)	-0.041 (0.040)	0.056 (0.059)	-0.020 (0.033)	-0.035 (0.078)	-0.051 (0.075)	-0.177** (0.087)
Earlier occupation is student	0.018 (0.044)	0.102* (0.062)	-0.184*** (0.057)	-0.146 (0.125)	0.066 (0.058)	0.060 (0.049)	-0.051* (0.030)	-0.069 (0.048)	-0.047 (0.038)	0.052 (0.059)
Earlier occupation is wage worker	0.037 (0.046)	0.025 (0.070)	0.004 (0.048)	-0.011 (0.061)	0.008 (0.049)	-0.003 (0.054)	-0.015 (0.044)	-0.069 (0.061)	0.109*** (0.028)	0.028 (0.062)
Earlier occupation is sex work	0.076 (0.053)	-0.094 (0.094)	-0.094 (0.101)	-0.067 (0.165)	0.022 (0.059)	-0.087 (0.143)	-0.064 (0.048)	-0.049 (0.075)	0.203** (0.087)	0.248 (0.163)
Earlier occupation is others	-0.052 (0.074)	0.032 (0.086)	0.085 (0.070)	0.203* (0.121)	-0.001 (0.075)	-0.021 (0.077)	-0.036 (0.041)	-0.016 (0.089)	0.179*** (0.052)	0.110 (0.145)
Muslim	-0.146 (0.122)	-0.284 (0.204)	-0.056 (0.068)	-0.182* (0.096)	0.030 (0.080)	-0.109 (0.100)	-0.085 (0.081)	-0.154 (0.109)	0.161*** (0.048)	0.122 (0.076)
Original residence is better-quality material	-0.005 (0.036)	-0.007 (0.062)	0.062* (0.035)	0.025 (0.078)	-0.028 (0.051)	0.070 (0.102)	-0.009 (0.034)	-0.012 (0.066)	-0.050 (0.043)	0.009 (0.047)
Hometown is rural	-0.038 (0.064)	0.075 (0.086)	-0.072 (0.059)	-0.050 (0.083)	0.022 (0.080)	0.100 (0.063)	-0.019 (0.032)	-0.002 (0.048)	-0.009 (0.037)	-0.019 (0.047)
Hotel-based worker	0.153 (0.189)	0.141 (0.178)	-0.132 (0.100)	-0.111 (0.163)	0.147 (0.213)	0.133 (0.261)	-0.077 (0.063)	-0.088 (0.130)	0.051 (0.111)	0.214 (0.171)

Call girl	0.049 (0.196)	0.029 (0.213)	-0.285* (0.171)	-0.235 (0.151)	0.032 (0.266)	0.134 (0.331)	-0.258*** (0.069)	-0.274* (0.162)	-0.123 (0.144)	-0.064 (0.160)
Street worker	0.180 (0.172)	0.137 (0.169)	-0.161 (0.102)	-0.257* (0.132)	0.075 (0.222)	0.077 (0.261)	-0.138** (0.054)	-0.203 (0.124)	0.075 (0.130)	0.164 (0.146)
Residence worker	0.145 (0.153)	0.059 (0.159)	-0.145 (0.101)	-0.217 (0.148)	0.127 (0.225)	0.281 (0.250)	-0.081 (0.063)	-0.116 (0.139)	0.038 (0.131)	0.168 (0.141)
Other types of sex worker	-0.097 (0.185)	-0.066 (0.188)	-0.260* (0.155)	-0.376* (0.215)	0.105 (0.207)	-0.094 (0.218)	-0.201* (0.109)	-0.425* (0.228)	-0.013 (0.136)	-0.020 (0.116)
<b>Home District Characteristics</b>										
Log (Population)	0.016 (0.056)	0.158*** (0.055)	0.109 (0.091)	0.103 (0.074)	-0.095 (0.119)	-0.088 (0.080)	-0.075 (0.050)	-0.128*** (0.050)	0.002 (0.088)	0.033 (0.057)
Number of train stations	0.000 (0.003)	-0.005 (0.004)	0.002 (0.004)	0.007* (0.004)	0.003 (0.006)	0.008 (0.005)	0.003 (0.002)	0.003 (0.005)	0.003 (0.004)	0.007 (0.006)
Log (# migrants)	0.004 (0.046)	0.007 (0.063)	-0.060* (0.032)	-0.110*** (0.040)	0.013 (0.026)	0.025 (0.053)	-0.001 (0.019)	0.034 (0.055)	0.069** (0.034)	0.043 (0.050)
Daily wage for children in agricultural sector	-0.000 (0.000)	-0.001 (0.001)	-0.000 (0.000)	-0.001** (0.001)	-0.001 (0.001)	-0.002*** (0.000)	-0.000 (0.000)	-0.001 (0.001)	-0.001 (0.001)	-0.002* (0.001)
Proportion of housings with poor-quality material	-0.004 (0.007)	-0.011 (0.008)	0.002 (0.006)	-0.001 (0.008)	-0.006 (0.005)	-0.001 (0.006)	-0.008** (0.003)	-0.007 (0.006)	0.004 (0.006)	-0.008 (0.007)
Proportion of households with access to tap water	-0.000 (0.004)	-0.002 (0.004)	0.001 (0.004)	0.006** (0.003)	0.001 (0.002)	0.003 (0.005)	0.001 (0.002)	0.002 (0.005)	-0.006*** (0.002)	-0.011** (0.005)
Observations	1,302	468	1,302	468	1,302	468	1,302	468	1,302	468

The estimation result is adjusted by the sample weight. Standard errors clustered at the working-district level are in parentheses. \* Significant at the 10% level; \*\* significant at the 5% level; \*\*\* significant at the 1% level.

## Abstract(In Japanese)

### 要約

人身売買は世界的な人道問題であるが、これに関する学術的知見は非常に少ない。本稿は、バングラデシュ全国の児童セックスワーカーを対象とするサーベイデータを用いて、人身売買によって強制的にセックスワークに従事させられている子どもたちが、その他の児童セックスワーカーと比較してどの程度劣悪な労働環境に置かれているのかを明らかにする。人身売買被害者の内生性をコントロールするため、本稿では操作変数として出身県の自然災害発生頻度を用いた。分析結果によると、人身売買被害者は暴力被害や薬物使用の確率が高く、自分の意志でセックスワークを辞める自由がなかった。また、彼女らはより多くの相手と取引をするが、相手一人あたりの賃金は有意に低かった。一方で、避妊具使用や性感染症リスクについては両者の間で有意な差は見られなかった。これらの分析結果は、被害者が努力水準を高めるために暴力をふるわれている一方、将来的な生産性維持も考慮されている可能性があることを示唆している。

**キーワード：**人身売買、セックスワーカー、最悪の形態の児童労働、強制労働、バングラデシュ



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