

# Understanding Human Trafficking Using Victim-Level Data\*

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## Abstract

Quantitative research on human trafficking is scant due to lack of data. This study makes use of a unique survey we collected on former victims of trafficking and vulnerable women and girls in the Philippines. We start by exploring the correlates of trafficking and show that household composition (in particular the presence of older sisters) and plausibly exogenous measures of health and economic shocks predict the likelihood of being trafficked. We then study the effects of trafficking on victims' intertemporal and risk preferences using entropy balancing. We find that trafficking victims are not differentially patient, but they are more risk-loving. Our novel data and findings are pertinent to the design of policies intending to prevent trafficking and reintegrate victims.

*Keywords:* human trafficking, prostitution, Philippines, child labor

*JEL:* D13, D80, J47

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# 1 Introduction

The exploitation and trafficking of men, women, and children is a humanitarian problem of global scale. A recent study estimates that more than 24 million people worldwide are trapped in conditions of forced labor ([International Labour Organization, 2017](#)). Roughly a fifth of these people are trafficked for forced sexual exploitation. Women and girls are disproportionately affected and account for 99 percent of human trafficking victims in the commercial sex industry. Trafficking is a major violation of human rights and causes its victims to suffer from long-lasting psychological and physical trauma, diseases (including HIV/AIDS), unwanted pregnancies and, often, drug addiction, malnutrition and social ostracism ([United Nations Office on Drugs and Crime, 2016](#); [US Department of State, 2017](#)).

In addition to the above humanitarian costs, trafficking in persons also has negative implications for economic development. Victims of trafficking mostly consist of vulnerable members of society, e.g. poor women and children. While many of the countries at high risk of human trafficking lack access to universal education and employment opportunities for women, trafficking perpetuates discriminatory practices that further diminish women's agency by increasing the gender gap in education as well as in political and economic participation. The social and health costs associated with this phenomenon also contribute negatively to economic development. Finally, a sizable shadow economy, where trafficking activities take place, makes official statistics on unemployment and labor force participation unreliable.

Despite the attention that human trafficking has received in policy circles in recent years, there exists little research and almost no systematic data collection to assist in understanding the microeconomic causes and consequences of trafficking. At first glance, human trafficking can be assimilated into what the International Labor Organization (ILO) defines as the "worst forms of child labor," i.e. those that significantly jeopardize the health and safety of the children involved. As such, it is plausible to rely on existing studies of child labor to hypothesize that poverty, returns to schooling, and parental preferences are major drivers of both child labor and trafficking. However, while sending a child to work can be a temporary choice, "selling" a child to traffickers is an irreversible one. It is therefore vital to investigate

the factors associated with trafficking as a separate phenomenon. The quantitative economics literature is largely silent on this issue, yet filling this gap is essential to designing effective policies against trafficking.

This paper is, to the best of our knowledge, the first to use microdata to quantitatively analyze the determinants and consequences of human trafficking.<sup>1</sup> We fielded a unique cross-sectional survey of vulnerable women and girls in the Philippines. The sample population consisted of girls above 14 years of age residing in 12 shelters in the Cebu metropolitan area of the Philippines during 2009 and 2010. These shelters host, care for, and educate girls at risk of social exclusion. Their population includes orphans, abandoned children, child laborers, street children, and victims of abuse and trafficking. We surveyed both human trafficking victims as well as non-trafficked children living in the shelters. Our survey collected retrospective information on respondents' economic, social, and domestic situations prior to leaving the household as well as information on household shocks and other factors that potentially influence the supply of women and children who are subject to trafficking. We use this information to determine the relative importance of different variables in the probability that someone becomes a human trafficking victim. Additionally, the survey includes measures of expectations and subjective well-being to study victims' psychological recoveries, outlook towards future jobs, and preferences on intertemporal decisions and risk taking.

Our results can be summarized as follows. First, we focus on pre-determined and exogenous variables to investigate the determinants of trafficking. We show that both birth order (in particular, having older sisters) and income shocks (as predicted by rainfall shocks) have a positive relationship with a girl's propensity to be trafficked.

Second, we estimate the effect of being trafficked on the victims' time and risk preferences. While previous studies document changes in preferences induced by traumatic experiences such as violent conflict, economic crises, or natural disasters (see, for example, [Malmendier and Nagel \(2011\)](#); [Voors et al. \(2012\)](#); [Callen et al. \(2014\)](#)), we are the first to examine effects

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<sup>1</sup>Most of the existing studies, even when they rely on individual interview data, are qualitative in nature. See [Laczko and Godziak \(2005\)](#) for a review.

on preferences post-trafficking. Due to the cross-sectional nature of our data, we do not have exogenous variation in the probability of being trafficked. Instead, we rely on a matching approach that uses entropy balancing to compare the preferences of trafficking victims to those of other girls with similar observable characteristics who were not trafficked. Our results suggest that, while trafficking does not seem to impact intertemporal preferences, it does cause victims to become more risk-loving. More precisely, trafficking causes the average victim's coefficient of relative risk aversion to fall by 0.13 to 0.18, which is roughly one-half of a standard deviation.

Our study is related to several strands of literature. The first is a relatively small literature on human trafficking.<sup>2</sup> A few early studies aimed at quantifying trafficking have focused on country risk factors (e.g. [Clawson and Layne \(2007\)](#); [Danailova-Trainor and Belser \(2006\)](#)). Recent work has explored the relationship between regulating the sex market and trafficking, both from a theoretical (e.g., [Lee and Persson \(2013\)](#)) and an empirical point of view (e.g., [Akee et al. \(2010\)](#); [Cho, Dreher and Neumayer \(2014\)](#); [Jakobsson and Kotsadam \(2016\)](#)). All these studies provide useful evidence from a policy perspective but are conducted at the macroeconomic (cross-country) level and do not investigate the determinants of trafficking at the microeconomic level. By contrast, [Mahmoud and Trebesch \(2010\)](#) analyze microdata from Eastern Europe and find that trafficking risk increases in areas of greater migration flows and decreases in areas with higher awareness about trafficking. However, because they have limited information on respondents' living conditions prior to being trafficked, the authors can provide little information on other pre-trafficking risk factors. Most of the remaining literature on human trafficking relies on qualitative evidence, crime statistics, or a combination of the two. In contrast, our study collects survey-type microeconomic data on former victims of trafficking.

From a microeconomic perspective, our work is also related to the literature on prostitution by [Edlund and Korn \(2002\)](#); [Gertler, Shah and Bertozzi \(2005\)](#); [Della Giusta, Di Tommaso and Strøm \(2009\)](#); [Robinson and Yeh \(2011\)](#); [Shah \(2013\)](#); [Arunachalam and Shah](#)

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<sup>2</sup>See [Jakobsson and Kotsadam \(2016\)](#) for a review.

(2013); Ghosal et al. (2015). While most existing theories of prostitution model it as a voluntary choice, this assumption does not hold in the case of trafficking. Furthermore, the vast majority of the trafficking victims in our sample were trafficked while under age, another feature that is not necessarily true of prostitutes. For these reasons, one may conjecture that the role played by family background and other environmental factors, as well as the consequences of social exclusion, may be different in the case of trafficking.

Finally, our work speaks to the extensive literature on child labor, especially on the “worst” forms of child labor (see Edmonds (2008) for a review). Households have been shown to respond to negative income shocks by sending children to work (Beegle, Dehejia and Gatti (2006)) and similar arguments have been put forward when discussing triggers of trafficking in policy circles. Intrahousehold structure, relations, and attitudes are widely known to play important roles in the allocation of resources and time (see, for example, Kanbur and Haddad (1994) and Ejrnaes and Pörtner (2004)). These factors could influence decisions to send children to work and to “sell” them to traffickers, to the extent that such choices are consciously made by households. One important difference emerges though, when we compare trafficking to child labor: while many children participating in household chores or other income earning activities combine work and school attendance (Edmonds, 2008), trafficked children typically exit the education system permanently. Our data support this: 66 percent of non-trafficking victims in our sample (i.e. children living in the shelters but not formerly trafficked) are continuing their education or have at least completed secondary school, compared to only 11 percent of trafficking victims. For these reasons, it is difficult to extrapolate from the above literature to conclude that the determinants of trafficking are the same as those of child labor. In the next section, we further elaborate on the differences between trafficking and the “worst forms of child labor” when presenting our research questions.

The remainder of the paper is organized as follows. In Section 2 we provide some background on human trafficking in the Philippines. In Section 3 we present our research questions, while in Section 4 we introduce our data and descriptive statistics. Section 5 contains

our results on the factors affecting entry into trafficking. We touch on the conditions experienced during trafficking in Section 5.2 and we examine the consequences of trafficking on victims' preferences in Section 5.3. Finally, Section 6 concludes with a discussion of the challenges facing future research on human trafficking.

## 2 Human trafficking in the Philippines

In 2003, the *United Nations Convention against Transnational Organized Crime* ratified a supplement to define and recognize human trafficking. According to Article 3 of the *Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Especially Women and Children* trafficking in persons is “the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation”. In this definition, exploitation refers to “the exploitation or the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organs” and encompasses “any person under eighteen years of age.”

Trafficking for sexual exploitation occurs when an adult is threatened or coerced into a commercial sex act. Proof of coercion is, however, not necessary for minors (under the age of 18) who are “recruited, enticed, harbored, transported, provided, obtained, or maintained to perform a commercial sex act” ([US Department of State, 2017](#)). We will rely on this latter definition to designate trafficking victims in our analysis.

Although legislation officially outlaws trafficking, the Philippines remains a source country for trafficking in persons. Populations that reside in poor urban areas and in rural communities suffering from natural disasters or armed conflict are deemed to be at high risk of trafficking ([US Department of State, 2017](#)). Traffickers, who are frequently known to victims, typically appeal to parents with false promises of high-paying domestic work for

their children. Given the culture of overseas migration in the Philippines, traffickers also target prospective migrants by advertising well-paying jobs overseas and providing recruits with fraudulent documentation to smuggle them out of the country ([Philippines Department of Social Welfare and Development, 2013](#)). Interviews indicate that many children trafficked for sexual exploitation come from large families with relatively poor and less educated backgrounds ([ECPAT, 2004](#)). Gender inequalities coupled with limited employment opportunities and lack of awareness about trafficking are also cited as major determinants of trafficking in the Philippines ([ECPAT, 2011](#)).

Victims of internal trafficking in the Philippines face forced domestic and factory labor, debt bondage in agriculture and fishing, and sexual exploitation. Sex trafficking, including that of children, is common in tourist destinations and frequently practiced at well-known establishments ([US Department of State, 2017](#)). Estimates from 2007 place the total number of girls exploited by the commercial sex industry in the Philippines between 60,000 and 70,000 ([ECPAT, 2011](#)). In 2014, the Department for Social Welfare and Development (DSWD) took in charge 1,228 trafficking victims, roughly 72 percent of whom were female. Approximately 34 percent were victims of forced labor and 19 percent had been trafficked for sexual exploitation ([Philippines Department of Social Welfare and Development, 2014](#)). At the time of our survey, the government supported a *Recovery and Reintegration Program for Trafficked Persons*, although it was challenging to guarantee adequate care to victims. Child victims rescued by DSWD were required to stay in one of 26 shelters operated in the Philippines by the DSWD, but these shelters did not always have the appropriate facilities to address their specific needs. While NGOs supplemented this gap to some extent, the overall environment provided limited long-term support to trafficking victims. Victims thus face a high risk of re-trafficking ([US Department of State, 2017](#)).

### 3 Conceptual framework

Our goal in this paper is threefold. First, we aim to understand what factors facilitate or trigger entry into trafficking; second, we provide quantitative evidence on the economic conditions experienced during trafficking; third, we try to assess the consequences of trafficking on two specific aspects of behavior: intertemporal preferences and risk aversion.

Starting from its determinants, though trafficking is often framed as a story of poverty, little is understood about specific characteristics that may place some individuals at a greater risk of victimization than others. A first set of candidates are extreme poverty and economic shocks. In the context of child labor, [Beegle, Dehejia and Gatti \(2006\)](#) show that households frequently respond to negative income shocks by sending children to work, suggesting that child labor forms part of a household's self-insurance strategy. Similarly, models of selection into the worst forms of child labor argue that the poorest households disproportionately opt for hazardous jobs due to the higher returns these jobs provide ([Dessy and Pallage, 2005](#); [Edmonds, 2008](#)). [Edmonds and Shrestha \(2014\)](#) present evidence from the first randomized controlled trial of a policy intervention to combat hazardous child labor. They provide child carpet weavers in Nepal with scholarships for school expenses or scholarships together with an in-kind transfer conditional on school attendance. The authors find temporary but not persistent effects on school attendance. The lack of persistence lends support to the idea that earnings from child labor play a crucial role in explaining why a household sends a child to do a hazardous job.

A second set of potential determinants includes variables related to household composition and parental preferences. Household size, sibling gender composition, birth order and spacing between siblings have potentially influential but ambiguous implications for the child labor decision. While parents may have relatively more resources to invest in an older child (due to reduced competition), this child might also be subject to more responsibility to support the household financially. Younger, later-born children might face scarcer household resources but could, on the other hand, benefit from transfers from their older siblings. Several empirical studies provide evidence that older children are indeed more likely to be sent



to work to support the household (Edmonds, 2006; Manacorda, 2006; Emerson and Souza, 2008; Dammert, 2009). There is also an interesting gender dimension to these effects. While sibling rivalry may induce competition for resources among children of the same gender, the effect is likely to be culture dependent. For example, a higher number of females in the household is associated with higher educational attainment in some cases (Akresh and Edmonds, 2011) and lower educational attainment in others (Lillard and Willis, 1994). Finally, given that parents exercise much control over their child’s labor decisions, their gender attitudes and preferences may influence the propensity for a child to be trafficked. Accurately capturing such attitudes and norms is challenging. Consequently, their role in child labor decisions is poorly understood in the empirical literature. Edmonds (2008) suggests that proxying for parental attitudes with community-level norms may be one way to sidestep this issue. We adopt this suggestion in Section 5.1. To the extent that relationships with conflicts between children and parents can partially capture parental preferences, we study this characteristic as well.

Misaligned expectations are another oft-cited reason for the decision to undertake jobs promising high rewards. Expected income is one component, but the dream of marrying a rich client is common in informal accounts of former victims of trafficking (ECPAT, 2004). Related to this is the notion that girls and families may be deceived by “recruiters” who visit villages and communities advertising jobs as bartenders, dancers, or housekeepers, and then trick young girls into prostitution by holding them hostage through physical constraints or through debt bondage. Indeed, Rogers and Swinnerton (2008) argue that children selecting into the worst forms of labor have poor information on what the work involves (in particular, they are likely to be deceived) and then face exit barriers (e.g., they are held captive). We will try to assess the prevalence of expectation misalignments and information asymmetries in our sample.

Most available information on the conditions experienced during trafficking stems from qualitative reports. In addition to physical and verbal abuse, victims are often barred from moving about freely. They may work long hours and, despite facing serious health risks, have

limited access to health care (ECPAT, 2004). While prostitution generates high monetary returns (Lee and Persson, 2013), many trafficking victims become heavily indebted to their employers or develop drug addiction, which makes leaving even more difficult. With our survey data, we are able to shed some light on conditions experienced by victims during trafficking.

Regarding the consequences of trafficking, a literature exists on the medical and psychological front. Although there is little evidence of short-run effects of child labor on health (O'Donnell et al., 2002; Francavilla and Lyon, 2003; Beegle, Dehejia and Gatti, 2009), poorer adult health outcomes are found in former child laborers (Kassouf, Mckee and Mossialos, 2001). With respect to hazardous child labor, Blattman and Annan (2010) find that military service of child soldiers in Uganda undermines the long-term economic performance of children mainly via reductions in education, while adverse mental health effects are present in those exposed to the worst violence. Given this evidence, we should expect severe health consequences for trafficking victims, as coercion into sexual work can cause deep psychological trauma. Public health studies highlight physical, psychological, and sexual implications of trafficking for sexual exploitation as well as the detrimental effects of stigmatization (Tsutsumi et al., 2008; Zimmerman, Hossain and Watts, 2011).

Moreover, coerced sex work may alter victims' risk attitudes and patience.<sup>3</sup> Recent empirical evidence supports the idea that preferences are temporally or permanently malleable in response to traumatic life experiences. How risk preferences react to such experiences may depend on whether trauma has induced anger (leading victims to be more risk-seeking) or fear (leading victims to be more risk averse). Similarly, if negative shocks spur self-protective behavior, victims may have higher discount rates. Voors et al. (2012) show, through a series of lab-in-the-field experiments, that individuals exposed to conflict in Burundi have lower risk aversion and higher discount rates. Callen et al. (2014) show that exposure to violence in Afghanistan induces preferences for certainty.<sup>4</sup> Using both subjective and objective data

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<sup>3</sup>Risky sexual behavior can be the result of a low degree of risk aversion (see Gertler, Shah and Bertozzi (2005) for a discussion), but this does not necessarily extend to *coerced* sexual behavior.

<sup>4</sup>See also Eckel, El-Gamal and Wilson (2009); Cassar, Healy and Von Kessler (2011); Malmendier and Nagel (2011); Cameron and Shah (2015).

on preferences, we attempt to analyze if the experience of human trafficking alters victims' preferences in a similar fashion.

## 4 Data

### 4.1 Survey

In the fall of 2009 and spring of 2010, we conducted surveys in 12 shelters for women and girls in the Cebu metropolitan area of the Philippines. Our ability to conduct this survey on such a vulnerable population hinged largely on the availability of local partners specialized in assisting victims of trafficking.<sup>5</sup> As a result of their cooperation, we were virtually able to cover the universe of shelters in the Cebu metro area. The surveyed shelters host, care, and educate young girls at risk of social exclusion. Their population includes orphans and abandoned children, child laborers and street children, and victims of abuse and trafficking. These vulnerable children faced many dangers before entering the shelter, including injury and illness, inadequate food and shelter, lack of medical care, exploitative caregivers, and mental trauma.

All residents aged 14 and older were surveyed, regardless of their trafficking status, resulting in 365 interviews in total. While this is not a large sample size, the challenges inherent in surveying this type of population impose limitations on the possibility of conducting a study like ours on a large scale. We surveyed both trafficked children as well as other girls living in the shelter in an attempt to establish a comparison group of girls from similar backgrounds as the trafficked children. The non-trafficked girls surveyed are girls that had been identified by social workers as being at-risk in terms of neglect and abuse and, as a result, placed in these shelters.

Prior to the start of the interview, each prospective respondent was given a short overview of the nature of the survey and its purpose. She was then asked whether she agreed to

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<sup>5</sup>Our study was approved by the Philippines' Department of Social Welfare & Development (DSWD) on 09/09/2009 with protocol no. PDPB-ENDO-090015.

be interviewed. All interviews were entirely voluntary and anonymous. Interviews were conducted by selected female enumerators who had previously received training as volunteer social workers.

Our questionnaire first collects retrospective data on the economic and family characteristics of the respondent before she left the household, including information on family structure, interpersonal relations, domestic violence, and parental attitudes. The survey then prompts the respondent to describe her last job before entering the shelter. Shelter staff identified trafficking victims, but instructed us to avoid asking directly about sex work, so we included a series of questions on the ‘last job’ done by the respondent, which were intended to indirectly retrieve information about the situation during the girl’s trafficking period.<sup>6</sup> Respondents were also asked to answer questions and play hypothetical games that gauged their preferences towards risk and intertemporal decisions, as well as their expectations about the future. These questions help to shape a before/after profile of each individual.

Our survey was not exempt from challenges. While we envisioned a longer and more detailed survey from the outset, shelter staff advised cutting the length of the survey since some respondents would find concentrating for long periods of time challenging.<sup>7</sup> The average interview took roughly 47 minutes, with a standard deviation of 27 minutes.

Finally, a brief comment on the representativeness of our sample. Human trafficking remains relatively under-studied due to data limitations. In household surveys, minors who have left the household are not included in household rosters. Surveying victims of trafficking is very difficult for several reasons. First, it is challenging to find and identify them. Second, even if one were able to find them, there may be selection in the types of victims that one can reach. In this paper, we survey women and children who are recovering in shelters, and we are

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<sup>6</sup>The questions on the ‘last job’ were not asked to the non-trafficking victims since they did not have a job prior to entering the shelter.

<sup>7</sup>de Nicola and Giné (2014) discuss two potential reactions of the respondent to the length of survey (and its implications for recall). The first is that rapport with the enumerator improves and respondents feel more comfortable responding to questions. The second is that respondents may experience survey fatigue, which causes their concentration to fall. The latter issue is particularly relevant for our population, given the psychological costs of their past experience.

therefore able to reach a targeted population minimizing the problem of self-selection. This is because entry into shelters occurs through a variety of means (police raids, indications by social workers or family members, etc.), which limits the extent to which systematic sorting may be occurring. In our case, police raids in bars and clubs where the girls were working were reported as a common method through which girls were directed to shelters.

## 4.2 Definition of trafficking and descriptive statistics

We define a respondent as a trafficking victim if she began to engage in commercial sex acts before the age of 18.<sup>8</sup> Because we did not directly ask respondents about their engagement in commercial sex, social workers from each shelter identified which respondents were trafficking victims. In our survey, these victims typically reported working in jobs such as waitress, ‘guest relations officer’ (GRO), entertainer or dancer.

Our sample for analysis includes 126 trafficking victims and 219 non-trafficking victims, yielding a total of 345 individuals. We exclude the 20 adult prostitutes who claimed to have entered their line of work after 18 years of age from our sample. Table 1 presents summary statistics of the main variables, and Appendix table A.1 provides a more comprehensive list.

[Insert Table 1 here]

Trafficking victims are on average 21 years of age at the time of the survey, while non-trafficking victims are younger, at 17 years old on average. Respondents who were not trafficked have roughly two more years of education than trafficking victims. Trafficked respondents are more likely to come from urban areas and from households that are wealthier.<sup>9</sup> In terms of household demographics, trafficking victims on average have 5.5 siblings while non-trafficking victims have 4.6.

[Insert Table 2]

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<sup>8</sup>Note that, according to the Philippine Republic Act 7610 and Republic Act 9208, an individual below that age of 18 is also considered a child.

<sup>9</sup>Wealth is measured through an index that captures ownership of durable goods. Specifically, we take the first principal component of the following assets, where loading factors are included in parentheses: bicycle (0.30), car (0.12), mattress (0.43), motorcycle (0.30), radio (0.22), refrigerator (0.45), stove (0.43), television (0.40).

It is useful to explore how our sample compares to the general population of the Philippines. The majority of our respondents are from the Central Visayas region. In Table 2, we rely on Demographic and Health Survey (DHS) data from four rounds (1993, 1998, 2003 and 2008) to compute summary statistics for the average household in the Central Visayas.<sup>10</sup> For a number of key variables, we report mean values for our sample in column 1, and means for the above mentioned DHS rounds in columns 2, 4, 6 and 8, respectively. In the remaining columns we show the difference between our sample and the DHS means, indicating cases when these differences are statistically significant at conventional levels with asterisks. The number of observations are in square brackets. Compared to the average DHS respondent, our sample includes girls who are 9 to 15 percentage points more likely to come from urban areas and 5 to 10 percentage points more likely to come from poor households.<sup>11</sup> Moreover, girls in our sample come from households that are significantly larger (7 as opposed to 5 members on average), and that have a higher number of minors compared to the average DHS household. No significant difference emerges in the share of girls living at home.

## 5 Results

### 5.1 Entry into trafficking

Edmonds (2008)'s standard model of child labor shows that the household's decision problem is a function of a household's standard of living and a child's future welfare. This decision is subject to constraints on the child's time which can be divided between education, leisure, outside work, and household labor. This simple set-up suggests that poverty, returns to schooling, and parental preferences play decisive roles in how parents allocate and value a child's time.

Although alternative models have been proposed for studying hazardous forms of child

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<sup>10</sup>In the table we report several years and not only the one closest to our survey because the girls in our sample entered into trafficking at different points in time, some of them already in the mid-1990s.

<sup>11</sup>We compute an indicator for poverty equal to one if a household falls below the average wealth. For DHS surveys, this indicator is based on the DHS wealth index, while for our sample we create a similar indicator based on our asset index.

labor, to the best of our knowledge no specific theory has been developed to understand the decision behind human trafficking. Therefore, we use this simple framework to guide our presentation of the correlates of human trafficking in this section. We proceed by regressing an indicator for being trafficked on various characteristics using a linear probability model.<sup>12</sup> First, we show how household composition relates to the probability of being trafficked. We document parental preferences toward the gender composition of their children as well as intrahousehold conflict. We then turn to income shocks, examining various shocks experienced by a household in the year prior to the one in which the respondent left the household.

### **Household characteristics and parental preferences**

In Table 3 we regress the probability of being trafficked on several characteristics of the respondent and her household at the time she left. We include indicators for whether a respondent's birth mother and father were alive and if the respondent was an only child or lived in an urban area.<sup>13</sup> We also control for household assets and its square.

[Insert Table 3]

Column 1 shows that the total number of siblings is positively and significantly related to the likelihood of being trafficked. The number of siblings loses significance when we control for a respondent's number of sisters (column 2). Hence, what seems to be important is whether the girl has sisters, not siblings, per se. In column 3, we distinguish between sisters who are older or younger than the respondent, and we find that the higher the number of older sisters, the more likely that a girl is trafficked. We then further disaggregate sisters by whether they lived inside or outside the household (column 4). Each additional older sister in the household is associated with a 6.6 percentage points higher probability of being trafficked, while sisters living outside the household have, if anything, the opposite effect, albeit insignificant. The coefficients remain similar in magnitude and significance when

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<sup>12</sup>Results are similar when using a probit model (available from the authors).

<sup>13</sup>Information on these characteristics is collected retrospectively at the time we administer our survey. Given the nature of these variables, we think that recall bias is unlikely to play a major role. For more sensitive questions, we discuss the potential nature and direction of the bias below.

introducing additional covariates for parental presence in the household (column 5): whether or not the respondent lived with her birth mother, birth father, or both birth parents.

Consistently through all specifications in Table 3, we see that having the birth mother or father alive does not affect the likelihood of being trafficked. However, being the only child in a household decreases the likelihood that the girl became a trafficking victim to virtually zero (given an average probability of being trafficked of 0.37 in our sample), other things being equal. Also, *ceteris paribus*, girls who lived in urban areas had a 27 percentage points higher probability of being trafficked.

Overall, the results in Table 3 indicate that for a household with several girls, the younger ones face higher risk of becoming a victim of trafficking. Earlier empirical studies on child labor have shown that older children are more likely to be sent to work to support the household. However, in our data, we see that this channel does not work the same way when the decision is about trafficking instead of traditional work. These results are also consistent with existing studies on cultural preferences in the Philippines. For example, in the Philippines the first- and last-born children are often favored (Mendez and Jocano (1974)), although the first-born may receive particular attention from parents as he or she will be in charge of their old-age security (Medina (1991)).

To gain a clearer picture of the relationship between trafficking and cultural preferences, we next turn to nationally representative DHS data from the year 1998.<sup>14</sup> The DHS survey asks female respondents about their preferred or ‘ideal’ number of daughters and sons.<sup>15</sup> We use this data to compute the average ideal number of girls, boys, and total children by province and household size. We then match these averages by province and household size to each respondent in our original dataset. The goal here is to approximate the local social

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<sup>14</sup>This is the earliest available DHS survey that will allow us to approximate gender preferences near respondents’ year of birth. In fact, given that our own survey was conducted in 2009-2010 and that we restrict the sample to girls age 14 and above, all our respondents were born before 1998.

<sup>15</sup>To get a sense of trends in the region, for the average woman in the Central Visayas the total number of children born decreased from 2.5 in 1993 to 1.98 in 2008. Her ideal number of children also decreased from 3.06 to 2.7. The total number of daughters decreased from 1.06 to 0.91, and the total number of sons also decreased from 1.25 to 0.99. The ideal number of girls decreased from 1.41 to 1.21, and the ideal number of boys decreased from 1.33 to 1.09. Thus, the final preferred gender ratio is slightly biased in favor of girls, though the *actual* gender ratio is biased in the opposite direction.



norm as much as possible (hence the geographic focus on the province of origin), accounting for socioeconomic factors that may correlate with household size at the same time. For each respondent, we compute three measures: (i) the difference between the actual number of girls in her household at the time she left and the *ideal number* of girls in a representative household of the same size in her province; (ii) the difference between the actual share of girls in the household and the *ideal share* of girls in a household of the same size in the province; and (iii) an indicator equal to one if a respondent's actual birth order is higher than the ideal number of girls in a household of the same size in the same province.

[Insert Table 4]

Table 4 regresses a respondent's trafficked status on each of these three measures in turn, controlling for location and household characteristics. Regardless of the measure used, we observe that the probability of being trafficked increases if a respondent lives in a household that deviates positively from the provincial norm. In other words, the probability of being trafficked increases if the girl's household had more daughters than socially desired in her province by households of a similar size to hers, and if the respondent's birth order places her above the desired number of children in a comparable household in her province. This result reinforces the results in Table 3, which show that a higher number of older sisters in the household increases the propensity to be trafficked.<sup>16</sup>

A potential caveat for the above analysis is that the DHS data may be subject to bias from ex-post rationalization, whereby a mother's ideal number of children is likely to approach the number of children she has. In the data, the correlation between the ideal number and the actual number of children averaged at the household-province level is 0.6. The mean ideal number of children is 4.14 and the mean total number of children is 5.90. A paired t-test of the difference in means reveals that the total number of children is 1.76 higher on average than the ideal number. In other words, women have more children than they would prefer, which suggests, at least to some extent, that our measure of deviation from the ideal

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<sup>16</sup>Note that this effect does not pick up household size, because our measure of social norm is computed from households of the same size as the one to which we match.

norm can be informative even in the presence of ex-post rationalization.

[Insert Table 5]

In Table 5 we regress trafficking status on intrahousehold conflict, where conflict is defined by an indicator for quarrelling between (i) the respondent’s mother and father (column 1); (ii) a respondent and either one of the parents (column 2); (iii) a respondent and her mother (column 3), or (iv) a respondent and her father (column 4). The results show that parent-respondent conflict is positively related to trafficking, but this relationship is driven entirely by mother-respondent quarrelling, while father-respondent quarrelling has a precisely estimated zero coefficient. This result might be important for the Filipino context, where mothers typically control the household’s financial decisions (Ashraf, 2009).<sup>17</sup> Finally, while we might expect intergenerational conflict to be more pronounced in the presence of a step-parent, we are unable to investigate this channel as we observe only four respondents with step-mothers in our dataset.

### Health and income shocks

We next examine the role of shocks experienced by the household in the year prior to the girl’s departure. We explore three types of shocks: illness of a household member (column 1), job loss of a household member (column 2), and weather shocks at the village level (column 3).

Weather shocks are measured using the Standardized Precipitation Evapotranspiration Index (SPEI), a global drought index computed from precipitation and standardized potential evapotranspiration and reported in standard deviations from averages over various timescales from one to forty-eight months (Vicente-Serrano, Beguería and López-Moreno, 2010).<sup>18</sup> To measure conditions preceding a respondent’s departure from her household, we use the end-of-year deviation from the twelve-month village average in the year before

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<sup>17</sup>In our dataset, we observe that 26 percent of mothers have exclusive decision making power over finances and schooling.

<sup>18</sup>We downloaded this data from the Global SPEI Database, SPEIbase: <http://spei.csic.es/database.html>; accessed in July 2014.

her departure, using this deviation as a proxy for income shocks.<sup>19</sup> The Philippines, like many developing countries, heavily relies on agricultural production as a source of income, and a large fraction of the workforce is employed in the mainly rainfed agricultural sector. Agricultural practices depend on natural weather patterns and variations in rainfall result in large variations in agricultural output and farm incomes. Therefore, weather shocks are plausible proxies for household income shocks. [Yang and Choi \(2007\)](#) also use rainfall shocks as an instrument for income shocks in the Philippines, arguing that negative rainfall shocks detrimentally affect both rural and urban households, the latter via reduced demand for non-agricultural goods and services.<sup>20</sup> A key advantage of using weather shocks for the purpose of identification is their exogeneity ([Rose, 2001](#)).

[Insert Table 6]

Table 6 shows that neither illness (column 1) nor job loss (column 2) in the family of origin during the year before the girl left are significantly associated with trafficking. Qualitatively, the directions of the two estimated coefficients are intuitive: illness might require extra help around the household, thus reducing the likelihood that a girl is sent away, while job loss may call for a girl to be sent to work to make up for the lost income.

Shocks to SPEI (indicated as ‘ $\Delta weather$ ’ in Table 6) have a non-linear relationship with trafficking (column 3), with positive weather shocks reducing the probability of trafficking over our sample range. In particular, *ceteris paribus*, a one standard deviation increase in  $\Delta weather$  reduces the probability of being trafficked by 6.4 percentage points. The relationship with weather shocks holds when controlling for all types of contemporaneous shocks (column 4). The significant effect of weather, compared to the insignificant relationship with illness and job loss, may be due to reduced measurement error, as well as to the fact that weather shocks may affect a larger number of household members (as opposed to health or employment shock which directly affect one member).

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<sup>19</sup>When weather information was unavailable for a village, we used the next-nearest weather station for which the index is reported.

<sup>20</sup>[Yang and Choi \(2007\)](#) further show that households with overseas migrants use remittances to smooth consumption. This concern does not apply to our sample as we only see 5 cases of girls whose parents are overseas (4 among non-trafficked victims and 1 among trafficked victims).

## **Information and expectations prior to leaving the household**

Obtaining a clearer idea of a respondent's information and expectations at the time of leaving the household is critical for understanding entry into trafficking. Table 7 presents the difference in means between trafficked and non-trafficked respondents with respect to several characteristics at the time they left, reported retrospectively.

[Insert Table 7]

When they left their household, trafficking victims were more likely to know a girl who had left their village but less likely to be the first among their siblings to leave the household. The knowledge of other girls who had left the village is consistent with two potential mechanisms of entry into trafficking. One is related to aspirations, e.g. the desire to follow the example of young people who have left home to look for a brighter future. The second relates to a recruitment channel often discussed in the policy debate on trafficking: former victims become intermediaries, returning to their villages and advertising attractive employment opportunities to other girls.

To better understand the beliefs held by victims before they were trafficked, we elicited subjective expectations directly from the respondents. Respondents were asked to project themselves back to the time when they left the household and rate their expectations of the probability of occurrence of different events by ticking a box on a line with 10 boxes, each one representing a 10 percent increment in probability from “no chance at all” to “for sure”. Table 7 shows that, before leaving their household, trafficked victims were 14 percentage points more likely to believe they would marry a foreign man and 20 percentage points less likely to anticipate returning to school compared to non-trafficking victims. Trafficked and non-trafficked girls instead do not differ in their expectation of sending money home to their families, both groups believing that they would do so with a likelihood of about 65 percent. Our interest in these variables comes from the possibility that entry into trafficking may be triggered by misaligned expectations, e.g. more optimistic priors on favorable events or economic conditions. Such misalignments would form the basis for policy interventions centered around information campaigns.

One concern with the above results is that the data might suffer from ex-post reporting bias, since all questions were asked months or years after respondents had left their households. The responses could therefore be affected by what the girls experienced during the period between leaving the household and our interview. In particular for trafficking victims, responses may reflect what happened during the period of trafficking. While we cannot rule this out, we note that for the variable ‘*Likelihood of marrying a foreign man*’, the results go in the opposite direction to what ex-post rationalization would suggest. In fact, as we discuss in the next section, marrying a foreign client is a relatively rare event for a trafficked girl. Hence, if respondents were to misreport their beliefs ex-post, they should update downwards, not upwards (while we find a positive difference in expected probabilities between trafficked and non-trafficked respondents).

## 5.2 Conditions during trafficking

For the subsample of respondents who were identified as trafficked, we asked a number of questions about their experiences in their ‘last job’ before entering the shelter, which was our way of referring to the period of trafficking without stigmatizing respondents or causing uneasiness. Table 8 presents these descriptives.

[Insert Table 8]

Bonded labor, while sometimes cited as an intrinsic feature of trafficking, does not seem to be common in our sample: only 9 percent of families received an advance payment from their daughter’s employer. A majority of trafficking victims (85 percent) reported that their families were unaware of the nature of their job. Just over 50 percent of victims indicated that the job they received was different than what was described to them at the outset. Thus, while half of victims were deceived from the beginning, the other half were aware of what their work would entail. This is a striking fact.

On average, respondents reported working with 32 other co-workers during their last

job.<sup>21</sup> However, the standard deviation is large, at 31. Of these co-workers, 10 percent are reported to have married a foreign client, 15 percent to have become pregnant, and 7 percent to have fallen seriously ill. Because these measures rely on memory recollection, we face two potential issues. The first is that our statistics will be biased upwards if respondents are more likely to remember those girls to whom something unusual happened and forget the others. For example, if getting pregnant is salient then the respondent might think that the event was more common than it actually was. On the other hand, girls experiencing unusual events might leave the workplace, and the event would remain unknown to others.

Table 8 further shows that respondents spent on average 2.4 years in their last job (though this duration varies substantially) and worked an average of 6 nights per week. The average salary was 1,148 PHP per night or 27,552 PHP per month.<sup>22</sup> For the year 2009, this wage rate puts sex workers in an income bracket comparable to that of high-skilled workers in the Philippines. This is consistent with the global evidence that prostitutes, particularly younger ones, receive an earnings premium relative to other low-skilled laborers due to higher riskiness and stigma (see [Edlund and Korn \(2002\)](#) for a discussion). Finally, for the subsample of respondents who were indebted to their employer, the average debt amounted to 2,700 PHP.<sup>23</sup>

### 5.3 Consequences of trafficking

The experience of being trafficked for sexual purposes is extremely traumatic. Prostitution itself is a high-risk activity, typically accompanied by social stigma. On top of that, trafficking victims also face physical and emotional abuse. As discussed in Section 3, victims react to traumatic events by altering their behavior, and this can have important implications for recovery programs. For example, [Ghosal et al. \(2015\)](#) show that prostitutes who underwent a psychological training program aimed at improving self-image positively changed their

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<sup>21</sup>Note that this number refers to multiple years. In fact, in Table 8, the average number of years spent in the last job is 2.4.

<sup>22</sup>At an exchange rate of 44.32 PHP to USD in 2009, this yields a salary of roughly 26 USD per night.

<sup>23</sup>Out of the 124 respondents that provided an answer to the question on whether they had any debt towards the employer, only 16 respondents had a positive debt.

future-oriented behavior. In this section we describe some features of our survey that allow us to account for respondents' time and risk preferences, and we attempt to assess how the experience of trafficking impacted these preferences.

### **Measuring time and risk preferences**

To measure inter-temporal preferences, we follow a standard experimental design for eliciting individual discount rates (Thaler, 1981; Andersen et al., 2008). The respondent is asked to choose between a given sum of money that she receives in the short term and a higher sum of money to be received at a later date. While in regular experiments respondents are actually paid those sums, for ethical reasons related to the girls' presence in the shelters, we could not pay the participants. We made it very clear to them that they would not receive a payout. Instead, we asked the respondent to behave "as if" she were to receive money and prompted her to react as she would in a real situation.<sup>24</sup> In our survey, respondents were given the choice of (fictitiously) receiving 500 PHP in one week (Option A, or the "impatient" choice) or receiving  $500+x$  PHP in five weeks (Option B, or the "patient" choice), where  $x$  increased by 50 PHP for each of twelve payoff options. Respondents were asked to choose between Option A and Option B for each of the twelve payoff alternatives. Based on the point at which a respondent switches from the impatient to the patient choice, we can compute her discount rate.

To understand how respondents who are victims of trafficking compare to non-trafficked girls in risk attitudes, we use the Holt and Laury (2002) experimental measure of risk aversion using a multiple price list. Each respondent is presented with a choice between two alternatives, A and B. The respondent has to consider a situation in which she chooses between these two options: option A provides money with certainty, and option B involves playing a lottery with a 50:50 chance of success. The lottery is such that the respondent would gain 500 PHP in the event of success and zero otherwise, yielding an expected payoff of 250 PHP. A risk neutral individual should always prefer option A if the sure amount offered is greater

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<sup>24</sup>We used the following phrasing: "Imagine that you were a participant in a game where someone asks you to choose between different options where you can win some money. This is an imaginary and not a real situation but please try to answer as if you were really given that choice."

than 250 PHP, while she should always prefer option B when the sure amount is less than 250 PHP. On the other hand, a risk averse individual could be content with receiving less than 250 PHP with certainty. We repeatedly presented the choice between options A and B, gradually increasing the sure amount in option A by 25 PHP, until the respondent preferred option A. We use the point at which the respondent switches from the safe option (A) to the lottery (B) and compute the coefficient of constant relative risk aversion (CRRA), using  $U(y) = \frac{y^{1-\gamma}}{1-\gamma}$  for lottery prize  $y$  and latent risk coefficient  $\gamma$ . As with the previous experiment, we made clear to the respondents that we were putting them in a hypothetical situation, but that they should try to provide an answer that was as realistic as possible.

In addition to gathering experimental measures of time and risk preferences, we also elicited respondents' subjective preferences in a manner similar to how we elicited subjective expectations. We ask respondents to rank their willingness to take risks and their impulsiveness on a scale from 1 to 10. On a similar scale we also elicit the importance of conforming to others' expectations and respondents' self-confidence.

[Insert Table 9]

Table 9 compares the difference in means in objective and subjective preferences as well as in expectations between the respondents who were trafficked and those who were not. The two groups do not exhibit any significant differences in time preferences but show differences in risk aversion: trafficking victims are more risk-loving compared to the non-trafficked girls. The CRRA coefficient is 0.45 for trafficked respondents and 0.58 for non-trafficked respondents, which is significantly different at the 1 percent level. These values are broadly consistent with other studies on low-income populations: for example, [Brick, Visser and Burns \(2012\)](#) estimate a CRRA coefficient of 0.39 on 555 individuals in fishing communities in south Africa. [Harrison, Humphrey and Verschoor \(2010\)](#) conduct lab-in-the-field experiments with 531 respondents from ultra-poor areas of Ethiopia, India and Uganda, and they estimate a CRRA coefficient of 0.54.

In terms of self-reported preferences and behavior, there is no significant difference between the average willingness to take risks, impulsiveness, confidence, contact with family or



desire for children. However, trafficking victims are less likely to believe that conforming to others' expectations is important. Expectations regarding future earnings in the next job do not significantly differ between the two groups. This is interesting from a policy perspective, because one of the arguments sometimes put forward to explain why it is difficult to reintegrate former victims in the labor market is that they became accustomed to high hourly earnings from prostitution and do not want to take on low-paying jobs. This argument does not seem to be supported by our data.

Finally, we compare ex-ante expectations and ex-post experience using the sample of trafficking victims for a variable of particular interest: the probability of marrying a foreign client. This is another recurring topic in the anecdotal literature on trafficking: girls being attracted to (or retained in) the job with the hope of improving their lifetime situation through a lucky marriage. Panel A of Figure 1 shows the distribution of the probability of marrying a foreign man, as perceived by the respondent at the time of leaving the household.<sup>25</sup> This ex-ante probability shows a peak in the first of 10 bins (which corresponded in our question to “no chance at all”), another peak at 5, and a (smaller) peak at 10 (representing certainty).

[Insert Figure 1]

To measure the ‘objective’ probability of marrying a foreign man, we rely on girls’ actual experience during the time when they worked in the sex industry. We asked each respondent to remember what happened to her entire reference group, i.e., all other sex workers she had met. Specifically, we first ask how many girls each respondent met while working during trafficking, and then ask how many of these girls married a foreign man. The ratio of the latter to the former gives us the ex-post frequency, which we display in Panel B of Figure 1. In contrast to the ex-ante probability, Panel B clearly shows that in the majority of cases (70 percent), the respondents did not witness any marriage at all between their co-workers and a foreign client. The contrast between the two panels is striking: in the face of high expectations ex-ante, the reality is that few, if any, girls conclude their experience

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<sup>25</sup>This probability is elicited retrospectively, asking the respondent to go back in time to the moment when she left and remember what she expected back then.

as sex workers with a lucky marriage. While the figures in Panel A may be biased due to the retrospective nature of the assessment, if anything one would expect that girls would underestimate their ex-ante beliefs, after having observed so little success ex-post. The wedge between ‘the dream’ and reality opens the scope for information campaigns targeting young girls and their families.

### **Effect of trafficking on preferences**

We next study the effect of trafficking on respondents’ preferences. In this analysis our sample contains two types of individuals: victims of human trafficking and girls considered vulnerable, neglected, or at risk of exploitation or abuse by social workers, but not trafficked. We use the latter as a counterfactual under the assumption that trafficked and vulnerable girls may share similar unobservable characteristics. This is a strong assumption, which may be invalidated by two different types of selection. The first concerns why certain girls were trafficked and others not, even though they originated from similarly vulnerable families. The analysis in the first part of the paper speaks to this point, suggesting that sibling composition and birth order play a significant role together with shocks experienced by the household. When estimating our regressions, we therefore control for these variables, as well as for other observable characteristics listed in Table 1. The second type of selection regards the fact that, conditional on being trafficked, a girl ends up in our sample or does not. In this respect, we should note that whether a victim is rescued from trafficking (and hence included in our sample) mostly depends on the decision of the police to conduct a raid in a bar or a club, and very rarely on the choice of the respondent. This alleviates concerns about this type of selection.

Having said this, it is certainly true that a simple comparison of trafficked and non-trafficked respondents may yield biased estimates. Hence, we turn to matching techniques. Due to our limited sample of observational data, we rely on entropy balancing to generate covariate balance with a binary treatment as described in [Hainmueller \(2011\)](#). Put simply, entropy balancing is a generalization of conventional propensity score matching in which

weights vary smoothly across units and adjust directly to sample moments.<sup>26</sup> This technique is particularly suitable for our small sample because it does not require unsuitable matches to be discarded. Moreover, entropy balancing lowers model dependency by orthogonalizing trafficking relative to observables in imposed balance conditions.

Using a maximum entropy reweighting scheme that relies on a large set of conditions based on first, second, and higher order sample moments, we balance treatment and control group on selected observables to generate the average treatment effect on the treated (ATT), that is  $E[Y(1)|T = 1] - E[Y(0)|T = 1]$ .

More formally, as described in detail by [Hainmueller \(2011\)](#), by employing a weight  $w_i$  for each control unit (a vulnerable, non-trafficked respondent), the following describes the estimated counterfactual mean:

$$E[Y(0)|\widehat{T} = 1] = \frac{\sum_{i|T=0} Y_i w_i}{\sum_{i|T=0} w_i} \quad (1)$$

Weights follow the reweighting scheme:

$$\min_{w_i} H(w) = \sum_{i|T=0} h(w_i) \quad (2)$$

where  $h(\cdot)$  is a non-negative and decreasing loss function for minimizing the distance between the distribution of estimated control and base weights. Equation 2 is subject to a set of  $R$  balancing conditions ( $\sum_{i|T=0} w_i c_{ri}(X_i) = m_r$  where  $r \in 1, \dots, R$ ) and normalization constraints such that the set of weights sums to one ( $\sum_{i|T=0} w_i = 1$ ) and is non-negative ( $w_i \geq 0$  for all  $i$  such that  $T = 0$ ). The  $w_i$ 's satisfy the constraints while remaining as close as possible to a set of uniform base weights.

We thus run the weighted estimation of the outcome (preference) of individual  $i$ ,  $Y_i$ , on trafficking status ( $T_i$ ), a vector of individual covariates ( $X_i$ ) and region fixed effects ( $\delta_r$ ). Standard errors are clustered at the province level.

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<sup>26</sup>Entropy balancing has recently been applied to study the effect of unemployment on spousal mental health in Germany ([Marcus, 2013](#)) and the relationship between individual opinions and Eurozone bailouts ([Bechtel, Hainmueller and Margalit, 2014](#)).

$$Y_i = \gamma T_i + \mathbf{X}_i \psi + \delta_r + \epsilon_{ir} \quad (3)$$

Equation 3 relies on sufficient overlap between treated and control observations (without which we cannot achieve balance) and the unconfoundedness assumption that no unobserved factors influence both the outcome (in our case, preferences) and the likelihood of being trafficked. While we cannot completely rule out the influence of unobservables, drawing a sample from a pool of at-risk girls with similar observables likely mitigates this risk.

The small size of our sample poses a challenge to an entropy balancing approach. If the treated and untreated groups are relatively small, we may not have sufficient overlap in our selected balance constraints. In an extreme case, this implies that no matches exist to satisfy the balance constraints we impose, particularly for higher order moments. Fortunately, our data show that trafficked and non-trafficked respondents share many similar observables, which ensures convergence in the weight estimation. To further address this issue, we exclude from our balance constraints covariate moments that are not meaningful for identification.

However, a second challenge arises if only a handful of matches exist to satisfy a particular balance condition. If this is the case, our balanced sample could contain a few heavily weighted observations. Again, sufficient overlap between trafficked and non-trafficked respondents produces weights that are largely uniform.<sup>27</sup>

[Insert Table 10]

In Table 10, we test whether the experience of trafficking affected time and risk preferences of respondents, compared to vulnerable (non-trafficked) girls in our sample. We present OLS estimates in Panel A and entropy balancing estimates in Panels B and C. Panel B presents weighted estimates balanced on the first moment and first-order interactions of the following observables: indicators for urban and only child as well as the total number of sisters and older sisters. Removing less meaningful interactions yields 26 balance conditions. Panel C balances on the first three moments of the same set of characteristics, thus imposing 18

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<sup>27</sup>We exclude from our final results one outlier weight (which is three times the size of the next smallest weight). Our results are also robust to its inclusion.

balance conditions. The dependent variables are listed by column, with columns 1 and 2 regressing time preferences on trafficking status plus controls, and columns 3 and 4 regressing risk preferences.

As we discussed above, using a respondent's trafficking status as treatment presents a challenge. The results of an OLS approach may be driven by differential selection into trafficking based on a respondent's observable and unobservable traits. By allowing for comparisons of trafficked and non-trafficked respondents with similarly weighted observable characteristics, entropy balancing helps us to address this potential for selection bias. The results in table 10, column 1 and 2 show that entropy balancing results for time preferences are qualitatively consistent with those of the OLS approach, although somewhat different in terms of magnitude and significance. OLS estimates in Panel A report a delayed amount that is 50 PHP more and a discount rate that is 10 percentage points higher on average for trafficked respondents compared to non-trafficked ones. These estimates are slightly higher in Panel B (balancing on the first moment and first-order interactions) while in Panel C, when balancing on the first three moments, the point estimates decrease in size and lose significance.

Turning to risk aversion (columns 3-4), the OLS and entropy balancing results are fully consistent: Panel C shows that trafficking victims require 38 PHP more on average to switch from the patient to the impatient option. Trafficking victims have an estimated risk aversion coefficient that is 15 percentage points lower than that of the control group (i.e. the non-trafficked respondents). This implies that trafficking brings about more risk-seeking attitudes.

Our results on how human trafficking affects preferences relate to a recent and growing literature that seeks to explain how traumatic experiences such as violent conflict, financial losses ([Malmendier and Nagel, 2011](#); [Page, Savage and Torgler, 2014](#)), and natural disasters ([Cameron and Shah, 2015](#); [Hanaoka, Shigeoka and Watanabe, 2015](#); [Cassar, Healy and Von Kessler, 2017](#)) influence risk aversion. Violence is a unique type of trauma. As [Moya \(2018\)](#) notes, both how an individual experiences violence (indirect versus direct victim-

ization) and the time when violence occurs influence behavior. Voors et al. (2012) find a negative relationship between the share of deaths at the community level and an individual's risk aversion after exposure to conflict in Burundi. However, narrowing their analysis to the household level, they find no effects. Similarly Callen et al. (2014) do not document changes to respondents' preferences for certainty despite exposure to individual and district violence in Afghanistan. Instead, by asking subjects to recall violent events, the authors show that the salience of violent events operates as a priming mechanism for how individuals make decisions by increasing their preference for certainty. Moya (2018) studies how subjects respond to violence along the intensive margin via temporal and severity of exposure to violence in Colombia. Similar to our study, Moya (2018) focuses on 284 respondents who were either direct victims of violence or members of victimized households.<sup>28</sup> The author links the violence experienced to symptoms of psychological trauma such as anxiety. Using incentivized lab-in-the-field experiments to gauge preferences, the study shows that exposure to violence follows a dose-response relationship – while it increases risk aversion, this effect dissipates as time passes. Over the short-run, Jakiela and Ozier (2018) show that 5,000 Kenyan youths exposed to (but not victimized by) post-election violence between December 2007 and February 2008 substantially increased their risk aversion. In a long-run example, Kim and Lee (2014) show that exposure to war in Korea permanently reduces risk aversion in cohorts that experienced a higher intensity of conflict in childhood.

Our sample differs from this previous literature along several dimensions. First, and most important, our respondents suffered extreme trauma by being victims of trafficking and being sexually abused as children. Second, the respondents in our study are in shelters during our survey. Hence our results on preferences should be interpreted as short- to medium-run, and preferences may change depending on the content and effectiveness of the rehabilitation programs they undergo. For example, Blattman, Jamison and Sheridan (2017) run an intervention in Liberia attempting to discourage the criminal activities of high-

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<sup>28</sup>Of these respondents, 59 percent were caught in the cross fire of armed conflict, 51 percent received threats, 26 percent experienced the assassination of a household member, 16 percent suffered a violent attack, and 10 percent experienced and survived a massacre.

risk males aged 18 to 35. A combination of financial incentives with cognitive behavioral therapy to encourage nonviolent, noncriminal behavior produced significant changes in time preferences in his sample. This paper suggests that the influence of violence on risk and time preferences could be counteracted, at least in part, by effective rehabilitation. Whether this is also the case for the human trafficking victims is an open question for future research.

## 6 Conclusion

Human trafficking is modern-day slavery, and it is one of the fastest growing crimes in the world. According to a recent study by the ILO, roughly five million people worldwide are being subject to forced sexual exploitation as a result of human trafficking. This creates an urgency to design effective policies to prevent and combat trafficking. Yet, we lack good quantitative evidence on the issue in general and micro-level data on human trafficking victims in particular.

This paper aims to fill this gap by making use of a unique dataset collected directly from victims of human trafficking in the Philippines, aiming to study the microeconomic causes and consequences of trafficking. Specifically, the goal of this paper is threefold. First, we aim to understand which factors facilitate or trigger entry into trafficking; second, we provide quantitative evidence on the economic conditions experienced during trafficking; third, we try to assess the consequences of trafficking on two specific aspects of behavior: time preferences and risk aversion. To the best of our knowledge, ours is the first paper to use this type of microdata to quantitatively analyze the factors associated with trafficking.

Despite being a small-scale study, a number of interesting and surprising lessons arise from the analysis. Our results show that household composition (having older sisters) and income shocks have a positive relationship with an individual's propensity to be trafficked. In households with several girls, the younger, later-born girls face a higher risk of becoming a human trafficking victim. However, being the only child in a household decreases the likelihood of being trafficked. This is consistent with the household income resource hypothesis

discussed – younger, later-born child face scarcer household resources and, according to our results, these girls are more likely to end up trafficked. Moreover, we use household survey data matched by province and household size to each respondent in our original dataset to study the relationship between trafficking and cultural preferences. Here, we observe that the probability of being trafficked increases if a girl’s household had more daughters than socially desired in the province and if the respondent’s birth order places her above the desired number of children in a household comparable to her own. This result reinforces the idea that sibling composition and gender preferences are important contributing factors in trafficking likelihood. Finally, we also aim to understand the consequences of human trafficking on patience and risk attitudes. We find that, while trafficking appears to have no implications for intertemporal preferences, trafficking victims are more risk-loving compared to similar at-risk but non-trafficked girls.

Our study makes several contributions. First, it helps to fill the dearth of empirically rigorous studies of human trafficking and, specifically, demonstrates the importance of microdata on victims for designing policies to effectively fight trafficking. The challenges of collecting data on victims of trafficking are evident and numerous: tracking and surveying high-risk respondents, retrospective bias, measurement error, and so on. Our survey marks a first attempt to systematically gather this type of primary data. We hope this study will help inform future efforts of researchers and policymakers in the anti-trafficking community about the possibilities and importance of collecting more and better data to improve the global understanding of human trafficking.

Second, our findings have implications for the design of policies to prevent trafficking and reintegrate the victims. Our results show that one of the determinants of trafficking is birth order. In particular, girls living in families with an older sister have a positive relationship with the likelihood of being trafficked. This result is somewhat contradictory to previous studies that find that older children are more likely to be sent to work to support the household and, hence, younger children would benefit from transfers from older siblings. We also observe that the probability of being trafficked increases if a household had more



daughters than socially desired in the province (measured using household survey data) and if the respondent's birth order places her above the desired number of children in a household comparable to her own. Hence, intrahousehold structure affects the propensity to be trafficked. These findings suggest that policies focused on promoting gender equality and increasing girls' value (i.e. through investments in education) within the family as well as information campaigns about the danger of human trafficking might be effective in preventing human trafficking. Poverty reduction policies aimed at increasing household income might also help prevent human trafficking in these high-risk families with many female children.

Beegle, Dehejia and Gatti (2006) found that households respond to negative income shocks by sending children to work. Our results confirm that this is also true for the worst form of child labor – human trafficking – where children are used as a self-insurance strategy. We find that negative income shocks (measured by rainfall shocks) increase the propensity for a girl to be trafficked. These findings suggest that insurance (e.g. rainfall insurance in rural, agricultural areas) could be an important component in policies to prevent trafficking of young girls.

Our study is the first to examine the effects on preferences post-trafficking. We find that, while trafficking does not seem to impact intertemporal preferences, it does cause victims to become more risk-seeking. These findings are important to consider when designing reintegration programs for former victims. Risk-loving preferences among former human trafficking victims might induce them to engage in risky future income generating activities. Reintegration programs could play an important role to ensure that the girls are not targeting high-risk income opportunities when they are entering the labor market.

Policies to prevent and combat trafficking require coordination between local and international authorities. They also require a stable landscape of information based on rigorous, quantitative data in order to clearly understand the determinants of trafficking. This work is a first attempt to show that such studies are possible by using microdata from victims. Nevertheless, more work is clearly needed. The research community, with its extensive experience in quantitative survey data collection and data analysis, could help fill this gap.

## References

- Akee, Randall, Arnab K Basu, Nancy H Chau, and Melanie Khamis. 2010. "Ethnic fragmentation, conflict, displaced persons and human trafficking: an empirical analysis."
- Akresh, Richard, and Eric V. Edmonds. 2011. "Residential Rivalry and Constraints on the Availability of Child Labor." National Bureau of Economic Research Working Paper 17165.
- Andersen, Steffen, Glenn W Harrison, Morten I Lau, and E Elisabet Rutström. 2008. "Eliciting risk and time preferences." *Econometrica*, 76(3): 583–618.
- Arunachalam, Raj, and Manisha Shah. 2013. "Compensated for Life Sex Work and Disease Risk." *Journal of Human Resources*, 48(2): 345–369.
- Ashraf, Nava. 2009. "Spousal Control and Intra-Household Decision Making: An Experimental Study in the Philippines." *The American Economic Review*, 99(4): 1245–1277.
- Bechtel, Michael M., Jens Hainmueller, and Yotam Margalit. 2014. "Preferences for International Redistribution: The Divide over the Eurozone Bailouts." *American Journal of Political Science*, 58(4): 835–856.
- Beegle, Kathleen, Rajeev Dehejia, and Roberta Gatti. 2009. "Why should we care about child labor? The education, labor market, and health consequences of child labor." *Journal of Human Resources*, 44(4): 871–889.
- Beegle, Kathleen, Rajeev H. Dehejia, and Roberta Gatti. 2006. "Child labor and agricultural shocks." *Journal of Development Economics*, 81(1): 80–96.
- Blattman, Christopher, and Jeannie Annan. 2010. "The Consequences of Child Soldiering." *Review of Economics and Statistics*, 92(4): 882–898.
- Blattman, Christopher, Julian C Jamison, and Margaret Sheridan. 2017. "Reducing Crime and Violence: Experimental Evidence from Cognitive Behavioral Therapy in Liberia." *The American Economic Review*, 107(4): 1165–1206.

- Brick, Kerri, Martine Visser, and Justine Burns.** 2012. "Risk aversion: experimental evidence from South African fishing communities." *American Journal of Agricultural Economics*, 94(1): 133–152.
- Callen, Michael, Mohammad Isaqzadeh, James D. Long, and Charles Sprenger.** 2014. "Violence and Risk Preference: Experimental Evidence from Afghanistan." *The American Economic Review*, 104(1): 123–148.
- Cameron, Lisa, and Manisha Shah.** 2015. "Risk-taking behavior in the wake of natural disasters." *Journal of Human Resources*, 50(2): 484–515.
- Cassar, Alessandra, Andrew Healy, and Carl Von Kessler.** 2011. "Trust, risk, and time preferences after a natural disaster: experimental evidence from Thailand." *Unpublished manuscript*.
- Cassar, Alessandra, Andrew Healy, and Carl Von Kessler.** 2017. "Trust, risk, and time preferences after a natural disaster: experimental evidence from Thailand." *World Development*, 94: 90–105.
- Cho, Seo-Young, Axel Dreher, and Eric Neumayer.** 2014. "Determinants of Anti-Trafficking Policies: Evidence from a New Index." *The Scandinavian Journal of Economics*, 116(2): 429–454.
- Clawson, Heather J, and Mary Layne.** 2007. *Estimating Human Trafficking Into the United States: Development of a Methodology: Final Phase Two Report*. ICF International Fairfax, VA.
- Dammert, Ana C.** 2009. "Siblings, child labor, and schooling in Nicaragua and Guatemala." *Journal of Population Economics*, 23(1): 199–224.
- Danailova-Trainor, Gergana, and Patrick Belser.** 2006. *Globalization and the illicit market for human trafficking: an empirical analysis of supply and demand*. ILO Geneva.

- Della Giusta, Marina, Maria Laura Di Tommaso, and Steinar Strøm.** 2009. "Who is watching? The market for prostitution services." *Journal of Population Economics*, 22(2): 501–516.
- de Nicola, Francesca, and Xavier Giné.** 2014. "How accurate are recall data? Evidence from coastal India." *Journal of Development Economics*, 106: 52–65.
- Dessy, Sylvain E., and Stéphane Pallage.** 2005. "A Theory of the Worst Forms of Child Labour\*." *The Economic Journal*, 115(500): 68–87.
- Eckel, Catherine C., Mahmoud A. El-Gamal, and Rick K. Wilson.** 2009. "Risk loving after the storm: A Bayesian-Network study of Hurricane Katrina evacuees." *Journal of Economic Behavior & Organization*, 69(2): 110–124.
- ECPAT.** 2004. "Endangered Generation: Child Trafficking in the Philippines for Sexual Purposes." End Child Prostitution, Child Pornography and Trafficking of Children for Sexual Purposes Philippines Report.
- ECPAT.** 2011. "Global monitoring status of action against commercial exploitation of children: Philippines." ECPAT Report.
- Edlund, Lena, and Evelyn Korn.** 2002. "A Theory of Prostitution." *Journal of Political Economy*, 110(1): 181–214.
- Edmonds, Eric.** 2008. "Child Labor." Elsevier Handbook of Development Economics.
- Edmonds, Eric V.** 2006. "Understanding sibling differences in child labor." *Journal of Population Economics*, 19(4): 795–821.
- Edmonds, Eric V., and Maheshwor Shrestha.** 2014. "You get what you pay for: Schooling incentives and child labor." *Journal of Development Economics*, 111: 196–211.
- Ejrnaes, Mette, and Claus C. Pörtner.** 2004. "Birth Order and the Intrahousehold Allocation of Time and Education." *Review of Economics and Statistics*, 86(4): 1008–1019.

- Emerson, Patrick M, and Andre Portela Souza.** 2008. "Birth order, child labor, and school attendance in Brazil." *World Development*, 36(9): 1647–1664.
- Francavilla, F, and S Lyon.** 2003. "Household chores and child health: preliminary evidence from six countries." *Florence: Innocenti Research Centre*.
- Gertler, Paul, Manisha Shah, and Stefano M. Bertozzi.** 2005. "Risky Business: The Market for Unprotected Commercial Sex." *Journal of Political Economy*, 113(3): 518–550.
- Ghosal, Sayantan, Jana Smarajit, Mani Anandi, Mitra Sandip, and Roy Sanchari.** 2015. "Sex Workers, Self-Image and Stigma: Evidence from Kolkata Brothels." *Working paper*.
- Hainmueller, Jens.** 2011. "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies." *Political Analysis*, mpr025.
- Hanaoka, Chie, Hitoshi Shigeoka, and Yasutora Watanabe.** 2015. "Do Risk Preferences Change? Evidence from the Great East Japan Earthquake." *American Economic Journal: Applied Economics*.
- Harrison, Glenn W, Steven J Humphrey, and Arjan Verschoor.** 2010. "Choice under uncertainty: evidence from Ethiopia, India and Uganda." *The Economic Journal*, 120(543): 80–104.
- Holt, Charles A., and Susan K. Laury.** 2002. "Risk Aversion and Incentive Effects." *The American Economic Review*, 92(5): 1644–1655.
- International Labour Organization.** 2017. "Global Estimates of Modern Slavery: Forced Labour and Forced Marriage." United Nations Report.
- Jakiela, Pamela, and Owen Ozier.** 2018. "The Impact of Violence on Individual Risk Preferences: Evidence from a Natural Experiment." *Review of Economics and Statistics*.

- Jakobsson, Niklas, and Andreas Kotsadam.** 2016. “The Economics of Trafficking for Sexual Exploitation.” In *The Oxford Handbook of the Economics of Prostitution.* , ed. Scott Cunningham and Manisha Shah.
- Kanbur, Ravi, and Lawrence Haddad.** 1994. “Are Better Off Households More Unequal or Less Unequal?” *Oxford Economic Papers*, 46(3): 445–458.
- Kassouf, Ana Lúcia, Martin Mckee, and Elias Mossialos.** 2001. “Early entrance to the job market and its effects on adult health.” *Journal of Health Policy and Planning.*
- Kim, Young-II, and Jungmin Lee.** 2014. “The long-run impact of a traumatic experience on risk aversion.” *Journal of Economic Behavior & Organization*, 108: 174–186.
- Lee, Samuel, and Petra Persson.** 2013. “Human trafficking and regulating prostitution.” *NYU Stern School of Business EC-12-07*, 12–08.
- Lillard, Lee A., and Robert J. Willis.** 1994. “Intergenerational Educational Mobility: Effects of Family and State in Malaysia.” *The Journal of Human Resources*, 29(4): 1126–1166.
- Mahmoud, Toman Omar, and Christoph Trebesch.** 2010. “The economics of human trafficking and labour migration: Micro-evidence from Eastern Europe.” *Journal of Comparative Economics*, 38(2): 173–188.
- Malmendier, Ulrike, and Stefan Nagel.** 2011. “Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?\*” *The Quarterly Journal of Economics*, 126(1): 373–416.
- Manacorda, Marco.** 2006. “Child Labor and the Labor Supply of Other Household Members: Evidence from 1920 America.” *The American Economic Review*, 96(5): 1788–1801.
- Marcus, Jan.** 2013. “The effect of unemployment on the mental health of spouses. Evidence from plant closures in Germany.” *Journal of Health Economics*, 32(3): 546–558.
- Medina, Belinda.** 1991. “The Filipino Family: A Text with Selected Readings (Quezon City, Philippines.”

- Mendez, Paz Policarpio, and F Landa Jocano.** 1974. *The Filipino Family in Its Rural and Urban Orientation: Two Case Studies in Culture and Education*. Centro Escolar University, Research and Development Center.
- Moya, Andrés.** 2018. “Violence, psychological trauma, and risk attitudes: Evidence from victims of violence in Colombia.” *Journal of Development Economics*, 131(Supplement C): 15–27.
- O’Donnell, O., Van Doorslaer, Eddy, and Furio C. Rosati.** 2002. “Child Labour and Health: Evidence and Research Issues.” Social Science Research Network SSRN Scholarly Paper ID 1780320, Rochester, NY.
- Page, Lionel, David A Savage, and Benno Torgler.** 2014. “Variation in risk seeking behaviour following large losses: A natural experiment.” *European Economic Review*, 71: 121–131.
- Philippines Department of Social Welfare and Development.** 2013. “DSWD warns public to be vigilant against traffickers | Department of Social Welfare and Development.”
- Philippines Department of Social Welfare and Development.** 2014. “DSWD year-end report: Looking back, moving forward | Department of Social Welfare and Development.”
- Robinson, Jonathan, and Ethan Yeh.** 2011. “Transactional sex as a response to risk in Western Kenya.” *American Economic Journal: Applied Economics*, 35–64.
- Rogers, Carol Ann, and Kenneth A. Swinnerton.** 2008. “A theory of exploitative child labor.” *Oxford Economic Papers*, 60(1): 20–41.
- Rose, Elaina.** 2001. “Ex ante and ex post labor supply response to risk in a low-income area.” *Journal of Development Economics*, 64(2): 371–388.
- Shah, Manisha.** 2013. “Do sex workers respond to disease? Evidence from the male market for sex.” *The American Economic Review*, 103(3): 445–450.

- Thaler, Richard.** 1981. “Some empirical evidence on dynamic inconsistency.” *Economics letters*, 8(3): 201–207.
- Tsutsumi, Atsuro, Takashi Izutsu, Amod K. Poudyal, Seika Kato, and Eiji Marui.** 2008. “Mental health of female survivors of human trafficking in Nepal.” *Social Science & Medicine*, 66(8): 1841–1847.
- United Nations Office on Drugs and Crime.** 2016. “Global Report on Trafficking in Persons 2016.” United Nations Report No. E.16.IV.6.
- US Department of State.** 2017. “Trafficking in Persons Report 2017.” US Department of State Report.
- Vicente-Serrano, Sergio M, Santiago Beguería, and Juan I López-Moreno.** 2010. “A multiscalar drought index sensitive to global warming: the standardized precipitation evapotranspiration index.” *Journal of Climate*, 23(7): 1696–1718.
- Voors, Maarten J., Eleonora E.M. Nillesen, Philip Verwimp, Erwin H. Bulte, Robert Lensink, and Daan P. Van Soest.** 2012. “Violent Conflict and Behavior: A Field Experiment in Burundi.” *The American Economic Review*, 102(2): 941–964.
- Yang, Dean, and HwaJung Choi.** 2007. “Are remittances insurance? Evidence from rainfall shocks in the Philippines.” *The World Bank Economic Review*, 21(2): 219–248.
- Zimmerman, Cathy, Mazedra Hossain, and Charlotte Watts.** 2011. “Human trafficking and health: A conceptual model to inform policy, intervention and research.” *Social Science & Medicine*, 73(2): 327–335.



**Table 1:** Descriptive statistics

	Trafficked			Not trafficked			All		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Mean	SD	Obs.	Mean	SD	Obs.	Mean	SD	Obs.
Trafficked							0.37	0.48	345
Age	21.20	6.45	126	17.12	2.99	219	18.61	4.97	345
Years of education	6.98	2.75	126	8.80	3.08	219	8.13	3.09	345
Only child	0.00	0.00	126	0.03	0.17	210	0.02	0.13	336
Total siblings	5.50	2.93	125	4.63	2.99	208	4.95	2.99	333
Sisters	3.08	2.50	121	2.28	2.00	205	2.58	2.23	326
Brothers	2.51	1.84	121	2.34	1.96	196	2.41	1.92	317
Birth mother alive	0.94	0.23	126	0.95	0.22	219	0.95	0.22	345
Birth father alive	0.90	0.31	126	0.89	0.31	219	0.90	0.31	345
Lived with both birth parents	0.66	0.48	126	0.59	0.49	219	0.61	0.49	345
Urban	0.75	0.43	126	0.52	0.50	219	0.60	0.49	345
Assets	0.13	1.76	125	-0.07	1.68	216	0.00	1.71	341

**Table 2:** Comparison to Demographic and Health Survey data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Our Sample	DHS 1993	Difference	DHS 1998	Difference	DHS 2003	Difference	DHS 2008	Difference
Urban	0.60	0.48	0.123***	0.45	0.153***	0.52	0.0855***	0.45	0.156***
	[331]	[1,020]	(0.0310)	[850]	(0.0316)	[862]	(0.0317)	[813]	(0.0318)
Poor	0.59	0.54	0.0540*	0.53	0.0595*	0.49	0.102***	0.49	0.0981***
	[345]	[1,020]	(0.0310)	[850]	(0.0317)	[862]	(0.0317)	[813]	(0.0320)
Above primary ed.	0.52	.39	0.127***	0.42	0.0995***	0.5	0.0113	0.51	0.00549
	[345]	[1,020]	(0.0306)	[850]	(0.0316)	[862]	(0.0319)	[813]	(0.0321)
HH size	7.3	5.3	1.979***	5.2	2.148***	4.8	2.517***	4.7	2.563***
	[344]	[1,020]	(0.169)	[850]	(0.175)	[862]	(0.167)	[813]	(0.172)
< 18 in HH	4.6	2.4	2.215***	2.5	2.136***	2.4	2.289***	2.1	2.540***
	[344]	[1,020]	(0.142)	[850]	(0.152)	[862]	(0.151)	[813]	(0.147)
< 18 girls in HH	2.3	1.1	1.119***	1.2	1.010***	1.2	1.102***	0.98	1.273***
	[344]	[1,020]	(0.0880)	[850]	(0.0965)	[862]	(0.0954)	[813]	(0.0929)
< 18 boys in HH	2.4	1.3	1.096***	1.3	1.126***	1.2	1.187***	1.1	1.267***
	[344]	[1,020]	(0.0927)	[850]	(0.0982)	[862]	(0.0972)	[813]	(0.0939)
Share of < 18 girls in HH	0.49	0.46	0.0246	0.5	-0.0144	0.49	-0.000165	0.46	0.0330
	[344]	[1,020]	(0.0216)	[850]	(0.0226)	[862]	(0.0229)	[813]	(0.0236)

*Notes:* DHS statistics are computed for the average household in the Central Visayas region. Columns 1, 2, 4, and 8 report sample means with the number of observations in square brackets. Columns 3, 5, 7 and 9 report the results of a t-test of difference in means with Column 1. Standard errors are in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

**Table 3:** Household composition and trafficking

Dependent variable: Trafficked	(1)	(2)	(3)	(4)	(5)
Total siblings	0.021*** (0.004)	0.003 (0.006)	0.004 (0.007)	0.005 (0.006)	0.003 (0.006)
Sisters		0.031*** (0.009)	-0.002 (0.022)		
Older sisters			0.051** (0.023)		
Sisters in HH				-0.008 (0.017)	-0.010 (0.015)
Sisters outside HH				0.090 (0.127)	0.089 (0.130)
Older sisters in HH				0.066*** (0.020)	0.067*** (0.019)
Older sisters outside HH				-0.079 (0.140)	-0.076 (0.145)
Lived with birth mother					0.030 (0.074)
Lived with birth father					-0.088 (0.111)
Lived with both birth parents					0.115 (0.110)
Birth mother alive	-0.080 (0.099)	-0.091 (0.103)	-0.068 (0.108)	-0.072 (0.108)	-0.157 (0.128)
Birth father alive	-0.051 (0.086)	-0.048 (0.085)	-0.025 (0.075)	-0.016 (0.087)	-0.026 (0.071)
Only child	-0.294*** (0.052)	-0.308*** (0.053)	-0.312*** (0.052)	-0.317*** (0.054)	-0.340*** (0.055)
Urban	0.272*** (0.051)	0.269*** (0.051)	0.277*** (0.050)	0.276*** (0.047)	0.272*** (0.045)
Assets	0.033** (0.016)	0.035** (0.015)	0.032** (0.014)	0.032** (0.013)	0.032** (0.011)
Assets <sup>2</sup>	-0.010 (0.006)	-0.009 (0.006)	-0.008 (0.006)	-0.010** (0.005)	-0.010** (0.005)
Region fixed effects	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes
Mean of dependent variable	0.37	0.37	0.37	0.37	0.37
R <sup>2</sup>	0.172	0.180	0.191	0.194	0.199
Observations	289	289	289	289	289

*Notes:* This table reports OLS estimates. The unit of observation is the respondent. The dependent variable is equal to one if the respondent was trafficked and zero otherwise (mean=0.365). The estimations include controls for urban, mother alive, father alive, and only child as well as assets and assets squared. Standard errors (in parentheses) are clustered at the province level.

\*, \*\* and \*\*\* indicate significance at the 10, 5, and 1% levels.

**Table 4:** Gender norms and trafficking

Dependent variable: Trafficked	(1)	(2)	(3)
Deviation from ideal no. of girls	0.012*** (0.004)		
Deviation from ideal ratio of girls to boys		0.041** (0.020)	
Respondent's birth order higher than ideal no. of girls			0.117* (0.064)
Region fixed effects	yes	yes	yes
Controls	yes	yes	yes
R <sup>2</sup>	0.213	0.211	0.196
Observations	272	225	289

*Notes:* This table reports OLS estimates. The unit of observation is the respondent. The dependent variable is equal to one if the respondent was trafficked and zero otherwise (mean=0.365). Deviations are computed with respect to the representative province average from the 1998 Demographic and Health Survey. Respondents are matched to DHS households by province and household size. The estimations include controls for urban, mother alive, father alive, and only child as well as assets and assets squared. Standard errors (in parentheses) are clustered at the province level. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

**Table 5:** Intra-household conflict and trafficking

Dependent variable: Trafficked	(1)	(2)	(3)	(4)
Mother-father quarrels	-0.012 (0.112)			
Parent-respondent quarrels		0.106** (0.052)		
Mother-respondent quarrels			0.176*** (0.057)	
Father-respondent quarrels				-0.005 (0.080)
Region fixed effects	yes	yes	yes	yes
Controls	yes	yes	yes	yes
R <sup>2</sup>	0.182	0.187	0.198	0.186
Observations	205	264	245	226

*Notes:* This table reports OLS estimates. The unit of observation is the respondent. The dependent variable is equal to one if the respondent was trafficked and zero otherwise (mean=0.365). Column 1 is conditional upon having both a mother and father present in the household. Column 2 is conditional upon having any parent present in the household. Columns 3 and 4 are conditional upon having a mother or father present in the household, respectively. The estimations include controls for urban, mother alive, father alive, and only child as well as assets and assets squared. Standard errors (in parentheses) are clustered at the province level. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

**Table 6:** Health and income shocks

Dependent variable: Trafficked	(1)	(2)	(3)	(4)
Illness	-0.022 (0.060)			-0.074 (0.056)
Job loss		0.045 (0.058)		0.088 (0.064)
$\Delta$ weather			-0.117*** (0.032)	-0.123*** (0.034)
$\Delta$ weather <sup>2</sup>			0.061*** (0.020)	0.062*** (0.020)
Region fixed effects	yes	yes	yes	yes
Controls	yes	yes	yes	yes
R <sup>2</sup>	0.185	0.186	0.223	0.230
Observations	297	297	269	268

*Notes:* This table reports OLS estimates. The unit of observation is the respondent. The dependent variable is equal to one if the respondent was trafficked and zero otherwise (mean=0.365). Illness is a dummy equal to one if a household member was ill in the year prior to the respondent's departure. Job loss is an indicator for whether a household member lost his/her job over the same period.  $\Delta$  weather is the deviation of village-level SPEI over the same period from its long term average. The estimations include controls for urban, mother alive, father alive, and only child as well as assets and assets squared. Standard errors (in parentheses) are clustered at the province level. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

**Table 7:** Expectations prior to leaving the household

	(1)	(2)	(3)
	Trafficked	Not trafficked	Difference in means
Personally knew a girl who left village	0.58	0.46	0.117**
	[126]	[214]	(0.0559)
First to leave HH	0.61	0.76	-0.146***
	[126]	[218]	(0.0507)
Likelihood of marrying a foreign man (%)	0.46	0.32	0.136***
	[125]	[218]	(0.0327)
Likelihood of going back to school (%)	0.61	0.81	-0.201***
	[122]	[171]	(0.0380)
Likelihood of sending money home (%)	0.66	0.65	0.0154
	[125]	[210]	(0.0409)

*Notes:* Columns 1 and 2 report sample means with the number of observations in brackets. Column 3 reports the results of a t-test of difference in means between Columns 1 and 2. Standard errors are in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

**Table 8:** Work conditions during trafficking

	(1)	(2)	(3)
	Mean	SD	Observations
Family received advance payment	0.09	0.29	110
Family not aware of sex work	0.85	0.36	116
Job different than described	0.51	0.50	110
Unable to leave workplace alone	0.16	0.37	104
No. of co-workers in last job	32.31	31.33	113
Co-workers married a foreign man (%)	0.10	0.15	103
Co-workers became pregnant (%)	0.15	0.17	108
Co-workers fell ill (%)	0.07	0.12	99
Years in last job	2.38	3.71	116
Nights worked in typical week	5.76	1.95	116
Typical earnings per night (PhP)	1147.55	1812.13	108
Indebted to employer	0.13	0.34	124
Amount owed to employer (PhP)	2,700	2,146	16



**Table 9:** Preferences and expectations by trafficked status

	(1)	(2)	(3)
	Trafficked	Not trafficked	Difference in means
Amount in 5wks (PHP) <sup>a</sup>	243	213	30
	[80]	[180]	(21.65)
Discount rate	0.49	0.43	0.0600
	[80]	[180]	(0.0433)
Sure amount (PHP) <sup>b</sup>	113	82	31.44***
	[119]	[184]	(10.47)
Risk coefficient	0.45	0.58	-0.123***
	[119]	[184]	(0.0435)
Willingness to take risks (self-reported)	5.3	5.8	-0.464
	[126]	[219]	(0.385)
Impulsiveness (self-reported)	3.4	3.4	0.0426
	[126]	[219]	(0.337)
Confidence (self-reported)	6.7	6.9	-0.299
	[126]	[219]	(0.281)
Importance of conforming to expectations	6.5	7.4	-0.981***
	[126]	[219]	(0.317)
Has contact with family	0.75	0.72	0.0325
	[126]	[219]	(0.0496)
Wants children	0.7	0.77	-0.0786
	[125]	[213]	(0.0490)
Expected wage in next job	4139	552	3586.9
	[126]	[218]	(2454.0)

*Notes:* Columns 1 and 2 report sample means with the number of observations in brackets. Column 3 reports the results of a t-test of difference in means between Columns 1 and 2. Standard errors are in parentheses. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

<sup>a</sup> Amount in 5wks (PHP) is the respondent's preferred sum to receive in five weeks' time instead of 500PHP in one week's time.

<sup>b</sup> Sure amount (PHP) is the sum a respondent would like to receive with certainty instead of choosing to participate in a lottery game that yields 0PHP with a probability of 50% and 500PHP with a probability of 50%.

**Table 10:** Effect of trafficking on time and risk preferences

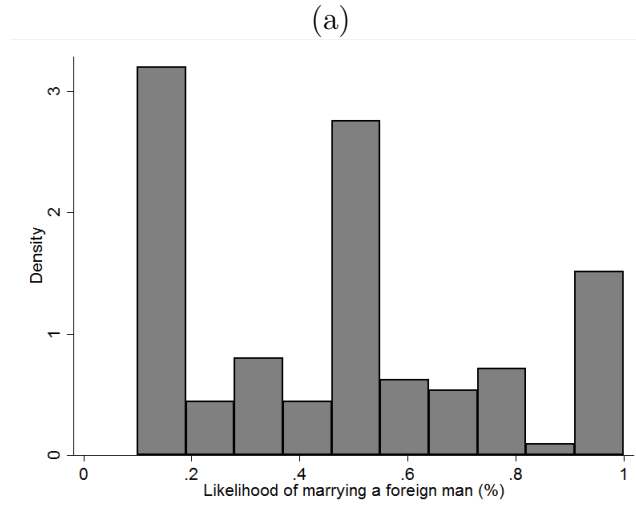
	(1)	(2)	(3)	(4)
Dependent variable:	Amount in 5wks (PHP) <sup>a</sup>	Discount rate	Sure amount (PHP) <sup>b</sup>	Risk coefficient
Panel A: OLS				
Trafficked	49.863*** (14.280)	0.100*** (0.029)	33.803*** (5.877)	-0.126*** (0.029)
Region fixed effects	yes	yes	yes	yes
R <sup>2</sup>	0.096	0.096	0.143	0.132
Observations	216	216	253	253
Panel B: Balancing on first moment and first-order interactions				
Trafficked	65.275** (26.809)	0.131** (0.054)	37.731*** (12.995)	-0.150*** (0.051)
Region fixed effects	yes	yes	yes	yes
R <sup>2</sup>	0.077	0.077	0.189	0.181
Observations	216	216	253	253
Panel C: Balancing on first three moments				
Trafficked	36.817 (25.825)	0.074 (0.052)	38.230*** (11.879)	-0.151*** (0.050)
Dep. var. mean	242.50	0.49	113.24	0.45
Region fixed effects	yes	yes	yes	yes
Controls	yes	yes	yes	yes
R <sup>2</sup>	0.068	0.068	0.160	0.143
Observations	216	216	253	253

*Notes:* This table reports OLS and entropy balancing estimates. The unit of observation is the respondent. The estimations include controls for urban, mother alive, father alive, and only child as well as assets and assets squared. Standard errors (in parentheses) are clustered at the province level. \*, \*\* and \*\*\* indicate significance at the 10, 5, 1% levels.

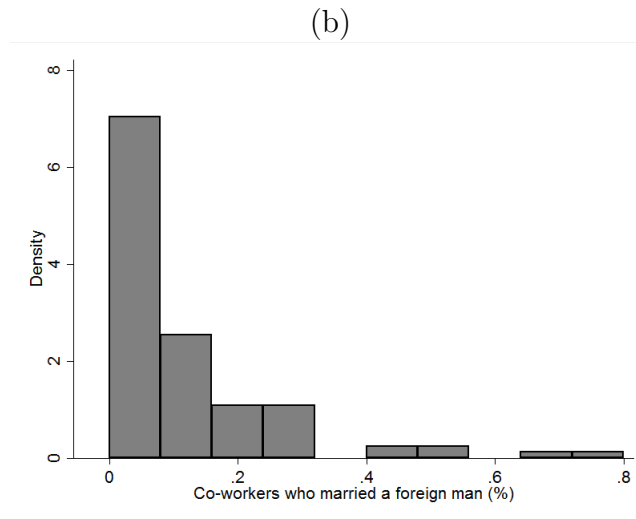
<sup>a</sup> Amount in 5wks (PHP) is the respondent's preferred sum to receive in five weeks' time instead of 500PHP in one week's time.

<sup>b</sup> Sure amount (PHP) is the sum a respondent would like to receive with certainty instead of choosing to participate in a lottery game that yields 0PHP with a probability of 50% and 500PHP with a probability of 50%.

**Figure 1:** Ex-ante and ex-post probability of marrying a foreign client



*Notes:* The likelihood of marrying a foreign man is computed for trafficked respondents from the following question: “On a scale of 1 to 10, where 1 is no chance at all and 10 is for sure, how likely did you think it was that you would marry a foreign man?” Respondents were asked to report what they believed at the time of leaving the household. (N=125)



*Notes:* The percentage of co-workers who married a foreign man is computed for trafficked respondents by the ratio of co-workers who married a foreign man to the total of number of co-workers. (N=103)

# 7 Appendix

**Table S1:** Additional descriptive statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Mean	SD	Observations	Mean	SD	Observations	Mean	SD	Observations
		Trafficked		Not trafficked			All		
Has child	0.32	0.47	126	0.07	0.25	219	0.16	0.37	345
Mother-father quarrels	0.91	0.29	108	0.91	0.28	174	0.91	0.28	282
Parent-respondent quarrels	0.77	0.42	125	0.69	0.47	213	0.72	0.45	338
Mother-respondent quarrels	0.68	0.47	120	0.50	0.50	205	0.57	0.50	325
Father-respondent quarrels	0.36	0.48	115	0.38	0.49	193	0.37	0.48	308
Illness	0.34	0.48	124	0.33	0.47	209	0.34	0.47	333
Job loss	0.34	0.47	125	0.27	0.44	208	0.29	0.46	333
$\Delta$ weather	0.44	1.06	115	0.57	0.76	193	0.52	0.88	308
Expected wage in next job	4138.57	36250.45	126	551.66	925.82	218	1865.47	21964.40	344
Amount in 5wks (PHP)	242.50	166.52	80	212.50	158.72	180	221.73	161.43	260
Discount rate	0.49	0.33	80	0.43	0.32	180	0.44	0.32	260
Sure amount (PHP)	113.24	98.82	119	81.79	82.08	184	94.14	90.19	303
Risk coefficient	0.45	0.42	119	0.58	0.33	184	0.53	0.37	303
Willingness to take risks (self-reported)	5.29	3.74	126	5.76	3.27	219	5.59	3.45	345
Impulsiveness (self-reported)	3.44	3.00	126	3.40	3.03	219	3.42	3.01	345
Confidence (self-reported)	6.65	2.46	126	6.95	2.54	219	6.84	2.52	345
Importance of conforming to expectations (self-reported)	6.45	2.86	126	7.43	2.82	219	7.08	2.87	345
Has contact with family	0.75	0.43	126	0.72	0.45	219	0.73	0.44	345
Wants children	0.70	0.46	125	0.77	0.42	213	0.75	0.44	338