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# The Economic Drivers of Human Trafficking: Micro-Evidence from Five Eastern European Countries.<sup>1</sup>

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## Abstract

Human trafficking is a humanitarian problem of global scale, but quantitative research on the issue barely exists. This paper is a first attempt to explore the economic drivers of human trafficking and migrant exploitation using micro data. We argue that migration pressure combined with informal migration patterns and incomplete information are the key determinants of human trafficking. To test our argument, we use a unique new dataset of 5513 households from Belarus, Bulgaria, Moldova, Romania, and Ukraine. The main result is in line with our expectations: Migrant families in high-migration areas and with larger migrant networks are much more likely to have a trafficked victim among their members. Our results also indicate that illegal migration increases trafficking risks and that awareness campaigns and a reduction of information asymmetries might be an effective strategy to reduce the crime.

Keywords: Human Trafficking, Migrant Exploitation, Illegal Migration, Migration Networks, Eastern Europe

JEL classification: F22, J61, K42, O17

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*“Like many things that should have been stamped out a long time ago, slavery, it seems, is alive and well.”*

The Economist, March 9th 2005

*“The trade in people is surely the most morally repugnant of all the illicit trades that flourish today. But it’s deeply entrenched and interwoven with the world’s ever more complex migration flows.”*

Moises Naim in “Illicit” (2005, p. 89)

## 1. Introduction

The exploitation and trafficking of men, women and children is a humanitarian problem of global scale. A recent study estimates that at least 12 million people worldwide are trapped in conditions of forced labour. Around a fifth of these are being exploited as a result of human trafficking (ILO 2005). These forms of modern day slavery have become one of the most profitable businesses in the world – and one of the most horrifying. Human trafficking is said to be the fastest growing source of income for organised crime and its third most important, exceeded only by drugs and arms trade (Obuah 2006).

After decades of neglect, public attention on the problem has increased considerably in recent years. Policymakers in international organisations and national governments all over the world as well as NGOs have augmented their efforts to combat trafficking and to raise public awareness on the issue.<sup>3</sup> There has also been a notable increase in donor funding, e.g. by the European Union and the US government.

Despite the policy relevance, academic research on the topic remains scarce, especially when it comes to economics. The large economic literature on organised crime and illicit activities (e.g. Fiorentini and Peltzman 1995 or Freeman 1999) has largely ignored the sizeable market of human trafficking and migrant exploitation. The same is true for the rapidly growing field of the economics of migration, which has been notably silent on the issue. As a result, and despite frequent calls for empirical research on the topic<sup>4</sup>, there is still very little knowledge on human trafficking as an economic phenomenon. One major reason for this is the grave difficulty in gathering reliable and representative data.

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3 Most prominently, the UN issued the Protocol to Prevent, Suppress and Punish Trafficking in Persons (UN, 2000a) and the Protocol Against the Smuggling of Migrants (UN, 2000b), which entered into force in 2004 and 2003 respectively. In March 2007, the UN also formally launched a Global Initiative to Fight Human Trafficking (UN.GIFT). The work of counter-trafficking NGOs such as Free the Slaves or La Strada and pioneering books such as Bales (1999) have helped to increase awareness of the problem.

4 Gozdzik and Collett (2005, p.122) conclude that “future research needs to move beyond stating that there is a problem, to more systematic and rigorous data collection and analysis.” Among others, similar calls have been voiced by Tyldum and Brunovskis (2005), Piper (2005) and Chand (2008).

This paper is the first to analyse the drivers of human trafficking with micro data and the tools and rationale of economics. Our main theoretical argument is based on simple supply and demand considerations and is rooted in the literature on the economics of crime. In a nutshell, we argue that trafficking and exploitation are the sad but obvious consequence of migration pressure in a world of closed borders. The growing, but unsatisfied demand for legal migration options has created a breeding ground for smuggling networks and other criminal organisations, which have learned to make a profit from people's desire to work abroad. Migration has become a multibillion-dollar industry that can be particularly lucrative for criminals willing to use physical violence and restraint.

In line with the above, we expect the risk of human trafficking to be highest in areas with high rates of out-migration. Simply put, "traffickers fish in the stream of migration" (Coomaraswamy 2001, p. 3), so that more people leaving means more people at risk. In addition to this, two channels may explain why the risk of being trafficked increases with regional emigration rates. The first channel is linked to potential agglomeration forces in the trafficking industry, as traffickers are likely to focus their activities to those regions where migration pressure is highest, and the supply of potential victims largest (Naim 2005). In these areas shadow-migration industries will tend to flourish so that traffickers may more easily conceal their activities and take advantage of other semi-legal or criminal agents such as people smugglers or those providing documents or employment abroad (Tamura 2007).

The second channel relates to negative self-selection into migration. High-emigration areas are often disadvantaged in the first place, with migration representing the only available strategy to escape poverty. Accordingly, there are good reasons to expect individuals in these areas to be more prone to take risks when departing. Moreover, large migrant networks and diasporas abroad tend to lower the costs of migration, thus fostering the departure of migrants with lower skills and less education from regions where many have already left (McKenzie and Rapoport forthcoming and Beine et al. 2009). If this is true, migrants from high-emigration regions might be less prepared and more vulnerable to deceptionist schemes by traffickers.

By stressing the close link between trafficking and migration, our focus differs from that of many recent media and policy reports<sup>5</sup>, which frequently point to legislation and law enforcement, poor border controls, bribery and corruption, or insufficient education as drivers of human trafficking. These factors certainly exacerbate the trafficking problem, but may not explain it at its core. We argue instead that it is first and foremost the wish for a better life abroad that puts millions of people at risk of exploitation. Their

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5 Compare e.g. ILO (2005), UNODC (2006), US State Department (2008).

willingness to depart and to take risks in the migration process can be easily exploited by criminal agents who benefit from the large information asymmetries involved.

To test our arguments, we use a novel and unique survey on human trafficking which covers 5513 randomly selected households from Belarus, Bulgaria, Moldova, Romania, and Ukraine. These Eastern European countries are among the most important source countries of human trafficking worldwide (ILO 2005). Human trafficking is defined as a situation in which an individual travelling abroad was locked and forced to work for no or little pay via means of coercion. As such, trafficking differs importantly from migrant smuggling, a commercial service that normally occurs with the consent of migrants, and from illegal migration, which does not typically involve any forms of exploitation. About 7 per cent of the migrant families (108 out of 1563 households) identified by the survey reported to have a trafficking victim among their members. This includes victims of both sexual and non-sexual forms of human trafficking, but not trafficked children.

The main empirical result is in line with our expectations. Trafficking occurs where migration flows are largest, not in remote regions with no or little migration. More specifically, we find that regional migration prevalence rates and other proxies of migration pressure are the key predictors of the incidence of human trafficking on the household level. Put differently, individual trafficking risks *rise* with the regional scale of emigration. This result holds when controlling for selection effects and for the subsample of migrant households.

We can report two further main results. First, as expected, the prevalence of illegal migration patterns appears to increase trafficking risks. Second, we find some evidence that awareness campaigns can play a successful role in reducing trafficking risks. The incidence of trafficking is considerably lower in regions where the awareness of the phenomenon of human trafficking is high. In contrast, other regional factors such as overall crime rates or proxies for the level of socio-economic development do not appear to be decisive factors.

The rest of the paper is structured as follows: Section 2 defines the main concepts and summarises the current state of knowledge on human trafficking. It also provides stylised facts on the patterns of migration and trafficking in Eastern Europe. Section 3 sketches our main argument. In section 4, we describe the data and variables used in the econometric analysis. Section 5 discusses the results and presents a number of robustness checks. Section 6 concludes.

## 2. What Do We Know About Human Trafficking?

### 2.1 Definitions

It is crucial to clearly define the concepts that lie at the core of this paper. We follow the UN protocols against human trafficking, which, after years of debate, succeeded in clearly defining and distinguishing these concepts.<sup>6</sup> In accordance with the UN definition, the main purpose of *smuggling* is to facilitate the illegal entry of a person into another country. Typically, migrants are smuggled with their consent, paying the smuggler for his service. The smuggler gains a material benefit but does not necessarily exploit the migrant. In contrast, *trafficking* always involves the violation of human rights and severe forms of exploitation. Victims of trafficking are recruited, transported and forced to work by means of coercion. The main purpose of trafficking is *exploitation*, either sexual exploitation or other forms of economic exploitation. While these definitions are helpful from a legal perspective, trafficking, exploitation and smuggling are often interrelated.<sup>7</sup> Some migrants using smuggling services may depart voluntarily, but end up being exploited. In such cases, smugglers become traffickers.

### 2.2 Determinants of Human Trafficking

A fundamental breeding ground for trafficking and exploitation is the economic situation of people in poorer regions of the world, pushing vulnerable people to emigrate and seek better opportunities abroad (Bruckert and Parent 2002, Chand 2008). The large potential gains from migration<sup>8</sup>, joint with network and herd effects have generated an unprecedented demand for legal migration to richer countries (World Bank 2005). However, with most middle and high-income country labour markets shut off, there is only very limited supply of legal employment opportunities abroad. At the same time, there is a constant demand for cheap manual workers and prostitutes in both developed and developing countries.

This situation has fostered the emergence of shadow migration industries offering services such as border crossings and the procurement of illegal work abroad (Orrenius 1999, Stalker 2000, Gathmann 2008). These activities, including its worst forms such as human trafficking, offer large monetary rewards and have to be seen in parallel to other fields of criminal intermediation, e.g. drugs and arms trade. Aronowitz (2001), Salt and Stein (1997) and Schloenhardt (1999) provide a detailed analysis of the business of trafficking and exploitation. In essence, the organisational structure of trafficking

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<sup>6</sup> The exact definitions are given in UN (2000a) and UN (2000b).

<sup>7</sup> In this paper, we use the terms “trafficking” and “exploitation” interchangeably.

<sup>8</sup> For an individual, emigration can be the single most effective strategy to improve economic opportunities and increase income, often by a multiple. The large “place premium” in wages between sending and receiving countries is carefully documented in a recent paper by Clemens et al. (2008).

networks is similar to that of providers of legal services. Trafficking organisations find and attract people willing to work abroad via advertisements in newspapers, the internet or through employment agencies. They also contact people on an individual basis, often via dispersed recruiters who may have even been trafficking victims themselves.

All available evidence indicates that human trafficking is an exceptionally lucrative business for criminal groups. In a recent study, the ILO (2005) estimates that sexual and labour exploitation yields US\$ 32 billion of profits a year to the actors involved. This corresponds to an estimated US\$ 13,000 of yearly profits for each forced labourer. Another estimated figure is the profit of criminal gangs from sex trafficking alone, which is conservatively estimated at US\$ 5 to 7 billion a year, with Interpol giving a higher estimate of US\$ 19 billion annually (ILO 2005, US State Department 2008).

The business can be highly attractive for criminal actors. Start-up costs are small and as Väyrynen (2005) harshly puts it, “people are a good commodity as they do not easily perish, but they can be transported over long distances and can be re-used and re-sold”. Moreover, the risks of detection, prosecution or arrest are much lower compared to other fields of illegal activity such as drug or arms trade. Exploited victims often feel discouraged to denounce their traffickers, as they face the risk of deportation and other legal consequences when contacting authorities in receiving countries (Langberg 2005, Surtees 2005). And even if traffickers are arrested, penalties are relatively low compared to other illicit activities (LexisNexis 2008).

In economic research, two recent theoretical papers have shed some light on the link between migration and its dark side in the form of trafficking or forced labour.<sup>9</sup> Tamura (2007) focuses on the interaction of human smuggling and trafficking. In his model, migrants hire a smuggler to cross borders and find work abroad. Once migrants depart, it depends on the smuggler’s decision and the profitability of exploitation whether they end up being trafficked or not. In a different setup, Friebe and Guriev (2006) model the market of illegal migration with debt/labour contracts. As most migrants cannot pay for migration costs in advance, criminal intermediaries and smugglers offer loans to potential migrants, which they have to pay back in the destination country. The contracts between migrants and intermediaries can only be enforced in the illegal sector, not in the legal one. Although the enforcement of such contracts can take place through coercion and punishment, the possible risk of exploitation and trafficking by the intermediaries is ruled out.

While theory is scarce, empirical evidence is even scarcer. There is very little systematic knowledge about which households and regions are most vulnerable to exploitation and

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<sup>9</sup> In a further paper, Dessy and Pallage (2006) focus on the trade off between trafficking and child labour. In their model, the risk of trafficking acts as a deterrent to sending children to work. They come to the conclusion that successful policy measures against trafficking may lead to an increase in child labour, because parents will be less afraid of letting their children work.

human trafficking. We are aware of only one econometric study on human trafficking.<sup>10</sup> Akee et al. (2007) analyse the determinants of trafficking of children and women in a cross-section of countries. A main result is that the stage of economic development and the inequality of incomes between countries are major determinants of trafficking. Contrary to expectations, they find that granting legal status to trafficked victims in host countries and banning prostitution in source countries leads to a higher, not lower, likelihood of trafficking. Despite this pioneering study, much remains to be done to uncover the drivers and mechanisms of human trafficking, particularly on the micro level.

### 2.3 Human Trafficking in Eastern Europe

There is a small but growing body of literature on the general migration patterns in Eastern Europe.<sup>11</sup> The countries under study have witnessed large and often seasonal migration flows since the breakdown of the Soviet Union. The main drivers of migration in the area are poor living conditions and a lack of jobs as well as migration networks. There is little evidence for positive self-selection, as most migrants work in low-skilled jobs in sectors such as construction, agriculture or in domestic services, often under dismal conditions. As to destinations, Mansoor and Quillin (2006) estimate that from 1990 to 2006 about 80 per cent of emigrants from the former Soviet Union moved within the CIS region, predominantly towards Russia, which is now the second largest recipient of international migrants worldwide. Other main destinations, particular for migrants from Bulgaria and Romania, are countries in the European Union.

Countries of the former Eastern bloc have also become major origins of forced labour and human trafficking in the last two decades. The exploitation of human beings has a long and sad history in the region. In medieval times, Venetian and Genoese merchants established a massive trade with slaves from Eastern Europe and the epoch of “second serfdom” implied highly repressive forms of exploitation (Blum 1957, Domar 1970). Today, the main destinations of trafficking victims are Western Europe and Russia, but they also include North America, Asia and, increasingly, the Middle East, in particular Turkey, Israel, Lebanon and the United Arab Emirates (Surtees 2005, UNODC 2006). Estimates of the extent of trafficking and forced labour in Eastern Europe vary widely. The report by the ILO (2005) estimates that a minimum of 200,000 people from Eastern Europe and Central Asia have fallen victim to trafficking, while Mansoor and Quillin (2006) cite estimates from the United Nations Population Fund that more than 175,000 persons are trafficked *annually* in Europe and Central Asia.

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<sup>10</sup> Basu and Chau (2003) provide cross-country evidence on child labour in debt bondage, but do not place their analysis in a migration or trafficking context.

<sup>11</sup> The following stylised facts are based on Bauer and Zimmermann (1999), Kraler and Iglicka (2002), Mansoor and Quillin (2006) and Görlich and Trebesch (2008).



Media coverage and reports such as UNODC (2006) suggest that Eastern European trafficking victims are mostly young women who are exploited in the commercial sex industry. It is certain that many victims from the region are females forced into prostitution. Yet, the IOM (2006) report and recent more qualitative surveys from Russia and South-eastern Europe (Tyuryukanova 2005, Surtees 2005) underline the dominant but neglected issue of male exploitation.<sup>12</sup> According to these sources, a large share of those trafficked from Central and Eastern Europe are men being exploited in agriculture, construction, or warehouse work.

A further key insight from recent studies in the region is that most of the victims of trafficking depart on a voluntary basis (ILO 2005, Tyuryukanova 2005). They often enter the destination countries at legal border crossings and with legal documents (Surtees 2005, ILO 2005). Typically, victims become subject to coercion and violence only *after* arrival at the destination, where their life in the shadows and a new environment makes them prone to be lured into seemingly attractive jobs by traffickers. The role of middlemen in the Eastern European trafficking business has also been documented in a small number of studies. According to the ILO (2005), trustworthy social networks can lower the risks of being trafficked, while the use of middlemen increases it. However, it is important to underline that social networks are not infallible and do not assure safety from trafficking. The IOM study by Surtees (2005) illustrates that the large majority of victims of sexual exploitation in countries like Albania, Bulgaria, or Macedonia was recruited by close friends, family members, or even the fiancé. Similarly, Laczko and Gramegna (2003) report that in South-eastern Europe 60 per cent of victims are recruited by acquaintances or friends, mostly with the promise to find them a job abroad.

In sum, these stylised facts show that the human trafficking flows from the region run in parallel to the general migration flows in Eastern Europe. Trafficking affects men and women alike and does not necessarily imply illegal border crossings or the use of unknown middlemen. Instead, it appears that many trafficked victims are recruited through personal relationships and leave voluntarily, but ill-prepared.

### **3. Human Trafficking as a Side Effect of International Labour Flows**

In line with the above, we argue that human trafficking is an unavoidable side effect of migration in a world of large income disparities but closed borders. Large emigration flows should be a main predictor of the incidence of trafficking. One obvious reason is that more people migrating implies more people at risk. Assuming a fixed low probability that a departing migrant ends up being trafficked, it is coherent to expect a larger number of trafficking victims to come from regions with large emigration flows.

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<sup>12</sup> Piper (2005) highlights that there is a particular need for data and empirical research on non-sexual forms of trafficking.

In addition to this mechanical effect, two main channels can explain why trafficking risks may increase with regional emigration rates. The first channel is linked to the demand side of the human trafficking market (crime groups recruiting for exploiters abroad), the second relates to its supply side (vulnerable individuals willing to work abroad).

On the demand side, agglomeration effects may explain why trafficking networks are most likely to be active in high-migration areas. Just like legal businesses, criminal activities tend to agglomerate in larger markets. This is true for drug gang concentration in cities (Glaeser and Sacerdote 1997) and applies to many other crime industries that concentrate geographically (Freeman et al. 1996, Zenou 2003). In the context of trafficking, recruiting markets will be larger where migration pressure is exceptionally high and the supply of potential victims continuous. Trafficking networks may also benefit from an established shadow migration industry in high-migration areas, as they can free-ride on the reliance of migrants on middlemen offering work procurement or smuggling services (see the related model by Tamura 2007). As indicated above, traffickers are just one type of private agents in the underground migrant service industry that has developed in countries of Eastern Europe, but also in many other areas worldwide, e.g. in Northern Africa or at the US-Mexican border. Recent sociological and criminological research indicates that the markets of migrant smuggling, work procurement and human trafficking/exploitation are indeed closely intertwined (e.g. Leman and Janssens 2007, Väyrynen 2005, Aronowitz 2001, Ruggiero 1997).

Turning to the supply side, self-selection effects may explain why those departing from high-migration areas are more likely to share characteristics that make them more vulnerable to trafficking networks. First, there are regional factors, as areas witnessing mass emigration are often particularly disadvantaged in the first place, often suffering from poor economic development and weak institutions. In these deprived areas, migration may represent the only strategy available to increase economic opportunities and start a better life. This will have strong implications for the preference set of those departing. Would-be migrants in areas with high migration pressure may generally be more prone to take risks in the migration process, such as crossing borders illegally or accepting jobs in the informal sector abroad. In extreme cases, migrants may even consent to exploitative working conditions. They may be keen to access so-called “3D” jobs (difficult, dirty, dangerous) because they would do nearly everything just to escape their dismal living conditions at home (Bhabha 2005). Second, skills, education and unobserved characteristics might also play a role. Recent evidence indicates that migrants from high-migration areas tend to be poorer and less educated than migrants departing from areas of little emigration.<sup>13</sup> Migrant networks and an established “migration

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13 See, in particular, Beine et al. (2009), Chiquiar and Hanson (2005) and McKenzie and Rapoport (2007, forthcoming)

infrastructure” all lower migration costs and hence increase the likelihood that people from lower social classes start to emigrate. These increasingly negatively self-selected groups may be more susceptible to deception schemes and also less able or willing to thoroughly prepare their journey.

In conclusion, both channels predict that individual trafficking risks increase with migration prevalence on the regional level. An important counter-veiling argument is the protective role of migrant networks. It is well-documented that networks on the family or regional level can shield from risks by decreasing information asymmetries and lowering migration costs (Carrington et al. 1996, Winters et al. 2001, Munshi 2003, Bauer et al. 2007). However, the above cited evidence on the patterns of human trafficking in Eastern Europe suggests that the effect of networks with regard to trafficking may be ambiguous. Relying on networks does not always assure safety from exploitation, as traffickers have learnt to misuse trust relationships to the migrant’s disadvantage.

#### **4. Data and Econometric Approach**

The household survey used in this analysis was commissioned by the International Organization for Migration. Fieldwork was conducted in Belarus, Bulgaria, Moldova, Romania and Ukraine between August and September 2006.

To arrive at nationally representative estimates, the survey relied on a multi-stage stratified sampling scheme.<sup>14</sup> Accordingly, the survey covers both urban and rural areas and sampled households of all regions in the five countries. In each country, at least 1000 individuals were interviewed, with slightly larger samples in Bulgaria and Ukraine, resulting in a total sample of 5513 households. The interviews were conducted with the person whose birthday was last among the rest of dwellers. The largest module in the survey was dedicated to human trafficking across borders. Most importantly, interviewed persons were asked whether persons in their close surroundings (relatives, friends and neighbours), in their close family<sup>15</sup>, or they themselves had experienced situations which would be classified as trafficking according to the definition above. Since households were randomly selected for the interview, selection bias suffered by other datasets that are based on the number of assisted victims or the number of border apprehensions (Tyldum and Brunovskis 2005) is avoided here. To the best of our knowledge, the relatively large sample and the survey design make it the most comprehensive and representative micro-level survey on human trafficking available worldwide.

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<sup>14</sup> See IOM (2006) for more details.

<sup>15</sup> The term “closed family” is defined as only including parents, children, husband/wife, brothers and sisters of the interviewed person. The survey generally refers to households as identified by close family ties with respect to the interviewee and not by residency.

To estimate the determinants of human trafficking on the household level, we use binary response models. A potential problem in this regard is that human trafficking, although affecting millions of people, is a relatively rare event on the household level King and Zeng (2001) show that the maximum likelihood estimator of standard logit or probit models is biased when the number of non-events (zeros) is multiple times higher than the number of events (ones). They illustrate that standard binary models underestimate the probability of rare events and do increasingly so as the event gets rarer. As a baseline method, we therefore rely on the rare event logit model suggested by King and Zeng (2001). In essence, their model is based on the basic logit model, but uses a bias-corrected estimator for rare events that generates a lower mean square error for coefficients. Note that this approach is particularly popular in political science (e.g. Fearon and Laitin 2003, Harff 2003, Collier and Hoeffler 2004) but is also increasingly used in research on economic issues (e.g. Hausmann et al. 2005, Leblang and Satyanath 2008). To test the robustness of our results, standard logit models are also applied.<sup>16</sup>

Our dependent variable is a dummy denoting whether the interviewed person reported a victim of human trafficking among close family members.<sup>17</sup> Given the relatively small number of individuals with trafficking in their close family, we combine sexual exploitation and other forms of exploitation. More specifically, the dummy takes the value of one if a close family member had travelled abroad and experienced one of the following situations: (i) “was offered a domestic or nursing job, but was locked and forced to work for no pay”, (ii) “was offered a job at an enterprise, on a construction site, or in agriculture, but was locked and forced to work for no or little pay” (iii) “was offered employment, but the passport was taken away upon arrival to the destination country and was forced to work in the sex business”. In line with the UN definition of human trafficking given above, these three situations have in common that the individual was forced to work by means of coercion.

Overall, 108 individuals indicate a victim of human trafficking in their close family. Out of these, there are 22 reported cases of members being forced to work in the sex business, while 86 cases were associated with non-sexual forms of exploitation. In our sample, most trafficked cases come from Moldova (56 out of 1073). The rest is found in Bulgaria (18 out of 1007), Ukraine (15 out of 1345), Belarus (11 out of 1071), and

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16 In light of the large economic and institutional differences between the countries under consideration, we cluster standard errors on the country level throughout the analysis. However, our main results are not affected when clustering on regions.

17 As the interviewee is by definition part of the close family, we make sure that our dependent variable also includes the case when the interviewed person was a victim of human trafficking him- or herself.

Romania (8 out of 1017). A very large number of interviewed people had not heard about any case of trafficking among the people they knew (4905 out of 5513).

Our data are likely to suffer from some degree of reporting bias. Victims of human trafficking and their relatives might be reluctant to share their experiences, being afraid of stigmatisation or problems with authorities at home or abroad. This is especially true for the case of sexual exploitation, which is a highly sensitive issue (Laczko 2005).<sup>18</sup>

To minimise the degree of underreporting, the survey instrument used various ways of reducing the stigma associated with human trafficking. First, instead of asking directly whether a family member had been “trafficked”, the survey instrument rather referred to typical situations of coerced labour. Second, the respondent did not have to reveal the identity of a trafficked family member. Third, if there was a case of sexual exploitation in the family, the interviewed person could still “hide” this experience in a more general answer category of exploitation. Based on these considerations, we believe that the potential under-reporting bias should not seriously invalidate our findings.<sup>19</sup>

Turning to the explanatory variables used in our analysis, we consider a set of household and regional<sup>20</sup> characteristics. We also include age, gender, marital status, and educational level of the respondent, which should control for systematic reporting biases along these dimensions. By contrast, we have no information on the personal characteristics of the trafficked member, or on the destinations or migration processes of those departed.

On the household level, we use household size, the number of children aged 16 or younger<sup>21</sup>, a dummy for households living in rural areas and another dummy indicating whether households live in the district around their respective capital city. In addition, a household’s living standard is proxied by subjective measures of its perceived financial status.<sup>22</sup> Unfortunately, information on household size and financial status is unavailable for households interviewed in Bulgaria and Romania. To capture access to public information and news, we also code a dummy for households that use the TV, as opposed to other media and social contacts, to get informed about social and political issues. With a view to the empirical literature on the determinants of migration in Eastern Europe, we expect household size, the number of children and poverty to increase the likelihood of human trafficking. In contrast, TV use can be seen as a source of relatively

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18 Another problem might be that the survey did not put a focus on marginal social groups, among whom trafficking prevalence rates could be higher.

19 An unavoidable bias in any database on human trafficking or migrant exploitation is that it only provides information on victims with known whereabouts or those returned.

20 Overall, the analysis covers 82 regions.

21 Due to a modification of the question, the number of children is defined as 14 or younger in Romania.

22 More precisely, households indicating that they even “have to save money for the basic necessities (food, clothing, footwear)” are coded as poor, while those indicating that they just “have enough money for the bare necessities (food, clothing, footwear)” are coded as middle-income households.

objective and high-quality information and is anticipated to raise awareness of trafficking risks, thus lowering the trafficking likelihood.

Our key variable of interest is the regional migration prevalence rate. It is constructed by taking the share of surveyed households in each region that reported to have had a member of the close family abroad in the last 3 years. To test the robustness of our argument, we also employ a proxy of low migration pressure. Concretely, we construct a regional variable capturing the share of interviewed individuals who stated that they could never imagine working abroad. Our main proposition suggests that high (low) migration pressure should increase (decrease) the risk of being trafficked.

To proxy the degree of information asymmetries, we include a risk awareness measure, which corresponds to the regional share of respondents who stated that they had heard of the phenomenon of human trafficking before. We try to most closely resemble a migrant's knowledge status before departure and reduce potential endogeneity by excluding respondents who knew a victim of human trafficking or lived in a migrant household in calculating this share. We suppose that a person who is aware of the risk of being trafficked would be more alert in dealing with people during the migration process and perhaps even disregard the possibility of migration. Hence, we expect the regional risk awareness to reduce the likelihood of having a trafficked family member.

We also use a regional measure for the prevalence of illegal migration. It is defined as the share of households in each region that reported to have had a member working abroad illegally. On the one hand, this variable aims to capture the fact that their notorious vulnerability makes illegal migrants more prone to be trafficked than legal migrants at any stage of the migration process. On the other hand, shadow migration industries, which might act as a breeding ground for trafficking networks, are presumably more present in areas with high levels of illegal migration. Consequently, we predict that the risk of being trafficked should grow with the extent of illegal migration.

Further regional control variables are coded from the Statistical Yearbooks of each of the five countries.<sup>23</sup> First, we use the number of reported crimes per 10,000 inhabitants in each region as a proxy for the rule of law. Second, the level of socioeconomic development and the availability of public services are proxied by the infant mortality rates per 1000 live births and the number of physicians per 10,000 inhabitants. Finally, the share of people living in rural localities is used to capture the remoteness of a region.

Before discussing the econometric results, it is worth having a look at the summary statistics (Table A1 in the appendix). For reasons of brevity, we only focus on the second half of the table, which contrasts migrant families with and without a trafficked member.

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23 Given that our dependent variables are retrospective and in order to minimise potential endogeneity problems, all variables from the Statistical Yearbooks were coded for the year 2004.

A simple means comparison suggests that the incidence of human trafficking is indeed positively correlated with regional migration rates. For migrant families without a trafficked member, the average regional prevalence of migration is about 37 per cent. Families with trafficking experiences, however, live in areas with even higher migration rates (46 per cent). The table also shows that households with an exploited member tend to live in regions where illegal migration patterns are more common (20 versus 14 per cent). Information and awareness seem to play a role as well. The share of families which uses the TV to get informed about socio-economic issues and knows about the phenomenon of human trafficking is noticeably higher among those without a trafficked member (85 versus 79 per cent and 79 versus 70 per cent respectively). Overall, there is little indication that poverty or low levels of regional development are positively associated with human trafficking. It also seems that crime levels are lower where the incidence of trafficking is high (104 versus 122 recorded crimes per 10,000 inhabitants).

## 5. Results

Overall, the econometric results are in line with our expectations.<sup>24</sup> We find that migration prevalence and informal migration patterns increase trafficking risks, while public awareness of human trafficking appears to play a protective role. However, some variables, especially those capturing the push factors of migration, turn out to be insignificant. Nevertheless, one should keep in mind that our analysis cannot control for individual characteristics of trafficked members. Idiosyncratic factors like age, sex, and education may well play a crucial role in determining a migrant's vulnerability to traffickers.

### 5.1 Main Results

Table 1 displays our main estimation results for the whole sample. The prevalence of migration appears to be the key predictor of human trafficking. Compared to other explanatory variables, it also has a large marginal effect<sup>25</sup>. A one percentage point increase in the share of migrant households in a region raises the likelihood of having a trafficked family member by 0.056 percentage points. This may appear small, but one has to keep in mind that trafficking is a rare event. A one percentage point increase in migration prevalence effectively translates into a five *percent* increase in the predicted probability of human trafficking on the household level. Or, when increasing the regional share of migrant households by one standard deviation (from 0.20 to 0.37), the risk of trafficking actually more than doubles. This finding is confirmed when we use our proxy for low migration pressure, the regional share of people who could never imagine working abroad

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24 All our findings hold when standard logit procedures are employed. For reasons of brevity, however, these results are not reported.

25 With the exception of dummy variables, all marginal effects are evaluated at the mean of the independent variables.

("stayers") (column 4). The incidence of trafficking appears to be significantly lower in regions where fewer people intend to leave.

We also find a significant link between risk perceptions and trafficking. Households in regions with higher awareness of the phenomenon of human trafficking are less likely to have a trafficked family member. The same is true for households which use the TV as main source of information on social and political issues.<sup>26</sup> These findings, although not fully robust, underline the potential benefits of public awareness campaigns to counter human trafficking.

A further main result concerns the role of illegal migration (column 3). In areas where the prevalence of illegal migration is high, the risks of being trafficked increase considerably. This confirms the intuition that exposure to informal labour markets and its intermediaries increases the risk of exploitation (Friebel and Guriev 2006, Tamura 2007). In contrast, the presence of criminal activities per se, which we try to capture through the number of reported crimes, does not appear to increase the likelihood of human trafficking.

Generally, remoteness and living standards do not seem to matter much for trafficking risks. Living in regions with a large share of rural population, high rates of infant mortality, or low density of physicians does not increase the likelihood of trafficking. If at all, there is weak evidence that households in regions with higher levels of infant mortality are even less likely to report a trafficked family member. On the household level, perceived poverty, as measured by financial status, does not appear to play a role either (column 2). It should be kept in mind, however, that the survey does not report any pre-migration assessments of living standards. Hence, no strong conclusions should be drawn from this result. As regards the remaining household-level variables, we do not find that trafficking risks depend on the number of children, while the household size is a positive, but only weakly significant predictor.

## 5.2 Selection Effects and Subsample of Migrant Households

Since we only consider human trafficking across international borders, one can argue that migration is a necessary prerequisite to be exposed to the risk of being trafficked. We therefore rerun all regressions, restricting the sample to migrant households only. It turns out that all major findings for the entire sample also hold for this subsample of 1560 migrant households (Table 2). Migration prevalence, risk perceptions, and the level of illegal migration remain the most important predictors of trafficking.

With a view to the arguments outlined above, our findings in this sub-sample are particularly important. As we only look at migrant households now, the positive and

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26 Arguably, TV use may also be a proxy for household wealth. Note, however, that this result remains unaffected when controlling for a household's financial status (column 2 of Table 1).



significant coefficient for regional migration prevalence suggests that the risk of trafficking on the family level increases more than proportionally with emigration rates. This lends some support to our hypothesis that agglomeration and/or self-selection effects render migrants in high-migration areas more prone to the risk of being trafficked. Data limitations, however, do not allow us to explicitly identify the underlying mechanisms.

In a next step, we account for the fact that human trafficking should only be observable for migrant households. To econometrically allow for this we estimate a probit sample selection model with a dummy for migrant households as dependent variable in the selection equation and a dummy for households with a trafficked family member in the outcome equation. For this Heckman-type selection model to be identified, it is necessary to find a variable that is a significant predictor in the selection equation, but excludable from the outcome equation. Our dataset offers only a limited choice of such instruments. Arguably, the most credible variable is a dummy indicating whether the household has an employed member at home. Our identifying assumption is that having a domestically employed household member relieves the household's migration pressure, but does not directly affect the risk of being trafficked.<sup>27</sup> Having an employed household member turns out to be a highly significant and negative predictor of having a family member abroad. The results of the probit selection model (first column of Table 3) closely resemble those of the rare events logit estimation. In addition, our estimates do not appear to be biased due to sample selection. The Likelihood Ratio test of independent equations cannot reject the null hypothesis of no correlation between the error terms (p-value 0.56). Thus, it is sufficient to separate the sample selection model and focus on the outcome equation as done in Table 2.

### 5.3 Further Robustness Checks

Further robustness tests are reported in the remaining columns of Table 3. Our sample continues to be restricted to migrant households only. In column 2, we check whether our previous result that trafficking risks increase with the rates of illegal migration holds at the household level. For this purpose, we include a dummy indicating whether a household's members abroad worked illegally. As expected, households with illegal migration experience are significantly more likely to report a trafficked family member. While it is hard to infer a causal relationship from this result, it further indicates that illegal migration and human trafficking are closely interwoven.

We also check whether Moldova, which has by far the highest prevalence of both migration and trafficking, biases our results. To do so, we add interaction terms of the

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<sup>27</sup> An alternative form of identification is through functional form, thus relying on the non-linearity of the model. The application of this approach yields similar results.

major predictors of human trafficking (regional migration prevalence, risk awareness, and legal migration shares) with a dummy for Moldovan households to our regression model. We then test whether these interaction terms are jointly significantly different from zero. While most of our previous results remain stable (column 3), none of the interaction terms is individually different from zero. The F-test also fails to reject the null hypothesis of joint insignificance (p-value 0.96). Thus, our main findings do not seem to be driven by the case of Moldova, but rather apply more generally to the five countries under consideration.<sup>28</sup>

Finally, we address the concern that some regional variables might be highly correlated with regional migration rates. As a result, the inclusion of migration prevalence may render other regional variables insignificant. However, when running the regression without regional migration rates, factors like the density of physicians or crime levels do still not appear to be significant predictors of human trafficking (last column of Table 3).

## 6. Concluding Remarks

Our results for the Eastern European context have several implications. First, policymakers concerned about human trafficking should generally acknowledge the important role of migration. Measures to counter human trafficking and related awareness campaigns should be targeted to areas where migration rates are high or on the rise, not to remote areas with no or little migration.

Second, our indicative findings on the role of risk awareness and information use may provide some orientation for policy initiatives facing cost-benefit trade-offs. In fact, the results give some reason for optimism that anti-trafficking campaigns and measures to reduce information asymmetries in the migration process can indeed be a promising way to reduce the crime. Besides awareness campaigns, the ILO (2005) suggests to set up labour market information systems on jobs at home and abroad and the general use of model employment contracts.

Third, our results document the close link between illegal migration patterns and trafficking. Restrictive immigration policies certainly add to the problem by pushing would-be immigrants into illegality. However, a moderate increase of legal migration opportunities is unlikely to solve the problem given the magnitude of global migration pressure (Amin and Mattoo 2006). In addition, traffickers' incentives would remain unchanged through such measures.

Finally, we find some indication that large, regional migration networks increase risks and may thus have ambiguous effects. This stands in some contrast to the existing migration literature, which generally advocates a risk-reducing role of networks. More research is

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<sup>28</sup> In the same spirit, we also tested whether any of the other four countries biases our results but find no indication that this is the case.

needed to better understand the role of social networks and personal recruitment processes for migration and trafficking.

As a general conclusion, it seems likely that the market of human trafficking and the number of victims will continue to grow as long as migration pressure remains high.

## Literature

- Akee, R., A. Basu, A. Bedi, and N. Chau (2007). Determinants of Trafficking in Women and Children: Cross-National Evidence, Theory and Policy Implications. Mimeo.
- Amin, M., and A. Mattoo (2006). Can Guest Worker Schemes Reduce Illegal Migration? Policy Research Working Paper Series 3828, The World Bank, Washington, D.C.
- Aronowitz, A. (2001). Smuggling and Trafficking in Human Beings: The Phenomenon, the Markets That Drive It and the Organizations That Promote It. *European Journal on Criminal Policy and Research* 9: 163-195.
- Bales, K. (1999). *Disposable People: New Slavery in the Global Economy*. Berkeley: University of California Press.
- Basu, A., and N. Chau (2003) Targeting Child Labor in Debt Bondage: Evidence Theory and Policy Prescriptions. *World Bank Economic Review* 17: 255-281.
- Bauer, T., G. Epstein, and I. Gang (2007). The Influence of Stocks and Flows on Migrants' Location Choices. *Research in Labor Economics* 26: 199-229.
- Bauer, T., and K. Zimmermann (1999). Assessment of Possible Migration Pressure and Its Labour Market Impact Following EU Enlargement to Central and Eastern Europe. IZA Research Reports 3, Institute for the Study of Labor (IZA).
- Beine, M., F. Docquier and C. Ozden (2009). Diasporas. CESifo Working Paper No. 2607.
- Bhabha, J. (2005). Trafficking, Smuggling, and Human Rights. *Migration Information Source: Special Issue on Migration and Human Rights*.
- Blum, J. (1957). The Rise of Serfdom in Eastern Europe. *American Historical Review* 62: 807-836.
- Bruckert, C., and C. Parent (2002). Trafficking in Human Beings and Organized Crime: A Literature Review. Royal Canadian Mounted Police. Mimeo.
- Carrington, W., E. Detragiache, and T. Vishwanath (1996). Migration with Endogenous Moving Costs, *American Economic Review* 86(4): 909-30.
- Chand, S. (2008). Economics of Human Trafficking: A Survey. The Australian National University. Mimeo.
- Chiquiar, D. and G. Hanson (2005). International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States. *Journal of Political Economy* 113: 239-281.
- Clemens, M., C. Montenegro, and L. Pritchett (2008). The Place Premium: Wage Differences for Identical Workers Across the US Border. Policy Research Working Paper Series 4671, The World Bank, Washington, D.C.
- Collier, P. and A. Hoeffler (2004). Greed and grievance in civil war. *Oxford Economic Papers* 56: 563-595.
- Coomaraswamy, R. (2001). United Nations Addendum Report to the Human Rights Commission regarding Mission to Bangladesh, Nepal and India on the issue of trafficking of women and children.
- Dessy, S., and S. Pallage (2006). Some Surprising Effects of Better Law Enforcement Against Child Trafficking. *Journal of African Development* 8: 115-132.

- Domar, E. (1970). The Causes of Slavery or Serfdom: A Hypothesis. *Economic History Review* 30: 18-32.
- Fearon, J. D. and D. D. Laitin (2003). Ethnicity, Insurgency, and Civil War. *American Political Science Review* 97: 75-90.
- Fiorentini, G., and S. Peltzman (1995). *The Economics of Organised Crime*. Cambridge University Press.
- Freeman, S., J. Grogger, and J. Sonstelie (1996). The Spatial Concentration of Crime. *Journal of Urban Economics* 40: 216-231.
- Friebel, G., and S. Guriev (2006). Smuggling Humans: A Theory of Debt-Financed Migration. *Journal of the European Economic Association* 4: 1085-1111.
- Gathmann, C. (2008). Effects of Enforcement on Illegal Markets: Evidence from Migrant Smuggling Along the South-western Border. *Journal of Public Economics* 92: 1926-1941.
- Glaeser, E., and B. Sacerdote (1999). Why Is There More Crime in Cities? *Journal of Political Economy* 107: 225-229.
- Gozdziak, E., and E. Collett (2005). Research on Human Trafficking in North America: A Review of Literature. *International Migration* 43: 99-128.
- Görlich, D., and C. Trebesch (2008). Seasonal Migration and Networks – Evidence on Moldova’s Labour Exodus. *Review of World Economics* 144: 107-133.
- Harff, B. (2003). No Lessons Learned from the Holocaust: Assessing Risks of Genocide and Political Mass Murder Since 1955. *American Political Science Review* 97: 57-74.
- Hausmann, G., L. Pritchett and D. Rodrik (2005). Growth Accelerations. *Journal of Economic Growth* 10: 303-329
- ILO (2005). A Global Alliance against Forced Labour. ILO, Geneva.
- IOM (2006). Human Trafficking Survey: Belarus, Bulgaria, Moldova, Romania, and Ukraine. December 2006. IOM Kyiv, Ukraine.
- King, G., and L. Zeng (2001). Logistic Regression in Rare Events Data. *Political Analysis* 9: 137-63.
- Kraler, A., and K. Iglicka (2002). Labour Migration in Central and Eastern European Countries. In: F. Laczko, I. Stacher, A. Klekowski von Koppenfels (eds.), *New Challenges for Migration Policy in Central and Eastern Europe*. The Hague: Asser Press: 27-58.
- Laczko, F. (2005). Data and Research on Human Trafficking. *International Migration* 43: 5-16.
- Lackso, F., and M. Gramegna. (2003). Developing Better Indicators of Human Trafficking. *Brown Journal of World Affairs* 10: 179-94.
- Langberg, L. (2005). A Review of Recent OAS Research on Human Trafficking in the Latin American and Caribbean Region. *International Migration* 43: 129-139.
- Leblang, D. and S. Satyanath (2008). Politically Generated Uncertainty and Currency Crises: Theory, Tests, and Forecasts. *Journal of International Money and Finance* 27: 480-497.
- Leman, L. and S. Janssens (2007). Travel Agencies as a Linking Element for Human Smuggling and Trafficking from Eastern Europe, *Migration Studies* 166: 443–459.

- LexisNexis (2008). LexisNexis Global Survey of Human Trafficking Laws. July 2008. Available at [http://www.lexisnexis.com/documents/pdf/20081218105838\\_large.pdf](http://www.lexisnexis.com/documents/pdf/20081218105838_large.pdf)
- Mansoor, A., and B. Quillin (2006). *Migration and Remittances: Eastern Europe and the Former Soviet Union*. The World Bank, Washington, D.C.
- Mansour, A., N. Marceau, and S. Mongrain (2006). Gangs and Crime Deterrence. *Journal of Law, Economics and Organization* 22: 315-339.
- McKenzie, D., and H. Rapoport (2007). Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico. *Journal of Development Economics* 84: 1-24.
- McKenzie, D., and H. Rapoport (forthcoming). Self-selection Patterns in Mexico-U.S. Migration: the Role of Migration Networks. *Review of Economics and Statistics*.
- Munshi, K. (2003). Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market. *Quarterly Journal of Economics* 118: 549-599.
- Naim, M. (2005). *Illicit: How Smugglers, Traffickers and Copycats Are Hijacking the Global Economy*. Doubleday.
- Obuah, E. (2006). Combating Global Trafficking in Persons: The Role of the United States Post-September 2001. *International Politics* 43: 241-265.
- Orrenius, P. (1999). The Role of Family Networks, Coyote Prices and the Rural Economy in Migration From Western Mexico: 1965-1994. Working Paper 99-10, Federal Reserve Bank of Dallas.
- Piper, N. (2005). A Problem by a Different Name? A Review of the Research on Trafficking in South-East Asia and Oceania. In: F. Laczko and E. Gozdzik (eds), *Data and Research On Human Trafficking: a Global Survey*. IOM, Geneva: 202-233.
- Ruggiero, V. (1997). Trafficking in Human Beings: Slaves in Contemporary Europe. *International Journal of the Sociology of Law* 25: 231-244.
- Salt, J. (2000). Trafficking and Human Smuggling: A European Perspective. *International Migration* 38: 31-54.
- Salt, J., and J. Stein (1997). Migration as Business: The Case of Trafficking. *International Migration* 35: 467-494.
- Schloenhardt, A. (1999). Organized Crime and the Business of Migrant Trafficking. *Crime, Law and Social Change* 32: 203-233.
- Stalker, P. (2000). *Workers Without Frontiers: The Impact of Globalisation on International Migration*. ILO, Geneva.
- Surtees, R. (2005). Second Annual Report on Victims of Trafficking in South-Eastern Europe. IOM, Geneva.
- Tamura, Y. (2007). Migrant Smuggling. Warwick Economics Research Paper Series 791, University of Warwick, Department of Economics.
- Tyldum, G., and A. Brunovskis (2005). Describing the Unobserved: Methodological Challenges in Empirical Studies on Human Trafficking. *International Migration* 43: 17-34
- Tyuryukanova, E. (2005). Forced Labour in the Russian Federation Today. ILO, Geneva.

- UN (2000a). Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, Supplementing the United Nations Convention Against Transnational Organized Crime. United Nations, New York.
- UN (2000b). Protocol against the Smuggling of Migrants by Land, Sea and Air, Supplementing the United Nations Convention Against Transnational Organized Crime. United Nations, New York.
- UNODC (2006). Trafficking in Persons: Global Patterns. United Nations Office on Drugs and Crime.
- US State Department (2008). Trafficking in Persons Report. Office to Monitor and Combat Trafficking in Persons.
- Väyrynen, R. (2005). Illegal Immigration, Human Trafficking and Organized Crime. In: G. Borjas and J. Crisp (eds.), *Poverty, International Migration and Asylum*. New York: Palgrave Macmillan: 143-170.
- Winters, P., A. de Janvry, and E. Sadoulet (2001). Family and Community Networks in Mexico-U.S. Migration. *Journal of Human Resources* 36: 159-184.
- World Bank (2005). Global Economic Prospects 2006: Economic Implications of Remittances and Migration. Washington, D.C.
- Zenou, Y. (2003). The Spatial Aspects of Crime. *Journal of the European Economic Association* 1: 459-467.

Table A1: Summary statistics for households with and without trafficked members

	All households (n=5,513)				Migrant households only (n=1,560)			
	No trafficked member		With trafficked member		No trafficked member		With trafficked member	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Rural	0.39	0.49	0.53	0.50	0.44	0.50	0.56	0.50
Capital district	0.18	0.38	0.21	0.41	0.14	0.34	0.10	0.30
Share of rural population	0.38	0.22	0.51	0.26	0.48	0.24	0.58	0.23
Infant mortality (regional)	10.93	3.75	11.09	2.57	11.87	3.72	11.39	2.56
Density of physicians (per 10,000 inh.)	35.40	16.24	28.84	12.51	29.41	15.43	27.09	12.25
Crime rate (crimes per 10,000 inh.)	160.92	107.93	115.89	77.72	122.28	80.46	104.41	65.21
Migration prevalence	0.28	0.17	0.42	0.19	0.37	0.18	0.46	0.20
Share of illegal migrants	0.10	0.09	0.17	0.14	0.14	0.11	0.20	0.14
Share of stayers	0.51	0.12	0.48	0.11	0.49	0.12	0.46	0.11
Awareness of trafficking (regional)	0.79	0.14	0.75	0.18	0.79	0.15	0.70	0.19
Migrant household	0.28	0.45	0.67	0.47	1.00	1.00	1.00	1.00
Household size	3.10	1.35	3.37	1.44	3.18	1.41	3.54	1.52
Number of children (0-16)	0.46	0.75	0.63	0.84	0.55	0.83	0.76	0.91
Poor financial status	0.41	0.49	0.48	0.50	0.45	0.50	0.48	0.50
Medium financial status	0.37	0.48	0.30	0.46	0.34	0.47	0.26	0.44
Rich financial status	0.22	0.41	0.23	0.42	0.22	0.41	0.26	0.44
Illegal migration experience (in hh)	0.09	0.29	0.40	0.49	0.34	0.47	0.60	0.49
Employed hh member (dummy)	0.46	0.50	0.49	0.50	0.41	0.49	0.50	0.50
TV use	0.83	0.38	0.78	0.42	0.85	0.35	0.79	0.41
Age (respondent)	43.86	17.71	41.50	16.04	42.32	17.14	39.99	16.38
Male (respondent)	0.45	0.50	0.47	0.50	0.44	0.50	0.49	0.50
No or primary educ. (respondent)	0.29	0.45	0.27	0.45	0.29	0.46	0.31	0.46
Secondary education (respondent)	0.43	0.50	0.46	0.50	0.41	0.49	0.46	0.50
Higher education (respondent)	0.28	0.45	0.27	0.45	0.30	0.46	0.24	0.43
Married (respondent)	0.60	0.49	0.67	0.47	0.63	0.48	0.67	0.47



Table 1: Baseline regressions (all households)

	(1)		(2)		(3)		(4)	
	Baseline		With financial status and household size		With regional share of illegal migrants		With regional share of stayers	
	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect
Rural	0.196 (0.226)	0.002	0.222 (0.285)	0.003	0.231 (0.220)	0.003	0.222 (0.225)	0.003
Capital district	1.270** (0.619)	0.024	0.924* (0.489)	0.017	1.160** (0.580)	0.022	1.496** (0.668)	0.032
Share of rural population	0.568 (1.184)	0.007	-0.863 (1.162)	-0.014	0.839 (1.135)	0.011	2.007* (1.199)	0.025
Infant mortality	-0.073*** (0.022)	-0.001	-0.007 (0.065)	-9.490E-05	-0.087*** (0.022)	-0.001	-0.044 (0.034)	-0.001
Density of physicians	-0.010 (0.011)	-1.276E-04	-0.006 (0.018)	-1.093E-04	-0.016 (0.011)	-1.962E-04	-0.008 (0.009)	-1.059E-04
Crime rate	0.000 (0.001)	1.900E-06	-0.001 (0.001)	-1.250E-05	-0.001 (0.001)	-1.810E-05	-0.001 (0.001)	-1.700E-05
Awareness of trafficking	-1.549* (0.887)	-0.018	-1.885** (0.889)	-0.026	-0.801 (0.748)	-0.010	-1.708* (0.906)	-0.021
Migration prevalence	4.727*** (1.019)	0.056	4.860** (2.465)	0.072				
Share of illegal migrants					3.682*** (1.294)	0.044		
Share of stayers							-2.665** (1.074)	-0.032
TV use	-0.381** (0.156)	-0.005	-0.387** (0.170)	-0.006	-0.385*** (0.149)	-0.005	-0.373** (0.163)	-0.005
Number of children (0-16)	0.064 (0.070)	0.001	-0.074 (0.148)	-0.001	0.066 (0.066)	0.001	0.073 (0.070)	0.001
Poor financial status				-0.077 (0.384)				
Medium financial status				-0.284* (0.161)				
Household size				0.179* (0.095)	0.002			
Age (respondent)	-0.009* (0.005)	-1.116E-04	-0.009 (0.008)	-1.374E-04	-0.010** (0.005)	-1.301E-04	-0.009 (0.006)	-1.144E-04
Male (respondent)	0.185 (0.115)	0.002	0.292*** (0.081)	0.004	0.202* (0.117)	0.002	0.188* (0.113)	0.002
No or primary education (respondent)	-0.353 (0.215)	-0.004	-0.116 (0.200)	-0.002	-0.318 (0.217)	-0.004	-0.338 (0.208)	-0.004
Secondary education (respondent)	-0.078 (0.186)	-0.001	0.130 (0.235)	0.002	-0.032 (0.201)	-3.265E-04	-0.028 (0.183)	-3.029E-04
Married (respondent)	0.288** (0.115)	0.003	0.331** (0.138)	0.005	0.317*** (0.118)	0.004	0.298** (0.121)	0.004
Belarus	-0.211 (0.280)	-0.003	-0.161 (0.849)	-0.002	-1.063*** (0.192)	-0.010	-1.050*** (0.176)	-0.010
Bulgaria	0.776 (0.477)	0.011			-0.062 (0.337)	-0.001	-0.037 (0.356)	-0.001
Romania	-0.667 (0.411)	-0.007			-0.983*** (0.315)	-0.010	-1.190*** (0.312)	-0.011
Ukraine	0.451 (0.439)	0.006	0.328 (0.835)	0.006	-0.239 (0.424)	-0.003	-0.165 (0.488)	-0.002
Number of observations	5,513		3,369		5,513		5,513	

Note: \*\*\*/\*\*/\* denote significance at a 1/5/10 per cent level respectively. Country-clustered standard errors in parentheses. The dependent variable is a dummy for human trafficking incidence on the household level.

Table 2: Baseline regressions (migrant households only)

	(1)		(2)		(3)		(4)	
	Baseline		With financial status and household size		With regional share of illegal migrants		With regional share of stayers	
	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect
Rural	-0.011 (0.300)	7.150E-05	-0.027 (0.364)	-3.273E-04	0.015 (0.296)	0.001	-0.008 (0.301)	1.846E-04
Capital district	0.506 (0.656)	0.017	0.354 (0.636)	0.012	0.402 (0.629)	0.013	0.761 (0.693)	0.030
Share of rural polulation	0.794 (1.014)	0.026	0.582* (0.302)	0.017	1.716* (0.886)	0.057	2.604** (1.079)	0.086
Infant mortality	-0.113*** (0.028)	-0.004	-0.066 (0.070)	-0.002	-0.145*** (0.020)	-0.005	-0.086*** (0.029)	-0.003
Density of physicians	0.004 (0.020)	9.350E-05	0.012 (0.021)	3.898E-04	0.004 (0.014)	1.153E-04	0.011 (0.016)	3.364E-04
Crime rate	0.002 (0.002)	5.700E-05	0.001 (0.001)	7.960E-06	0.001 (0.002)	1.630E-05	0.000 (0.002)	2.470E-06
Awareness of trafficking	-2.677*** (0.915)	-0.083	-3.180*** (1.028)	-0.120	-1.777* (0.978)	-0.057	-2.745*** (0.939)	-0.089
Migration prevalence	5.104*** (0.815)	0.158	4.479** (2.128)	0.184				
Share of illegal migrants					3.491*** (1.017)	0.109		
Share of stayers							-2.772** (1.177)	-0.090
TV use	-0.563** (0.238)	-0.020	-0.691*** (0.174)	-0.032	-0.582** (0.245)	-0.022	-0.529* (0.285)	-0.020
Number of children (0-16)	0.161 (0.113)	0.004	0.067 (0.197)	0.003	0.143 (0.107)	0.004	0.179* (0.109)	0.005
Poor financial status			-0.224 (0.412)	-0.008				
Medium financial status			-0.485*** (0.122)	-0.017				
Household size			0.178 (0.116)	0.006				
Age (respondent)	-0.007 (0.006)	-2.322E-04	-0.006 (0.009)	-2.538E-04	-0.009* (0.005)	-2.946E-04	-0.007 (0.006)	-2.533E-04
Male (respondent)	0.153 (0.243)	0.005	0.337*** (0.125)	0.013	0.194 (0.250)	0.006	0.179 (0.240)	0.006
No or primary education (respondent)	-0.131 (0.294)	-0.004	0.187 (0.229)	0.008	-0.046 (0.276)	-0.002	-0.077 (0.285)	-0.003
Secondary education (respondent)	0.005 (0.313)	3.813E-04	0.372 (0.399)	0.015	0.073 (0.333)	0.003	0.059 (0.324)	0.002
Married (respondent)	0.137 (0.206)	0.005	0.216 (0.322)	0.009	0.191 (0.188)	0.007	0.163 (0.207)	0.006
Belarus	0.930** (0.426)	0.041	0.889 (0.591)	0.055	-0.171 (0.363)	-0.005	-0.108 (0.249)	-0.003
Bulgaria	1.468*** (0.488)	0.079			0.541 (0.406)	0.020	0.567 (0.421)	0.022
Romania	-0.068 (0.550)	-0.003			-0.344 (0.485)	-0.011	-0.525 (0.454)	-0.016
Ukraine	0.988*** (0.350)	0.045	0.856** (0.348)	0.052	0.145 (0.250)	0.005	0.368 (0.315)	0.015
Number of observations	1,560		987		1,560		1,560	

Note: \*\*\*/\*\*/\* denote significance at a 1/5/10 per cent level respectively. Country-clustered standard errors in parentheses. The dependent variable is a dummy for human trafficking incidence on the household level.

Table 3: Robustness checks

	(1)			(2)		(3)		(4)	
	Heckman estimation			With illegal migration experience at household level		With interaction terms for Moldova		Without migration prevalence	
	migrant	trafficked member							
	coeff. / se	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect	coeff. / se	marginal effect
Rural	0.111** (0.049)	0.035 (0.142)	0.001	-0.029 (0.288)	0.028	-0.029 (0.437)	-0.001	0.001 (0.301)	4.922E-04
Capital district	-0.018 (0.077)	0.194 (0.253)	0.006	0.512 (0.735)	-4.839E-04	0.514 (0.756)	0.016	0.341 (0.563)	0.011
Share of rural population	0.078 (0.199)	0.360 (0.637)	0.010	0.763 (1.127)	0.016	0.888 (1.531)	0.026	2.340** (1.024)	0.079
Infant mortality	0.008 (0.007)	-0.048* (0.029)	-0.001	-0.131*** (0.024)	0.023	-0.135** (0.055)	-0.004	-0.117*** (0.018)	-0.004
Density of physicians	-0.000 (0.003)	-0.000 (0.010)	-6.700E-07	0.004 (0.017)	-0.004	0.003 (0.027)	6.330E-05	0.017 (0.021)	0.001
Crime rate	-0.001* (0.000)	0.001 (0.001)	1.450E-05	0.002 (0.002)	8.870E-05	0.002 (0.002)	5.870E-05	0.001 (0.002)	3.610E-06
Awareness of trafficking	-0.094 (0.152)	-1.187*** (0.428)	-0.031	-2.258*** (0.772)	0.143	-2.030 (1.626)	-0.060	-3.026*** (1.167)	-0.100
Migration prevalence	1.856*** (0.213)	2.742*** (0.759)	0.073	4.940*** (0.973)	5.080E-05	5.005*** (1.487)	0.148		
TV use	0.055 (0.054)	-0.232 (0.170)	-0.007	-0.525** (0.232)	-0.017	-0.298 (0.530)	-0.008	-0.538** (0.260)	-0.021
Number of children (0-16)	0.062** (0.026)	0.089 (0.064)	0.002	0.120 (0.132)	0.003	0.104 (0.091)	0.003	0.173 (0.105)	0.005
Age (respondent)	-0.006*** (0.001)	-0.004 (0.004)	-1.167E-04	-0.004 (0.006)	-1.353E-04	-0.005 (0.009)	-1.615E-04	-0.008 (0.005)	-2.850E-04
Male (respondent)	0.028 (0.039)	0.070 (0.113)	0.002	0.222 (0.259)	0.007	0.231 (0.230)	0.007	0.182 (0.249)	0.006
No or primary education (respondent)	-0.165*** (0.055)	-0.106 (0.163)	-0.003	-0.111 (0.298)	-0.003	-0.108 (0.342)	-0.003	-0.062 (0.276)	-0.002
Secondary education (respondent)	-0.039 (0.048)	-0.031 (0.143)	-0.001	-0.014 (0.280)	-2.247E-04	-0.008 (0.311)	-1.252E-04	0.067 (0.322)	0.003
Married (respondent)	0.102** (0.044)	0.078 (0.129)	0.002	0.080 (0.196)	0.003	0.099 (0.295)	0.003	0.193 (0.194)	0.007
Employed household member	-0.116*** (0.043)								
Illegal migration experience (hh level)				0.840*** (0.083)	0.037	0.808*** (0.303)	0.027		
TV use * Moldova						-0.495 (0.587)	-0.013		
Migration prevalence * Moldova						-0.591 (2.446)	-0.017		
Awareness of trafficking * Moldova						-0.464 (1.974)	-0.011		
Illegal migration experience * Moldova						0.017 (0.440)	0.001		
Belarus	-0.206** (0.100)	0.362 (0.375)	0.013	0.705** (0.357)	-0.065	-0.336 (2.326)	-0.006	-0.570 (0.494)	-0.015
Bulgaria	-0.213** (0.095)	0.616* (0.363)	0.027	1.456*** (0.468)	0.027	0.536 (1.970)	0.022	0.105 (0.401)	0.003
Romania	-0.068 (0.078)	-0.054 (0.229)	-0.001	-0.119 (0.523)	0.074	-1.170 (2.177)	-0.026	-0.509 (0.482)	-0.016
Ukraine	-0.246** (0.112)	0.382 (0.388)	0.013	0.885** (0.345)	-0.004	-0.165 (2.158)	-0.002	-0.406 (0.354)	-0.011
rho	0.471 (0.862)								
Number of observations		5 513		1 560		1 560		5 513	