Courant Research Centre
'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'

Georg-August-Universität Göttingen
(founded in 1737)

Discussion Papers

No. 97

Modern Day Slavery:
What Drives Human Trafficking in Europe?

Diego Hernandez, Alexandra Rudolph

September 2011, revised November 2011

Modern Day Slavery:
What Drives Human Trafficking in Europe?

Diego Hernandez* and Alexandra Rudolph**

November 2011

Working Paper

Abstract

At a time of increased attention on the international agenda for human trafficking, this paper examines the determinants of human trafficking inflows in to 13 European countries based on officially recorded victim numbers. By employing a fixed effects zero-inflated, negative binomial gravity-type model, we address data characteristics appropriately. The econometric analysis suggests that human trafficking occurs in well established routes for migrants and refugees. Victims are more likely to be transported to, and exploited in, host countries with suboptimal institutional quality levels. Countries whose nationals do not require a visa for short term visits are especially prone to being potential source countries. Legal status and regulation of commercial sex services does not affect the pattern of trafficking flows.

* University of Goettingen, Department of Economics, Platz der Goettinger Sieben 3, D-37073 Goettingen, Germany, Email: dhernan@uni-goettingen.de
** University of Goettingen, Department of Economics, Platz der Goettinger Sieben 3, D-37073 Goettingen, Germany, Email: arudolp@uni-goettingen.de

1.   Introduction

Declining costs of communication and transportation have allowed for the escalation of migratory flows over the last few decades. This has been facilitated by people's willingness to move to more prosperous and politically stable regions. Together with strict border controls and limited working opportunities for foreigners in host countries, these factors have nurtured organized crime organizations assisting in illegal migration. The illicit activity of Trafficking in Persons (TIP), often acknowledged as "modern day slavery," bases its source of profits on the exploitation of human rights by using people as commodities.[1] According to the U.S. Department of State (2006), between 600,000 and 800,000 people fall victim to these trafficking mafias every year. The International Labor Organization (ILO 2005) estimates that at least 2.4 million adults and children are victims of forced labor and sexual servitude as a result of TIP. Moreover, revenues from this form of exploitation are calculated to be at least US$ 30 billion annually, making human traffic the most profitable illicit activity after drugs and weapons smuggling (ILO 2005; Interpol 2009).

Despite the magnitude of these figures, there are few quantitative studies in this area. This is mainly because acquiring data is difficult and its collection process is not homogeneous across countries. Uniform data collection is largely affected by government effectiveness in identifying relevant actors (both victims and traffickers), as they belong to the "hidden population" (Heckathorn 1997). In addition, given how politicized the topic is, identification efforts may be canalized towards specific human trafficking segments, above all sexual exploitation (Tyldum and Brunovskis 2005). Given this constraint, the scarce quantitative research on human trafficking bases its analysis on self-constructed estimations and proxies, or on surveys implemented for specific case studies. This limits its comparability and impedes the identification of relevant factors driving human trafficking. The recent attempts to address the subject empirically are a response to the growing importance of the issue of human trafficking on the international agenda.

One part of the literature, which accounts for a large portion of quantitative research on the subject, focuses on the impact and effectiveness of policies combating human trafficking (Akee et al. 2010b; Avdeyeva 2010; Cho and Vadlamannati 2011; Di Tommaso et al. 2009; Simmons and Lloyd 2010). In line with this strand of research, Cho et al. (2011a) develop an anti-trafficking policy index measuring the three main dimensions of trafficking: prosecution, protection and prevention.[2] A second and less developed strand of the literature focuses on the determinants of TIP. Akee et al. (2010a; 2010b) find, among other factors, that granting legal status to victims in host countries and

---

[1] "Modern day slavery" is widely used to describe the phenomenon of human trafficking and its characteristics today in delimitation to historical slave trade. See for instance Danailova-Trainor and Laczko (2010).
[2] Thus the index is called 3P Anti-trafficking Policy Index. It is available at http://www.human-trafficking-research.org/.

legally ban prostitution in source countries increase the likelihood of trafficking. They employ a self-constructed binary variable within a gravity-type model.[3] With a similar methodological strategy as before, Akee et al. (2010c) highlights the importance of ethnic fragmentation, conflict, and internally displaced persons in source countries as determinants of trafficking flows.[4] These three studies provide first insights into the determinants of human trafficking in the countries of origin and destination of victims.[5] However, more comprehensive and reliable data on TIP victims have been systematically collected in recent years by several national institutions in Europe,[6] which to date remain largely unexplored.[7] These data describe more precisely the intensity and direction of TIP flows, therefore more consistent and accurate results can be drawn.

We built on the methodology suggested by Akee et al. (2010a; 2010b; 2010c) and use the information provided by official national institutions to analyze the drivers of human trafficking in Europe. Therefore, a gravity-type model for the flows of human trafficking victims between 120 source countries worldwide and 13 host countries in Europe is constructed. Each series has an average length of 5 years per reporting country. The country reporting the flows of human trafficking victims is classified as the host country since TIP victims are identified only after they have been exploited.[8]

This paper improves upon quantitative studies on the determinants of human trafficking in at least three important ways. First, it is based on the analysis of officially recorded victim flows, which are more accurate in describing their pattern than other self-constructed estimations or proxies used in previous studies. By employing a fixed effects set-up and controlling for data collection or reporting institutions, we are able to control for deficiencies in the recording of human trafficking cases. Second, given the inclusion of multiple host countries, our model allows for the analysis of the characteristics of countries where victims are exploited, which we find to be relevant

---

[3] The binary variable indicates the reporting of at least 100 victims of human trafficking between a specific source and host country, based on the US Department of State TIP Report (2003) and the Protection Project Country Report (2002).

[4] A study by Cho (2011) on the effect of globalization on women's rights uses the UNODC Human Trafficking Citation Index (2006) as well as the US Department of State TIP Report (2001 -2009) to proxy for the extent of exploitation of foreign women in a country.

[5] Another gravity model using flows of victims is constructed by Jac (2010). However, in this case the analysis is restricted to victim inflows into the US only, therefore concentrating on source country conditions that allow for human trafficking.

[6] A complete list of institutions is given in Table 1.

[7] This study focuses solely on Europe due to data availability and quality. Other important destination countries for victims of TIP outside Europe had not published comprehensive figures on the size and origin of victim flows at the time this research was conducted.

[8] Identification of victims might also occur in a transit country. However, TIP reports by national institutions include only victims identified after exploitation has occurred, therefore we do not consider countries of transit in our framework.

1

in shaping the direction of TIP flows. Finally, as our data set contains information for several years, our study captures the evolution of policies over time, such as the expansion of the European Union.

The empirical findings indicate that human trafficking occurs within well established routes of migrants and refugees. In addition, victims are found more often in source countries whose nationals do not require a visa for short term visits, and are more likely to be exploited in host countries with low levels of institutional quality. Results also suggest that recognition rates of asylum seekers and legislation of prostitution in host countries do not affect trafficking flows significantly.

The paper is structured as follows. Section 2 describes the phenomenon of human trafficking and its delimitation to illegal immigration and smuggling. We discuss our hypotheses regarding host and source countries in section 3, while section 4 describes the data generated and outlines the empirical strategy used. Section 5 shows the results, revealing which factors are crucial in the determination of TIP in Europe. Finally, in section 6 we summarize and draw conclusions.

2.   Framing human trafficking

In order to be able to conduct an empirical study, a clear concept of human trafficking is needed. The most basic definition refers to smuggling of an individual for the purpose of exploitation, however this basic definition leaves significant room for interpretation, as well as overlapping with the concept of human smuggling. For this reason, we elaborate a more specific and formal definition before starting with the identification of determinants.

2.1   Definition and distribution

The most precise definition of TIP is given by the Protocol to Prevent, Suppress and Punish Trafficking in Persons (also called the Palermo Protocol), issued in December 2000 and adopted by the UN.[9] This protocol is the most serious attempt to internationally harmonize the definition of human trafficking. In Article 3 it describes TIP as "the recruitment, transportation, transfer, harboring 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." Specifically, "exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labor or services, slavery or practices similar to slavery, servitude or the removal of organs" (UN 2000a). This definition highlights

---

[9] The Protocol to Prevent, Suppress and Punish Trafficking in Persons is a supplement to the United Nations Convention against Transnational Organized Crime, together with the Protocol against the Smuggling of Migrants (UN2000b). Both were issued in December 2000. In addition, the UN inaugurated a Global Initiative to Fight Human Trafficking in 2007 (UN.GIFT).

three core components of trafficking, namely, the use of deception or coercion, the movement or harboring of an individual, and the placement of the said individual in exploitative situations.

According to this definition, human trafficking is considered a criminal activity carried out by criminal organizations. As alluded to by the US State Department in 2003, "Traffickers may be freelancers or members of organized criminal networks" (p. 6). In both cases, traffickers need to coordinate as trafficking routes can cros0073 borders and even cover long distances. For the purpose of this paper, organized crime (such as trafficking mafias) shall be defined as an organization where "participants […] are considered to be persons associated for the purpose of engaging in criminal activity on a more or less sustained basis" (UNESC 1994, p. 4), which can "range from highly structured organizations to more fluid and dynamic networks" (ibid, p. 11). Given that the illicit business of human trafficking is conducted by a diversity of alliances, ranging from individual operators to highly sophisticated enterprises (Schloenhardt 1999, Savona et al. 1996), we use the different concepts interchangeably.

Looking at the distribution of victims, it becomes clear that women are the main target of human trafficking. The Global Report on Trafficking in Persons (UNODC 2009) maintains that trafficking in women and girls for the purpose of sexual exploitation is the most common case of human trafficking, accounting for 79% of all cases identified. This is followed by trafficking for the purpose of labor exploitation, which account for 18% of all cases identified. Moreover, 66% of all human trafficking victims are women, with 13% being girls, 12% men and 9% boys (ibid, p. 11). This indicates that more than a fifth of all victims are children. These figures could, however, misrepresent the reality of the phenomenon, and the distribution of the victims might in fact reflect the attention of the international community to specific segments of TIP (ibid, p. 7).[10]

2.2   Distinction between illegal immigration, smuggling and human trafficking

Human trafficking is considered as a variant of human smuggling. Article 3 of the Protocol against the Smuggling of Migrants by Land, Sea and Air provides the following definition: "Smuggling of migrants means the procurement, in order to obtain, directly or indirectly, a financial or other material benefit, of the illegal entry of a person into a State Party of which the person is not a national or a permanent resident" (UN 2000b).

Clearly, definitions of human trafficking and human smuggling overlap to some degree. In order to explicitly identify and separate human trafficking from illegal immigration and human smuggling, a clear delineation is given by a nested concept suggested by Väyrynen (2005). According to him, "illegal migration, smuggling and trafficking are nested concepts" with a shared "illegal

---

[10] For this same reason, the large majority of studies on TIP focus on trafficking of women and girls for the purpose of sexual exploitation, as there are more information available for this segment.

character of the entry to a country" (ibid, p. 4). Thus, migratory movements comprising illegal border crossing and/or unauthorized stays in the country of destination are essential components of both human smuggling and trafficking. Nevertheless, the economic deliberations, as well as the steps undertaken by the agents involved, are distinct. The basic matter of smuggling deals with assistance in border crossing. The smuggler receives financial remuneration before the journey and acts as a support in illegally crossing international borders. Most importantly, the smuggled individual is free upon arrival in the destination country. With human trafficking however, the intermediary doesn't only earn from transporting the individual, but also from exploiting or selling him/her in the destination country. This is possible through physical coercion, fraud or deception at any point during the trafficking process, and is made easier when financial remuneration is still expected by the smuggler after the trafficked individual has arrived in the destination country.

It is important to highlight that in many cases people get trafficked without receiving assistance in illegally crossing an international border. People can enter the country of destination legally with an official document after they have been promised a job as waitress, model or construction worker for example, and only realize their victimization upon arrival. After entering the country, they usually have to handover their legal documents and are forced to work in the prostitution business and/or face slave-like conditions. In other cases, individuals can enter the country with a valid short-term visa and accept a job offer that requires them to remain in the country illegally after the document expires. In such situations, individuals often have to pay exorbitant amounts of money to the employer for the journey and/or to retrieve legal documents, which implies that they have been exploited (Aronowitz 2001, p. 166). In these instances of human trafficking, individuals have crossed an international border legally, thus making it even more difficult to detect.

Accordingly, there are three possible scenarios in which people might fall into the hands of traffickers: In the first case, an individual wanting to migrate contacts a smuggler in order to enter the destination country illegally and eventually ends up being trafficked. Having an outstanding debt with the smuggler sharply increases the chances of being trafficked. In the second scenario, individuals are deceived by a job offer abroad which seemed legitimate, however their documents are expropriated upon their arrival. This means they, too, end up being trafficked. During the hiring process, traffickers collect information on the individual's relatives and friends to manipulate their victims and facilitate exploitation. The final scenario is one in which individuals are kidnapped in their home country and transported against their will to a different place, where they are subsequently

exploited.[11] These modi operandi of traffickers play an important role in identifying factors that determine TIP. Taking into account the different trafficking scenarios, we closely examine aspects that should influence human trafficking according to anecdotal evidence in the next section.

3.   Determinants and hypotheses

In this section we identify country characteristics influencing the direction and intensity of TIP flows. As referred to earlier, human trafficking falls under the broad concept of migration, thus consequently, international movements of people are an essential condition for trafficking to occur. Nevertheless, human trafficking is only possible when legal conditions in the countries facilitate the involvement of criminal organizations at certain points of the migratory process. Therefore, we examine factors affecting international movements of people, as well as the incentives and costs involved in the operations of trafficking mafias.

Every factor shaping and strengthening international movements of people can be categorized as either "pull" or "push" (Ravenstein 1885, 1889; Lee 1966; Sjaastad 1962). Push factors refer to source country characteristics triggering outflows of people or increasing the pressure to emigrate. Such factors also support human trafficking outflows, because the higher the willingness to emigrate, the more likely an individual will get involved with trafficking organizations. Pull factors, on the other hand, relate to conditions in host countries that attract migratory inflows. Trafficking flows react to such factors too, since the main target of trafficking mafias are vulnerable groups among the population that are highly exposed to exploitation (Stark 1991; Castless and Miller 2003). Moreover, well established routes for migrants and refugees might encourage trafficking opportunities because high potential for recruitment decreases operational costs considerably (Salt and Stein 1997).

Additionally, criminal organizations prefer to search for victims where it is less costly to do so, transporting them through less risky routes, and exploiting them where revenues are higher. We include factors facilitating trafficking activities in countries of recruitment and exploitation, which equally impact upon mafia profits and decisions on where to locate. Following the literature, we cover aspects affecting the three aforementioned core components of the human trafficking business. These factors are grouped within any of the following categories (Cho 2011/2): movement

---

[11] One can imagine an additional situation in which victimization can occur when parents send their children away in the hope that they would gain better living or economic conditions (Jac 2010). Such a scenario mainly takes place inside national borders, and is therefore not captured in our data as we cover international victim flows.

of people, institutional quality and regulation, crime, and women's rights.[12] In the following subsections, we develop empirically testable hypotheses.

3.1 Movement of people

International movements of people are an essential component of human trafficking. The expectation of higher income, better living conditions, and employment opportunities abroad encourage the decision to migrate. People are inclined to take the risk to migrate when the income gap is high, even if they have a stable source of income in their home country (Harris and Todaro 1970; Sjaastad 1962). In addition, generous welfare systems in high income countries can attract individuals without the certainty of work in the recipient country (Rotte and Volger 1998; De Giorgi and Pellizzari 2009). From the perspective of criminal organizations, it is advantageous to carry out human trafficking operations in countries with a potentially sizeable population willing to migrate. This creates opportunities through offering smuggling services and/or false international job prospects.

On the other hand, the demand for cheap labor in insecure and informal service sectors (for instance domestic and factory work, and prostitution) is substantial in high income countries as such positions are rarely filled by nationals (ILO 2003).[13] Given this market fragmentation and restricted opportunities for legalization, migrants are left with no other option than subsisting on the shadow economy (Friebel and Guriev 2004; Akee et al. 2010a).[14] Poor labor conditions in informal services make exploitation and strict control of victims possible, which together with language barriers and the fear of deportation circumvent victims looking for legal support. Due to the vulnerable situation of migrants, as well as the high demand and prices for informal services in host countries, an ideal environment is created for traffickers seeking high exploitation yields (Belser 2005). Profits from sexual exploitation in industrialized countries alone are calculated to be around US$ 15.5 billion per year, making up half of all profits made worldwide in this sector (ibid, p. 14).

Geographical distances between countries of origin and destination are also relevant regarding the pattern of international movements of people. Countries in the near vicinity with better economic conditions are preferred for migration due to the fact that shorter journeys reduce costs and risks (Sjaastad 1962; Greenwood 1975; Jac 2010). Traffickers prefer to locate their recruitment and exploitation activities near to each other. Moving victims within short distances

---

[12] We thank Seo-Young Cho for inspiring our interest in this topic. The four pillars of determinants of human trafficking and many of the variables we use in this paper are borrowed from her work on the determinants of human trafficking she presented in a project meeting in Goettingen in May 2010 (see Cho 2011/2).

[13] These insecure and informal positions are called "3-D jobs: dirty, degrading and dangerous" (ILO 2003, p. 4).

[14] Since 1992, European countries limited accessibility to their territory, especially for asylum seekers and refugees, beyond existing restrictions impeding economic and non-economic migration (Zaiceva and Zimmermann 2008). The role of this migrant population will be further explored in section 4.2.

minimizes logistical complications and transportation costs, as well as detection risk. Presumably, trafficking routes are located within the same geographical region, and proportionally less intercontinentally.

Finally, criminal organizations can take advantage of well established migratory flows. Abducting people and/or smuggling them into a country is more costly than localizing trafficking activities in areas of dense migratory flows. Joint logistic operations of recruitment, transportation and exploitation are facilitated if criminal organizations are certain about where potential victims are coming from, and where they are heading to. The involvement of traffickers with migration networks makes it easier to manipulate the trusting relationships between friends and relatives of an individual crossing an international border (Jureidini 2009; Mahmoud and Trebesch 2010). For these reasons, trafficking should occur more often within areas of intense migratory flows. A similar argumentation applies for established refugee flows. Besides possessing very similar characteristics to migrants, this population, given its vulnerable nature, is also willing to give up certain liberties and even accept being exploited in order to reach a destination. Both populations can be classified as people at risk of being trafficked (Tyldum and Brunovskis 2005; Akee et al. 2010c). Traffickers will be highly interested in focusing their activities along the travel paths of both groups. Based on this reasoning, we formulate the following hypotheses:

Hypothesis 1a: More intense flows of human trafficking victims are observed between country pairs that have larger income differentials and are geographically closer to each other.

Hypothesis 1b: Well established routes for migrants and refugees encourage human trafficking and increase the number of victims.

3.2   Institutional quality and regulation

Institutional quality and regulation factors encompass the capacity of governments to uncover and prosecute criminal actors. Legal enforceability is guaranteed by the effectiveness of the prevailing institutions and the judicial system to prosecute traffickers. Human trafficking organizations locate their operations where the probability of detection and conviction is low. In countries where enforcement of laws is poor, and the risk of exposure when carrying out illicit activities is low, trafficking activities are expected to flourish.[15] This applies to both the country of origin and destination of victims.

Moreover, border controls in countries of destination should affect the scope of trafficking operations. We capture the entrance regulations into countries of destination by using two measures: visa requirements to enter a host country, and recognition rates of asylum applicants.

---

[15] As Cho et al. (2011a) point out the three main policy elements to combat human trafficking are the prosecution of traffickers, protection of victims and prevention. In addition, Cho et al. identify important requirements for countries which also show the quality of institutions prevailing in the countries.

These two elements reflect border controls for migrants and refugees, respectively. First, the effect of visa requirements on the intensity of human trafficking is a priori unclear. On the one hand, when an international border is closed, a trafficking opportunity is created because unwanted immigrants will look for assistance in crossing the border illegally (Feingold 2005). Closing borders forces people into irregular migration, thus leading them to contact trafficking mafias in order to reduce crossing risks (Gathmann 2008; Mahmoud and Trebesch). Business can become increasingly lucrative for traffickers in response to this market pressure (ILO 2003). On the other hand, it can be argued that when an international border is open, traffickers will face little risk and low transportation costs in bringing victims to destination countries where labor demand in the informal sector is growing (ibid, p. 4)). As mentioned in section 2, unlike human smuggling, international borders do not necessarily need to be closed for human trafficking to occur. Migrants can cross international borders legally with a short-term visa but remain in host countries longer than they are legally allowed to. Given their then illegal status, migrants turn to the shadow economy as the only possible source of income, where exploitation, and therefore trafficking, is commonplace (ibid). In the European context, it is of great relevance to observe the direction of the effect of border controls on human trafficking. This is because the expansion of the European Union in the last decade has brought substantial changes regarding bilateral border controls.[16]

Turning to recognition rates of asylum seekers, they illustrate the willingness of a country to receive international refugees. As before, the effect of rigid requirements on refugees wishing to settle within a country is also a priori unclear. If refugees lack the legal means to remain in a country, they are more likely to seek the help of criminal organizations and consequently be exploited (Friebel and Guriev 2004). In contrast, granting legal status to victims can increase the incentive to traffic. As the stock of potential victims declines in host countries, the returns from exploitation soar, promoting further trafficking (Akee et al 2010a; 2010b). This analysis considers the declining trend of asylum acceptance rates in European countries during the last decade.[17]

Sexual exploitation is a key part of human trafficking. According to the United Nations (2009), 79% of TIP victims reported in 52 countries in 2006 were sexually exploited (p. 50). We therefore expect legislation on prostitution to be crucial in determining exploitation opportunities, as well as playing a major role in traffickers' choices regarding destination countries (see for instance Akee et al. 2010a; 2010b; Jacobson and Kotsadam 2010; Cho et al. 2011b, Di Tommaso et al. 2009). However, there is still no general consensus on how, and in which direction, legislation of commercial sex activities affects trafficking. There are two diametrically opposed lines of argumentation.

---

[16] For detailed information on bilateral visa requirements in the European Union please refer to EU Council Regulation (EC) No. 539/2001 of March 15th 2001, and its subsequent updates in 2004, 2005, 2007 and 2009.

[17] For comprehensive statistics on asylum recognition rates refer to UNHCR (2009).

Abolitionists claim that prohibiting prostitution activities considerably reduces the room for trafficking to occur in the commercial sex market, and thus profits expected in this area (Jakobson and Kotsadam 2011; Aghatise 2004). Supporters, on the other hand, argue that legalizing commercial sex services reduces the price paid for prostitution and the opportunity for exploitation, consequently reducing trafficking incentives (Feingold 2005; Akee et al. 2010b).[18] We examine the additional effect of regulating the market for sexual services, after controlling for law enforcement levels in host countries. We expect legislation on prostitution to have different effects on trafficking opportunities and risks, depending on the capacity of a government to implement and monitor such legislation. In summary, we presume the following:

Hypothesis 2a: Flows of trafficking victims are larger between country pairs with poor law enforcement levels.

Hypothesis 2b: Stricter border regulations increase human trafficking flows.

Hypothesis 2c: Restrictive asylum recognition promotes illegal migration and therefore trafficking.

Hypothesis 2d: Legislation on prostitution impacts trafficking profits and incentives via supply and demand for sexual services.

3.3   Crime

Trafficking flows should flourish in countries with higher levels of criminality. As TIP is a large scale business assisting international movements of people, it is backed by intermediaries at all stages of the trafficking process. These intermediaries operate during the recruitment stage, when individuals accept misleading job offers abroad; in the mobilization stage, when individuals cross international borders illegally; and in the exploitation stage, when criminal organizations realize most of their revenue (Salt and Stein 1997). Coordination among intermediaries from these three core elements is guaranteed by larger international criminal organizations (Brucker and Parent 2000; Salt 2000; Stoecker 2000). To some extent, trafficking mafias are likely to work jointly with businesses engaged in other illicit activities (drugs or arms trafficking for example). Criminal enterprises tend to share similar risks, such as the dismantling of operations along trafficking routes and prosecution (Schloenhardt 2001). Traffickers can take advantage of the presence of well established criminal groups to commence or even deepen their activities. Human trafficking is frequently part of a broad portfolio of activities carried out by large criminal organizations. Europol states that "criminal groups are increasingly multi-commodity and poly-criminal in their activities" (ibid, p. 5), indicating that TIP can be seen as an opportunity for criminal groups to ensure risk diversification.

---

[18] The result in Akee et al. (2010a) for legislation on prostitution in host countries is not robust. The effect becomes insignificant when controlling for law enforcement.

Given the difficulties with homogeneously defining crime (especially in a multi-country context), as well as with measuring an activity whose actors are part of the underground population, we evaluate the existence of criminality by observing offenses which have a high probability of detection, such as homicides (Bruckert and Parent 2000; Soares 2002). Based on the above we expect:

Hypothesis 3: Trafficking flows are more common between country pairs with higher levels of criminal activity.

3.4   Women's rights

As the majority of human trafficking victims are women (see section 3.1), a vulnerable environment could widen recruitment opportunities for traffickers and thus increase victim numbers. Besides regular "push" factors, female migration is decisively affected by their social roles and their capacity for making decisions and exerting autonomy in their country of origin (UN 2006). This implies that female migratory pressure, and subsequently their likelihood of being trafficked rises as women's conditions concerning political participation and employment opportunities deteriorate. This effect is accelerated when the abuse and exploitation of foreign women is widely tolerated throughout a society (Cho 2011). Giving women the possibility to be active and equal participants in society reduces their exposure to exploitation that might arise from a lack of awareness about the potential dangers of human trafficking and its *modus operandi* (Mahmoud and Trebesch 2010). Therefore, we expect that women with more equal and secure rights in a society should be less exposed to the dangers of trafficking.

However, the scope for international human trafficking should also be small if the norms of a society severely deprive women's rights. This is because such societies don't allow women to make their own decisions, e.g., socializing with people other than close relatives or moving from one place to another,[19] and as a result, women would be prevented from establishing contacts with human trafficking groups. If women are forced to be under constant supervision from their families, and are not allowed to participate in the labor market or travel abroad, for example, their possibilities to contact smuggling services or look for dubious job offers abroad are minimal. There is, however, room for human trafficking if at least some basic rights for women are guaranteed. For this reason, we expect less human trafficking outflows from countries at the lower end with respect to women's rights. Taking both arguments into account we anticipate:

Hypothesis 4: There is an inverted U-shaped relationship between women's rights and human trafficking.

---

[19] For example, women in Saudi Arabia do not have the right to drive an automobile (BBC News 2007, New York Times 2009); women in Yemen must obtain an approval from their husbands or fathers to receive an exit visa to leave the country (US Department of State 2004).

4.   Empirical analysis

The estimation strategy consists of employing a gravity-type model to flows of human trafficking victims between 120 source countries worldwide and 13 host countries in Europe, taking Akee et al. (2010a; 2010b; 2010c) as a point of reference. We draw on bilateral victim flows, which were obtained by contacting national institutions.[20] This section provides a description of the institutions contacted and of the data set collected. We also propose an estimation strategy outlining the characteristics of our data.

4.1   Data collection

In order to assess the intensity and origin of human trafficking inflows into Europe, we contacted 37 national institutions across the continent that produce TIP statistics. Among these were anti-trafficking centers, national police offices, ministries of interior, immigration offices, service centers, research centers, and universities.[21] We specifically requested information on the size and origin of victim inflows to the reporting country on an annual basis. From the 37 institutions contacted, 22 provided us with the information inquired about, with 10 providing incomplete or inaccurate data, and 5 not having such statistics. The list of institutions contacted, as well as a short description of the data provided, is presented in Table 1. It is worth noting that neither France nor Italy collect accurate data on victims of human trafficking, while Germany publishes its TIP statistics only partially, therefore these 3 countries are excluded from our analysis.[22] Our final data include 13 host countries in Europe and extends to 120 source countries, covering the 1998-2009 period.[23]

A description of our data set is provided in Graph 1 and Table 2. Taking yearly averages as the baseline, the United Kingdom and the Netherlands reported the largest numbers of victims, with 447 and 308 reported victims per year, respectively, while Ireland and Portugal reported the lowest numbers, with 31 and 21 reported victims per year. Spain, Switzerland and Greece reported more than 100 victims per year, while Belgium, Austria, Poland, Denmark, Sweden and the Czech Republic reported less than 100. Moreover, as seen in Table 2, the largest proportion of victims originates

---

[20] As pointed out by Gassebner et al. (2010) "the advantage of a count variable is that it allows us to obtain a more precise estimate […]" (p. 10).

[21] In the EU Parliamentary Directive 2011/36/EU on preventing and combating TIP and protecting victims issued on April 5, the EU Council and EU Parliament encourage intensified data collection on HT as well as the implementation of national rapporteurs that include "…gathering of statistics in close cooperation with relevant civil society organizations active in the field." Hence we include in our analysis data from public as well as civil society organizations.

[22] In France, the Central Office for the Suppression of Trafficking in Persons produces statistics on victims of soliciting prostitution, while the Central Office for the Fight against Illegal Migration produces statistics on victims of labor and living conditions against human dignity - both statistics do not refer exclusively to TIP. Similarly, in Italy the Ministry of Interior produces a statistic on victims of prostitution and TIP altogether. The German Federal Criminal Police Office publishes only the 10 largest source countries of victims.

[23] Our 13 countries are: Austria, Belgium, Czech Republic, Denmark, Greece, Ireland, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

from Eastern Europe. In nine of our 13 host countries, this region makes up at least six of the top ten source countries of victims. In contrast, the largest proportion of victims in Ireland originates from Sub-Saharan Africa, and in Spain from Latin America. The origin of victims in the United Kingdom and Portugal is dispersed more uniformly across different regions. Romania, Ukraine, Russia, Nigeria and Bulgaria are generally the source countries where most of the victims come from in our sample. For example, Nigeria is the most reported origin in five of our 13 host countries (Belgium, Denmark, Ireland, the Netherlands and the United Kingdom), while Romania and the Ukraine are the two most reported after that (Greece and Spain, and Czech Republic and Poland, respectively). Furthermore, the distribution of victims is not highly concentrated among the top ten source countries in Belgium, Netherlands, Switzerland and the United Kingdom, as more than 20% of the victims originate outside this group. The opposite case is seen in Portugal and Poland, where only four (Brazil, Mozambique, Romania and Ukraine) and five (Ukraine, Belarus, Bulgaria, Romania and Russia) source countries, respectively, make up the entire number of victims.

Differences in the generation of victim statistics could exist due to the reporting characteristics of institutions in host countries.[24] We have identified three dimensions which might affect victim numbers across reporting institutions. Even though we control for such reporting differences among other unobservable time-invariant host country characteristics via host country fixed effects, we include these three dimensions in a separate specification to test the extent to which they affect the recording of victim numbers. The first dimension is the type of institution collecting the data, which could either be the national police force or a service center for victims (publicly founded shelter or NGO). Arguably, service centers tend to report fewer victims than police forces as they include the number of victims they shelter, and these are constrained by their assigned budget and available accommodation.[25]

The second dimension consists of the types of exploitation the source institution is reporting. Some only include victims of sexual exploitation, while others account for additional types (labor, organ removal, etc.). Naturally in the second case, overall numbers reported are likely to be higher.[26] Controlling for this feature also allows us to address the issue of politicization towards sexual exploitation (Tyldum and Brunovskis 2005). In our sample countries, this is the case in Ireland, Spain, Sweden and Switzerland, who all only report victims of sexual exploitation. The third and last

---

[24] In order to harmonize data collection across EU countries the EU initiated an Action Plan 2011-2015 on the harmonization of crime statistics (included human trafficking). However, this will not be implemented until 2015 and therefore differences in data collection along the three dimensions addressed here exist (ec.europa.eu/home-affairs/policies/crime/crime_statistics_en.htm, accessed 10.11.2011).

[25] Host countries collecting statistics from service centres report 71 victims yearly on average; from national police offices this figure is 140.

[26] Host countries with statistics including solely sexual exploitation cases report 100 victims yearly on average; including all exploitation cases this figure is 135.

dimension distinguishes victim counting methods. Statistics can either include the number of confirmed victims, or the number of suspected victims (not yet confirmed). Source institutions counting confirmed victims will most certainly report smaller numbers, as not all persons suspected of being TIP victims turn out to be actual victims.[27] We expect the best quality data to come from the police, who count confirmed victims of all types of exploitation, meaning that the reporting entity is fulfilling all three dimensions.

4.2   Estimation strategy

Our variable of interest is the number of human trafficking victims per year originating from source country j and identified in host country i in year t. These bilateral victim flows are modeled allowing for both the characteristics of sending and receiving countries by employing a gravity-type model.[28] Our model specification is a zero inflated negative binomial, given two particular characteristics of the data for the dependent variable: left skewed distribution caused by a large proportion of zeros and over-dispersion.[29] Data omissions for a country pair and a given year are assumed to be a truly absence of victims rather than a missing value within that flow, given that the origin of every single victim is listed in the TIP reports. This produces a large proportion of zero values. In the raw data set these account for close to 90% of all observations. Moreover, the sample mean and variance for our variable of interest are 0.66 and 18.66 respectively, a sign of over-dispersion.

The first model specification includes host country and source country fixed effects to control for unobserved country characteristics.[30] In the second specification, host country fixed effects are excluded to allow for data quality controls. Year dummies are introduced in both specifications in order to correct for any time trends. Following the use of applied gravity models in the economic literature, and taking Akee et al. (2010a) as a starting point, our basic setting includes the income level and population size of the host and source country, as well as the geographical

---

[27] Host countries counting confirmed victims report 91 victims yearly on average; counting possible TIP victims this figure is 488.

[28] Gravity models were initially conceptualized in economics for the trade literature in order to identify the determinants of commercial and foreign direct investment flows. They have been also used to examine flows of migration and human trafficking victims. See, for instance, Anderson and van Wincoop (2003) for a gravity model application on trade flows, Gassebner and Méon (2010) on cross-border mergers and acquisitions flows, Sjaastad (1962), Greenwood (1975), Borjas (1987; 1989), Karemera et al. (2000), and Kim and Cohen (2010) on migration flows, or Akee et al. (2010a; 2010b; 2010c) on human trafficking flows.

[29] Following Long and Freese (2006) an assessment of the differences between observed and average estimated probabilities from different count data models suggests the use of a zero inflated negative binomial model in our specification. Furthermore, a zero inflated negative binomial is preferred to a negative binomial specification according to the Akaike's and Schwarz's Information Criterions (AIC) and the Schwarz's Bayesian information criterion (BIC). The same specification choice is also supported by Voung's likelihood ration test (Voung 1989).

[30] Host country and source country fixed effects are used. Country pair fixed effects could lead to incidental parameter problems. If the number of variables in the model is substantially high, estimates might be biased (Neyman and Scott 1948).

distance between the country pair. This basic setting is subsequently enlarged in both specifications to test the developed hypotheses. The following general form of the equation summarizes this:

$$victims_{ijt} = const + ß_G G + ß_{Xn} Xn + \mu_i + \omega_j + \gamma_t + \varepsilon_{ijt} \qquad (1)$$

$$victims_{ijt} = const + ß_G G + ß_{Xn} Xn + ß_Q Q + \omega_j + \gamma_t + \varepsilon_{ijt} \qquad (2)$$

The dependent variable is denoted with *victims_{ijt}*. It is the number of TIP victims reported in host country i coming from source country j in a given year t. On the right hand side of the equation, we find the variables forming our basic setting, grouped in Matrix *G*, and additional variables to test a number of *n* hypotheses, grouped in Matrix *Xn*. Matrix *Q* includes quality controls. These are three dummy variables considering the three reporting dimensions. Host country, source country, and time fixed effects are specified by μ, ω, and γ, respectively. βs denotes coefficient vectors for our variables and ε is the error term. All regressions include standard errors clustered at the country pair level to avoid spuriously small p-values due to the large number of observations, a well-known problem in many gravity-type models.

The income levels and population size in Matrix *G* are measured as GDP per capita in current dollars and total population from the World Development Indicators (WDI), while geographical distance within country pairs is the distance in kilometers between both countries' largest agglomerations according to the Institution for Research on International Economy (CEPII). We take logs for all variables in this matrix. Regarding Matrix *Xn*, migrant and refugee movement data are taken from the Eurostat Population Statistics and the UNHCR Refugee Statistics, respectively. These refer to the stock of migrants and of refugees coming from source country j and residing in host country i in a given year t. Both statistics are in logs.[31] Law enforcement levels refer to the law and order index provided by the International Country Risk Guide (ICRG). This index measures the capability and objectiveness of institutions, as well as the power of the law to monitor activities within the country. The visa requirement variable is also a three-stage index. It takes a value of 0 if citizens of source country j need a visa to enter host country i, regardless of the purpose or length of stay, for a given year t, 1 if such a document is not required to enter the host country for short visits,[32] and 2 if allowed to permanently remain in the host country without having a visa. The index is founded on specific clauses of EU council regulations, Irish immigration acts, and UK

---

[31] A value of one is added in both statistics to include zero observations.
[32] A short term visit cannot exceed three months according to the Council of the European Union.

immigration acts.[33] Asylum recognition rates are based on UNHCR Refugee Statistics. They consist of the number of asylum applications approved in host country i for asylum seekers from source country j for a given year t, divided by the total number of decisions taken (approvals, rejections and closed cases) in the host country. Legislation on prostitution in host countries is captured by a self-constructed index based on national laws.[34] This variable is only included in the second specification because, for the most part, it remains constant over time in our 13 host countries, and is therefore perfectly collinear with the host country dummies. The index takes a value of 0 if the exchange of money for any type of sexual services is prohibited, 1 if prostitution activities are legalized, and 2 if these are further regulated for a given year t.[35] The prevalence of criminality in host and source countries is accounted for by taking the homicide rates provided in different versions of the Crime Trend Survey by the UNODC. Finally, women's rights in source countries are measured by a women's political right index from the Cingranelli-Richards Human Rights Dataset (CIRI, Cingranelli and Richards 2006). The indicator covers the right to vote, the right to run for political office, the right to hold elected and appointed government positions, the right to join political parties, and the right to petition government officials. It takes a value between 0 and 3 and demonstrates whether these political rights for women are provided by law, as well as if they are guaranteed within the state. All our ordinal indices are entered as dummy variables, with each value being relative to the base value. This ensures better interpretability of the expected effects.

5. Results

5.1 General findings

Table 4 and Table 5 present results for the first and second specification, respectively. Marginal effects are displayed with robust p-values in brackets indicating levels of significance. At the bottom of the table the alpha coefficient is the dispersion parameter.[36] The basic setting suggests that

---

[33] Council Regulation (EC) 574/1999 of March 12th 1999; Council Regulation (EC) 539/2001 of March 15th 2001; Council Regulation (EC) 2414/2001 of December 7th 2001; Council Regulation (EC) 453/2003 of March 6th 2003; Council Regulation (EC) 851/2005 of June 2nd 2005; Council Regulation (EC) 1791/2006 November 20th 2006; Council Regulation (EC) 1932/2006 of December 21st 2006; Council Regulation (EC) 1244/2009 of November 30th 2009; Irish Immigration Act of 2004 (No. 2) Order 2006; United Kingdom Borders Act of 2007; United Kingdom Borders, Citizenship and Immigration Act of 2009.

[34] Articles 104 to 106 and 214 to 217 of the Austrian Criminal Code; articles 136 and 379 to 380 of the Belgian Criminal Code; article 204 of the Czech Republic Penal Code; articles 228 to 233 of the Danish Penal Code; Article 349 of the Greek Criminal Code; Irish Criminal Law (Trafficking in Persons and Sexual Offenses) Bill of 2006; article 273 of the Dutch Criminal Code; articles 203 to 205 of the Polish Penal Code; articles 169 to 170 of the Portuguese Penal Code; articles 187 to 189 of the Spanish Penal Code; chapter 6 of the Swedish Penal Code; article 195 of the Swiss Criminal Code; United Kingdom Sexual Offenses Act of 2003.

[35] Further regulation includes allowing the operation of brothels and pimping.

[36] This parameter must be different from zero in order to validate the assumption of over-dispersion of the data and therefore additionally tests whether the zinb model is appropriate. If alpha is not zero, a negative binomial model is a better specification than a poission-type model.

human trafficking flows increase with income disparity and population size, whereas they decrease with geographical distance. The marginal effects for all three variables have the expected signs in both model specifications, however, the magnitudes and levels of significance are larger for the income disparity and population size variables in the second specification. Given that our data sample covers a short period of time, the effect of these two variables is captured by the host country fixed effects in the first specification. These initial findings support our first hypothesis and are in line with Akee et al. (2010a; 2010b; 2010c). The results for income inequality between host and source countries reflect push and pull factors of international movements of people, as individuals are more inclined to migrate when the gap between income at home and potential income abroad is high. It also reveals traffickers' preferences towards operation locations. Higher incomes in host countries make it more attractive for traffickers to exploit victims there due to higher profit expectations, while higher incomes in source countries make it more difficult for traffickers to find potential victims, given the smaller size of the vulnerable population. Findings for geographical distance show that individuals prefer to migrate to higher income countries in the near vicinity, and also that traffickers prefer to recruit victims which are as close as possible to the chosen location being trafficked to. Clandestine transport of victims is costly and trafficking becomes less profitable the higher the distance.

The inclusion of migrant and refugee flows (columns 2 and 3, respectively) supports the hypothesis that well established routes for migrants and refugees within a host-source country pair have an ascending effect on the number of people trafficked within that country pair. The marginal effects for both variables are positive and significant at the 1% level in both model specifications. The magnitude of the effect is slightly larger for migrants than for refugees, however. Specifically, a threefold increase in the stock of migrants originating from a given source country and residing in a given host country translates into an additional TIP victim reported within the same country pair. A fourfold increase in the stock of refugees produces the same outcome. These findings suggest that trafficking mafias have a better chance of finding potential victims when there is a considerable population willing to relocate. For this reason, mafia operations involving human trafficking are most likely be located at both ends of well established routes for migrants and refugees.

Turning to institutional quality and regulation factors (columns 4 to 6), it is evident that the quality of the legal system matters in host countries. In both model specifications, the law and order variable in host countries is negative and significant at the 1% level. For source countries, although negative, it fails to be significant at conventional levels. This outcome implies that the exploitation of victims in host countries is challenging for traffickers in an environment of sound institutional quality. Traffickers prefer to locate their activities in countries where they are less likely to be prosecuted and can keep their operations hidden. However, during the process of recruiting victims in source

countries, this does not seem to have an influence. It is quite possible that human trafficking is difficult to detect when deceiving job offers are at the heart of the decision to migrate, or when it does not involve the smuggling of persons (when borders are open, for example). Victims usually only come to realize that they have been trafficked after they have reached their destination, making it even more difficult for authorities to identify them as victims. Therefore, trafficking mafias do not necessarily need a poor institutional environment in the recruitment process, as is the case for their other exploitative activities.

The effect of entrance regulations for migrants and refugees on trafficking inflows is presented on columns 4 and 5. For the first case, two dummies measure the impact of visa requirements. Here, the baseline is set for source countries whose nationals are required to apply for an official permit for short and long term stays in the host country, which are issued by authorities of the specific country. The first dummy identifies the change in the likelihood of being trafficked if such visa requirements are lifted for short term stays, while the second dummy ascertains whether this change is additionally offset for long term stays.[37] The marginal effect for the first dummy is positive and highly significant at the 1% level, whereas for the second dummy, no significant effect can be identified in both model specifications. This shows that even after controlling for institutional quality, there are better trafficking opportunities when potential victims are not required to obtain an entry permit for short term stays. Within country pairs with such visa policies, there are, on average, two more victims when compared to other country pairs with different entry requirements. This scope for trafficking vanishes when third country nationals are also allowed to stay permanently. Therefore, we conclude that trafficking mafias in Europe do not tend to operate as smugglers but rather through the provision of deceptive job opportunities given that borders are open for a large proportion of potential victims. In the second case, no significant evidence can be found between recognition rates of asylum seekers in host countries and human trafficking.

The empirical analysis also suggests that legislation of prostitution activities in host countries (column 6) does not affect trafficking inflows. As pointed out in the previous section, this hypothesis is only tested under the second specification given collinearity problems in a host country fixed effects setting. The prostitution index is split into 3 parts and 2 dummies are included in the regression instead of the index. Taking the scenario where prostitution is illegal as a baseline, the first dummy captures the extra effect of legalizing the commerce of sexual services in host countries after controlling for legal system quality, while the second dummy captures the extra effect of

---

[37] The first dummy distinguishes host-source country pairs with a score of one in our self-constructed visa requirements index, and the second dummy with a score of two.

further regulation of the prostitution market.[38] The marginal effects for both dummies turn out to be insignificant at conventional levels, implying similar trafficking opportunities regardless of the legal status and regulation of commercial sexual activities in host countries. These results, although unexpected, might respond to the growing importance of segments other than sexual exploitation in TIP inflow patterns. Other exploitation segments account for more than half of registered trafficking cases where such information is available.[39] Therefore, although legislation on prostitution activities might still influence trafficking opportunities in the prostitution market, it does not have a significant effect on trafficking opportunities when all segments are analyzed as a whole.

Hypothesis 3 suggests that crime influences human trafficking flows positively; however this effect is not evident in the empirical analysis (column 6). Although we expect human trafficking to increase with criminal activity, the insignificant effect is probably a consequence of the data quality of this variable.[40] First, the number of observations drops sharply as the sample is reduced to almost a third of the size of the other specifications. Thus, results obtained are only based on incomplete information. Second, the data available does not properly address the intensity of criminal activity given difficulties with measuring an activity whose actors are part of the underground population.

According to column 7, women's political rights in source countries do not show an inverted U-shape relationship, as suggested in hypothesis 4. The index is decomposed into dummies with the baseline being the case when the index takes a value of 1.[41] The marginal effects of both dummy variables are not significant, although the p-value of the first dummy is considerably lower than that of the second dummy. We can therefore not conclude that recruitment opportunities are impacted by the level of political rights for women in source countries, although the signs of the coefficients and size of respective p-values point to a possible inverted U-shape relationship.

Reporting quality controls, included in the second specification (Table 5), ensure data comparability across countries in a framework without host country fixed effects. With few exceptions, all three variables are significant at the 1% level. The negative sign for the institution type variable indicates that national police offices tend to report fewer victims than service centers. This

---

[38] The first dummy distinguishes host countries with a score of one in our self-constructed prostitution index, and the second dummy with a score of two.

[39] For example, according to the Dutch Foundation against Trafficking in Women (STV Comensha), segments other than sexual exploitation accounted for 51% of all human trafficking cases in the Netherlands in 2009. The same figures are 55% for the United Kingdom in 2009, and 69% for Belgium in 2010, according to the United Kingdom Human Trafficking Centre (UKHTC) and the Belgium National Immigration Department, respectively.

[40] The UN Surveys of Crime Trends and Operations of Criminal Justice Systems report is, however, the most comprehensive compilation of crime statistics we are aware of. In subsection 5.2, it is shown that insignificant results for homicide rates are very likely to be driven by the quality of the data sample.

[41] The first dummy distinguishes source countries with a score of two in the women's political rights index reported by the CIRI, and the second dummy with a score of three. Index scores of zero and one are classified within one category, as scores of zero are almost non-existent in our data sample.

outcome might reflect the fact that victims are often hesitant to contact or work together with the police, in fear of deportation or criminal punishment (Tyldum and Brunovskis 2005). In addition, institutes report significantly larger victim numbers when their statistics include victims of all kinds of exploitation, rather than only sexual exploitation, and also if they count suspected victims, rather than confirmed victims. For this reason, the reporting characteristics of institutions producing TIP statistics need special attention when comparing victim number across countries.

5.2   Robustness checks

To check the robustness of the results we use two approaches. First, as the sample size changes substantially from one regression to another, we perform the analysis excluding observations with missing values for the law and order index variable, then for the asylum recognition rate variable, and finally for the homicide rate variable. Here we show results for the first regression.[42] Tables 6 and 7 present the analysis outcome when excluding observations with missing values for the law and order index and for our two model specifications respectively. Inspection of the tables indicates that all previous results remain similar in direction and magnitude, at similar levels of significance. Consequently, differences in sample size do not seem to drive regression outcomes, indicating consistency of the determinants of TIP victim inflows in to the 13 host countries. Similarly, when excluding observations with missing values for the asylum recognition rate variable, the results do not change noticeably. Under this setting, as in previous specifications, the effect of border controls for refugees does not turn out to be significant at conventional levels either. Reducing the sample by excluding observations with missing values for the homicide rate variable changes the picture, however. But for a few exceptions, the coefficients are significant. This supports the suggestion that the number of observations in this regression is driving the results for this variable, which is not significant at conventional levels in any of the specifications.

Second, we check whether the results hold with simpler model specifications. We run the regressions using negative binomial and probit models. Only the results are described here.[43] Although negative binomial models do not account for the excess zeros of the dependent variable, unlike poisson models, they do address over-dispersion. The results for negative binomial specifications are almost identical to those from the initial zero inflated negative binomial specification. Sizes, signs and significance levels remain almost unaffected, adding further support to the idea that the results predominantly reflect interdependent behavior of the explanatory variables, and to a lesser extent model specification selection. In order to test the stability of the findings in a model similar to the one estimated by Akee et al. (2010a; 2010b), we construct a binary variable out

---

[42] Results excluding observations with missing values for the asylum recognition rate and homicide rate variables are available upon request.

[43] Results for the negative binomial and probit specifications are available upon request.

of the victim numbers. Probit models test for the probability of the occurrence of human trafficking. The binary variable constructed takes a value of one if at least one TIP victim is reported within a country pair, and zero otherwise. Results do not differ qualitatively from those in the two original specifications. The three variables from the basic setting take the expected sign and become even more significant. All other results are also supported, therefore conclusions drawn previously hold under this model specification.

6.   Conclusion

This study is the first to quantitatively analyze the determinants of human trafficking by employing officially recorded victim flows. The results support the evidence from the previous literature, suggesting that these numbers are appropriate to describe the direction and intensity of human trafficking flows. We identify the reporting characteristics of institutions and find that these do, in fact, influence the statistics produced. However, potential country comparability problems are tackled under a fixed effects framework.

Results show that trafficking is more frequent between country pairs that exhibit large income disparities and are located in the near vicinity. Victims are preferably recruited in lower income countries, where the size of the vulnerable population is larger, and exploited in higher income countries, where profits are higher. Recruitment and exploitation activities are more likely to be located within small geographical distances due to presumably lower logistical and victim transportation costs. In addition, trafficking is more common within well established routes for migrants and refugees corridors because they can enter into contact with these populations through deceptive activities assisting migration.

We also find that good institutional quality hinders exploitation opportunities in host countries. However, it does not reduce recruitment operations in source countries. This is because traffickers in Europe prefer to operate through offering deceptive job opportunities rather than smuggling services, probably because illegal border crossing is very costly. Victims are typically recruited in source countries whose nationals do not require a visa to enter host countries, and usually only come to realize they have been trafficked after reaching their destination. This makes it difficult for authorities to identify them as TIP victims before they have been exploited in host countries. In addition, similar trafficking patterns are found irrespective of legal status and regulation of commercial sex services in host countries. These findings might respond to the relevance of segments other than sexual exploitation in the pattern of TIP flows, however.

Trafficking in persons is a business routed in the international movement of people and, as is the case with any other criminal activity, is being driven by large profits. Even if borders are open,

as in the European Union, governments from both sides must assist such movements in order to reduce trafficking opportunities. Policies seeking to combat human trafficking should not focus exclusively on the implementation of optimal legislation for commercial sex services. In fact, policies should center on adopting and enforcing anti-trafficking law and strengthening the prosecution and conviction of offenders. This would lead to a more effective reduction in victim numbers in the future.

References

Aghatise, E. (2004). Trafficking for Prostitution in Italy: Possible Effects of Government Proposals for Legalization of Brothels, *Violence Against Women*, 10(10), 1126-1155.

Akee, R., Basu, A.K.K., Bedi, A.S. and N. H. Chau (2010a). Determinants of Trafficking in Women and Children: Cross-national evidence, Theory and Policy Implications. *Frontiers of Economics and Globalization*, Volume 8, Migration and Culture, by Ira Gang and Gil Epstein.

Akee, R., Basu, A.K.K., Bedi, A.S. and N. H. Chau (2010b). Transnational Trafficking, Law Enforcement and Victim Protection: A Middleman's Perspective. Mimeo, Department of Economics, Cornell University.

Akee, R., Basu, A. K. K., Chau, N. H. and M. Khamis (2010c). Ethnic Fragmentation, Conflict, Displaced Persons and Human trafficking: An Empirical Analysis. *IZA Discussion Paper* No. 5142. (Available at SSRN: http://ssrn.com/abstract=1667766.)

Anderson, J. E. and E. van Wincoop (2003). Gravity with Gravitas: A Solution to the Border Puzzle, *American Economic Review*, 93(1), 170-92.

Aronowitz, A. A. (2001). Smuggling and Trafficking in Human Beings: The Phenomenon, the Markets that drive it and the Organisations that promote it, *European Journal on Criminal Policy and Research,* 9, 163–195.

Avdeyeva, O. (2010). Trafficking in Persons: Why Do States Comply with International Treaties? Paper presented at the 51st International Studies Association Annual Convention, San Francisco, February, New Orleans, LA.

BBC News (2007). Saudi Women Challenge Driving Ban. http://news.bbc.co.uk/2/hi/7000499.stm (Last accessed: 06.05.2011, 6pm MEZ).

Belser, P. (2005). Forced Labour and Human trafficking: Estimating the Profits, *Working Paper* (Declaration/WP/42/2005). International Labour Office. Geneva.

Borjas, G. J. (1989). Economic Theory and International Migration, *International Migration Review*, 23(3), 457-85.

Borjas, G. J. (1987). Self-selection and the Earnings of Immigrants, *American Economic Review*, 77(4), 531-53.

Bruckert, C. and C. Parent (2002). Trafficking in Human Beings and organized crime: A literature review. Research and Evaluation Branch. Royal Canadian Mounted Police.

Castles, S. and M. J. Miller (2003). Migration to Highly Developed Countries since 1945. In S. Castles, & M. J. Miller, The Age of Migration: International Population Movements in the Modern World (Third ed., pp. 68-93). New York, The Guilford Press.

CEPII. 2010. Distances database. http://www.cepii.fr/anglaisgraph/bdd/distances.htm (Accessed November 10, 2010).

Cho, S-Y. (2011). Integrating Equality - Globalization, Women's Rights, Son Preference and Human Trafficking. *Courant Research Center Discussion Paper 73*. University of Goettingen.

Cho, S-Y. (2011/2 forthcoming). Modeling for Determinants of Human Trafficking, mimeo, University of Goettingen

Cho, S-Y., Dreher, A. and E. Neumayer (2011a). The Spread of Anti-trafficking Policies – Evidence from a New Index, *Cege Discussion Paper 119*, University of Goettingen.

Cho, S-Y., Dreher, A. and E. Neumayer (2011b). Does Legalization of Prostitution increase Human trafficking? *Courant Research Center Discussion Paper 96*. University of Goettingen.

Cho, S-Y. and K. Vadlamannati (2011). Compliance for Big Brothers: An Empirical Analysis on the Impact of the Anti-trafficking Protocol, *Cege Discussion Paper 118*, University of Goettingen.

Cingranelli, D. L. and D. L. Richards (2006). The Cingranelli-Richards (CIRI) human rights dataset 2006. http://www.humanrightsdata.org/ (Accessed November 27, 2010).

Danailova-Trainor, G. and F. Laczko (2010). Trafficking in Persons and Development: Towards Greater Policy Coherence, *International Migration*, 48 (4), 38-83.

De Giorgi, G. and M. Pellizzari (2009). Welfare Migration in Europe, *Labour Economics*, 16(4), 353-363.

Di Tommaso, M. L., Shima, I., Strøm, S. and F. Bettio (2009). As Bad as it gets: Well-being Deprivation of Sexually Exploited Trafficked Women, *European Journal of Political Economy,* 25, 143-162.

Europol (2011). EU Organised crime threat assessment. Europol Public Information, The Hague. http://www.europol.europa.eu/index.asp?page=news&news=pr110504.htm (Accessed May 16, 2011).

EU Council (2001). Council Regulation No. 539/2001 of March 15th 2001. *Official Journal of the European Communities*, Brussels.

EU Parliament (2011). Parliamentary Directive 2011/36/EU pf April 5th 2011. Preventing and combating trafficking in human beings and protecting its victims, and replacing Council Framework Decision 2002/629/JHA.

Feingold, D. A. (2005). Human trafficking. *Foreign Policy* (September/October), 26-32.

Friebel, G. and S. Guriev (2004). Smuggling Humans: A Theory of Debt-Financed, *Discussion Paper, 1025*, IZA, Bonn, Germany.

Gassebner, M., Keck, A. and R. Teh (2010). Shaken, Not Stirred: The Impact of Disasters on International Trade, *Review of International Economics*, 18(2), 351-368.

Gassebner, M. and P.-G. Meón (2010). Where do Creditor Rights Matter? Creditor Rights, Political Constraints, and Cross-Border M&A Activity, *CEB Working Paper No.* 10/019.

Gathmann, C. (2008). Effects of Enforcement on Illegal Markets: Evidence from Migrant Smuggling Along the South-western Border, *Journal of Public Economics*, 92(10), 1926-1941.

Greenwood, M. (1975). Research on National Migration in the United States: A Survey, *Journal of Economic Literature*, 13, 397-433.

Harris, J. R. and M. P. Todaro (1970). Migration, Unemployment and Development: A Two-Sector Analysis, *American Economic Review*, 60 (1), 126–42.

Heckathorn, D.D. (1997). Respondent-driven sampling: a new approach to the study of hidden populations, *Social Problems*, 44(2), 174-198.

ILO (2003). Getting at the Roots. Stopping Exploitation of Migrant Workers by Organized Crime, International Labour Organisation Series "Perspectives on Labour Migration". International Labor Organization, Geneva.

ILO (2005). A Global Alliance against Forced Labour, Global Report under the Follow-up to the ILO Declaration on Fundamental Principles and Rights at Work. International Labor Organization, Geneva.

Interpol (2009), http://www.interpol.int/Public/THB/ (Accessed January 17, 2011).

Jac, A. (2010). The determinants of human trafficking. ISA Annual Convention 2010, New Orleans.

Jakobson, N. and A. Kotsadam (2011). The Law and Economics of International Sex Slavery: Prostitution Laws and Trafficking for Sexual Exploitation, *European Journal of Law and Economics*, Springer Link.

Jureidini, R. (2009). Are Contract Migrant Domestic Workers Trafficked?, in IOM "Human trafficking: New Directions for Research, p. 132-152. International Organization of Migration, Geneva.

Karemera, D., Iwuagwu Oguledo, V. and B. Davis (2000). A Gravity Model Analysis of International Migration to North America, *Applied Economics*, 32(13), 1745-1755.

Kim, K. and J.E. Cohen (2010). Determinants of International Migration Flows to and from Industrialized Countries: A Panel Data Approach beyond Gavity. *International Migration Review,* 44(4), 899-932.

Lee, E. (1966). A theory of migration. *Demography*, 3, 47-57.

Long, J. S., and J. Freese (2006). Regression Models for Categorical Dependent Variables Using Stata. 2nd ed. College Station, TX: Stata Press.

Mahmoud, T. O. and C. Trebesch (2010). The Economic Drivers of Human Trafficking: Micro-Evidence from Five Eastern European Countries, *Journal of Comparative Economics*, 38(2), 173-188.

New York Times (2009). A Year Later, a Saudi Woman Still Waits to Drive Legally http://thelede.blogs.nytimes.com/2009/03/12/saudi-woman-drives-for-youtube-protest/ (Accessed May 06, 2011).

Neyman, J. and E.L. Scott (1948). Consistent Estimation from Partially Consistent Observations. *Econometrica*, 16, 1-32.

Ravenstein, E.G. (1885). The laws of migration. *Journal of the Statistical Society*, 48, 167-227.

Ravenstein, E.G. (1889). The laws of migration. *Journal of the Statistical Society*, 52, 214-301.

Rotte, R. and M. Vogler. (1998). Determinants of International Migration: Empirical Evidence for Migration from Developing Countries to Germany, *Discussion Paper No. 1920*, Centre for Economic Policy Research, London, U.K.

Salt, J. (2000). Trafficking and Human Smuggling: A European Perspective, *International Migration*, 38, 31-56.

Salt, J. and J. Stein (1997). Migration as a Business: The Case of Trafficking, *International Migration* 35(4), 467-494.

Savona, E.U., Di Nicola, A. and G. Da Col (1996). Dynamics of Migration and Crime in Europe: New patterns of an old nexus. *Working Paper*, Research Group on Transnational Crime, University of Trento, School of Law.

Schloenhardt, A. (1999). Organized crime and the business of migrant trafficking. *Crime, Law & Social Change*, 32, 203-333.

Schloenhardt, A. (2001). Trafficking in migrants: Illegal migration and organized crime in Australia and the Asia Pacific Region*. International Journal of the Sociology of Law*, 29, 331-378.

Simmons, B. and P. Lloyd (2010). Subjective Frames and Rational Choice: Transnational Crime and the Case of Human trafficking. Mimeo. Government Department, Harvard University.

Sjaastad, L. A. (1962). The Cost and Returns of Human Migration, *Journal of Political Economy*, 70(5), 80-93.

Soares, R. (2002). Development, crime and punishment: Accounting for the international differences in crime rates*. Journal of Development Economics*, 73 (2004), 155-184

Stark, O. (1991). The Migration of Labor. Basil Blackwell, Cambridge.

Stoecker, S. (2000). The Rise in Human trafficking and the Role of Organized Crime. *Demokratizatsiya*, 8, 129-131.

Tyldum, G. and A. Brunovskis (2005). Describing the Unobserved: Methodological Challenges in Empirical Studies on Human trafficking. Data and research on human trafficking: a Global Survey. International Organization of Migration, 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.

UN (2006). Women and International Migration. 2004 World Survey on the Role of Women in Development, United Nations, New York.

UNESC (1994). Problems and dangers posed by organized transnational crime in the various regions of the world, Background document for the World Ministerial Conference on Organized Transnational Crime, E/CONF.88/2, United Nations Economic and Social Council, New York.

UNHCR (2009). Asylum Levels and Trends in Industrialized Countries, The United Nations Refugee Agency, Division of Program Support and Management, United Nations High Commissioner for Refugees, Geneva.

UNODC (2006). Trafficking in Persons, Global Patterns, United Nations Office on Drugs and Crime, Vienna.

UNODC (2009). Global Report on Trafficking in Persons. Human trafficking a crime that shames us all, United Nations Office on Drugs and Crime, Vienna.

US Department of State (2003). Trafficking in Persons Report. Office of the Undersecretary for Global Affairs, Washington D.C.

US Department of State (2004). Country Profile: Yemen, Washington D.C.

US Department of State (2006). Trafficking in Person Report. Office to Monitor and Combat Trafficking in Persons, Washington D.C.

US Department of State (2010). Trafficking in Persons Report. Office to Monitor and Combat Trafficking in Persons, Washington D.C.

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.

Vuong, Q. H. (1989). Likelihood ratio tests for model selection and nonnested hypotheses. *Econometrica,* 57, 307-333.

Zaiceva, A. and K.F. Zimmermann (2008). Scale, diversity, and determinants of labour migration in Europe, *Oxford Review of Economic Policy*, 24(3), 427–451.

Table 1: List of Institutions Contacted for TIP Victims Statistics

Institution	Country	Statistics Provided[44]	Range
Inquiry 1455/J XXIV.GP (Austrian Parliament)*	Austria	Complete	2005-2008
Human trafficking Task Force - TFMH (Austrian Foreign Ministry)	Austria	None	-
Institute for International Research on Criminal Policy - IRCP*	Belgium	Complete	1999-2005
National Immigration Department	Belgium	Complete	2006-2010
Payoke	Belgium	Complete	2004-2009
Pag-Asa	Belgium	Complete	2004-2008
ASBL-Sürya	Belgium	Incomplete	-
Center for Equal Opportunities and Opposition to Racism - CEOOR	Belgium	Incomplete	-
Criminal Police Service	Belgium	None	-
National Commission for Combating Human trafficking in Beings	Bulgaria	None	-
Human trafficking National Rapporteur (Ministry of Interior)	Czech Republic	Complete	2003-2008
La Strada*	Czech Republic	Complete	2006-2009
Security Police Department	Czech Republic	Incomplete	-
Danish Anti-Trafficking Centre*	Denmark	Complete	2009
Danish Immigration Service	Denmark	Complete	2008-2009
Ministry of Gender Inequality	Denmark	Incomplete	-
Reden International	Denmark	Incomplete	-
Federal Criminal Police Office - BKA	Germany	Incomplete	1999-2009
Hellenic Police (Ministry of Citizen Protection)*	Greece	Complete	2003-2009
Ruhama*	Ireland	Complete	2007-2009
Immigrant Council of Ireland - ICI	Ireland	Incomplete	-
National Rapporteur on Trafficking in Human Beings - BNRM[45]*	Netherlands	Complete	1998-2008
National Rapporteur on Trafficking in Human Beings - BNRM[46]	Netherlands	Complete	2002-2003

---

[44] "Complete" denotes data provided contain both size and origin of inflows, "Incomplete" either size or origin is missing, "None" size and origin are missing.
[45] Victims identified by the Dutch Foundation against Trafficking in Women (STV Comenscha).
[46] Victims identified by Police Information Node System (IKP-S).

Table 2: (Continued)

National Rapporteur on Trafficking in Human Beings - BNRM[47]	Netherlands	Complete	1998-2002 2005-2008
Unit for Trafficking in Human Beings (Ministry of Interior)*	Poland	Complete	2005-2008
Central Team Trafficking in Human Beings (Police Headquarters)[48]	Poland	Complete	2005-2008
La Strada	Poland	Incomplete	-
Human trafficking Studies Centre (University of Warsaw)	Poland	None	-
Centre of Migration Research (University of Warsaw)	Poland	None	-
Observatory on Trafficking in Human Beings (Ministry of Interior)*	Portugal	Complete	2008-2009
Ministry of Interior[49]	Portugal	Complete	2008-2009
National Agency against Trafficking in Persons (Ministry of Administration and Interior)	Romania	Incomplete	-
National Police Corps of Spain*	Spain	Complete	2000-2005
Swedish Royal Police*	Sweden	Complete	2002-2008
Advocacy and Support for Migrant Women and Victims of Trafficking - FIZ*	Switzerland	Complete	2005-2008
Swiss Coordination Unit against Trafficking in Persons and Smuggling of Migrants - SCOTT	Switzerland	Complete	2007
Federal Police	Switzerland	Incomplete	-
United Kingdom Human trafficking Center - UKHTC (Serious Organized Crime Agency - SOCA)*	United Kingdom	Complete	2008-2009
The Poppy Project (Eaves Hosing for Women)	United Kingdom	Incomplete	-

Note: Data sets employed in empirical analysis are marked with *

---

[47] Number of B9 residence permits granted by the Immigration and Naturalization Service.

[48] Numbers provided by Police Headquarters are the same as the ones from the Ministry of Interior.

[49] Numbers provided are the same as the ones of the Observatory on Trafficking in Human Beings.

Graph 1: Reported number of victims per year in host countries (1998-2009 average)
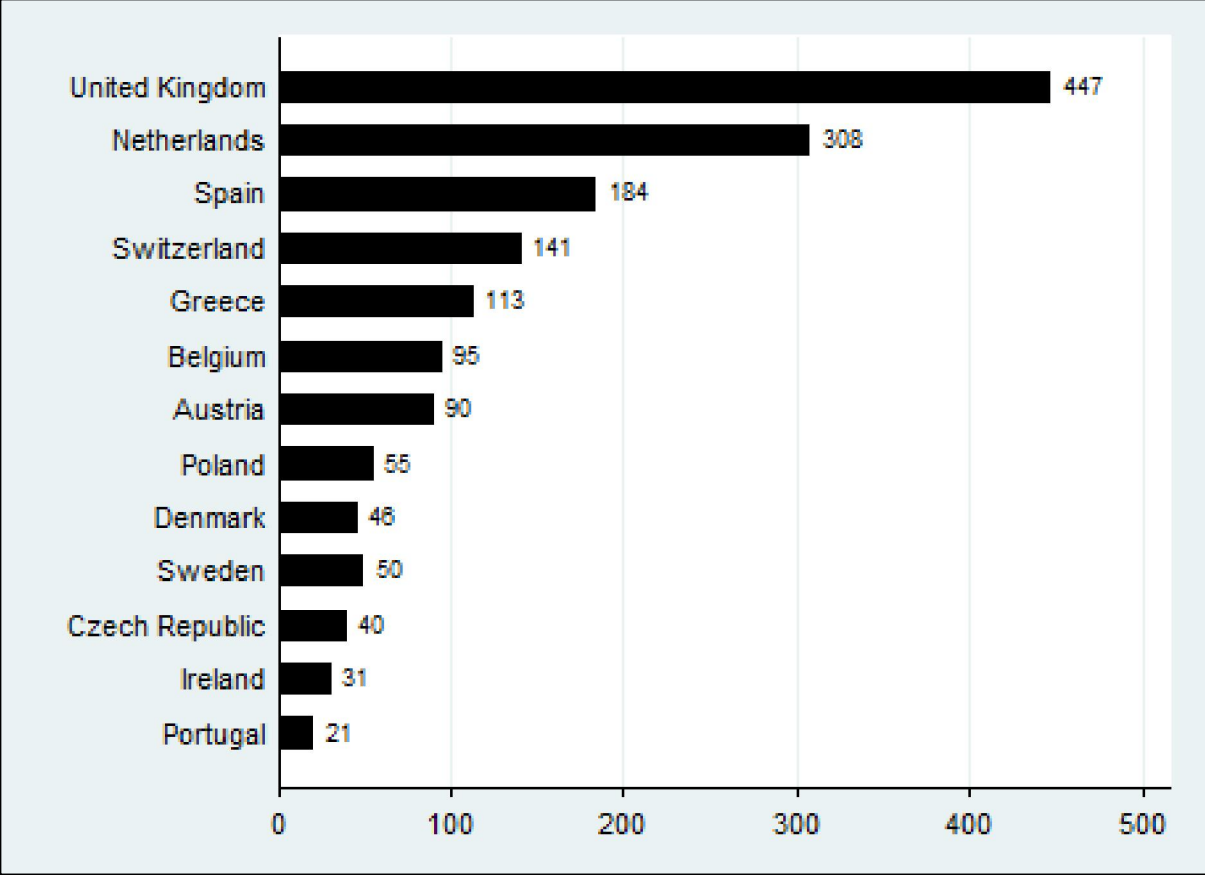
Source: TIP reports, refer to Table 1.

Table 2: Source countries of reported victims per year by host country (1998-2009 average)

Host Country: Austria	
Source Country	Victims
Hungary	19
Romania	18
Moldova	9
Bulgaria	7
Slovak Rep.	7
Belarus	5
Ukraine	4
Nigeria	4
Czech Rep.	3
Russia	3
Other	14

Host Country: Belgium	
Source Country	Victims
Nigeria	16
China	9
Romania	9
Bulgaria	8
Albania	7
Russia	5
Moldova	4
Ecuador	4
Morocco	3
Ukraine	3
Other	25

Host Country: Czech Rep.	
Source Country	Victims
Ukraine	12
Bulgaria	4
Romania	4
Russia	4
Vietnam	3
Kyrgyz Rep.	3
Macedonia	2
Slovak Rep.	2
Brazil	1
Indonesia	1
Other	4

Host Country: Denmark	
Source Country	Victims
Nigeria	19
Thailand	10
Romania	5
Latvia	2
Slovak Rep.	2
Ukraine	2
Cameroon	1
Cote d'Ivoire	1
Hungary	1
Portugal	1
Other	2

Host Country: Greece	
Source Country	Victims
Romania	35
Russia	26
Bulgaria	15
Ukraine	8
Moldova	5
Nigeria	5
Albania	4
Belarus	3
Lithuania	3
Uzbekistan	2
Other	8

Host Country: Ireland	
Source Country	Victims
Nigeria	16
Romania	3
Cameroon	1
Malawi	1
Zimbabwe	1
Congo D. Rep.	1
Kenya	1
Moldova	1
Somalia	1
Venezuela	1
Other	5

Host Country: Netherlands	
Source Country	Victims
Nigeria	46
Bulgaria	38
Romania	22
China	21
Russia	15
Sierra Leone	15
Poland	11
Ukraine	11
Czech Rep.	9
Hungary	9
Other	111

Host Country: Poland	
Source Country	Victims
Ukraine	37
Belarus	12
Bulgaria	3
Romania	2
Russia	1
Other	0

Host Country: Portugal	
Source Country	Victims
Brazil	8
Mozambique	8
Romania	5
Ukraine	1
Other	0

Table 2: (Continued)

Host Country: Spain	
Source Country	Victims
Romania	84
Colombia	35
Brazil	25
Russia	7
Ukraine	7
Lithuania	6
Paraguay	5
Ecuador	3
Venezuela	3
Germany	2
Other	8

Host Country: Sweden	
Source Country	Victims
Estonia	17
Russia	10
Poland	3
Lithuania	2
Romania	2
Hungary	1
Slovak Rep.	1
Nigeria	1
Albania	1
Azerbaijan	1
Other	1

Host Country: Switzerland	
Source Country	Victims
Brazil	29
Thailand	25
Romania	16
Hungary	12
Bulgaria	8
Dominican Rep.	8
Russia	5
Serbia	5
Cameroon	4
Ukraine	3
Other	29

Host Country: UK	
Source Country	Victims
Nigeria	68
China	60
Romania	44
Vietnam	33
Slovak Rep.	26
Poland	17
India	16
Czech Rep.	13
Uganda	12
Zimbabwe	11
Other	150

Source: TIP reports, refer to Table 1.

Table 3: Data Description and Sources

Variable	Description	Source	Years
Victim flow	TIP victim inflows.	TIP reports. Refer to Table 1.	1998 – 2009
(log) GDP pc	GDP per capita in current US dollars.	World Bank Development Indicators (WDI) database.	1998-2009
(log) Population	Total population.	World Bank Development Indicators (WDI) Database.	1998-2009
(log) Distance	Geographical distance between country pair's largest cities in terms of population share.	Institute for Research on the International Economy (CEPII).	1998-2009
(log) Foreign population	Stock of permanent migrants in country of destination per country of origin.	European Union Statistical Office (EUROSTAT).	2001-2009
(log) Refugees	Number of refugees in country of destination per country of origin.	UN Refugee Agency (UNHCR)	1998-2009
Law and order	Law and order Index. From 0 (worst) to 6 (best).	International Country Risk Guide (ICRG).	1998-2009
Prostitution Index	Legislation on prostitution Index. 0 (not legal), 1 (legal), 2 (legal and regulated).	Self-construction, based on national legislation. Refer to page 18.	1998-2009
Visa Index	Visa requirements Index. 0 (required for short term), 1 (not required for short term), 2 (not required for long term).	Self-construction, based on multilateral and national legislation. Refer to page 19.	1999-2009
(log) Asylum recognition rate	Number of recognitions of asylum seekers per country of origin out of total decisions taken in country of destination.	UN Refugee Agency (UNHCR)	1998-2009
Homicides rate	Homicides per 100,000 people.	UN Surveys on Crime Trends and the Operations of Criminal Justice Systems (UNODC-CTS).	2000-2008
Women's political rights	Women's political rights Index. From 0 (worst) to 3 (best).	Cingranelli- Richards (CIRI) Human Rights Dataset.	1998-2008

Table 3: (Continued)

Institution	Data quality control for type of institution. 0 (service center), 1 (police).	Self-constructed, based on TIP reports. Refer to Table 1	1998-2009
Exploitation	Data quality control for types of exploitation accounted for. 0 (only sexual exploitation), 1 (other types in addition).	Self-constructed, based on TIP reports. Refer to Table 1	1998-2009
Identification	Data quality control for counting victim method. 0 (confirmed), 1 (suspected).	Self-constructed, based on TIP reports. Refer to Table 1	1998-2009

Table 4: TIP victim flows, zinb, full sample, 1998-2009 (unbalanced panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(log) GDP pc diff	0.363 [0.179]	1.260*** [0.001]	0.548* [0.059]	0.510 [0.157]	1.076 [0.171]	0.559 [0.432]	0.726** [0.015]
(log) Population sum	1.150 [0.338]	1.002 [0.510]	0.511 [0.710]	3.341 [0.108]	1.759 [0.633]	0.766 [0.827]	-0.224 [0.867]
(log) Distance	-1.751*** [0.000]	-0.951** [0.035]	-1.615*** [0.000]	-2.323*** [0.000]	-4.400*** [0.000]	-1.924 [0.255]	-1.694*** [0.002]
(log) Foreign population		0.409*** [0.000]					
(log) Refugees			0.266*** [0.000]				
Law and order (host)				-1.251*** [0.000]	-2.591*** [0.000]		
Law and order (source)				-0.259 [0.178]	-0.291 [0.483]		
Visa Index 1 (host)				2.157*** [0.000]			
Visa Index 2 (host)				0.455 [0.231]			
Asylum recognition rate					0.627 [0.439]		
Homicides rate (host)						-0.880 [0.135]	
Homicides rate (source)						-0.023 [0.655]	
Women's Index 2 (source)							0.251 [0.151]
Women's Index 3 (source)							0.185 [0.479]
Alpha (over dispersion)	0.946*** [0.000]	0.762*** [0.000]	0.908*** [0.000]	0.969*** [0.000]	0.706*** [0.000]	0.622 [0.162]	0.997*** [0.000]
Observations	11,076	8,060	11,023	7,962	4,235	3,489	9,585
Host FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The dependent variable is the bilateral TIP victim flows to 13 countries in Europe. Estimation is a zero inflated negative binomial (zinb) including host country, source country and time fixed effects. Reported values are marginal effects, robust p-values in bracket; *, **, *** significant at 10%, 5%, 1%. The whole sample, without restriction of observations is used (full sample).

Table 5: TIP victim flows, zinb, full sample, 1998-2009 (unbalanced panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(log) GDP pc diff	1.688*** [0.000]	1.567*** [0.000]	1.454*** [0.000]	2.696*** [0.000]	4.147*** [0.000]	2.658*** [0.000]	1.563** [0.043]	1.601*** [0.000]
(log) Population sum	1.131*** [0.000]	0.922*** [0.000]	1.059*** [0.000]	1.301*** [0.000]	2.749*** [0.000]	1.474*** [0.000]	1.164*** [0.005]	0.932*** [0.000]
(log) Distance	-1.732*** [0.000]	-0.683** [0.035]	-1.667*** [0.000]	-2.322*** [0.000]	-4.215*** [0.000]	-2.390*** [0.000]	-1.698 [0.167]	-1.679*** [0.000]
(log) Foreign population		0.390*** [0.000]						
(log) Refugees			0.224*** [0.000]					
Law and order (host)				-0.647*** [0.001]	-0.940*** [0.007]	-0.359 [0.128]		
Law and order (source)				-0.266 [0.233]	-0.256 [0.544]	-0.320 [0.175]		
Visa Index 1 (host)				2.513*** [0.001]				
Visa Index 2 (host)				0.201 [0.567]				
Asylum recognition rate					0.918 [0.235]			
Prostitution Index 1 (host)						0.574 [0.317]		
Prostitution Index 2 (host)						0.456 [0.142]		
Homicides rate (host)							-0.242 [0.211]	
Homicides rate (source)							-0.052 [0.291]	
Women's Index 2 (source)								0.220 [0.258]
Women's Index 3 (source)								0.140 [0.626]
Dummy Institutiontype	-1.106*** [0.001]	-1.093*** [0.000]	-1.053*** [0.002]	-0.689* [0.056]	-1.994** [0.017]	-0.513 [0.212]	-1.047*** [0.005]	-1.095*** [0.002]
Dummy Exploitationtype	1.094*** [0.000]	1.410*** [0.000]	1.261*** [0.000]	1.005*** [0.007]	2.465*** [0.004]	0.504 [0.258]	1.311*** [0.000]	1.170*** [0.001]
Dummy Confirmed victims	1.468*** [0.000]	0.779*** [0.001]	1.230*** [0.000]	2.609*** [0.000]	4.357*** [0.000]	2.363*** [0.000]	1.120** [0.014]	1.412*** [0.000]
Alpha (over dispersion)	0.913*** [0.000]	0.762*** [0.000]	0.886*** [0.000]	0.883*** [0.000]	0.683*** [0.000]	0.889*** [0.000]	0.622 [0.159]	0.905*** [0.000]
Observations	11,076	8,060	11,023	7,962	4,235	7,962	3,489	9,585
Host FE	No	No	No	No	No	No	No	No
Source FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The dependent variable is the bilateral TIP victim flows to 13 countries in Europe. Estimation is a zero inflated negative binomial (zinb) including source country and time fixed effects, and data quality controls. Reported values are marginal effects, robust p-values in brackets; *, **, *** significant at 10%, 5%, 1%. Full sample.

Table 6: TIP victim flows, zinb, reduced sample, 1998-2009 (unbalanced panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(log) GDP pc diff	0.380 [0.323]	1.748*** [0.001]	0.649 [0.124]	0.510 [0.157]	1.076 [0.171]	0.485 [0.717]	0.922** [0.034]
(log) Population sum	0.958 [0.585]	0.969 [0.639]	-0.434 [0.817]	3.341 [0.108]	1.759 [0.633]	0.942 [0.814]	-1.260 [0.525]
(log) Distance	-2.390*** [0.000]	-1.140** [0.018]	-2.265*** [0.000]	-2.323*** [0.000]	-4.400*** [0.000]	-2.022 [0.615]	-2.132*** [0.000]
(log) Foreign population		0.551*** [0.000]					
(log) Refugees			0.393*** [0.000]				
Law and order (host)				-1.251*** [0.000]	-2.591*** [0.000]		
Law and order (source)				-0.259 [0.178]	-0.291 [0.483]		
Visa Index 1 (host)				2.157*** [0.000]			
Visa Index 2 (host)				0.455 [0.231]			
Asylum recognition rate					0.627 [0.439]		
Homicides rate (host)						-0.962 [0.484]	
Homicides rate (source)						-0.022 [0.747]	
Women's Index 2 (source)							0.326 [0.198]
Women's Index 3 (source)							0.161 [0.675]
Alpha (over dispersion)	0.922*** [0.000]	0.741*** [0.000]	0.903*** [0.000]	0.969*** [0.000]	0.706*** [0.000]	0.632 [0.456]	0.870*** [0.000]
Observations	7,962	5,940	7,935	7,962	4,235	3,226	7,138
Host FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The dependent variable is the bilateral TIP victim flows to 13 countries in Europe. Estimation is a zero inflated negative binomial (zinb) including host country, source country and time fixed effects. Reported values are marginal effects, robust p-values in brackets; *, **, *** significant at 10%, 5%, 1%. Sample size reduced in order to match availability of host country law and order variable.

Table 7: TIP victim flows, zinb, reduced sample, 1998-2009 (unbalanced panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(log) GDP pc diff	2.447*** [0.000]	2.310*** [0.000]	2.143*** [0.000]	2.696*** [0.000]	4.147*** [0.000]	2.658*** [0.000]	1.646* [0.058]	2.222*** [0.000]
(log) Population sum	1.554*** [0.000]	1.272*** [0.000]	1.445*** [0.000]	1.301*** [0.000]	2.749*** [0.000]	1.474*** [0.000]	1.259** [0.021]	1.214*** [0.000]
(log) Distance	-2.364*** [0.000]	-0.967** [0.035]	-2.261*** [0.000]	-2.322*** [0.000]	-4.215*** [0.000]	-2.390*** [0.000]	-1.735 [0.168]	-2.182*** [0.000]
(log) Foreign population		0.540*** [0.000]						
(log) Refugees			0.327*** [0.000]					
Law and order (host)				-0.647*** [0.001]	-0.940*** [0.007]	-0.359 [0.128]		
Law and order (source)				-0.266 [0.233]	-0.256 [0.544]	-0.320 [0.175]		
Visa Index 1 (host)				2.513*** [0.001]				
Visa Index 2 (host)				0.201 [0.567]				
Asylum recognition rate					0.918 [0.235]			
Prostitution Index 1 (host)						0.574 [0.317]		
Prostitution Index 2 (host)						0.456 [0.142]		
Homicides rate (host)							-0.271 [0.233]	
Homicides rate (source)							-0.054 [0.319]	
Women's Index 2 (source)								0.236 [0.394]
Women's Index 3 (source)								-0.077 [0.853]
Dummy Institutiontype	-1.098*** [0.006]	-1.160*** [0.001]	-0.984** [0.018]	-0.689* [0.056]	-1.994** [0.017]	-0.513 [0.212]	-1.086** [0.025]	-0.979** [0.018]
Dummy Exploitationtype	1.281*** [0.002]	1.767*** [0.000]	1.523*** [0.001]	1.005*** [0.007]	2.465*** [0.004]	0.504 [0.258]	1.379*** [0.005]	1.323*** [0.002]
Dummy Confirmed victims	2.116*** [0.000]	0.971*** [0.003]	1.786*** [0.000]	2.609*** [0.000]	4.357*** [0.000]	2.363*** [0.000]	1.234** [0.023]	1.908*** [0.000]
Alpha (over dispersion)	0.980*** [0.000]	0.741*** [0.000]	0.886*** [0.000]	0.883*** [0.000]	0.683*** [0.000]	0.889*** [0.000]	0.632 [0.453]	0.870*** [0.000]
Observations	7,962	5,940	7,935	7,962	4,235	7,962	3,226	7,138
Host FE	No	No	No	No	No	No	No	No
Source FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The dependent variable is the bilateral TIP victim flows to 13 countries in Europe. Estimation is a zero inflated negative binomial (zinb) including source country and time fixed effects, and data quality controls. Reported values are marginal effects, robust p-values in brackets; *, **, *** significant at 10%, 5%, 1%. Sample size reduced in order to match availability host country law and order variable.