OPPORTUNISTIC PREDATION:
HUMAN TRAFFICKING IN POST-DISASTER COMMUNITIES

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ABSTRACT

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Second only to the trafficking of drugs, human trafficking has become one of the fastest growing transnational criminal activities in the world (UNODC, n.d.). In an attempt to further understand the behavior of traffickers and trafficking victims alike, scholars have turned to the study of human trafficking determinants to discover the conditions in which human trafficking thrives. This thesis intends to contribute to this research tradition by introducing natural disasters, a previously unstudied set of variables, as a potential human trafficking determinant. Migration literature has established a connection between the personal decision of migration and human trafficking activity due to the vulnerable conditions that surround relocation. This connection extends to forced migration and disaster-induced displacement. Using the US State Department's Trafficking in Persons annual reports along with the International Emergency Database, I test the impact of natural disasters on human trafficking flows. This thesis concludes with support for the positive relationship between natural disaster outcomes on human trafficking presence.

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CHAPTER I

INTRODUCTION

Slavery is recognized as one of the oldest economic practices, traditionally regarding particular groups of human beings as physical property. Throughout years of social and economic development along with recent trends of globalization, slavery has transformed from a socially acceptable means of developing national and personal business interests into a criminal activity used by individuals for personal gain via sexual exploitation, debt bondage, and forced labor (Welch, 2009). As a criminal activity, slavery is now referred to as human trafficking. The constantly changing sphere of human bondage goes hand in hand with ever-changing methods of recruitment, detainment, and exploitation. From ancient prisoners of war to modern-day labor recruitment, the slave trade has found their supply in various locations. The varying situations where recruitment is optimal, more commonly known as determinants, have sparked an entire subsect in human trafficking literature. This subsect asks questions regarding under what circumstances does slavery still flourish in a globalized world that views such behavior negatively.

While previous studies have looked at the impact of factors such as economic development, law enforcement, and political stability, analysis of the impact of natural disasters on human trafficking is lacking. How do major meteorological or geological events known more commonly as natural disasters, affect human trafficking? As defined by the Centre for Research on the Epidemiology of Disasters, a disaster is "an unforeseen and often sudden event that causes great damage, destruction and human suffering. Though often caused by nature, disasters can have human origins" (EM-DAT Glossary). While this definition includes both natural and man-

made disasters, I look at the impact of random natural events that are unpredictable and unstoppable.

On April 25th, 2015, a pair of 7.8 and 7.3 magnitude earthquakes devastated the country of Nepal, causing nearly 9,000 casualties. In the weeks that followed, online news sources used the incident to highlight the number of children left vulnerable to human traffickers after orphanages were destroyed by the earthquake (Al Jazeera, 2015; Rawlinson, 2016; Goldberg, 2015). According to UNICEF estimates, more than 245 children were intercepted in the process of being trafficked after the Nepali earthquake (UNICEF, 2015). This sets annual projections for Nepal well above UNICEF's previous estimation of 12,000 children. Similarly, in 2010 a series of major earthquakes caused significant damages in Haiti, with reports of children being trafficked from hospitals in the aftermath into the Dominican Republic (Menezes, 2011). Both of these cases offer isolated incidents of opportunistic predation of those left vulnerable by natural disasters. While natural disasters of this magnitude are random and infrequent, several countries around the world experience such disasters every year. Trends such as these highlight the importance of systematic study in the aftermath of catastrophic events to better understand their impact on human trafficking. This thesis contributes to the existing literature by testing the impact of natural disasters on human trafficking. [1] Literature on human mobility, including voluntary and forced migration, uses a rational choice theoretic framework to explain why some people leave their homes while others stay put. Using factors such as violence, socio-economic conditions, and natural disasters, this literature suggests that people tend to flee from situations

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[1] Human trafficking in this thesis refers specifically to the outward flow of human trafficking victims from one country into another. States "experiencing" human trafficking activity are the countries of origin for victims, and should not be confused with destination countries, points of transit on larger trafficking routes, or locations experiencing internal trafficking.

of poverty, internal conflict, and political repression. What is less known are the theoretical and causal mechanism that link natural disasters with human trafficking. Building on the rational choice theoretical platform and using data from the US Department of State's annual Trafficking in Persons report, I provide one of the earliest analysis of the link between natural disaster and human trafficking.

Literature Review

Human trafficking is as old as human history and it is almost impossible to review all the existing literature in the field. Below, I review literature relevant to my thesis dividing them into two categories: policy recommendation and empirical analysis of the of the determinants of trafficking.

The first group of literature is either individual policy reports or government reports such as the United Nations Office on Drugs and Crime's annual *Global Report on Trafficking in Persons* and the United States Department of State's annual *Trafficking in Persons* (TIP) reports. The UNODC report includes specific policy concerns throughout the world and any particular shortcomings of trafficking policy effectiveness. The annual TIP reports focus on individual countries and the state of trafficking within their borders. These country narratives also come with policy analysis and recommendations on the status of human trafficking law enforcement.

Policy related literature lies in application of government policy both international and domestic. This aspect of the human trafficking discussion is very sensitive due to the controversial nature of the subject especially in less developed states where capacity and willingness to admit to such a major criminal activities presence is less than satisfactory (Emmers, Greener-Barcham, and Thomas, 2006). Due to the underground nature of organized crime and the need for multinational cooperation, initiating an effective policy can be both

incredibly difficult in terms of information gathering as well as when considering international

relationships (Miller, 2006).

Some researchers studying human trafficking have made policy recommendation for

international intervention and a shift in the prioritization of policing resources (Coonan &

Thompson, 2005; Jakobsson & Kotsadam, 2013). Others have attempted to find ways to assist

victims of human trafficking in their search for justice, such as providing pro-bono legal counsel

for those who have escaped (Vandenberg, 2012). The theoretical assumptions behind these calls

for action pertain to making victims and perpetrators public in the hopes of deterring future

criminal activity. However, this is rarely the case and in some instances may increase human

trafficking rates.

The study of the influence of policy and intervention is not exclusively in favor of heavy

domestic policing efforts and bold international influence on crises. There is extensive literature

on the effects of international influence in crisis areas, with human trafficking being mentioned

as one of these effects. For example, while UN peacekeeping forces have had positive influences

on conflict management, their presence in tumultuous states can lead to increased trafficking

activity (Smith & Smith, 2011). The general movement of foreign personnel into a conflict zone

has made preventing such activity difficult, showing that policy choices are not as clear as some

may think. The example of UN peacekeeping troops can easily be transferred into any

international efforts that target specific areas, even if the purpose of the intervention is

trafficking related.

A second form of trafficking policy critiques pertains specifically to developed states'

attempts to aid in the larger fight against human trafficking by pushing policy reform on

developing countries. Often times when policymakers from a single country have limited

exposure to the actual problem at hand, they make unnecessary and biased policy decisions (Potocky, 2010). Because states are not unified in their stance on human trafficking, threats of sanctions or other punishments for noncompliant states hold very little weight, and often act as more of a symbolic gesture than an attempt at real change. This stands as one of the most important reasons for research that focuses on the causes and indicators of human trafficking as a means to educate policymakers and prevent the creation of useless legislation.

Even in the case of agreement with major international guidelines and protocols, states vary in their willingness to carry out the terms of the agreements they join. In many cases, states will select parts of their agreed protocol that appeases the international community the most while costing as little as possible for them (Cho & Vadlamannati, 2012). This contributes to the understanding of a majority of human trafficking policy as nothing more than symbolic gestures adopted for the purpose of upholding public image.

The reports made by major international organizations and policy papers by scholars have influenced how human trafficking is policed and reported, however their impact is limited to government action. While these studies point out shortcomings in actively preventing human trafficking activity, they are unable to account for situations where preparation and international treaties have little impact, such as in the wake of major natural disasters. Policy research on human trafficking could benefit from the study of trafficking prevention as a part of national emergency preparedness.

The second group of literature focuses on identifying determinants or predictors of human trafficking. Using quantitative empirical methods, this group of literature provides systematic tests studying the relationship between determinants, or causes, of human trafficking and measurements of trafficking activity. These studies look specifically at traditional push and

pull factors used in migration research as a benchmark for their models of human trafficking indicators for the purpose of designing future policy based on the results. Those who pursue this study argue that in order for policy and government intervention to be feasible, the factors associated with large scale trafficking must be understood. While there are roughly 30 independent variables that have been identified as push-factor human trafficking determinants (Cho, 2015), I group them into larger themes such as economic, political, and miscellaneous factors.

A large number of studies on human trafficking determinants test for economic underdevelopment as a push factor that contributes to human trafficking (Danailova-Trainor and Bleser, 2006; Clawson and Layne, 2007; DiTomasso et al, 2009; Akee et al, 2010; Frank, 2011). Economic underdevelopment serves as a push factor in that individuals will relocate to states with better economic opportunity, resulting in a vulnerable transition period where they are susceptible to be trafficked. Each of these studies use GDP per capita (World Bank) as a proxy for economic development as well as an index value for human trafficking intensity as a dependent variable from either UNODC or TIP reports. Each author finds significant support for the negative relationship between economic development and outflows of human trafficking activity, providing support for the theoretical connection between migratory push factors and human trafficking.

Several studies test the impact of economic and social development on human trafficking using other factors. The argument made by each of these studies align with the measurement of GDP. Each of these measurements is an indicator of economic development, of which lower levels will push individuals to relocate, in turn making them susceptible to trafficking. A popular proxy for economic development is literacy rate. They argue that as the literacy rate for country

increases, they will have less human trafficking activity, whether it be the main independent variable or supplementing variables in their analyses. Unlike studies that measure GDP, each author fails to find support for their hypotheses.

The next proxy variable used for economic development in human trafficking research is television and phone usage, which assume that higher numbers of telephones and televisions per household are a measurement of higher economic development, and would in turn have a negative relationship with human trafficking trends usage (Mahmoud & Trebesch, 2010; Mo, 2011). Using the same rational choice framework used in the prior studies discussed, they do not find support for their hypothesis. The same authors also attempt to study the relationship between physicians per 1,000 people (Mahmoud and Trebesch, 2010), finding no support for their hypothesis proposing a relationship between higher physician rates and lower levels of trafficking.

The final three proxies for economic development used in trafficking research are literacy rates (Clawson & Layne, 2007; Di Tommaso, 2009; Bettio & Nandi, 2010; Zhang et al, 2010), total numbers of impoverished persons (Clawson & Layne, 2007), and unemployment rates (Clawson & Layne, 2007; Jac-Kucharski, 2012). These studies argued that higher literacy rates, lower numbers of impoverished persons, and lower unemployment rates would result in lower levels of trafficking. All of these variables came back with insufficient evidence to support their hypotheses.

Apart from economic development, existing research also studies the impact of political factors on human trafficking activity. The two political factors studied in the field have been the level of democracy (Jac-Kucharski, 2012) and political stability (Akee, et al, 2014). Jac-Kucharski (2012) studies push factors in countries specifically that serve as source countries for

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trafficking into the United States in order to test whether individuals are trafficked from non-democratic states to strong democratic states by using democracy as an independent variable. His results do not support his hypothesis, and rather indicate that more democratic states are more likely to be source states for trafficking into the United States. Akee et al (2014) tests for the relationship between political stability and trafficking and find support for their hypothesis that greater political stability results in a lessened likelihood of human trafficking.

Another set of existing literature looks at the relationship between crime rates and human trafficking. The first set of research uses overall crime rates under the argument that crime serves as a push factor, and following the framework of other research on rational choice in migration, would have a positive relationship with trafficking activity (Clawson & Layne, 2007; Bettio & Nandi, 2010; Mahmoud and Trabesch, 2010). Other research on crime specifically targets trafficking-centered policy enforcement, arguing that stricter policy enforcement leads to lower trafficking activity (Akee et al., 2014). The general crime independent variable comes directly from the UNODC, which also offers human trafficking reports used for data in these cases. Akee et al (2014) uses the "3P Anti-Trafficking Policy Index" (Cho et al, 2014) for their independent variable of trafficking policy enforcement. Each of these studies provide support for their hypotheses, which predict a positive relationship between higher crime rates and higher trafficking activity as well as higher trafficking rates with less trafficking-related policy enforcement.

The remainder of the studies look at independent variables that do not have a specific theme, or are not directly related to migratory push factors. These include variables such as the percentage of gross domestic product attributed to tobacco industries (Bales, 2007) as well as drug use and carbon dioxide emissions (Clawson & Layne, 2007). Each of these analyses find

support for their hypotheses finding more trafficking in states that have large tobacco exports and carbon dioxide emissions, but are irrelevant to the topic being discussed. One other variable that should be discussed is the region in which the state is located (Rao and Presenti, 2012). This study used each region as a dummy variable, and found significant results implicating regions such as South America, Africa, and East Asia in higher levels of human trafficking. This was attributed to economic development, but it should also be noted that these regions see higher levels of natural disaster activity than others.

Much like policy-based research, the study of determinants of trafficking has been successful in identifying the conditions in which human trafficking is more likely to take place. It can be said with relative confidence that the data supports the relationship between economic underdevelopment and increased human trafficking activity, as well as the merits of stable democratic institutions on the prevention thereof. However, none of the studies looks at the impact of natural disasters. As already discussed, variables with weak explanatory power such as regional dummies have deeper causes that need to be accounted for.

Road Map

The remainder of this thesis is divided into four additional chapters. Chapter 2 provides a theoretical framework that justifies the appropriateness of rational choice framework to study migration-related trafficking and lays out my hypotheses. Chapter 3 explains the research method. Chapter 4 discusses the main findings from the research, including the evaluations of my hypotheses. To conclude the thesis, Chapter 5 provides a discussion of the policy implications of the findings in Chapter 4 as well as concluding remarks about future research in the field.

CHAPTER II

THEORY

Traditionally, rational choice theoretical frameworks have been useful in understanding trafficking activity (Jac-Kucharski, 2012). When individuals live in unstable or even dangerous environments, they must take into consideration the option of leaving their homes versus staying put. This is a difficult choice, since the sentimental value of one's home is a powerful factor in the decision-making process. The decision is based on the opportunity costs of staying or leaving, based on two sets of cost/benefit analyses, one on the side of staying put and one on the side of leaving. For example, the cost of staying at home may include present or future danger or missed economic opportunity, while the cost of leaving include the family and friends left behind, any physical property that cannot be taken with, and the potential dangers in the moving process. The benefits of each include the opposite factors for staying and leaving, including economic opportunity abroad and maintaining social networks at home. When the cost of staying becomes too great for the benefits received in conjunction with the benefits abroad outweighing the costs of relocation, a rational decision is made to abandon life at home and try for a better future.

The discussion on migratory push and pull factors, as well as the rational-choice model in general, becomes more complex when the discussion shifts from voluntary migration to forced migration. As opposed to voluntary migration, forced migration often includes an immediate threat to physical integrity. This can take the form of violent political opposition, ethnic or religious dispute, or the physical destruction of one's home. While some may argue that the option for rational choice has been nullified in cases of immediate threat, forced migration scholars have studied the conditions necessary for individuals to make the difficult decision to

stay during times of crisis (Schmeidl, 1997; Moore and Shellman, 2004). Cleary, different scenarios present different options, and while the threat of political or insurgent-civilian violence may be passed off as insignificant by certain individuals, some situations of forced migration are simply unavoidable, restricting the applicability of rational choice to an even further extent.

Disaster and development-induced displacement is often overlooked in terms of its overall impact on a state. Where some may argue that there is a possibility to wait out a conflict or political targeting, natural disasters and major development projects are unavoidable in most situations. Development-induced displacement includes several types of projects, yet the most often discussed is the construction of dams that reroute major waterways. For example, the Three Gorges Dam in China was a major point of controversy when over 1 million residents were displaced due to flooding from the resulting reservoir. While it would seem that the applicability of rational choice is limited in this case, the principle still remains that they could have chosen to stay in their homes and face the fatal consequences.

The focus of this study is the consequence of natural disaster-induced displacement on human trafficking. Unlike the controlled environment surrounding development-induced displacement, natural disasters are unpredictable and potentially devastating. In cases where previous residents are left homeless in the aftermath of a major disaster, individuals are forced to make a difficult decision. The abandonment of physical property in normal conditions is both a physical cost as well as a sentimental cost. These costs can extend to social networks such as friends, family, and organized facets of civil society (Wood, 2008). When natural disasters destroy the physical, familial, and emotional ties to a specific location, the associated benefits of staying are greatly diminished and costs heightened. This tips the scale in favor of relocation and induces individuals to make a decision to leave. The more that the scale is contributing to an

individual's decision to leave, the more likely that an individual will engage in risky behaviors. This is where the traffickers are likely to step in.

Trafficker activity is equally important as the behavior of the victims. As criminals engaged in trade, supply must be gathered as quickly and efficiently as possible. In cases of drug trade, considerations are made as to where the supply will be cultivated or manufactured, how it is transferred, and how it will be distributed. Human traffickers do not have the same liberty in choosing their supply source, so they must meet their prey half way while meeting all the requirements of efficiency and discretion. Rather than focusing on any specific location, hunting grounds are chosen based on vulnerability of the potential victims and the profit to be made. The costs associated with this decision include potential imprisonment, the ability to transport victims across borders, and the time it will take to complete the process. On the other hand, benefits that are weighed include the demand for a specific demographic, the ease of transport, and the ability to circumvent law enforcement. For example, states with high levels of development and policing activity are more secure for their citizens, and in turn less secure for traffickers. Rather, traffickers are more likely to pursue victims found in underdeveloped states with inefficient policing, specifically border control. These states cannot protect their citizens as well as more advanced states, and in turn make prime locations for trafficking activity.

Now that forced (and voluntary) migration in the aftermath of a major natural disaster has been established as a rational choice by the act of an individual fleeing, the rational choice of predatory traffickers comes into play (Jac-Kucharski, 2012). A key component of rational choice theory is the desire of each actor to maximize their own personal gain. For the fleeing family in the wake of a tsunami, their maximized gain may be to relocate to a safer or more stable location. For the trafficker, the maximized gain is a balance of costs and benefits similar to that of the

displaced. Rather than migratory push and pull factors, traffickers weigh the potential risks

associated with criminal activity versus the potential gains. The weighing of risk and reward in

turn leads traffickers to find the most vulnerable prey, both in terms of law enforcement's ability

to protect potential victims as well as the victims own ability to do the same. Natural disasters,

while distracting law enforcement personnel, encourage risk behaviors. Wary travelers looking

for safe passage are particularly desperate, and in turn provide the optimal target for trafficking

predators. For this reason, traffickers make their predatory decisions based on the same factors

that cause individuals to leave their home. This may take the form of any push factor discussed

in the review of the literature, or a spontaneous factor such as the occurrence of a natural

disaster. It then follows that states stricken with natural disaster would be at greater risk for

human trafficking activity. However, this theory suggests that trafficking activity can be

attributed specifically to the displacement caused by natural disasters, a more direct connection

as opposed to measuring the presence of natural disasters or even the physical destruction caused

by a disaster. From the above theoretical argument, I derive the following hypotheses:

H_1(a): *States with higher levels of displacement caused by natural disasters will be more*
        likely to record human trafficking activity.

H_1(b): *States with higher levels of displacement caused by natural disasters will record a*
        higher intensity of human trafficking.

In addition to the total number of people displaced, several other factors associated with

natural disasters may provide opportunities for human trafficking predators. One of these

outcomes is the total physical damages caused by natural disasters. When physical infrastructure

is destroyed, individuals are left without shelter. The choice to leave home is a combination of

the costs and benefits of both staying and leaving. Costs of leaving include any ties to the

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country of origin that might make it difficult to leave. The destruction of personal property eliminates the cost of leaving behind belongings that hold either monetary or intrinsic value, making the likelihood of leaving greater. This argument may be countered by the involvement of international aid in the form of manual labor and peacekeeping forces. However recent studies (Smith & Smith, 2011), have suggested international involvement may have the opposite effect, inciting human trafficking rates rather than reducing them. This discussion leads to my second hypothesis:

H_2(a): *States experiencing greater damages to physical property due to natural disasters will be more likely to record human trafficking activity.*

H_2(b): *States experiencing greater damages to physical property due to natural disasters will record a higher intensity of human trafficking.*

Another mechanism that can lead to trafficking is the influence of fatalities on the decision to relocate, in the form of destroyed social. These connections, known in the literature as social networks, are the personal relationships or communities that provide support. Social networks can take the form of familial relations or social organizations such as religious groups or social clubs. When catastrophic events reduce the population, several domestic social networks are damaged, if not destroyed. The weakened network, often in combination with social networks abroad, leads the individual to attempt relocation.

H_3(a): *States experiencing larger numbers of casualties due to natural disasters will be more likely to record human trafficking activity.*

H_3(b): *States experiencing larger numbers of casualties due to natural disasters will record a higher intensity of human trafficking.*

In addition to the factors stemming from natural disasters, human trafficking is also likely to be affected by socio-economic conditions in the country of origin. I discuss those factors in the next chapter, included in the analysis as control variables.

CHAPTER III

RESEARCH METHOD

To test theoretical argument and hypotheses presented in the previous chapter, I use two sources of data. The Human Trafficking Indicators (HTI) dataset (Frank, 2011) and data coded from the US State Department's Trafficking in Persons (TIP) reports. The HTI dataset is derived from the US State Department's TIP reports, and covers years 2001-2011 at the country-year level of analysis. This data covers some numeric coding on each state's status as a source, destination, and transit country as well as information on treaties and international agreement compliance. I chose this data for its large number of cases and for its inclusion of a dummy variable for status as a source country. The annual TIP reports come in the format of country-narratives, including the flows of trafficking (inward, outward, or domestic), notes on the flow's intensity (limited, heavy, etc), and any special notes on prevention or law enforcement. The detailed narratives offer enough information to code for the intensity of trafficking flows, which will be discussed along with the dependent variables.

Maintaining consistency with existing quantitative human trafficking literature is not only ideal, but also unavoidable due to the available data on human trafficking. As will be discussed further in this chapter, outside of qualitative methods, the only available rigorous statistical tests are logistic and probability unit (probit) regression models along with their ordered variations for ordinal level data. In line with several other studies of human trafficking determinants, I have chosen probit regression models for analysis because of their ability to test both dichotomous and ordinal level data as dependent variables. These analyses will be conducted at the country-year level of analysis in order to offer the most specific data available.

To test my hypotheses I employ two empirical strategies. First, I am interested in testing the impact of natural disasters on the presence or absence of human trafficking activity. I use a probit regression analysis due to the dichotomous variable of human trafficking presence, coded as 1 for presence and 0 for no presence. I then run a test for the marginal effects of the independent and control variables in order to estimate their relationship with human trafficking presence.

In addition to testing the presence of human trafficking activity, I am also interested in testing the scaled intensity of human trafficking, coded as an index from the State Department's annual TIP reports. Testing this relationship requires an ordered probit regression model, since the data used for the dependent variable is an ordinal measurement of trafficking intensity. Much like the probit regression, marginal effects are used to test the actual relationship between the dependent and independent variables.

Dependent Variables

Given the difficulties in quantifying trafficking activity, previous studies have resorted to either the UNODC Report on Trafficking in Persons or the United States' Department of State's annual Trafficking in Persons Report. These reports take the form of country-level narratives that explain the current status of trafficking in each country, ranging from details of trafficking presence to the purposes for trafficking that pertain to each case.

The presence of human trafficking (*SOURCE_DUMMY)* is measured as a dichotomous dummy variable under the HTI dataset, which explicitly labels country-year cases that are indicated as sources of human trafficking 'yes' and cases that have no mention of being a source country for human trafficking 'no.' In order to utilize this data for probit regression, I recode this variable into numeric values. Values of 'yes' are recoded as the number '1' for presence, while

values of 'no' are recoded as the number '0' for absence. For example, country X is a *source* country for trafficking of the Y nature. In this example, Y may include any variant of human trafficking such as debt bondage, forced prostitution, forced labor, or domestic servitude, among others. Any case that is acknowledged as a source country, regardless of the variant of human trafficking, is coded '1,' otherwise, '0.' As seen in Table 1, the total mean of the source dummy variable for all cases is 0.79. This indicates that the majority of cases are source countries.

Table 1. Descriptive Statistics

Variable	N	Mean	Min	Max
SOURCE_DUMMY	2,124	0.79	0	1
SOURCE_SCALE	2,116	2.50	1	4
DISPLACED	2,124	15,485	0	5,003,500
DAMAGES	2,124	791,707	0	212,520,000
CASUALTIES	2,124	635	0	222,641
GDP_PERCAPITA	2,063	11,810	106	116,612
POPULATION	2,108	43,307,800	20,227	1,364,270,000
DEMOCRACY	2,100	3.41	1	7
TIER	2,106	1.92	1	3

Measuring human trafficking intensity is a much more complex endeavor, as discussed at the beginning of this chapter. The 2006 UNODC data sometimes cited in human trafficking determinant research limits the researcher both in terms of time as well as states, including only 161 as opposed to the TIP report's 190 (including microstates). TIP also allows for the coverage of all cases since 2001, making it the preferred data source. To quantify this data, each country

narrative included in the TIP reports since 2001 was coded into an index based on intensity. For a complete list of coding rules and examples, see Appendix A. As opposed to the dummy variable of presence, this index includes two additional values. States with no mention of trafficking are coded as '1,' being the lowest category in the ordinal data.

The first additional category identifies states that are considered a source of human trafficking, but only to a very limited degree. These are states that have small populations and moderate levels GDP per capita (10,000-20,000 USD), with the majority being Eastern European states. The states in this category are developed to the point of generating a demand for incoming trafficking activity, however not developed enough to counter the pull factor of economic prosperity in other states, namely advanced democracies in Europe. States that fall under this designation are coded '2.' States that have reports of trafficking with no designation of limited or abundant trafficking activity are coded as '3'.

The second additional category identifies states with a severe trafficking problem. These states are identified for their high outputs of trafficking victims, regardless of their intended use. Unlike the limited trafficking countries, there is no stereotypical state with a combination of qualities that fall under this category. However, these are often less-developed industrialized states such as Mexico, Brazil, and Russia. States falling under this category are coded '4', being the highest value in the index. It is important to note that a majority of cases fall under a score of 3 and 1, since a score of 2 or 4 requires explicit indication from TIP country narratives. According to Table 1, the mean value for TRAFFICKING_SCALE is 2.5. Looking at Table 2, the majority of cases are still identified as source countries at 1,461, with 450 total cases that lack trafficking activity, 177 that have minor trafficking problems, and only 28 that are considered to be major sources of trafficking activity.

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Table 2. Trafficking Scale by Region

Trafficking Scale	North/Central America	South America	Europe	Africa	Middle East	Asia	Total
1	35	2	184	44	119	66	450
2	11	10	79	18	11	48	177
3	173	115	291	510	54	318	1461
4	4	13	5	0	0	6	28
Total	223	140	559	572	184	438	2,116

When measuring the presence and intensity of human trafficking flows from annual TIP reports, it is important to note the time when the report was written. For example, the 2004 edition of the TIP report was published on June 14th, 2004. Once a calendar year is completed, the annual TIP report for the current year is compiled and published. This means that the reports given in 2004 actually refer to events and observations during the 2003 calendar year. It would be insufficient to attribute data from the 2004 report on cases that cover that particular year. To remedy this concern, all data for yearly TIP reports have been lagged by one year. For example, cases in the year 2003 use trafficking data from the 2004 report.

Independent Variables

In order to test the relationship between disaster-induced displacement and human trafficking, I use a measurement of the total displaced population (DISPLACED) due to a natural disaster at the country-year level. This data is gathered from the Emergency Events Database (EM-DAT). The EM-DAT from the Centre on the Epidemiology of Disasters offers in depth country-year statistics on natural disasters in every state. This database allows for coding by region, type of natural disaster, intensity, and casualties, among others. Because of the versatility of the dataset, EM-DAT also serves as the data source for the two additional independent variables of damages and casualties due to natural disasters. Table 1 shows that the mean number

of displaced persons per country-year is approximately 15,000 while the total number of persons displaced by natural disasters between 2001 and 2014 is over 30,000,000. The largest displacement of individuals in a country-year within the time range of the dataset occurred in 2005, with nearly 5,000,000 individual's homes being destroyed. Over half of these cases were due to the 2005 Kashmir earthquake, which displaced an estimated 2.8 million.

The relationship between disaster-induced damages and human trafficking is tested using the estimated total cost of damages to infrastructure due to natural disasters in a given year (DAMAGES), in US dollars. According to Table 1, almost $1.7 trillion in damages were inflicted on infrastructure between 2001 and 2014. If this were distributed among each country-year, each country would owe nearly $800,000 annually, roughly 2% of the GDP of Tuvalu. The highest infrastructural damages by a natural disaster was the result of the 2011 Japan Tsunami, which inflicted over $2 million in total damages.

The final independent variable serves as a proxy to test the relationship between damaged social networks and human trafficking. Domestic social network damage is operationalized as casualties from natural disaster, and is measured by the total number of casualties due to natural disasters in a given year (CASUALTIES). Between 2001 and 2014, over 1.3 million people were killed as a result of natural disasters, averaging just under 100,000 per year. A large portion of these casualties are the result of the 2010 Haiti Earthquake, with estimates over 200,000 casualties. The data for all three independent variables is then recoded into units of 100,000 (displaced persons, US dollars, and casualties; respectively) in order to make analysis figures easier to interpret.

Control Variables

In addition to testing for the impact of natural disasters, I also control for factors from previous studies. These control variables for the probit regression analyses are selected based on Cho's (2015) robustness check of all previously studied push-factor determinants of human trafficking. In order to control for states that have the capacity to actively monitor trafficking activities within their borders, two variables are added into the analysis. First, gross domestic product (GDP) per capita stands as the most common indicator of economic development in not only human trafficking literature, but most comparative studies. This information is gathered from the World Bank. Much like the variable of displacement, this measurement is then recoded into units of 100,000 USD in order to make analysis more friendly. The descriptive statistics in Table 1 show the range of GDP per capita stretches between $106 to over $115,000, and has a mean of 11,810.

Second, a control is used for the tiered ranking by the United States Department of State to assess compliance with current international standards for trafficking prevention as set by the United Nations (POLICY_TIER). This scale runs from 1 to 3, where 1 indicates full compliance and 3 indicates little or no compliance. A two indicates a state that is in partial compliance with international standards as recommended by the US Department of State, or is making progress towards compliance at the time of the report. Within the data, almost 90% of cases fell under tiers 1 or 2, indicating either compliance or progress made towards compliance with UN established standards of trafficking policy enforcement.

The next important control when studying human trafficking flows is the strength of democracy in each state (DEMOCRACY). Citizens from states with strong democracies theoretically possess less incentive to migrate, which in turn makes them less vulnerable when

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compared to less-effective democracies (Jac-Kucharski, 2012). Unlike the single-year case study used by Jac-Kucharski (2012) and the single-year measurement of democracy, I utilize measurements from Freedom House scores, which evaluate states' democratic processes and legitimacy and ascribe a score of "political freedom" from 1-7. 1 indicates a free state while 7 indicates a "not free" state, with varying degrees in between. Freedom House democracy scores come in two variables: political freedom and civil liberties. I operationalize democracy as the average between these two scores for a country in a given year.

Finally, I also control for geographic variation using a categorical variable to distinguish different regions of the world (REGION). While all regions experience natural disasters of some form, certain regions are able to respond to major disasters more effectively than others. These regional distinctions are made using the correlates of war (COW) country code designations, coding for the numeric ranges that encapsulate each region. This separates world into six regions: North & Central America, South America, Asia, Africa, Europe, and the Middle East. In many cases trafficking is limited to regional activity, with destination countries being located within the same region as their source countries (TIP 2001-2015).

Table 2 offers a cross-tabulation between the human trafficking intensity scale and the region variable. Of the approximately 1,600 cases of source countries, almost one third of them are located in Africa. However, Africa does not host any countries identified as major trafficking sources. South America has the largest number of "high intensity" cases at 13, comprising mainly of Colombia and Brazil. North and Central America's major sources of trafficking come from Mexico, while Europe's are due to trafficking in Russia. Looking at the proportions of trafficking source countries and natural disasters by region, Figure 1 shows a linear relationship

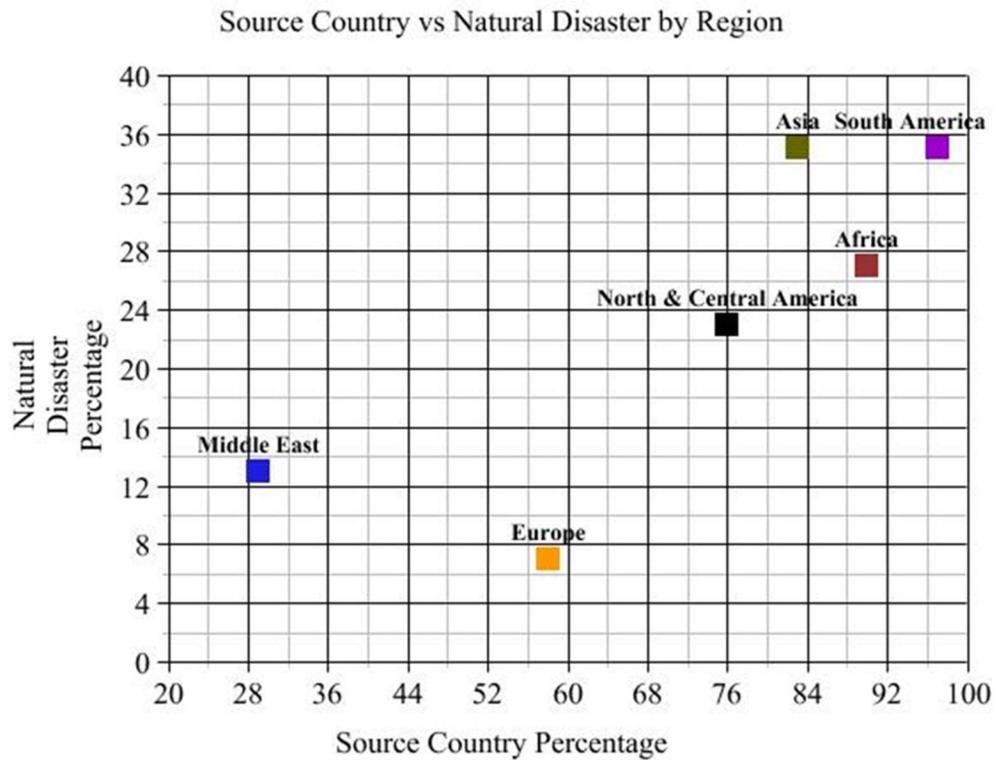**Source Country vs Natural Disaster by Region**

Figure 1. Scatterplot of Source Country and Natural Disaster Presence by Region

between the percentage of source countries in a region versus the percentages of cases experiencing natural disaster.

South America and Asia clearly have the highest rates of both natural disasters and human trafficking presence with around 35% presence of natural disasters and approximately 90% of cases experiencing human trafficking activity. While these descriptive results do not control for any other variables, this relationship will be tested in the regression analysis in the next chapter.

CHAPTER IV

ANALYSIS

Table 3 reports results from a probit regression on the presence or absence of trafficking. The results of Table 1 test hypotheses $H_1(a)$, $H_2(a)$, and $H_3(a)$. Model 1 tests the relationship between disaster-induced displacement and human trafficking presence while controlling for GDP per capita, democracy, human trafficking policy enforcement, and region. Model 2 tests for the relationship between disaster-induced damages and casualties and human trafficking presence, while controlling for each other as well as GDP per capita, democracy, human trafficking policy enforcement, and region.

$H_1(a)$ hypothesizes a positive relationship between disaster-induced displacement and human trafficking. The regression results for $H_1(a)$ are shown in Table 3, Model 1, are marginally in support of my hypothesis that the probability human trafficking presence increases as states experience greater displacement due to natural disaster. The marginal effect of disaster-induced displacements is 0.08, indicating that for every unit of displacement (100,000 persons), a state is approximately 8% more likely to be a source country for human trafficking activity.

$H_2(a)$ predicts that as the total number of damages done by natural disaster increases, so will the probability of human trafficking. $H_2(a)$ is tested in Table 3, Model 2, finding support for my hypothesis. The marginal effects indicate a positive increase in the predicted probability of human trafficking presence by 0.004 for every $1 million in infrastructural damages caused by natural disasters, meaning that for every million in damages, a state is approximately 0.4% more likely to be a source of trafficking activity. The marginal effects along with the significant regression coefficient support $H_2(a)$.

Table 3. Probit Regression of Human Trafficking Presence

	Model 1		**Model 2**	
	Coefficient (Standard Error)	Marginal Effects	Coefficient (Standard Error)	Marginal Effects
Displacement^	0.32 (.19) *	0.08		
Damages^^ (in USD)			.02 (.01)***	.004
Casualties^			0.46 (.86)	.12
GDP Per Capita	-4.81 (.55) ***	-1.19	-4.94 (.56)***	-1.26
Democracy	-0.05 (.02) **	-0.01	-0.04 (.02)**	-0.01
Policy Tier	-0.24 (.09) **	-0.06	-0.24 (.10)**	-0.01
Region	-0.08 (.03) **	-0.02	-0.07 (.03)**	-0.02
Pseudo R^2	0.273		0.274	
N	2,031		1,649	

^ per 100,000 units   ^^per 1,000,000 units
*=p<.10   **=p<.05   ***=p<.01

H$_3$(a) predicts a positive relationship between the total number of casualties inflicted by a natural disaster and the presence of human trafficking. H$_3$(a) is tested in Table 3 Model 2, with a probit regression coefficient of 0.46. The marginal effect of 0.12 indicates a positive relationship between casualties due to natural disasters and human trafficking; however, these results are not statistically significance. Therefore, I fail to support the relationship between disaster-induced casualties and human trafficking presence.

Table 4 contains the results of the ordered probit regression of human trafficking intensity. The regression analyses in Table 4 test hypotheses $H_1(b)$, $H_2(b)$, and $H_3(b)$. Model 1 tests for the influence of disaster-induced displacement on human trafficking intensity while controlling for GDP per capita, democracy, human trafficking policy enforcement, and region. Model 2 tests the relationship between disaster-induced damages and casualties and human trafficking presence, while controlling for each other as well as GDP per capita, democracy, human trafficking policy enforcement, and region

$H_1(b)$ hypothesizes that as disaster-induced displacement increases, the intensity of human trafficking activity will also increase. Table 4, Model 1 tests this relationship, which fails to find support for my hypothesis. The marginal effects of -0.007 indicate that for every increase of 100,000 disaster-displaced persons, a state is 0.7% less likely to fall under the next highest trafficking intensity category. This indicating a negative relationship between disaster-induced displacement and human trafficking intensity. This is contrary to the hypothesis, suggesting that as disaster-induced displacement increases, the intensity of trafficking decreases, therefore I fail to support $H_1(b)$.

$H_2(b)$ predicts that increased levels of damages due to natural disasters will lead to an increased intensity of human trafficking activity. Table 4, Model 2 tests for this relationship, failing to find support for my hypothesis. The marginal effect of -0.003 indicate a negative relationship between disaster-induced infrastructure damages and human trafficking intensity, meaning that for every $1 million in damages, a state is 0.3% less likely to fall under the next highest category of human trafficking intensity. This relationship suggests that as the total cost of damages increases, the intensity of human trafficking decreases This leads to a failure to support $H_2(b)$.

Table 4. Ordered Probit Regression of Human Trafficking Intensity Index

	Model 1		Model 2	
	Coefficient (Standard Error)	Marginal Effects (95% C.I.)	Coefficient (Standard Error)	Marginal Effects
Displaced^ Population	0.032 (.007)***	-0.007	0.027 (.007)***	-0.007[2]
Damages^^ (in USD)			0.011 (.003)***	-0.003
Casualties^			0.085 (.200)	-0.02
GDP Per Capita	-5.27 (.47)***	1.29	-5.37 (.47)***	1.31
Democracy	0.002 (.02)	-0.0004	0.001 (.02)	-.0003
Policy Tier	-0.37 (.08)***	0.09	-0.37 (.08)***	0.09
Region	-0.10 (.02)***	0.03	-0.11 (.03)***	0.03
Pseudo R^2	0.220		0.222	
N	2,031		2,031	

^ per 100,000 units   ^^per 1,000,000 units
*=p<.10   **=p<.05   ***=p<.01

H$_3$(b) hypothesizes that an increase in levels of casualties from natural disaster activity will result in higher levels of human trafficking intensity. Model 2, row 4 finds the regression coefficient of this relationship at 0.085. The marginal effects of -0.02 suggest a negative relationship between casualties and human trafficking intensity, however these results are

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[2] Some values may be listed as equivalent between models due to the small difference beyond the extent of significant digits.

statistically insignificant and cannot be used to accurate interpret the relationship. Therefore, I fail to support $H_3(b)$.

The regression results from Table 3 provide support for $H_1(a)$ and support of $H_2(a)$, while leaving $H_3(a)$ inconclusive. The results in Table 4 each suggest relationships contrary to the hypotheses. Chapter 5 will discuss the implications of the supported hypotheses from Table 3 as well as the contrary findings in Table 4. Following this discussion, I will assess the direction for future research on the subject of both human trafficking as well as environmental disaster-politics.

CHAPTER V

CONCLUSIONS AND RECOMENDATION

This study explored whether human traffickers are more likely to target areas struck by natural disasters. More generally, traffickers and trafficking victims alike seem to make conscious decisions that lead to human trafficking. The decisions made by traffickers are those of opportunity, while the decisions of victims are often those of necessity. The empirical results show support for this relationship, suggesting the need for an adjustment in both trafficking policy and disaster response protocol. In addition to the need of government response, the academic tradition of human trafficking research should pursue environmental influences to a greater extent.

Policy Recommendation

Human trafficking policy is only as effective as its implementation, so the clear policy recommendation is vigilant enforcement of human trafficking law. However, the broader theory of targeting vulnerable populations may speak to international organizations and their ability to police at the global level. Organizations such as the United Nations should update their existing protocol to give special attention to all forms of vulnerable populations, not only those which are economically disadvantaged. Rather than looking at long-term trends such as development, traffickers may be willing to adjust trafficking routes based on isolated incidents such as natural disasters. Looming threats of climate change must also be taken into consideration, as flooding and other climate-related disasters may become more frequent. In the case of such events, the importance of this study only increases. I recommend that a special watch list for disaster-prone states as well as those vulnerable to adverse effects of climate change be included in future editions of the US State Department's annual Trafficking in Persons report.

The second policy recommendation focuses not on trafficking policy, but rather on the disaster response protocol of both states and the international community. Disaster response is a multifaceted endeavor which includes rescue operations, relocation, and reconstruction. However, the protection of citizens not directly in harm's way is not a major priority of relief organizations and domestic governments. While it is difficult to prevent the outcomes of natural disasters as discussed in this study, relief organizations should place a greater emphasis on the security of survivors. This may take the form of a designated domestic police force or a special task force of United Nations' peacekeepers. If vulnerability is a major predictor of victimhood, the reduction of vulnerability should be a priority.

Future Research

The future research of human trafficking that could build upon this study are within two separate topics: further natural disaster-induced trafficking and environmental factors on trafficking. The first path of study would directly build upon the findings of this thesis in an attempt to further verify the conclusive results as well as explain the results that do not follow the theoretical expectations. First, I recommend conducting comparative research based on sub regions to account for special regions discussed in Chapter 3 such as Eastern Europe and North America. Qualitative case study research on special cases of development should also be considered. For example, states in BRICS (Brazil, Russia, India, China, and South Africa) tend to have higher levels of trafficking as well as similarly developed states such as Mexico. Also, states just entering the stages of industrialization become destination countries while still acting as source country. These countries such as those in Eastern Europe should be looked at qualitatively for theory-building purposes.

The second path of study would take a much broader approach to human trafficking and its relationship to environmental factors both internationally as well as within the United States. For example, forced labor in the United States occurs largely within growing season patterns as traffickers use debt bondage to receive free labor for crop harvesting. It is predicted that these victims are trafficked based on growing seasons, favoring the northern United States during the summer months and southern United States during winter months. A possible research agenda emerges surrounding the impact of global warming on the growing seasons in the United States and their effect on these patterns of trafficking. Hypotheses on this relationship could then be transferred to other countries or regions, and perhaps even a cross-national study. Other possible research could include general case studies on the influence of climatological or environmental influences on human trafficking activity, which would most likely begin at the country level.

Human trafficking determinants by no means capture the entire picture of human trafficking, yet shed light on some of the factors that create favorable trafficking conditions. This thesis has presented a new utilization of existing rational choice theories of trafficking with the inclusion of the unpredictable variable of natural disasters and its relationship to both human trafficking presence and intensity. I find that while human trafficking presence is influenced by the displacement and damages caused by natural disasters, the intensity of human trafficking is influenced in the opposite way. Because this is one of the earliest studies on environmental influences on human trafficking, the room for future research is practically unlimited, and will hopefully fill in another missing part of the human trafficking determinant puzzle.

APPENDIX

CODING RULES FOR HUMAN TRAFFICKING INTENSITY

Values for the dependent variable of Human Trafficking intensity is based on the following coding rules. It is important to note that these scores refer specifically to human trafficking victims that originate in each country and cross international borders as part of the trafficking process. The US State Department's Trafficking in Persons (TIP) reports list the three forms of trafficking flows (source, destination, and transit) in ranked order of prominence. For example, "Portugal is a destination, transit and source country for women, men and children…" (TIP, 2012). In cases where the source is of lesser prominence, the score may be reduced based on evidence within the country narrative. Special cases where the TIP report claims to lack reliable data, often due to an ongoing conflict, will be dropped from the analysis. For example: "Due to large-scale violence driven by militias, civil unrest, and increased lawlessness in Libya that worsened in 2014, accurate information on human trafficking became increasingly difficult to obtain" (TIP, 2015).

Table 5. Coding Rules for Human Trafficking Intensity

Value	Description
1	**No** mention of international human trafficking victims originating from this country. May be a destination, transit point, or source of internal trafficking.
2	Mention of **limited** international human trafficking victims originating from this country OR identified as primarily a destination with significantly less outgoing trafficking activity. Key words: *lesser, limited* Example: "Brunei is a destination country and, to a much lesser extent, a source and transit country for men and women who are subjected to forced labor and forced prostitution" (TIP, 2012).
3	Mention of international human trafficking victims originating from this country. This may also include internal and incoming trafficking activity.
4	Mention of **large numbers** of human trafficking victims originating from this country. May also be internal and incoming trafficking activity. Key words: *significant, severe, large, major* Example: "Brazil is a large source country for men, women, and children subjected to sex trafficking within the country and abroad…" (TIP, 2012).

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