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Human trafficking indicators: A new dataset

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ABSTRACT

This article describes the Human Trafficking Indicators (HTI) dataset, a new resource for research on the causes of, and policy responses to, human trafficking. HTI includes country-year level information on forty-six variables for up to 184 countries from 2000 to 2017. It is the first dataset to broadly capture different trafficking types and disaggregated measures of government responses. It includes seven types of trafficking including forced labor, sexual exploitation, domestic servitude, and debt bondage. The HTI also includes eighteen measures of a government's prosecution, protection, and prevention efforts. This paper presents an overview of the dataset, explains how it differs from other sources, describes several empirical trends, and highlights HTI's potential uses with a brief empirical example.

Este documento presenta el conjunto de datos de los Indicadores de Trata de Personas (Human Trafficking Indicators, HTI), un nuevo recurso para la investigación de las causas de la trata de personas y las respuestas políticas frente a este delito. HTI incluye información a nivel de país sobre cuarenta y seis variables, correspondientes a un máximo de 184 países, desde 2000 hasta 2017. Es el primer conjunto de datos que refleja ampliamente los diferentes tipos de tráfico y cuantifica las medidas desglosadas de las reacciones de los gobiernos. Incluye siete tipos de trata, como el trabajo forzado, la explotación sexual, la servidumbre doméstica y la esclavitud por deudas. El HTI también incluye dieciocho medidas de un gobierno, relacionadas con los esfuerzos de persecución, protección y prevención. Este artículo ofrece una visión general del conjunto de datos, explica en qué se diferencia de otras fuentes, describe varias tendencias empíricas y destaca los posibles usos de los HTI con un breve ejemplo empírico.

Ce manuscrit décrit le jeu de données Indicateurs de la traite des êtres humains (Human Trafficking Indicators, HTI), une nouvelle ressource pour la recherche sur les causes de, et les réponses politiques à la traite des êtres humains. Ces HTI comprennent des informations sur les niveaux par année et par pays de quarante-six variables pour jusqu'à 184 pays entre 2000 et 2017. Il s'agit du premier jeu de données qui capture

KEYWORDS

Human trafficking; modern slavery; forced labor; sex trafficking; child trafficking

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globalement différents types de traite et des mesures désagrégées des réponses gouvernementales. Il inclut sept types de traite, notamment le travail forcé, l'exploitation sexuelle, la servitude domestique et la servitude pour dettes. Les HTI comprennent également dix-huit mesures des efforts gouvernementaux en matière de poursuites, de protection et de prévention. Cet article présente une vue d'ensemble du jeu de données, explique la mesure dans laquelle il diffère des autres sources, décrit plusieurs tendances empiriques et met en évidence des utilizations potentielles des HTI en s'appuyant sur un bref exemple empirique.

Introduction

In the Palazzi di Giustizia in Palermo, Italy over four days in mid-December 2000 close to eighty United Nations (UN) member states signed the *Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children*, which supplemented the UN *Convention against Transnational Organized Crime*. Two decades later, 178 countries are parties to the Palermo Protocol (United Nations 2000); public awareness of human trafficking[1] has grown dramatically; and researchers have produced a sizable and significant literature on its myriad causes and effects.[2] These researchers, national and intergovernmental institutions, and non-governmental organizations have also generated a wide array of empirical indicators about trafficking victims, traffickers, and relevant government policies. Up to two thirds of the existing trafficking literature, however, does not test theoretical expectations using empirical research designs.[3] This can, in part, be attributed to the difficulties of measuring illicit trafficking flows, the potential biases that arise when doing so, and the lack of systematic, comprehensive data sources. The nature of recent research is gradually changing, however, as a number of recent data projects have estimated the size of human trafficking flows (International Labor Organization [ILO] 2012; Silverman 2020; Walk Free Foundation 2018), gathered information about perpetrators (Eurostat 2015), analyzed domestic trafficking laws (Schwartz and Allain 2020), and even captured labor trafficking from space (Boyd et al. 2018). Most existing data sources, however, do not vary over time (e.g., Bales 2004, 183–6) or they focus narrowly on a particular trafficking outcome (e.g., Lasley and Thyne 2015), a particular country or border zone (e.g., Schauer and Wheaton 2006) or estimate global, not country-specific, trafficking flows (ILO 2012). These

[1]Also known as trafficking in persons or modern slavery. This paper uses the term human trafficking. For a detailed discussion of definitions and terminology see Appendix A.

[2]For comprehensive literature reviews see Cho (2015), Gozdziak and Bump (2008), Gozdziak et al. (2015), Okech et al. (2017), Ottisova et al. (2016), and Russell (2018).

[3]Specifically, two recent systematic reviews of the human trafficking literature find between 67% (Russell 2018) and 83% (Gozdziak and Bump 2008) of the literature is non-empirical.

limitations, of course, arise because the data are generated either for specific research questions or by particular international organizations. It is clear, then, that scholars have, to date, not created a comprehensive trafficking database akin to those on other human rights violations like CIRI (Cingranelli and Richards 1999), the Human Rights Measurement Initiative (HRMI) (Brook, Chad Clay, and Randolph 2020), the Political Terror Scale (PTS) (Gibney et al. 2019), or the Social Conflict in Africa Database (SCAD) (Salehyan et al. 2012). A database with a broad temporal and spatial coverage and a simple and transparent coding scheme would enable new social science research into the causes and effects of human trafficking.

This paper presents such a dataset, the Human Trafficking Indicators (HTI). HTI includes country-year level information about twenty-eight types of human trafficking flows between 184 countries (and within them) from 2000 to 2017. It also includes eighteen measures of government efforts at prosecuting traffickers, protecting victims, and preventing future trafficking. The rest of this paper describes the HTI's data collection and coding procedures, its forty-six substantive variables, several initial trends, and an empirical example.

Data Collection

This section highlights the difficulties in coding human trafficking data, outlines HTI's categorical approach that builds on existing human rights databases, and describes HTI's sources. Since the 2000 Palermo conference, quantitative human trafficking analysis has increased markedly alongside our understanding of the associated data limitations (Bales, Hesketh, and Silverma 2015; Laczko 2007; Laczko and Gozdziak 2005). Most quantitative trafficking analyses depend on a few sources, and have raised concerns about under reporting, unrepresentative reporting, and inconsistent definitions of what constitutes human trafficking (Laczko and Gramegna 2003). In part this is attributable to inherent difficulties when studying any type of illegal activity – the perpetrators have strong incentives to hide what they are doing. Nevertheless, researchers in related fields have productively studied other illegal activities like drug smuggling (Cornell 2005), illicit weapon sales (Small Arms Survey 2003), and human rights violations (Poe, Tate, and Keith 1999). In human trafficking research, the International Labor Organization (2012), the Walk Free Foundation (2018), Rudolph and Schneider (2017), Silverman (2020), and others have used a number of methods including multiple systems estimation and latent variable approaches to estimating the size of human trafficking flows. These approaches have received both policymaking attention and researcher critiques.[4] While accurate and complete data on the actual numbers of people trafficked is difficult to come

[4]e.g., Whitehead et al. (2021).

by, there are other ways to measure human trafficking and governments' responses to it. Therefore, HTI does not focus on estimating flow sizes; rather it concentrates on categorical (often dichotomous) measures of a number of trafficking types and governmental responses to this particular form of human rights violation.

Like the United Nations (2014) this project considers human trafficking a form of human rights abuse. Human trafficking and human rights have repeatedly been conceptually linked (Landman 2018; Landman and Silverman 2019; Mende 2019; O'Connell-Davidson 2014). Indeed, human trafficking was initially reported the US annual human rights reports (Bagozzi and Berliner 2018). In developing its approach to measuring human trafficking HTI builds on existing approaches to coding other human rights violations like CIRI's Human Rights Data Project (Cingranelli and Richards 1999) and the Political Terror Scale (Gibney et al. 2019). CIRI codes data on physical integrity, labor, and gender rights, and it relies on annual State Department and Amnesty International (AI) reports as sources. PTS also uses AI and US reports when coding political repression. CIRI uses three or four-point ordinal variables on the levels of various human rights observance, while PTS uses a five-point ordinal scale. Ordinal measures like CIRI and PTS based on comprehensive and systematic yearly reports have enabled a large quantitative human rights literature – from responses to terrorism (Piazza and Walsh 2009) to interstate conflict and shared norms (Peterson and Graham 2011), human rights treaty commitments (Hathaway 2007) and international trade (Hafner-Burton 2005).[5] Like CIRI and PTS, HTI adopts an ordinal approach to measuring human trafficking phenomena but adapts this approach to the available source material.[6]

Since the US Congress passed the 2000 *Victims of Trafficking and Violence Protection Act*, the State Department's Office to Monitor and Combat Trafficking in Persons (ONCTP) has released an annual Trafficking in Persons (TIP) report. This TIP report includes countries and territories where evidence suggests that there are a significant number of trafficking incidents. "Significant" here is defined as anything over 100 people trafficked. The TIP reports themselves rely on a wide assortment of domestic governmental, nongovernmental, and media reports (US State Department 2001, 4). The annual TIP reports are probably best known for grouping countries into

[5]More recent human rights data collection on hidden phenomena include the Human Rights Measurement Initiative (Brook et al. 2020).

[6]Human rights scholars (e.g., Clark and Sikkink 2013; Fariss 2014, Cingranelli and Filippov 2020) have also explored whether and how human rights reports and data need to control for changes in standards and available information. Appendix G discusses whether these factors also apply to human trafficking data. Appendix G also presents the results of a preliminary dynamic latent item response theory (IRT) model of being a trafficking destination. Latent estimates are available in the replication data. These results do not suggest a significant change in trafficking reporting standards from 2001 to 2017. We would like to highlight, however, the important need to consider the risks of changing standards and informational effects when using these (and other) human trafficking data.

four tiers (Tiers I, II, II Watch List, and III)[7] according to their efforts in prosecuting, protecting, and preventing human trafficking – the so-called "3P's." The TIP report does have significant advantages when compared to other potential coding sources. Most notably, it is the only source we are aware of that provides *yearly* updates on human trafficking patterns and government responses. The UNODC's (various years) trafficking report is published every two or three years since 2006 and includes trafficking numbers that vary in time period reported and reporting criteria. UNODC also does not code information on government activities. The 3P Index (Cho 2015) by contrast codes government activities in prosecuting traffickers, protecting victims, and preventing further trafficking, but it does not include information about trafficking flows. Other flow sources like Eurostat (2015) have a regional focus or aggregate data from country-level organizations that often have different reporting criteria.[8]

In sum, the TIP reports allow us to see how trafficking flows and counter-trafficking efforts vary both across space and across time while also using clear and consistent definitions of trafficking types including an explicit threshold of severity.[9] Other data projects also rely on the US State Department's Reports, including Cho's (2015),3P Index, Kelley's (2012) Quality of Elections dataset, and others. Therefore, the HTI uses the TIP reports as source material for most of its variables. The United Nations and the International Labor Organization (ILO) are also used as sources for countries' involvement in related international treaties. As mentioned above, other trafficking sources do exist, and researchers may be interested in comparing HTI to other trafficking sources or gauging their analyses' robustness using different trafficking data sources. Therefore, we have developed a clear methodology to merge all publicly available human trafficking sources we are aware of (over 100 variables from eight sources) into a separate country-year data file (see Appendix D for details) that can be easily merged into the HTI dataset.

Variables and Descriptive Patterns

The TIP reports and HTI follow the United Nations' Palermo Protocol's definition of human trafficking:

> "[T]he recruitment, transportation, transfer, harboring or receipt of persons, by means of threat or use of force or other forms of coercion, of abduction, of fraud, of deception,

[7]Tier IIWL was first coded in the 2004 TIP report.

[8]There have been recent efforts at standardizing trafficking data generation at the national level toward meeting the Sustainable Development Goals' Target 8.7.

[9]There have been concerns about US government human rights reports. Poe, Tate, and Keith (1999) and others, however, find that since the Cold War there has been no significant observed foreign policy bias in US human rights reports. Recent research by Cordell et al. (2020) does suggest that there are changes across US presidential administrations in the State Department's human rights reports, but there has not been comparable research on the human trafficking reports.

> 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 (US State Department 2004, 9)." [10]

The unit of observation is the country-year. All countries with populations greater than 500,000 people and significant trafficking flows are coded, and forty-six substantive variables are included. Overall, intercoder agreement was 93.2%.[11] It is important to note that the TIP reporting period does not match the calendar year but instead stretches from April to March.[12] Additionally, the number of countries coded has expanded since 2000 as more information was gathered and human trafficking flows spread to new countries. For example, the 2001 TIP report includes eighty-two countries while the 2017 report includes 179.

Types of Trafficking

The HTI starts with four general measures of whether states are *source, transit*, and *destination* countries for human trafficking and whether they have *internal* domestic trafficking. For example, the 2018 TIP report (US State Department 2018, 362) states that "Romania is a source, transit, and destination country for men, women, and children subjected to forced labor and women and children subjected to sex trafficking." Trafficking flows are then disaggregated into seven trafficking types (*forced labor, sexual exploitation, domestic servitude, debt bondage, child labor, child sexual exploitation*, and *child soldiers*)[13] which are then broken into twenty-eight variables coding for each of the seven types whether a state was a source, transit, destination, or internal trafficking country.

The TIP reports themselves are focused on the 3P's (prosecution, protection, and prevention) not the number of victims trafficked – beyond whether or not there are more than 100 victims in the reporting period. Therefore, we code *yes/no mention/no* for the twenty-eight variables in this section. This operationalization differs from CIRI, which uses three-point or four-point ordinal scales (e.g., severely restricted, somewhat restricted, unrestricted),

[10] US State Department (2004, 9). A person, therefore, does not need to be physically transported from one location to another, either internally or cross-nationally, to be a victim of trafficking.

[11] Two coders coded the same thirty percent of available country-years in initial coding 2000 to 2011 reports. Intercoder agreement in subsequent years was similarly high. Final coding decisions were made by the primary investigator. All coding decisions and supporting documentation are included in the HTI's coding notes for each country-year. Intercoder reliability measures are reported in Appendix Table B3.

[12] Thus, the 2017 report covers April 2016 to March 2017 and was released in June 2017. A lagged version of an HTI variable for 2017, for example, would cover April 2015 to March 2016. It is important to keep this in mind when including HTI variables in empirical models.

[13] There are more than HTI's seven identifiable trafficking types. Other recognized trafficking types include forced marriage, kidnapping for adoption, begging, and organ removal. What is referred to here as "sexual exploitation" is also referred to as "forced prostitution" and sex "trafficking" in the TIP reports. When there is evidence for trafficking subcategories (e.g., domestic servitude), the broader category (forced labor) is also coded as being present. A discussion of definitional challenges and our operational definitions can be found in Appendix A.

Table 1. Trafficking variables.

Type	Definition
General measures	
TIP Tier	Tier placement based on compliance with standards for the elimination of trafficking in 2000 TVPA
Source	A source (or origin) for any type of trafficking in persons.
Transit	A transit point for any type of trafficking in persons.
Destination	A destination for any type of trafficking in persons.
Internal	Citizens are trafficked within international borders.
Any trafficking flow	Any type of trafficking in persons (source, transit, destination).
Trafficking types – four variables for each type (source, transit, destination, internal)	
Sex trafficking	Forced prostitution, commercial sexual exploitation, or sexual exploitation of children.
Forced labor	Any type of forced labor including agricultural work, construction, sweatshops, involuntary servitude, domestic servitude, bonded labor, begging, and various forms of forced child labor.
Debt bondage	Debt bondage, including children paying off adults' debt or migrants paying off broker fees for relocation and employment.
Domestic servitude	Any type of involuntary domestic servitude, including forced domestic labor or child domestic labor.
Child sex trafficking	Flow of victims of forced child prostitution, sexual exploitation of children, or child sex tourism.
Child labor	Forced child labor including agricultural work, construction, work in sweatshops, involuntary servitude, domestic servitude, bonded labor, begging, or to work as camel jockeys.
Child soldiers	Children trafficked to fight in civil conflicts or other wars.

Note: All variables but TIP Tier are coded *yes* (1); *no mention* (0); or *no* (−1). Full definitions in codebook.

and the Political Terror Scale (Gibney et al. 2019), which uses a five-point ordinal scale (from secure rule of law to widespread terror). These more informative scales are possible in part because the US and Amnesty International human rights reports specifically focus on the severity of human rights violations. Bales et al. (2015) and others have estimated victim numbers although the sparseness of the data and the reporting differences lead to interpretation difficulties (Whitehead et al. 2021). Therefore, HTI's coding is a conservative measure of trafficking that minimizes data sparseness and reporting differences.

The variables in this section are coded *yes* if there are reports of actual trafficking instances, even if the number of victims is unconfirmed beyond the 100-person threshold. Proving a negative (i.e., no trafficking exists) is difficult to do in the case of illicit flows, so we differentiate between cases where a trafficking type is not mentioned and cases where the report explicitly states that a type of trafficking *did not occur* in the reporting year. For example, "Albania is a country of origin for women and girls trafficked transnationally and internally for the purpose of commercial sexual exploitation; it is no longer considered a major country of transit, and it is not a significant country of destination," (US State Department 2007, 51). Sexual exploitation transit and destination are then coded "no" for Albania in 2007. There are, however, very few no's (far less than one percent of the observations) in the seven trafficking types. For statistical analysis, it is up to the individual user to decide

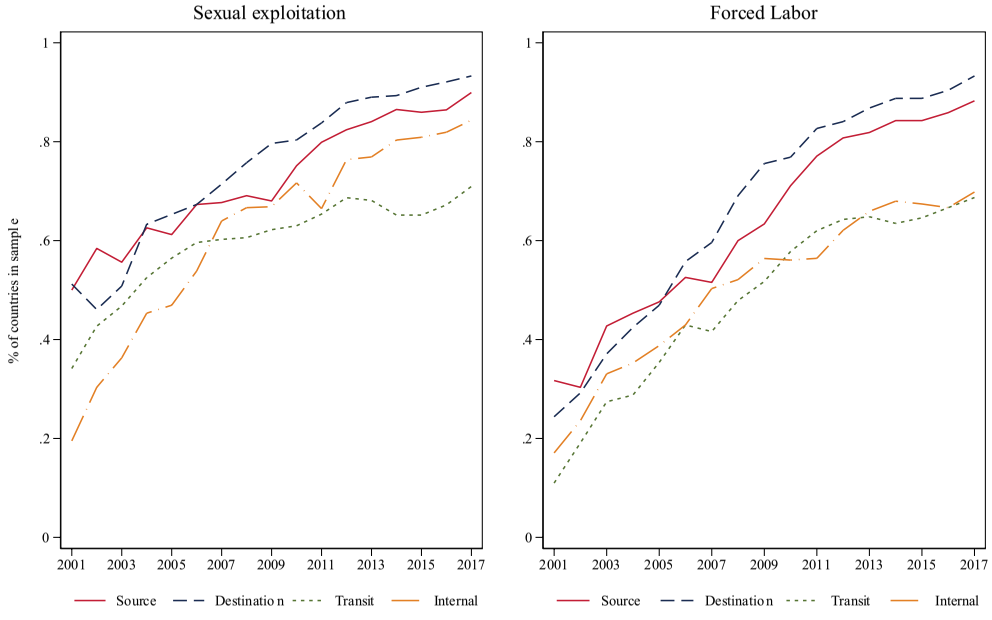

Figure 1. Trafficking by flow type.

Figure 2. Anti-trafficking prosecution efforts.

whether or not to combine "no mention" and "no," however the rare-event nature of "no"s and the resulting separation problems (Albert and Anderson 1984; Heinze and Schemper 2002) make combining these categories worth considering. The codebook provides more detailed descriptions, coder instructions, and our treatment of flow variable coding as an effort at capturing an underlying continuum of trafficking flows.

Table 1 summarizes the trafficking flow variables, and Figure 1 highlights the growth in countries reported for trafficking for sexual exploitation and labor. Two trends stand out. First, destination states have outnumbered source states since 2006. Second, a growing percentage of countries have significant internal trafficking flows. Compared to international flows, internal trafficking has received less attention in the relevant literature.[14] This is surprising in part because our data suggest that some types of internal trafficking (child labor trafficking for instance) are growing more rapidly than other internal or international flows.

Anti-trafficking Policy

The literature largely conceptualizes anti-trafficking policies according to the Palermo Protocol's "3P" framework: prosecution, protection, and prevention. One of HTI's significant contributions is the coding of a number of anti-trafficking activities (e.g., the enforcement of domestic trafficking laws) not previously available in other sources. HTI includes eighteen policy variables including five related to countries' legal efforts against human trafficking – the passage of domestic *anti-trafficking laws*, whether these laws are *enforced*, trafficking *prosecutions*, and *convictions*, and whether states are meeting a *minimum standard* of enforcement.[15] HTI data suggest that while domestic laws have become more frequent over time, the enforcement of the domestic rules have become more mixed (see Figure 2). Additionally, while most countries report some trafficking convictions (90% in 2017), over a third (37%) report less than 25 trafficking prosecutions in 2017.

Trafficking protections include three main efforts to identify and safeguard victims.[16] First, does the state have formal *procedures to identify victims*. Second, does it provide *protective services*. Third, do domestic laws *punish victims* for acts committed as a result of being trafficked. HTI data suggests that efforts to provide *victim services* (51% of states in 2017) and formal *procedures for identifying victims* (45% in 2017) have increased.

[14]Exceptions like Bales (2004) do exist. It is also important to note that the number of countries included in TIP reports did increase markedly. Once states enter the reports they rarely drop off. See Appendix Figure C17 for information about what countries are coded in which years.
[15]These elements are outlined in the US's Trafficking Victims Protection Act of 2000 (TVPA) Minimum Standard 4(1).
[16]Described in TVPA Minimum Standard 4(2).

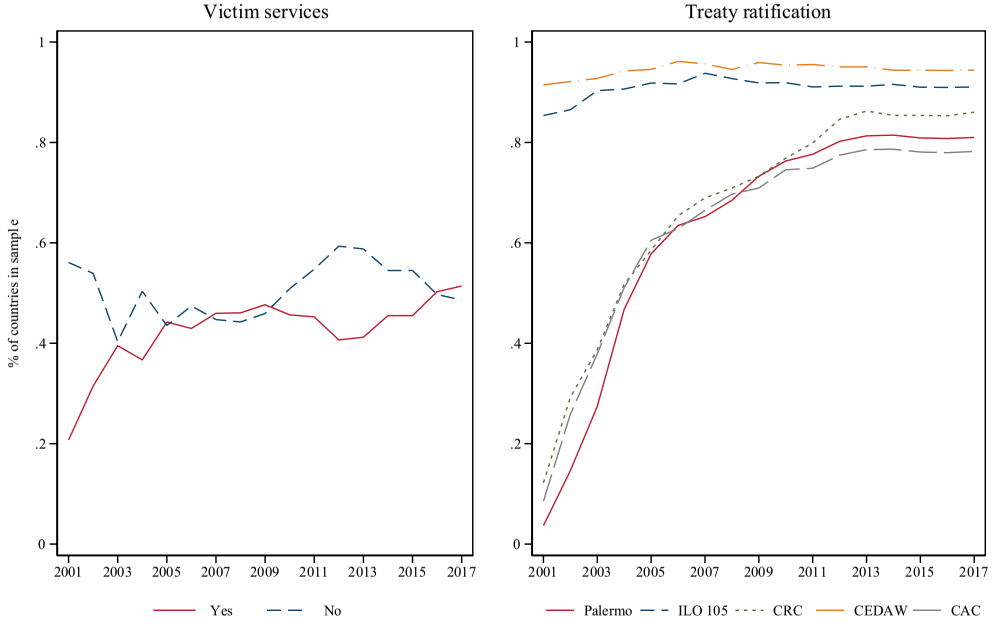

Figure 3. Anti-trafficking protection and prevention efforts. Note: Palermo = *Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime*,signed November15,2000; ILO105 = *Abolition of Forced Labor Convention*,signed 25 June 1957; CEDAW = *Convention on the Elimination of All Forms of Discrimination against Women*, signed 18 December 1979; CRC = *Convention on the Rights of the Child*,signed 20 November 1989, CAC = *Optional Protocol to the Convention on the Rights of the Child on the Involvement of Children in Armed Conflict*,adopted 25 May 2000.

Table 2. Anti-trafficking policy variables.

Policy type	Variable	Definition
Prosecution	*Domestic laws*	Comprehensive laws prohibiting all forms of trafficking have been passed and come into force, even if these laws are not always enforced (2). Laws prohibiting one or more types of human trafficking, but no comprehensive law (1). No mention (0). No laws prohibiting trafficking or laws that could be used to prosecute traffickers (−1).
	Enforce domestic laws	The country fully investigates and prosecutes cases of human trafficking (2). The enforcement of laws relating to human trafficking is minimal, limited, or weak or indicates that the country does not fully investigate and prosecute cases of human trafficking (1). No mention (0). The country does not enforce domestic laws regarding human trafficking or if enforcement is provided by international police or by other countries (−1).
	Prosecutions	The number of people prosecuted for violating human trafficking laws.
	Conviction information	Conviction information was provided by the government, NGOs or domestic media (1). No mention (0). The government does not provide data, keep statistics, or failed to report convictions regarding human trafficking (−1).
Protection	*Minimum standards*	The government fully complies with the minimum standards for the elimination of trafficking as defined in the 2000 TVPA (1). No mention (0). The government does not fully comply (−1).
	Significant efforts	The government is making significant efforts to combat trafficking (1). No mention (0). The government is not making significant efforts to combat trafficking (−1).
	Progress	The government has made progress (even minimal progress) in protecting victims of trafficking, including sustaining previous efforts (1). No mention (0). The government has not made any progress in protecting victims of trafficking (−1).
	Identify victims	The government has formal or systematic procedures to identify victims of trafficking. Telephone hotlines are not considered formal procedures. If the report indicates that victims were identified but not how the victims were identified, this is not sufficient to code yes (1). No mention (0). There are no formal or systematic procedures to identify victims of trafficking or if formal procedures are limited to a particular city or region (−1).
	Protective services	The government provides victims with protective services. Existing programs or victim shelters can be partly staffed or funded by NGOs, however it must be clear that the physical structure and the majority of the services are funded, staffed, and operated by the government. These protective services can include shelter, medical care, psychological services, work training, or some other specific program aimed at helping victims of trafficking. A country is still coded *yes* if these services are provided through existing non-trafficking-oriented state institutions (1). No mention (0). The government does not provide victims with protective services or that the majority (or all) of victim protective services is provided by NGOs (−1).
	Punish victims	Either federal or local officials arrest, fine, imprison, deport, or in some other way penalize victims of trafficking for acts committed as a result of being trafficked (1). No mention (0). Government officials do not punish victims for acts committed as a result of trafficking (−1)
Prevention	*Prevention progress*	The government is making substantial progress in its efforts to reduce both the supply and demand for trafficking or that it has new programs to prevent trafficking including education and awareness campaigns, documentaries, and providing information to potential victims of trafficking (2). The government is making minimal, limited, some, or sustained progress in its efforts to reduce both the supply and demand for human trafficking (1). No mention (0). The government is not making progress in its efforts to reduce both the supply and demand for trafficking (−1).
	Treaty involvement	The dates that countries signed, ratified or otherwise committed themselves through accession to international conventions and protocols that include provisions relevant to human trafficking. Treaties include *the United Nations (UN) Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children; Optional Protocol to the Convention on the Rights of the Child (UNCRC) on the Sale of Children, Child Prostitution and Child Pornography; Optional Protocol to the Convention on the Rights of the Child in Armed Conflict; Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW); ILO Convention 29, Forced Labor; ILO Convention 105, Abolition of Forced Labor; ILO Convention 182, Elimination of Worst Forms of Child Labor.*

Note: Full definitions in codebook.

Unfortunately, the *prosecution of victims* is still more common (59% of 179 reporting states in 2017, see Figure 3).

Trafficking prevention includes efforts to prevent new people from being trafficked.[17] The diffusion of international prevention norms can be seen with the growth in treaty involvement. HTI includes information on when countries signed and whether they ratified seven relevant international treaties (see Table 2). HTI data suggest that ratifying treaties increase dramatically in the first decade of the 21st century. Specifically, Figure 3 highlights how ratifications of the *Convention of the Rights of the Child* (CRC, signed 1989, 1577 U.N. T.S. 3) and the *Optional Protocol to the CRC on the Involvement of Children in Armed Conflict* (adopted May 2000) coincided with the adoption and ratification of the Palermo Protocol.

An Empirical Example

This section highlights how HTI's data can be used to conduct new and novel trafficking research using a brief empirical example. To date, quantitative research on trafficking either focuses on trafficking flows or anti-trafficking efforts. HTI can contribute to both literatures, but the example here focuses on trafficking flows. To date, the most robust test of human trafficking's push and pull factors is likely to be Cho's (2015) sensitivity analysis of over two million trafficking regressions. Cho's (2015) research has been influential and one of the most highly cited cross-national empirical test of human trafficking flows. She tests seventy push factors and sixty-three pull factors discussed in the literature using an extreme bounds analysis (EBA) of trafficking from 1995–2010 for up to 153 countries. Extreme bounds analysis is a way to systematically see which independent variables are robust to different model specifications.[18] Cho (2015) finds thirteen push factors and thirteen pull factors significant using at least two dependent variables for trafficking from as far back as 1995 (using ILO data) to 2010 (using State Department data) in up to 153 countries.

As a way of showing the additional information that can be gleaned from empirical models of trafficking this section summarizes a replication Cho's analysis using two of her dependent variables – UNODC's (United Nations Office on Drugs and Crime (UNODC). 2006. Trafficking in Persons: Global Patterns. Vienna: UNODC) cross-sectional five category destination measure (low [1]) to high [5]) and the US State Department's yearly measure of whether a state is a trafficking destination (0/1) – before extending her analysis to see whether the same factors predicting general trafficking flows also predict specific types of trafficking (forced labor and sexual exploitation). Given HTI's

[17]TVPA Minimum Standard 4(12).
[18]For more on extreme bounds analysis see Leamer (1983) and Sala-i-Martin (1997).

Table 3. Robust pull factors, extreme bounds analysis.

Variable	Robust in Cho (2015)	UNODC (2006) Destination (1–5)				Destination (0/1)				Human Trafficking Indicators Sex trafficking destination (0/1)				Labor trafficking destination (0/1)			
		ave. mean	ave. s. d	% sign.	CDF (>0)	ave. mean	ave. s. d.	% sign.	CDF (>0)	ave. mean	ave. s. d.	% sign.	CDF (>0)	ave. mean	ave. s. d.	% sign.	CDF (>0)
Anti-traf. protection		0.34	0.12	37%	1.00*	0.09	0.09	10%	0.93*	0.07	0.06	4%	0.89	−0.02	0.05	4%	0.35
Anti-traf. prevention		0.16	0.17	6%	0.86	0.15	0.08	26%	1.00*	0.15	0.05	55%	1.00*	0.16	0.08	68%	1.00*
British legal	Yes	0.57	0.35	21%	0.97*	2.04	1.04	95%	0.99*	0.51	0.46	25%	0.96*	0.24	0.16	11%	0.97*
Catholic population (%)	Yes	−0.00	0.00	37%	0.04*	−0.00	0.00	29%	0.12	−0.00	0.00	9%	0.08*	−0.00	0.00	16%	0.24
Conflict, external		−0.18	0.10	29%	0.04*	−0.00	0.08	1%	0.34	0.01	0.05	0%	0.45	−0.05	0.04	3%	0.09*
East Asia/Pacific	Yes	0.69	0.30	61%	0.98*	0.55	0.39	25%	0.96*	0.38	0.21	28%	0.99*	0.02	0.17	2%	0.55
English		−0.02	0.22	0%	0.45	0.88	0.32	92%	1.00*	0.38	0.27	72%	0.89	0.43	0.17	75%	0.99*
Ethnic fractionalization		−0.27	0.50	5%	0.28	0.70	0.42	45%	0.95*	0.21	0.38	7%	0.75	0.84	0.37	69%	0.98*
Ethnic tension		−0.17	0.08	21%	0.01*	−0.12	0.10	14%	0.05*	−0.10	0.07	9%	0.02*	−0.08	0.05	14%	0.07*
French		0.13	0.20	0%	0.78	0.65	0.27	77%	1.00*	0.36	0.18	10%	0.99*	0.48	0.16	55%	1.00*
French legal		−0.34	0.49	9%	0.19	−1.37	0.63	82	0.03*	−0.64	0.40	57%	0.00*	0.15	0.21	9%	0.83
GDP	Yes	0.44	0.22	79%	0.99*	0.49	0.21	89%	0.98*	0.32	0.15	85%	0.97*	0.25	0.19	72%	0.94*
German main language		0.66	1.09	0%	0.91*	.	.	.	.	0.42	0.17	0%	0.98*	−.06	0.23	1%	0.37
Homicides		−0.03	0.02	48%	0.03*	−0.01	0.01	9%	0.21	−0.01	0.01	9%	0.33	−0.01	0.01	7%	0.06*
International tourism	Yes	0.33	0.13	80%	0.98*	0.74	0.58	15%	0.92*	0.75	0.32	26%	1.00*	0.83	0.37	61%	0.98*
Language fractionalization	Yes	1.32	0.54	81%	1.00*	1.62	0.52	97%	1.00*	1.07	0.28	96%	1.00*	1.20	0.29	92%	1.00*
L. America/Caribbean		−1.12	0.46	91%	0.00*	−0.58	0.54	33%	0.04*	−0.30	0.30	18%	0.07*	−0.21	0.20	11%	0.12
MENA		−0.16	1.07	8%	0.20	0.05	0.50	6%	0.90*	−0.32	0.27	31%	0.08*	0.36	0.29	56%	0.83
Media freedom		−0.01	0.01	19%	0.04*	−0.00	0.01	6%	0.26	−0.00	0.01	24%	0.27	0.01	0.00	25%	0.98*
Muslim population (%)		−0.00	0.01	3%	0.45	0.01	0.01	41%	0.93*	0.00	0.00	6%	0.76	0.01	0.00	68%	0.96*
North America		0.81	0.46	0%	0.93*	.	.	.	.	−0.91	0.34	34%	0.00*	−0.28	0.24	6%	0.08*
OECD	Yes	1.01	0.34	74%	0.99*	0.47	0.20	11%	0.98*	0.51	0.15	45%	1.00*	−0.12	0.25	13%	0.24
Peacekeepers, foreign		0.69	2.20	10%	0.89	0.09	0.04	76%	0.99*	0.11	0.09	60%	0.96*	0.07	0.06	25%	0.94*
Peacekeepers, source		0.08	0.55	52%	0.89	0.10	0.03	75%	1.00*	0.07	0.02	72%	0.99*	0.08	0.03	84%	1.00*
Political stability		−0.16	0.30	11%	0.21	−0.14	0.14	7%	0.08*	−0.08	0.08	5%	0.15	−0.23	0.09	53%	0.00*
Polity2		0.03	0.03	20%	0.95*	−0.00	0.02	2%	0.54	0.02	0.01	20%	0.88	−0.02	0.01	24%	0.07*

(*Continued*)

Table 3. (Continued).

Population	Yes	0.40	0.11	96%	1.00*	0.11	0.10	24%	0.93*	0.08	0.06	28%	0.94*	0.11	0.06	61%	0.98*
Protestant population (%)		−0.18	0.10	29%	0.04*	−0.00	0.08	1%	0.34	0.01	0.05	0%	0.45	−0.05	0.04	3%	0.09*
Refugees	Yes	0.12	0.07	75%	0.99*	0.10	0.03	86%	1.00*	0.07	0.02	65%	1.00*	0.07	0.02	93%	1.00*
Right executive		0.54	0.31	18%	0.99*	0.18	0.11	1%	0.95*	0.03	0.12	0%	0.72	−0.03	0.16	0%	0.27
Scandinavian legal		−0.99	0.41	18%	0.01*	.	.	.	.	.	.	.	.	−0.70	0.25	94%	1.00*
Social globalization		−0.02	0.02	17%	0.12	0.03	0.02	49%	1.00*	0.04	0.01	97%	1.00*	0.03	0.02	58%	0.99*
South Asia		0.68	0.54	7%	0.95*	0.14	0.28	1%	0.72	0.06	0.24	1%	0.92*	0.14	0.28	1%	0.67
Spanish main language		−0.72	0.40	58%	0.05*	−0.53	0.34	33%	0.02*	−0.25	0.20	3%	0.07*	−0.29	0.18	14%	0.06*
Sub-Saharan Africa		−0.25	0.38	5%	0.17	0.37	1.00	52%	0.90*	0.29	0.29	19%	0.87	0.66	0.28	71%	0.99*
Unemployment		−0.04	0.02	60%	0.01*	−0.02	0.01	7%	0.03*	−0.01	0.01	3%	0.05*	−0.01	0.01	5%	0.05*
Urbanization		−0.01	0.01	17%	0.03*	−0.01	0.01	7%	0.02*	−0.01	0.00	40%	0.00*	0.00	0.00	0%	0.56
Trade		0.00	0.00	0%	0.57	0.00	0.00	9%	1.00*	0.00	0.00	21%	1.00*	0.00	0.00	7%	0.83
Women's' econ. rights		0.23	0.33	5%	0.75	−0.27	0.16	69%	0.09*	−0.20	0.08	50%	0.02*	−0.28	0.13	77%	0.03*

Note: UNODC (2006) results based on cross-sectional ordered probit models. HTI models based on cross-sectional time-series probit models. GDP included in all models. Variables listed above are significant (*) in at least two of the four series of models, complete results are in Appendix Table A6. Cho's (2015) robustness threshold of .90 used. All time-series variables lagged one year. UNODC (2006) models include averaged 1998–2003 values of independent variables. Robust standard errors clustered by country. Variables without values (.) for destination models were dropped due to lack of variation.

expanded time frame and destination data, the models here are run with fifty-eight of Cho's (2015) sixty-three independent variables.[19] A total of 8,052,197 million regressions were run on four dependent variables – UNODC destination (1–5), State Department destination (0/1), labor destination (0/1), and forced prostitution destination (0/1). Up to 178 countries were included in the analysis for years 2000 to 2017. All independent variables for HTI models were lagged one year.[20] For the cross-sectional 2006 UNODC models, the average value for independent variables for years 1998 to 2003 was used.

Results for robust pull factors (using Cho's 2015 robustness criteria) are summarized in Table 3.[21] Two of Cho's thirteen robust predictors were not robust in these expanded analyses – the size of a country's agricultural workforce and a landlocked country dummy. Like Cho (2015) we find that they were robust predictors using the same UNODC 2006 cross-sectional data, but they were not robust in the other three models using the new HTI data. We conclude, therefore, that our analysis largely confirms Cho's (2015) thirteen robust pull factors.

Crucially, though, the expanded analysis has a much larger number of robust predictors (thirty-nine) using Cho's (2015) decision criteria. This is important because it provides broad-based empirical support for additional factors the literature argues is relevant. Given space constraints three novel findings are highlighted here. First, larger populations robustly increase the probability of both international labor trafficking and sex trafficking. This result provides an interesting addition to Rao and Presenti's (2012) finding that larger populations increase overall UNODC trafficking. Second, consistent with Bell, Flynn, and Martinez Machain's (2018) findings, foreign troops robustly increase the risk of sexual exploitation while also having a robust positive effect on the risk of labor trafficking. Third, being a sub-Sahara African, Middle Eastern, or South Asian state increases the probability of being a trafficking destination. This highlights the importance of South-South migration and trafficking that has largely been overlooked in the comparative trafficking literature (Adepoju 2005).

Conclusion

This paper introduces the new Human Trafficking Indicators dataset, a collection of forty-six quantitative measures of human trafficking flows

[19]The functional form of the model is $\mathbf{Y} = \boldsymbol{\beta}_1\mathbf{I} + \boldsymbol{\beta}_\mu\mathbf{M} + \boldsymbol{\beta}_z Z + u$ where $\mathbf{Y}$ is the dependent variable (a trafficking destination dummy), I is a vector of core variables included in all models (GDP), M is the variable of interest, Z is a set of three controls, and u is the error term (Sala-i-Martin 1997). All fifty-eight variables of interest were regressed at least 29,260 times against each of the four dependent variables.

[20]Lagging is additionally important due to the TIP reports' non-calendar year reporting period mentioned above.

[21]See the appendix for a detailed model discussion and complete results. Given the lack of available replication files, we replicate her research design as closely as possible.

and anti-trafficking policy. HTI codes up to 179 countries from 2000 to 2017, and it will be updated yearly. HTI represents a large new publicly available human trafficking data resource, and it can easily be merged into other publicly available trafficking data from the UNODC, the International Organization for Migration, and other sources to enable further research on the causes and effects of one of the world's largest illicit activities (UNODC 2018). The two decades since the UN conference in Palermo's Palace of Justice has seen a growing amount of human trafficking research often in law, medicine, and public health, but most of it is non-empirical and not focused on human trafficking's political causes or implications (Russell United Nations Office on Drugs and Crime (UNODC). 2018. Global Report on Trafficking in Persons. 2018. Vienna: UNODC 2018, 120). The HTI dataset will enable new empirical research (both within and without social science) on the causes and effects of human trafficking.

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