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ABSTRACT

The State Department's annual Trafficking in Persons (TIP) Report is the U.S. Government's principal diplomatic tool to engage foreign governments on human trafficking. Each year, the report evaluates efforts to counter human trafficking, assigning each country to a tier level. We evaluate the relative role of various factors predictive of tier-level assignments, including (a) legislated changes to the ranking system, (b) party to the Palermo Protocol, (c) reported numbers of convictions, prosecutions, and identified victims, (d) independent estimates of prevalence, and (e) sample indicators of governance and economic development. We use singular-value decomposition to identify the relative influence among multiple inter-related factors across a matrix of tier rankings for twelve years and 189 nations. Our analysis indicates that investments in democratic institutions and individual rights may be significantly more influential than law enforcement, and the traditional economic theory for TIP vulnerability may be an oversimplification. Most significantly, the large number of attributes with small but statistically significant correlations with TIP tier levels confirms that TIP has many causal relationships. We affirm the need for Countering TIP (CTIP) strategies to apply an ecosystem approach with geographically targeted interventions consistent with Situational Crime Prevention.

Introduction

The U.S. State Department's Trafficking in Persons (TIP) Report is the U.S. Government's principal diplomatic tool to engage foreign governments on human trafficking (United States Department of State [U.S. DoS]., 2020a). The report is produced in accordance with the U.S. Victims of Trafficking and Violence Protection Act (TVPA) of 2000 (P.L. 106–386) and establishes U.S. anti-trafficking policy to (1) *prevent* trafficking, (2) *protect* trafficking victims, and (3) *prosecute* and punish traffickers (known as the "three Ps").[1,2]

The TVPA was developed as domestic legislation concurrently and in a manner consistent with the principles set forth in the Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime (also known as the "2000 UN TIP Protocol" or the "Palermo Protocol") (U.S.DoS, 2020a).[3] The TVPA requires the Secretary of State to produce an annual report ranking foreign governments based on their anti-trafficking efforts. The U.S. State Department's TIP report uses a ranking system in which the best-ranked countries are identified as Tier 1 and the worst ranked as Tier

3. Between the best and worst rankings, the State Department classifies nations into two intermediate tiers, Tier 2 and the Tier-2 Watch List, the latter ranking a probationary level. There is also the designation of *Special Case*, which describes countries that are too affected by conflict or natural disaster for a proper analysis of government-led counter-trafficking efforts to be made.

Under the TVPA, Tier-3 countries are subject to potential restrictions on certain types of U.S. foreign aid and other U.S. and multilateral funds. In 2019, for example, certain types of assistance from the U.S. were restricted for the governments of 15 countries that were ranked Tier 3 (U.S.DoS, 2020b).

Placement of each country into one of the tiers is based *not* on the size of the country's trafficking problem, but on the extent of governments' efforts to meet the TVPA's minimum standards for the elimination of human trafficking (22 USC 7106). These standards are generally consistent with the 2000 UN TIP Protocol (U.S.DoS, 2019). The minimum standards used to determine a country's tier rankings are their efforts toward (1) prohibiting severe forms of trafficking in persons and punishing acts of such trafficking, (2) prescribing punishment commensurate with that for grave crimes, (3) prescribing punishment that is sufficiently stringent to deter and reflects the heinous nature of the offense, and (4) making serious and sustained efforts to eliminate severe forms of trafficking in persons.[4] The State Department uses 12 "indicia" of "serious and sustained effort" for their evaluations, several of which have been noted to be subjective.

There are many criticisms of the TIP reports and the process through which nations are assigned to tier levels. The criticisms include not only the specific metrics that are purported to be used, but also the extent to which they are objectively applied. For example, one of the 12 indicia for determining the TVPA's minimum standards calls for reducing the demand for commercial sex acts and participation in international sex tourism. Some commentators consider the argument that certain forms of sex work can be considered legitimate enterprises rather than forms of trafficking (e.g., Jackson, 2019). In addition, there are a range of criticisms that the assignment to tier levels is not only subjective but also ultimately political in nature (e.g., DeStefano, 2007). Within the U.S. government, there are three reports by the Government Accountability Office (GAO) (2006, 2007, U.S.DoS, 2011) and two reports by the U.S. Congressional Research Service (CRS) (2013, 2019) that provide extensive reviews of the criticisms of the TIP Reports. While we recognize there are strong political and subjective aspects to the TIP reports, our goal is to present objective data analysis that both complements and informs the debates surrounding these criticisms.

The 2020 TIP Report evaluates 189 countries on their efforts to meet the TVPA's minimum standards. Figure 1 (a/b) illustrates both the percentage of countries at each tier level (left) and the
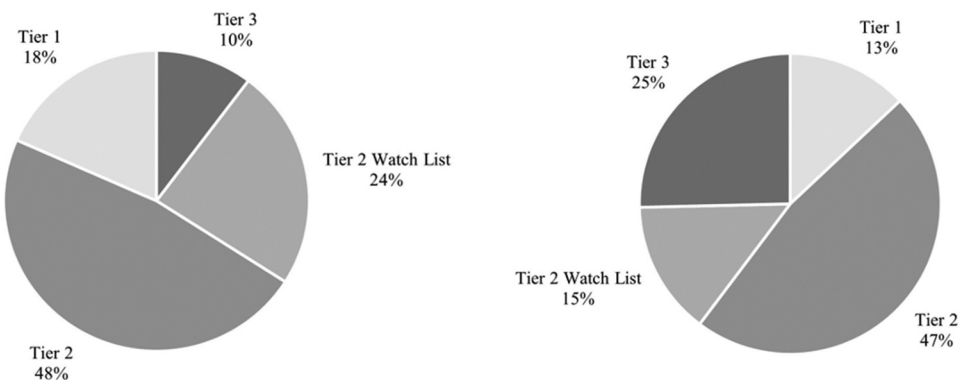
Figure 1. 2020 Global TIP Tier Rankings by Country and by Percent of Population Only about 10% of the countries fall within Tier 3 — the lowest level. However, these 10% of the countries represent 25% of the global population. So, while more nations are in Tier 1 than Tier 3 (18% vs. 10%), only half as many people are in Tier 1 as Tier 3 (13% vs. 25%). Globally, almost 2 billion people live in Tier-3 nations. Population data from United Nations Population Division, 2020.

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[4]In determining if serious and sustained efforts are being made (standard #4), 12 criteria are considered as indicators.

percentage of the global population (United Nations Population Division, 2019) at each tier level (right). While the percentage of countries in Tier 3 is small (10%), the number of people living in these Tier-3 countries makes up a quarter of the global population – almost double the percentage of the population living in Tier-1 conditions.[5]

In this paper, we explore the statistical relationships between TIP tier levels and appropriate national attributes. Our analysis includes not only information contained in the annual TIP reports, but also independent measures of TIP prevalence and sample indicators of economics and governance. Various statistical approaches are used to normalize, integrate and analyze the relationships between data sets and the TIP tier-level rankings. As an analytical summary, singular-value decomposition is used to determine inter-relationships among multiple indicators and their ability to explain variance among the TIP tier rankings. Our analysis attempts to provide insight on the following array of policy questions related to TIP:

1. What Has Been the Impact of Legislative and Diplomatic Efforts?
   a) Have modifications to the TIP tier-ranking system motivated governments to intensify their Countering TIP [CTIP] efforts?
   b) Does becoming party to the Palermo Protocol signify a meaningful commitment to enhancing CTIP efforts?
2. Do the efforts represented by TIP tier levels result in meaningful reductions in victimization?
3. What is the role of law enforcement in reducing TIP?
4. To what extent do economic and governance factors influence TIP tier levels?

The goal in understanding the strength and interconnected nature of relationships among the various data sets is to offer policy insights for CTIP strategies that will result in meaningful reductions in victimization.

Question 1: What has been the Impact of Legislative and Diplomatic Efforts?
Have modifications to the TIP tier-ranking system motivated governments to intensify their CTIP efforts?
Since the first TIP Report in 2001, the report's scope has expanded and there have been changes to the methodology for assigning countries to various tier levels. Of particular importance for this analysis are the following:

(a) The Trafficking Victims Protection Reauthorization Act (TVPA) of 2003 added to the original law a requirement that foreign governments provide the Department of State with data on trafficking investigations, prosecutions, convictions (P.L. 108-193, 2003).[6]
(b) The William Wilberforce Trafficking Victims Protection Reauthorization Act of 2008 limited the number of consecutive years a country may remain on the Tier-2 Watch List to four years (P.L. 110-457, 2008).[7]
(c) The Trafficking Victims Protection Reauthorization Act of 2017, enacted in 2019, further reduced the number of consecutive years that a country may remain on the Tier-2 Watch List to three years, and reduced presidential waiver authority to one year (P.L. 115-427, 2017).
(d) The Frederick Douglass Trafficking Victims Prevention and Protection Reauthorization Act of 2018, enacted in 2019, limited to one year the time a country may remain on the Tier-2 Watch List if they previously exhausted their time on the Tier-2 Watch List (P.L. 115-425, 2018).

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[5]If China (a Tier-3 nation) is removed from the analysis, the percentage of the remaining global population within Tier 3 is reduced from 25% to 8%.
[6]The 2004 TIP Report collected data on prosecutions, convictions, and identified victims for the first time. The 2007 TIP Report showed for the first time a breakout of the number of total prosecutions and convictions that related to labor trafficking.
[7]The standard limit is two (2) years, but a country may be waived from the automatic downgrade by the Secretary of State for an additional two (2) years, should a country devote significant resources to a written plan that, if implemented, would constitute significant efforts toward meeting the minimum standards for the elimination of human trafficking.
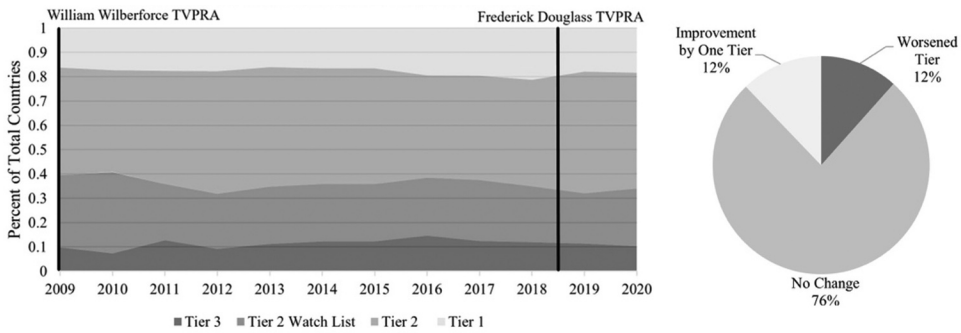
Figure 2. Percent of Countries and Global Population in Each Tier Since 2009. The percentage of countries at each tier level has remained relatively constant since 2009 (left). Of those that change tier level in a given year, equal numbers of nations (12%) improve their tier level as worsen their tier level (right) (United States Department of State annual Trafficking in Persons Reports, 2009-2019, 2020c).

Changes to the TIP Report's methodology are intended to strengthen the credibility of the TIP Report and increase its effectiveness in motivating governments to improve their anti-trafficking efforts. These changes, however, have also raised concerns that the ranking system could be seen as inconsistent, overly elaborate, or beyond reach, thus perhaps eroding some of the Report's effectiveness in motivating countries to improve their anti-trafficking efforts (U.S.CRS, 2019).

Figure 2 (a/b) shows the time-series of tier levels for up to 185 nations (special cases are excluded) from 2009 to 2020 capturing the impact of three changes to the tier-ranking system: (1) the William Wilberforce Trafficking Victims Protection Reauthorization Act of 2008, (2) the Trafficking Victims Protection Reauthorization Act of 2017, and (3) the Frederick Douglass Trafficking Victims Prevention and Protection Reauthorization Act of 2018 (U.S. DoS, 2009-2019, 2020c; P.L. 115-425, 2018).

Since 2009, the average number of countries improving their tier level is roughly equal to the average number of countries that worsen their tier level. The first year that a country received a downgrade to Tier 3 after remaining on the Tier-2 Watch List past the limit was in 2013.[8] Since then, there have been 48 instances where a country was eligible for an automatic downgrade. Of these times, 25 (52%) improved their counter-trafficking efforts and subsequently moved to Tier 2, and 23 (48%) were downgraded to Tier 3. The more recent tier-level adjustments implemented through Congressional Reauthorizations – the Frederick Douglass Trafficking Victims Prevention and Protection Reauthorization Act of 2018 and the Trafficking Victims Protection Reauthorization Act of 2017, both of which further reduced the amount of time for which a nation may be placed on Tier-2 Watch List, have coincided with tier-level changes, although not with a net improvement. In 2020, 23 nations improved a tier level, and 22 nations dropped a tier level.

For certain countries of specific interest, the legislative action may have provided a motivating factor. As of 2020, however, the legislative modifications to the TIP tier-ranking system have yet to demonstrate a significant impact on increasing counter-trafficking efforts as measured by systematic global improvements in tier levels. The number of nations at each tier level has remained stubbornly constant over the last decade.

Does becoming party to the Palermo Protocol signify a meaningful commitment to enhancing CTIP efforts?

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[6]The 2004 TIP Report collected data on prosecutions, convictions, and identified victims for the first time. The 2007 TIP Report showed for the first time a breakout of the number of total prosecutions and convictions that related to labor trafficking.

[7]The standard limit is two (2) years, but a country may be waived from the automatic downgrade by the Secretary of State for an additional two (2) years, should a country devote significant resources to a written plan that, if implemented, would constitute significant efforts toward meeting the minimum standards for the elimination of human trafficking.

In concert with the TVPA, the Palermo Protocol is considered a major diplomatic tool for Countering Trafficking in Persons. The Palermo Protocol was adopted and opened for signature, ratification and accession at the fifty-fifth session of the General Assembly of the United Nations on November 15, 2000, and entered into force on December 25, 2003.[9] It is the only international legally binding instrument that provides an agreed-upon definition of trafficking in persons (United Nations, 2000). The Palermo Protocol definition is considered to be comprehensive because it specifies what constitutes the "acts" (recruitment, transportation, transfer, harboring, receipt), "means" (threat, use of force, coercion, abduction, fraud, deception, abuse of power), and "purpose" (sexual exploitation, forced labor or services, servitude, removal of organs) of human trafficking (Clark, 2003). Palermo defines the meaning of "child" to be under the age of 18 and specifies that the means of trafficking are not relevant if the act involves a child.

Becoming party to Palermo is considered part of a nation's effort toward meeting the minimum standards of the TVPA for tier-level rankings, and has been included as a prioritized recommendation for nations within the State Department's TIP Report. One would hope that becoming party to the Palermo Protocol would signal an increased effort by the nation to counter human trafficking, and that increased effort would correspond to an improvement in tier ranking.

While few nations became party to Palermo in 2001, most (107) became party over the following five years (2002–2006). Since 2007, 66 countries have joined (U.S.DoS, 2020a). Improvements in tier level should be detectable among nations that signed the Protocol, especially after the first wave of endorsements ended in 2006. Figure 3 shows the tier rankings by year for each nation that become party to Palermo since 2007.
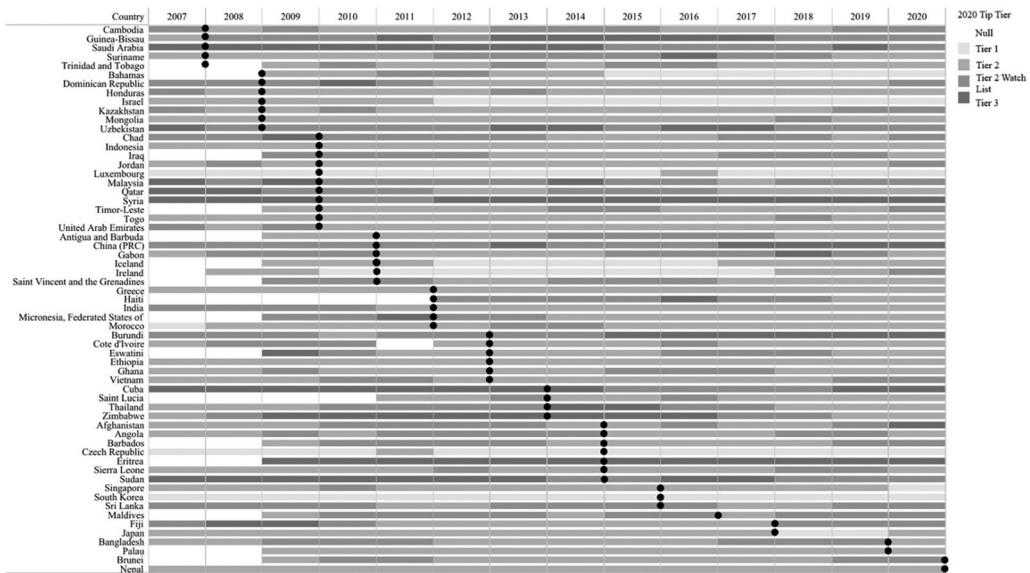

Figure 3. Parties to the Palermo Protocol 2007-2019. Since 2007, 66 countries have become party to the Palermo Protocol, 61 of which are included in the TIP Reports. The colors show the country's tier-level ranking for each year, where the lightest gray is Tier 1, the darkest gray is Tier 3, and white (labeled Null) is a country excluded from that year's TIP Report or designated as Special Case. The black dot represents the year the country became party to Palermo (USDoS, 2020a).

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[8]There are discrepancies regarding these limits. For example, Malaysia was downgraded to Tier 3 in 2014 after four years on the Tier-2 Watch List. It is now on its third consecutive year on the Watch List again (since 2018). Additionally, Uzbekistan was downgraded in 2013 after four years on the Watch List and has been on it again since 2018.

Of the countries that became party to Palermo since 2007, 4 (8%) are currently in Tier 1, 27 (55%) are in Tier 2, 12 (24%) are on the Tier-2 Watch List, and 6 (12%) are in Tier 3. Only 21% of the nations that became party to Palermo improved their tier ranking within one year, and 5% fell in tier ranking. The remaining 74% of the signatory nations did not change tier level, which is the same rate of change as the average percent of countries moving in any given year.

If becoming party to the Palermo Protocol is meant to signify a nation's increased effort to CTIP, in most cases, it was not followed by an increased level of effort as measured by an improvement in tier level. While disappointing, this finding is consistent with recent research into global anti-slavery legislation which shows that despite near-universal adherence to international anti-trafficking norms, many nations have not transferred that commitment into domestic law (Schwarz & Allain, 2020), and that gaps persist between human-rights norms and implementation of those rights (de Felice & Graf, 2015).

Question 2: Do the efforts represented by TIP tier levels result in meaningful reductions in victimization?

In looking at the relationships between TIP tier levels and victimization rates, we compare levels of effort toward CTIP (as measured by tier-level assignments) with independent measures of victimization (as measured by national estimates of TIP prevalence). While the TVPA requires the Secretary of State to assign tier levels based on anti-trafficking *efforts*, rather than the extent of human trafficking in the nation, a logical assumption would be that nations providing stronger efforts toward CTIP, as indicated by their tier level, would achieve lower rates of TIP prevalence.

Early versions of the TIP Report included national estimates of trafficking victims. The U.S. GAO found such estimates "questionable" and noted "significant discrepancy" between the estimated and reported numbers of victims (U.S.GAO, 2006, 2007, 2011). Prevalence estimates are no longer included in the TIP reports. The State Department, however, does present global estimates of the number of victims in public statements (U.S.DoS, 2020b).

The State Department uses the definition of human trafficking presented in Article 3 of the Palermo Protocol and estimates that globally there are 25 million victims of labor and sex trafficking worldwide (U.S.DoS, 2020b). The International Labor Organization (ILO) published its first estimate in 2005 of 12.3 million persons trafficked as a minimum at any given time between 1995 and 2004. As of 2012, the ILO estimates that 20.9 million people suffer forced labor at any given point in time over the ten-year period 2002 through 2011, reporting a standard error of 1.4 million at a 68% level of confidence (ILO, 2012). The Global Slavery Index (GSI) published by the Minderoo Foundation's Walk Free initiative uses a broader definition for TIP than the State Department and the ILO. The GSI estimates that globally there were 40.3 million victims of modern slavery in 2018, a decrease from their estimate of 45.8 million victims in 2016 (Walk Free Foundation, 2018, 2016). The GSI published prevalence estimates by country in 2012, 2014, 2016, and 2018. As with the State Department national estimates, the GSI national estimates have also been subject to criticism (e.g., Gallagher, 2014) and the earlier estimates (2012 and 2014) are no longer distributed, due to changes in the methodology.

The GSI estimate includes forced marriage, child marriage, and child soldiers. The State Department and ILO estimates treat these human rights abuses separately. The difference between estimates can be attributed not only to differences in scope of definition, but also to the inherent uncertainty of such estimates; specifically:

1) Ambiguity and differences exist in the terms human trafficking, trafficking in persons, modern slavery, slavery, slavery-like practices, etc.

2) Recorded victims of human trafficking generally self-identify and therefore include subjective assessments that are affected by different sociocultural norms,

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[9]The first nations to sign the Protocol met in a December 2000 ceremony at the Palazzi di Giustizia in Palermo, Italy. Although the US Senate did not provide advice and consent to ratification of the Palermo Protocol until November 3, 2005, the US was one of the first signatories on December 2, 2000.

3) The population of victims is largely a hidden population and it is therefore difficult to obtain a representative sample for statistical analysis, and

4) In any given survey, the number of self-identified alleged victims is generally small, and extrapolations from small numbers have significant uncertainty.

In addition, international definitions may not be fully consistent with national definitions and the local customs and laws of a particular country. For example, "forced marriage" is prohibited through the prohibitions on slavery and slavery-like practices, including servile marriage; and "child marriage" can be considered to be "forced marriage", as one and/or both parties by definition are not able to express free and informed consent (ILO & Walk Free Foundation, 2017). In many countries, however, parties under the age of 18 are legally allowed to marry. In the United States, for example, there is no federal law regarding child marriage, and each state has its own regulations.

The discrepancies in definitions and inherent ambiguity in victim identification can make estimating prevalence complex and subjective. TIP is notoriously difficult to measure and quantify. While methods that attempt to do so are imperfect, they still have merit and, as we will see, statistical significance with a nation's CTIP programs and efforts.

As an example of the relationship between the TIP tier rankings and estimates of prevalence, Figure 4 shows the most recent GSI prevalence estimates (2018) grouped by TIP tier rankings. The distribution shows that Tier-1 nations generally have lower estimated prevalence rates, and prevalence rates generally worsen as tier levels worsen. Among Tier-1 nations, the median prevalence rate is 2.0 victims per 1,000 population. The median prevalence rates are 4.5 for Tier 2, and 5.7 for the Tier-2 Watch List. In Tier 3, the median prevalence rate is 10.6.

The overall trend is consistent with the assumption that nations with stronger efforts toward CTIP (as measured by the TIP tier rankings) achieve lower rates of TIP (as measured by the GSI index). Although we are not assuming causal relationships, the correlation between stronger TIP tier rankings and lower estimated rates of TIP is a significant statistical relationship, regardless of its cause. As
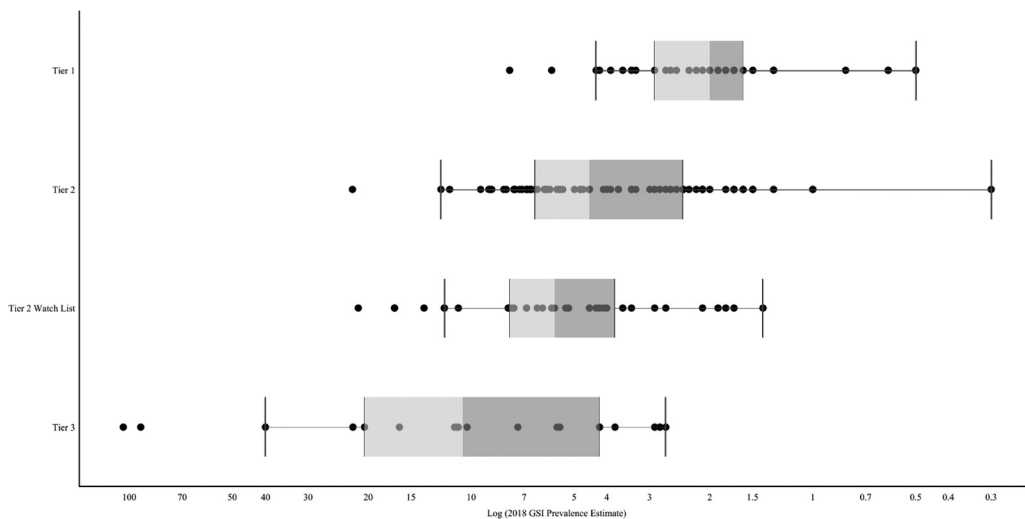

Figure 4. State Department TIP Tier Rankings and GSI Prevalence Estimates. GSI 2018 Estimates of TIP prevalence for each nation grouped by TIP tier assignment. In this box and whisker plot, each nation, represented as a dot, is plotted by its prevalence rate, where prevalence is defined as the estimated number of victims per 1,000 population. The median is marked by the change of shading in the box. The lower and upper hinges are the medians of the first and second halves of the data, roughly representing the 25th and 75th percentiles. The whiskers show the furthest data points within 1.5 interquartile ranges of the hinges. The United States is identified for reference. To increase the fidelity of the prevalence estimates and validity of the statistical representation, we have used the logarithm of the most recent GSI prevalence estimate. Prevalence rates decrease along the x-axis. The trend is consistent with the assumption that nations providing stronger efforts towards CTIP, as measured by the TIP tier rankings, have lower rates of TIP (as measured by GSI prevalence estimates).

Table 1. Factors statistically evaluated against tier levels of the US State department TIP report.

Percentage of variance in TIP tier-level rankings explained by metrics presented in the TIP Reports, selected economic and governance measures, and independent estimates of TIP prevalence. Data were normalized based on their distribution for the statistical analysis. Polarity of the correlation was adjusted for consistency.

Indicator Category	Indicator	Source	Variance (%) Tier-Ranking Explained 2009–2020	Variance (%) Tier-Ranking Explained 2020	Normalization Method	Polarity of Correlation
Governance	Democracy Index	Economist Intelligence Unit	58.2	35.7	linear	negative
Governance	Freedom Index	Freedom House	51.0	35.1	linear	negative
Governance	Fragile-State Index	Fund for Peace	47.5	28.4	linear	positive
Governance	Economic-Freedom Index	Heritage Foundation	45.9	24.3	linear	negative
Governance	Corruption-Perception Index	Transparency International	43.7	27.7	linear	negative
Governance	Ease-of-Business Index	World Bank	39.4	18.4	linear	negative
Governance	Press-Freedom Index	Reporters Without Borders	37.7	25.0	linear	positive
Economic	GDP per capita	World Bank	25.9	16.1	logarithmic	negative
Economic	GDP PPP	World Bank	22.7	12.7	logarithmic	negative
Economic	Poverty Rate	World Bank	10.9	3.2	logarithmic	positive
Law Enforcement	Prosecutions/capita	TIP Report	8.9	11.2	logarithmic	negative
Law Enforcement	Identified-Victims/capita	TIP Report	6.5	9.0	logarithmic	negative
Economic	GINI Coefficient	World Bank	4.4	0.9	linear	negative
Economic	Gross National Income Growth	World Bank	0.6	0.0	linear	positive
Economic	Unemployment	World Bank	0.0	0.0	square-root	positive
Law Enforcement	Convictions/Prosecution	TIP Report	0.0	0.6	logarithmic	negative
Independent estimates of prevalence from the Global Slavery Index (GSI) 2016 and 2018 reports						
TIP Prevalence	2018 GSI prevalence	Global Slavery Index (2018)	35.2	26.4	logarithmic	positive
TIP Prevalence	2016 GSI prevalence	Global Slavery Index (2016)	41.9	21.3	logarithmic	positive

demonstrated demonstrated in Table 1 the correlations between GSI prevalence estimates and either the 2020 TIP tier rankings, or decade-average tier rankings are many times larger than the 99% confidence level for nonrandomness. As demonstrated in subsequent sections, however, other factors show stronger relationships; and at the national level, variables such as war, natural disaster, and disease can become overriding factors.

Question 3: What is the Role of Law Enforcement in Reducing TIP?

Since 2004, law-enforcement metrics on prosecutions, convictions, and identified victims have been reported in the Annual TIP Reports (Trafficking Victims Protection Reauthorization Act of 2003). These data are compiled at the regional level and are included in many of the individual nation narratives. The 2020 TIP report, for example, presented totals of 11,841 prosecutions, 10,847 convictions, and 118,932 identified victims (U.S.DoS, 2020b). At the same time, the State Department presented an estimate of 25 million victims (U.S.DoS, 2020c). A comparison of the U.S. State Department's estimate of victims compared to the identified victims in the 2020 TIP report suggests that less than 0.5% (1 in 200) of the globally estimated victims of TIP have been identified.

Nevertheless, law-enforcement metrics reported in the TIP Reports are presented as evidence that government efforts stemming from the Palermo Protocol are working (U.S.DoS, 2019). Others have argued that viewing TIP as a "law and order" problem requiring an aggressive criminal justice response has resulted in hundreds of millions of dollars being invested with no appreciable reduction in the absolute number of people trafficked worldwide (Chuang, 2006). Others express concern that the emphasis on prosecution data means the socio-economic settings that enable trafficking in the first place are being ignored (U.S.CRS, 2019). The underlying debate is one that has been taking place in criminology theory for decades: What is the role of prosecutions in reducing crime?

To assess law enforcement's role in CTIP, we first evaluate the relationship between the law-enforcement metrics reported in the TIP Reports and TIP tier assignments (Figure 5). We next look at the relationship between prosecution rates and changes in victimization rates, using independent measures of prevalence (Figure 6). For each nation in Figures 5 and 6, we normalized the data to the population size and applied the prevalence estimates of the GSI (Walk Free Foundation, 2018) to the estimated size of the TIP victim population.[10] In an effort to account for possible time-delays and variations in justice systems, we used the most recent three-year average of yearly prosecutions scaled by population, the three-year average of convictions scaled by prosecution, and the three-year average of yearly number of identified victims scaled by population.

Figure 5 illustrates that the law-enforcement metrics reported in the TIP Reports generally trend with TIP tier levels, but the relationship is not strong. The weak relationship provides little support for the concern that TIP tier rankings are strongly influenced by the reported law-enforcement metrics. However, the remaining, and more relevant question, is whether law enforcement is an effective means for reducing TIP. To address this question, we use the more direct analysis of comparing changes in the reported prosecutions with changes in the number of victims. In other words, do increases in prosecutions result in decreases in TIP?

In our analysis, we have used two different data sets that relate to human trafficking – one is the numbers of victims that are reported in the TIP reports (these are the numbers of victims identified "rates of victim ID") (Figure 5c) and the other is the independent measures of TIP from the Walk Free Foundation's Global Slavery Index. In the case of hidden crimes (such as TIP, but also including, for example, domestic violence and hate crime) we might expect to see victim identification increase at the same time as prosecution rates. A simultaneous increase between those two metrics could reflect that government and law-enforcement attention is increasing on the issue. We do see such a relationship, albeit weak, in Figure 5c and Figure 9. We would, however, also expect to see a reduction in the estimated amount of criminal activity.

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[10]The data distribution is similar for when the reported prosecutions, convictions, and identified victims are normalized to the nation's population and to the estimated size of the number of victims in the nations, as derived from the Global Slavery Index prevalence estimates. Accordingly, we present only one of these figures in the paper.
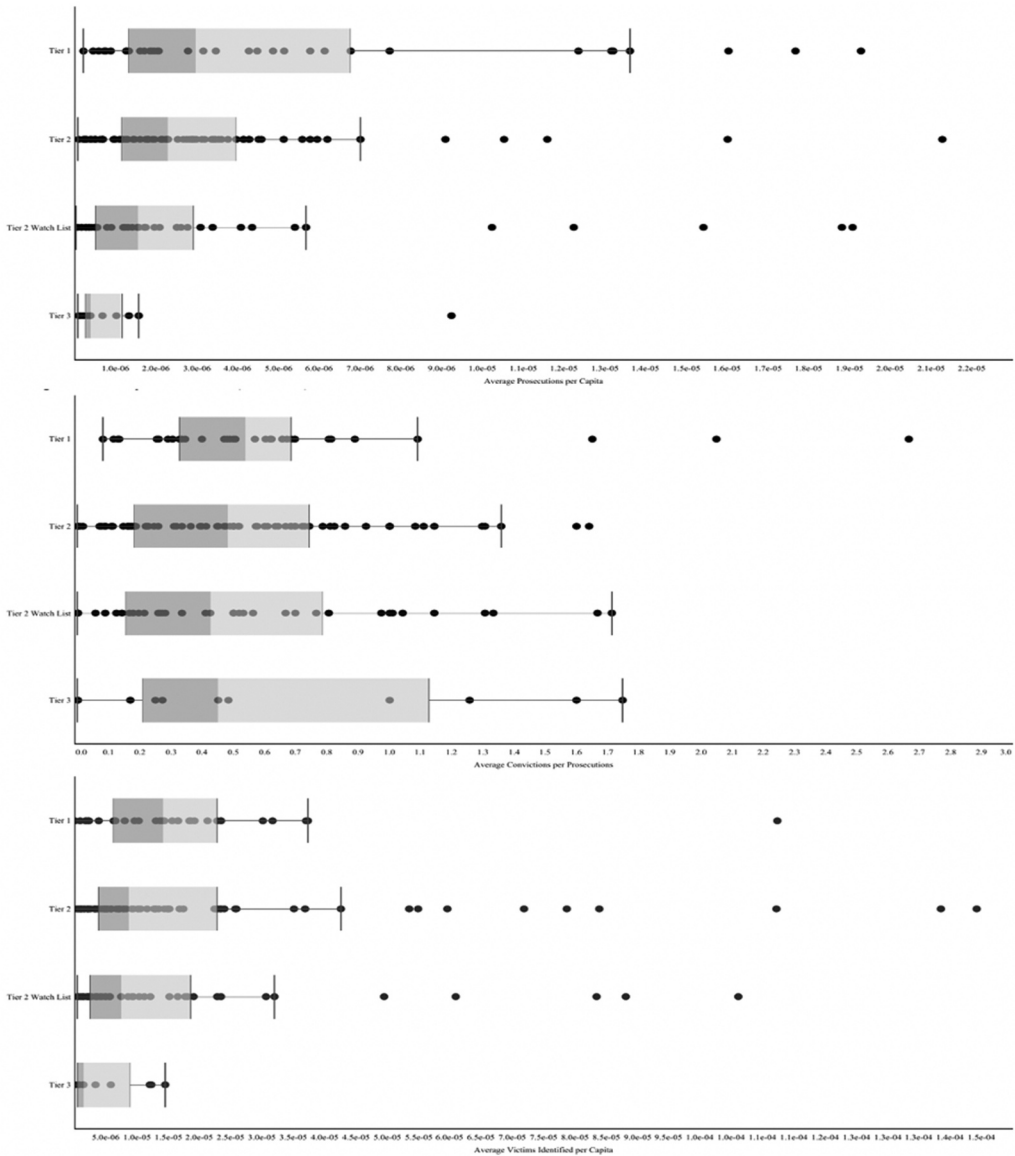
Figure 5. Prosecutions, Convictions, and Identified Victims by Tier Level. The box and whisker plot shows for each nation, the relationship between the law-enforcement metrics reported in the TIP Reports and the tier-level assignments. To make the figure more legible, two outlier countries with high rates of prosecutions per capita were excluded from the figure: Palau and the Federated States of Micronesia, both Tier 2. Three outlier countries with very high rates of convictions per prosecutions were excluded from the figure (although included within the statistical analysis): Ethiopia (Tier 2, with 751 yearly convictions on average and 10 yearly prosecutions on average for a ratio of prosecutions per conviction of 75.1), Suriname (Tier 2, with 9 yearly convictions on average and 1.3 yearly prosecutions on average for a ratio of 7), and Hong Kong (Tier-2 Watch List, with 6 yearly convictions on average and 1.3 yearly prosecutions on average for a ratio of 4.8). Three countries with high rates of victims identified per capita were also excluded: Palau (Tier 2), Saint Maarten (Tier 2), and Aruba (Tier-2 Watch List).

The analysis presented in Figure 6 is the relationship not between prosecutions and the number of reported victims, but rather the relationship between prosecutions and progress toward reducing the size of the TIP problem. In Figure 6, we are testing the hypothesis that over time, nations that devote effort toward decreasing TIP through increased prosecutions (*averaged* over 2015 to 2018 to account

for judicial time-lags) achieve decreases in the size of the problem within their country (change in estimates of TIP between 2016 and 2018).

If increased prosecutions resulted in decreases in TIP prevalence, we would expect to see the data points in Figure 6 trending from the upper right to the lower left. In other words, we would expect to see TIP decrease as prosecution rates increase. The data does not exhibit such a relationship. As presented in the analytical conclusion section of this paper, our statistical analysis reveals that nation-by-nation variations in 2015–2017 prosecutions explain 0.3% of the variance in the change in TIP between 2016 and 2018 at the 51% confidence for nonrandomness. While additional prevalence estimates and time series would improve the analysis, the lack of correlation over this time period challenges the narrative that increasing prosecutions will decrease TIP.

Question 4: To what extent do economic and governance factors influence TIP tier levels?

Many of those who have criticized the focus on "law and order" metrics in the TIP tier reports, have emphasized the need for a more holistic CTIP strategy that addresses the societal vulnerabilities that lead to TIP in the first place (e.g., Bales, 2007; Gallagher & deBaca, 2018; Wooditch, 2011).

One approach to determining the extent to which tier rankings may be associated with national characteristics not directly related to TIP is to evaluate national economic development and governance measures against TIP tier levels. For this analysis, we use indicators that measure and score each country's economy and governance.

In Figures 7 and 8 each dot represents a nation, and the nations are grouped by their tier ranking. The sample economic indicators presented in Figure 7 are: (1) Gross Domestic Product Purchasing Power Parity per capita (World Bank Group, 2020c), (2) Gross National Income Growth (World Bank Group, 2020d), (3) Gross Domestic Product per capita (GDP PPP) (World Bank Group, 2020b), (4) Poverty Rate (World Bank Group, 2020e), (5) Unemployment Rate (World Bank Group, 2020f), and, (6) GINI Index (World Bank Group, 2020d).

The sample governance indicators presented in Figure 8 are: (1) Democracy Index (Economist Intelligence Unit, 2019), (2) Ease of Doing Business (World Bank Group, 2020a), (3) Press Freedom Index (Reporters Without Borders, 2020), (4) Corruption Perception Index (Transparency International, 2019), (5) Freedom in the World (Freedom House, 2020), (6) Fragile State Index (Fund for Peace, 2020), and, (7) Economic Freedom Index (Heritage Foundation, 2020).
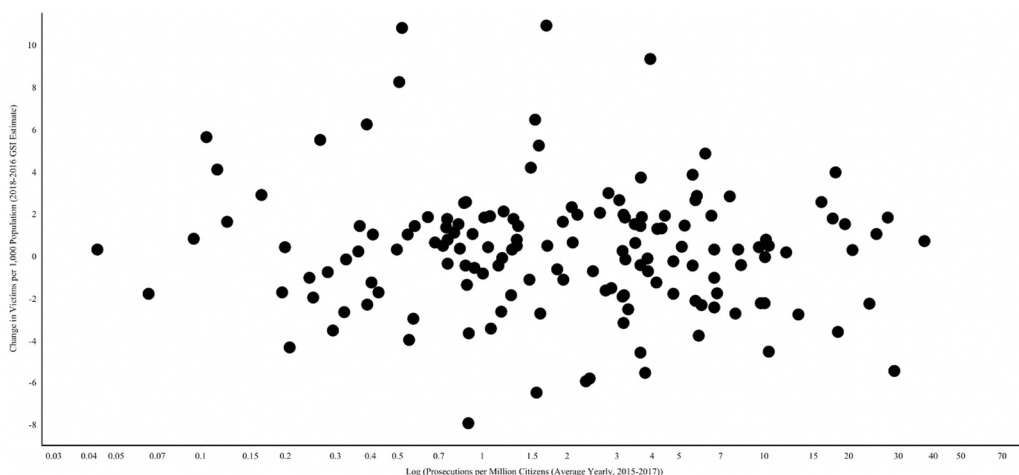

Figure 6. Relationship Between Prosecutions and Changes in TIP. Each dot represents a nation. The prosecution rates are normalized to the nation's population and averaged from 2015-2017. The change in TIP (estimates per 1,000 population) are calculated using the difference between the 2016 and 2018 GSI estimates of prevalence.
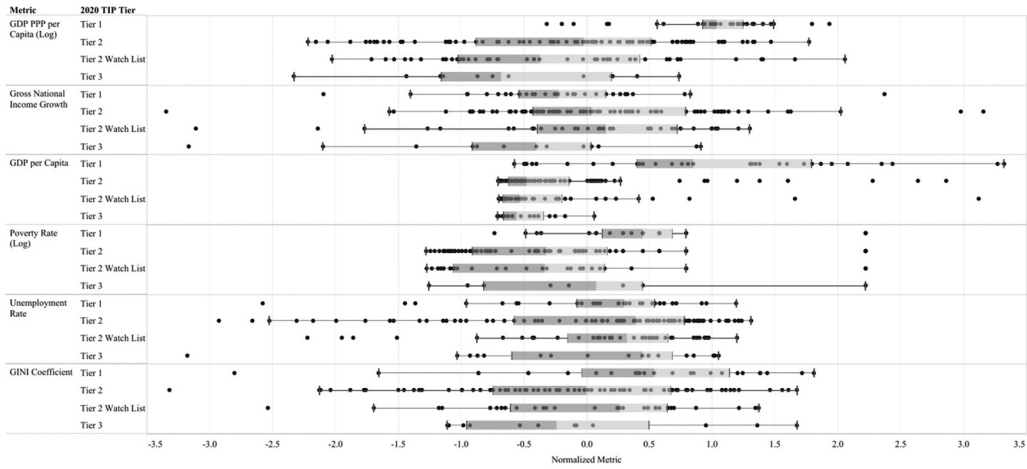
Figure 7. Economic Indicators by TIP Tier. Each dot represents a nation plotted against its economic indicator score. The nations are grouped by TIP tier level. The indicators are normalized to a common scale and adjusted so that larger x values indicate "better" performance.

To produce plots of economic and governance indicators, such that all the indicator values are on a common scale, we normalize the data using deviations from the mean. Indicators that do not demonstrate a normal (Gaussian) distribution across nations are first adjusted using the logarithm of the value, appropriate for logarithmic distributions (e.g., GDP PPP), or in some cases, using the square root of the value, appropriate for chi-squared distributions (e.g., unemployment), before applying the statistical analysis. For the indicators where a lower score is "better" (e.g., Poverty Rate, Corruption Perception Index), the normalized values are multiplied by negative one, flipping the curve over the y-axis so that all indicators can be plotted on the same graph with larger x values indicating "better" performance.
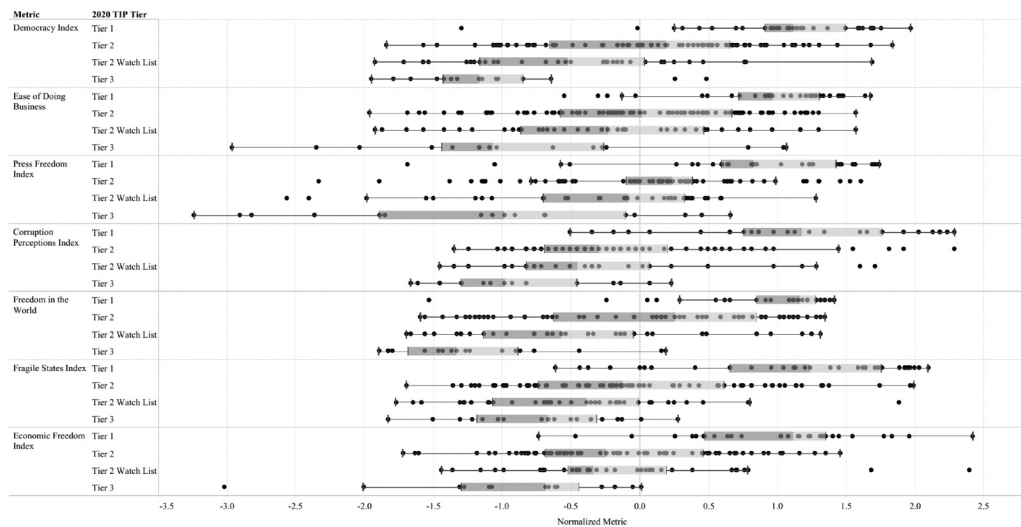

Figure 8. Governance Indicators by TIP Tier. Each dot represents a nation plotted against its governance score. The nations are grouped by TIP tier level. The indicators are normalized to a common scale and adjusted so that larger x values indicate "better" performance.

Figure 7 shows that countries with a higher GDP per capita and lower levels of income inequality (measured by the GINI Coefficient) are more often Tier 1 than Tier 3. The governance indicators shown in Figure 8 display an even stronger relationship with tier level. For example, the median Democracy Index value (a 0–100 score) is 80 for Tier-1 countries, 59 for Tier-2 countries, 43 for Tier-2 Watch List countries, and 29 for Tier-3 countries, indicating the importance of governance in a country's efforts to combat human trafficking.

Our analysis (Figures 7 and 9, and Table 1) shows there are correlations between poverty and TIP tier level (10.9% variance explained, which is twice the 99% confidence for nonrandomness). However, governance indicators correlate with the TIP tier levels more strongly than either economic indicators or law-enforcement indicators (Figure 9). For example, the democracy index explains 58.2% of the variance in the TIP tier rankings, far greater than poverty (at 10.9%), and the highest law-enforcement indicator (prosecutions at 8.9%).
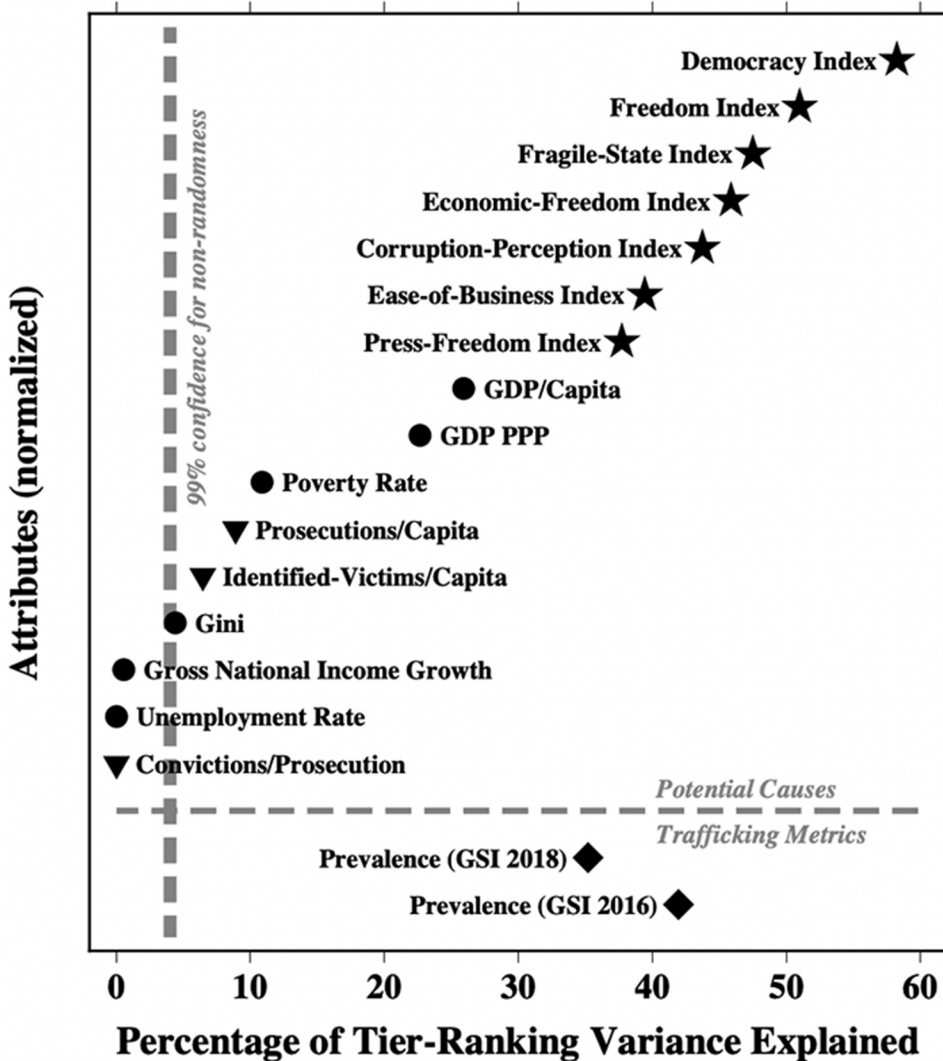

Figure 9. Percentage of Tier-Ranking Variance Explained by Various Measures.

Our sample of economic metrics traditionally associated with TIP (e.g., unemployment, poverty, etc.) are secondary to our governance measures in explaining efforts toward countering TIP, as represented by tier levels, and TIP prevalence rates. The traditional economic hypothesis that TIP arises from elevated poverty and unemployment appears to be an oversimplification. The broader question of why TIP and TIP tier rankings are more reflective of governance and social issues than economic factors is an important area of research (e.g., McGregor McGregor et al., 2013; Cho, 2015), but its full resolution is beyond the scope of this analysis. The strong relationship between governance metrics and tier assignments, however, does provide compelling support for those who have called for CTIP measures to include the promotion of democracy and individual rights (e.g., Landman & Silverman, 2019; Vidwans & Jamal, 2019).

At the broader international scale, it must also be recognized that open, democratic societies may still condone or export conditions of exploitation through transnational business practices. Many nations provide human rights protections for their own citizens but lose sight of their internal standards internationally. Legal protections for migrant workers, for example, are not yet reflected in TIP tier rankings; and international factors are also not accounted for within the Global Slavery Index prevalence estimates. Such shortfalls will perhaps be addressed in the future through revisions to the minimum standards of the TVPA.

Analytical Summary

In the previous sections, we examined relationships between tier-level assignments through time and various factors related to TIP. In this section, we summarize the analysis by quantifying the relationships in probabilistic terms. We use singular-value decomposition to identify the relative weightings among these multiple inter-related attributes across our matrix consisting of tier rankings for 12 years and 189 nations. In doing so, we estimate the relative importance to TIP tier rankings of the law-enforcement measures reported in TIP reports (reported prosecutions, convictions and identified victims), independent measures of trafficking prevalence (GSI prevalence estimates), and indicators intended to capture the nation's economic and governance conditions (e.g., indices of economics and governance). We recognize the limitations and political elements associated with the TIP tier rankings, and the weaknesses in the GSI prevalence estimates. We do not assume that correlations represent direct causal relations. Instead, we assume an ecosystem approach that treats all attributes as interdependent, with statistical correlations that measure the strength of the linkages.

Figure 9 and Table 1 summarize the percentage of variance among the TIP tier levels that can be explained by each of the factors analyzed. Table 1 includes the method of normalization applied to the data set before removing the mean and scaling to unit-average variance. Similar to Figures 7 and 8, for the indicators where a lower score is "better" the normalized values are multiplied by negative one so that larger values indicate "better" performance. Our null hypothesis is that the attributes of each nation are independent of the attributes of other nations. Assuming that nations are uncorrelated, the 99% confidence limit for a nonrandom correlation occurs for R-squared values of about 0.05. This means that an attribute can be considered statistically significant even though it explains only 4–5% of the nation-by-nation variance. Three metrics presented in this analysis are found to be statistically insignificant to the TIP tier levels. Two of them are economic measures: Gross National Income Growth, and Unemployment Rate. The third is the law-enforcement metric Conviction Rate (Figure 9).

Average tier rankings in the 2009–2020 TIP reports correlate best with national attributes that relate to governance (star-shaped symbols, Figure 9). The highest correlation involves the Democracy Index, accounting for 58% of its nation-by-nation variance among the 167 nations with index values. Other governance indicators correlate almost as strongly with tier rankings, but the variance explained by them tends to overlap with that explained by the Democracy Index. One of the indicators that augments the explained-variance significantly is the Economic Freedom Index; a joint regression of Democracy Index and the Economic Freedom Index explains 70% of the nation-by-nation variance in

the average tier rankings in the 2009–2020 TIP reports. Adding other national attributes to the regression does not increase this percentage significantly.

Many economic attributes (circular symbols, Figure 9) have relatively weak influence on tier ranking. The Poverty Rate explains only 11% of the tier rankings and the Unemployment Rate, Gross National Income Growth, and Convictions/Prosecution Rate are statistically insignificant. In addressing the underlying causal relationships, our sample of economic indicators suggests that the traditional economic theory of TIP being the result of poverty and unemployment may be an oversimplification.

The TIP tier levels are meant to measure a nation's efforts toward meeting the minimum standards of the TVPA. While special circumstances may apply to various nations at various times, the overall goal is to reduce the number of individuals who fall victim to human trafficking. Accordingly, one would expect that over time, nations that apply more effort would achieve better results than those that apply lesser effort. The GSI prevalence estimates vary greatly from nation to nation, with statistics similar to a log-normal distribution. After logarithmic scaling and demeaning, the 2016 and 2018 prevalence estimates explain 42% and 35%, respectively, of the nation-by-nation variance of the average 2009–2020 TIP Rankings (Figure 9).[11]

Implications for Policy Makers

For policy-makers who wish to combat TIP effectively, the results of our study offer several insights. Some previously hypothesized relationships are confirmed, others are called into question, and a few unexpected relationships emerged. The unexpected relationships are the most intriguing, as they lead to a more sophisticated understanding that, in turn, offers new opportunities for more nuanced and effective approaches.

Changes to the TIP tier-ranking system, and requirements to report prosecutions, convictions, and identified victims, have been implemented through the Congressional reauthorization of the TVPA. These legislative efforts, designed to motivate nations to increase their CTIP efforts, have almost certainly been effective for specific nations at specific times. Similarly, an individual nation's decision to become party to the Palermo Protocol has, at times, signaled a genuine increased commitment to addressing TIP. There are compelling anecdotes suggesting these tools have been effective. Anecdotes, however, are best used as illustrations supporting analysis, not as substitutes for analysis, because they are not always representative of the overall circumstances.

Using attributes for 189 nations and averaging across 12 years of TIP reports to obtain stable assessments, our analysis reveals that the overall impact of changes to tier-ranking requirements and encouraging nations to become party to the Palermo Protocol has been ambiguous. While such diplomatic approaches promote an atmosphere of increased awareness and support for CTIP activities, their role in substantially motivating countries to increase CTIP efforts, as measured by changes in tier levels, is weak. The number of nations at each tier level has remained stubbornly constant over the last decade. Since 2009, 76% of countries have not changed tiers in any given year, while approximately equal proportions (12%) of countries either improved or worsened by one tier level. For nations that become party to the Palermo Protocol, only 21% improved their tier level the following year.[12]

It may be surprising to some that there is only a weak relationship between the law-enforcement metrics reported in the TIP reports (reported prosecutions, convictions, and identified victims) and the TIP tier rankings. In addition, nation-by-nation variation in prosecution rates do not convincingly

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[11]If the logarithmic-prevalence estimates for the two GSI surveys are combined, the correlation is even higher, explaining nearly 49% of the tier-ranking variance. This suggests that the GSI prevalence estimates have high uncertainties, but relatively small biases, so that averaging independent surveys may increase the overall accuracy of the prevalence estimate.

[12]At the same time, considerable changes have occurred in the landscape of CTIP over time. Tier rankings in successive years of the TIP report typically correlate with R^2 values of 0.75, but the correlations decrease as the time interval increases. Correlation between the 2009 and 2020 tier rankings has $R^2 = 0.32$.

correlate with decreases in estimates of TIP prevalence. Countries that report more prosecutions tend to report fewer identified victims the following year, but the relationship is disappointedly weak. Reported prosecutions can only explain about 5% of the variance of the reported identified victims. The relationship between prosecutions and independent estimates of *reduction* in prevalence from the GSI is even weaker. Nation-by-nation variations in prosecutions during 2015–2017 explain 0.3% of the change in estimated prevalence between 2016 and 2018, at the 51% confidence for nonrandomness, which is statistically insignificant. While prosecutions have an important role in the overall CTIP strategy, from these data, there is no evidence that prosecutions result in meaningful reductions in TIP.

While this analysis is not presented as exhaustive, it is sufficiently representative to call into question some of the prevailing narratives surrounding TIP. Accepting that the TIP tier levels are designed to measure each nation's efforts toward meeting the minimum standards of the TVPA, the apparent weak relationship between tier levels and traditional global metrics of CTIP effort – reported prosecutions, reported convictions, reported identified victims, and becoming party to the Palermo Protocol, is disappointing. Additionally, it is surprising that our sample of economic metrics traditionally associated with TIP (e.g., unemployment, poverty, etc.) are secondary to our governance measures in explaining TIP tier rankings. The traditional economic hypothesis that TIP arises from elevated poverty and unemployment may be an oversimplification. On the other hand, the strong predictive nature of governance metrics with tier assignments provides support for those who have called for CTIP measures to include the promotion of democracy and individual rights (e.g., Vidwans & Jamal, 2019).

What is perhaps the most compelling result is the high correlation of TIP tier levels and the Democracy Index. The Democracy Index explains 58% of the variance; the joint regression of the Democracy Index and the Economic Freedom Index explains 70% of the nation-by-nation variance in the average tier rankings in the 2009–2020 TIP reports. From an ecosystem perspective, the correlations are consistent with the expectation that nations with strong democratic institutions are more likely to resist the descent of their marginalized subpopulations into forced labor or sex-trafficking, and that nations where entrepreneurs can more easily pursue a legal path to profit are less tolerant of businesses that depend on the coerced labor of their fellow citizens. While no single attribute qualifies as the independent variable, our analysis affirms that nations can best address TIP if their governance is more democratic, their press less fettered, their business environment more open, and their societal institutions are strong.

The strong relationship of TIP to the Democracy Index and the Freedom of Press Index (Figure 9) resonates with the Noble Prize-Winning Economist, Amartya Sen's observation that there has never been a famine in any independent and democratic country with a relatively free press (Sen, 1999). Sen's observation has been extended to natural disasters, finding that the Democracy Index is a leading predictive indicator of the human impact of natural disasters (van der Vink et al., 2007). The strong relationship between tier levels and indicators of governance suggests that investments in democracy, governance, and human rights are also investments in CTIP.

The most exciting and actionable finding for the development of more effective CTIP strategies is the discovery of the multiple independent linkages revealed by the data. These independent linkages indicate multiple causal relationships; and the multiple causal relationships have different relative priorities in different locations. This finding explains why universal solutions have had frustratingly little success in reducing TIP. Causal relationships are seldom direct, and the circumstances that foster vulnerable subpopulations vary from location to location. Just as there is no single cause for TIP, there is no single solution.

So how do we move forward in developing more effective CTIP strategies using the insights from this analysis? The short answer is that we adopt a different approach – an ecosystem approach similar to what has been used so effectively for crime reduction.[13] By identifying the characteristics of

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[13]The stability of many governance indices over time suggests that fundamental changes made in social ecosystems should be sustainable.

ecosystems that support TIP, we can formulate geographically targeted interventions to disrupt that system, and mitigate TIP in a more cost-efficient and effective manner. Ecosystem approaches have been proposed for addressing the sex trafficking of children (Finigan-Carr et al., 2019) and for building resilience to trafficking within communities (Gardner et al., 2020). Adopting an ecosystem approach for addressing TIP is consistent with the highly successful criminology theory of Situational Crime Prevention (SCP), and is focused toward the "Prevention" part of the "3P" paradigm for addressing TIP.

SCP focuses on the criminal setting and is different from most criminological approaches as it begins with an examination of the circumstances ("ecosystems") that allow particular types of crime. By gaining an understanding of these ecosystems, mechanisms are then introduced to change the relevant ecosystems and reduce the opportunities for crime. SCP focuses not on apprehending criminals, but on reducing criminal opportunities. SCP is considered an essential part of the United Nations Economic and Social Council's Guidelines for the Prevention of Crime (Resolution 2002/13) (United Nations Office on Drugs and Crime, 2010).[14]

While our analysis is not exhaustive, we feel it provides compelling evidence for an ecosystem approach to CTIP, consistent with SCP. In addition, it demonstrates the opportunity for further quantitative studies to tease out more sophisticated understandings of TIP, and the critical linkages among its array of underlying causal relationships.

Acknowledgments

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[14]Research has largely demonstrated that SCP does not necessarily lead to crime displacement (Clarke, 1995; Hesseling, 1994).

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