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The spatial dynamics of freedom of foreign movement and human trafficking

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ABSTRACT

Some existing human trafficking research has examined how trafficking laws and regulations deter traffickers. This research, however, has paid little attention to how states' freedom-of-movement policies influence human trafficking. Existing policy debates suggest two possible effects. Europe's experiences with open borders have led to claims that freedom of movement decreases the likelihood that traffickers are detected, thus making human trafficking in and out of states more likely. By contrast, movement restrictions could create an environment in which people become more vulnerable to traffickers. We use data from 182 countries from 2001 to 2017 to test whether freedom of movement increases or decreases human trafficking flows. We find that it is necessary, theoretically and empirically, to consider freedom of foreign movement both locally and in a state's neighborhood, because freedom of movement increases human trafficking when the local and neighborhood practices diverge from each other.

Introduction

Beginning with the formation of the European Economic Community in 1957, and culminating with the Schengen agreement in 1995, European Union (EU) member states have increasingly shifted toward greater freedom of foreign movement.[1] Many lawmakers and law enforcement agencies have responded to the increase toward freedom of foreign movement with criticism of its effects on the trafficking of people and goods. For example, while evaluating its membership in the European Union, a 2014 United Kingdom (UK) Home Office (2014, p. 45) report concluded, "Free movement within the EU is extensively exploited by organised criminals to bring illicit commodities including … human trafficking victims." This conclusion is based on a 2013 Europol report titled, "Serious and Organised Crime Threat Assessment." In that report, a clearly stated cause of human trafficking in the European Union was relaxed regulations for freedom of movement. The report suggested, "EU nationals are easily trafficked in the EU due to the freedom of movement realised by the Schengen Acquis and the combined low risk of identification and detection" (Europol, 2013, p. 24). This conclusion was later reported in mainstream UK press outlets like *The Telegraph* (Hope, 2014). Although this quote speaks to specifically to trafficking of EU nationals, it is but one example of policymakers linking freedom-of-movement policies to the trafficking in persons. Much of this line of argument's logic rests on the idea that freedom of foreign movement makes it easier for traffickers to skirt laws that punish human trafficking. As a

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Data used in the study can be obtained for purposes of replication at: https://dataverse.harvard.edu/dataverse/jhr.

result, it is argued, human trafficking out of a country with few constraints on movement is more likely.

However, scholars have argued that constraints on the right to freedom of movement have the exact opposite effect. For example, Sassen (2000, p. 517) suggested that "[s]ome features of immigration policy and enforcement may contribute to make women who are victims of trafficking even more vulnerable and give them little recourse to the law." These claims from the academic literature are directly in conflict with the kinds of claims that are being made by policymakers. In a recent forum on *Open Democracy*, a website that publishes debates among academics and activists, it is argued that constraints on freedom of movement are linked to greater levels of human trafficking. Specifically, O'Connell Davidson (2015) argued that without the right to freedom of movement, "people are at heightened risk of abuse and exploitation in the course of movement and at the point of destination." This line of argument suggests that it is actually restrictions on movement that create an environment at heightened risk of human trafficking.

Much of this disagreement boils down to policy disputes between law enforcement, policymakers, human rights activists, and some scholars. This debate continues, in part, because of the lack of systematic analysis of the theoretical and empirical links between freedom of movement and human trafficking. In this article, we seek to provide the first systematic analysis of the effect of freedom of movement on human trafficking, which provides us with greater empirical leverage to adjudicate between these competing arguments. More specifically, we examine how a state's practices restricting freedom of foreign movement, coupled with the movement policies of neighboring states, affect human trafficking flows out of a state. Our research is important, therefore, both for helping to resolve these policy debates and for advancing the growing theoretical and empirical literature on the causes of human trafficking flows.

This research also makes important contributions to a growing empirical literature examining why we observe human trafficking flows. This work focuses on various push factors that leave individuals vulnerable to being trafficked and the pull factors that create a market (or demand) for trafficked persons (Akee et al., 2012; Bettio & Nandi, 2010; Cho, 2015, Cho et al., 2013; Jac-Kucharski, 2012; Long, 2004). Here we posit a theoretical argument that speaks to how freedom of foreign movement impacts both the push and pull factors for human trafficking. There are, of course, any number of human rights that might play a role in shaping trafficking flows. For example, violations of physical integrity rights or of economic rights might leave individuals more vulnerable to being trafficked. However, the right to freedom of foreign movement, and its impact on the ability of individuals to more across borders, makes it the human right most likely to have a clear and direct connection to human trafficking flows.

Human trafficking causes

The existing human trafficking research suggests a number of individual and system-level push and pull factors behind human trafficking flows.[2] At the individual level, people with lower levels of economic opportunities (either relative or absolute) are more likely to be trafficked (International Labour Organization, 2012; Jac-Kucharski, 2012; Tallmadge & Gitter, 2018). At the systemic level, lower levels of economic development and employment, population size, political conflict, and natural disasters all increase the risk of trafficking (Cho, 2015; Rudolph & Schneider, 2017). This literature looks at systemic factors related to the source of trafficking flows as well as their destination, and it focuses mostly on the economic and social conditions that increase the risk of trafficking.[3] It also focuses on the legal and enforcement aspects of laws prohibiting trafficking (Akee et al., 2014; Cho, Dreher, & Neumayer, 2013; Goodey, 2008; Schwartz & Allain, 2020).

Specifically, the trafficking literature focuses on two factors that are especially important when examining the role that freedom of foreign movement plays: those that impact the vulnerability

of a state's population and those that might incentivize or disincentivize individuals participating in trafficking networks. Regarding the first factor, Cho (2015) highlighted vulnerability as one of four broad causes of trafficking and found that economic inequality, economic development, and conflict lead to a bigger pool of individuals seeking to leave their home country, and as a result more individuals becoming vulnerable to trafficking networks. In our theoretical argument below, we posit that restrictions on movement can also make these populations more vulnerable to trafficking.

By contrast, Jac-Kucharski (2012) argued that research on trafficking should focus more attention on the state characteristics that impact the expected costs and benefits to a potential trafficker. In the US context, she focused on the extent to which a trafficker might expect to be caught, which has an effect on the costs of participating in trafficking. More generally, some existing research has shown that places with steeper punishments and a greater ability to punish are less likely to see trafficking (Cho et al., 2013). Here we focus on how freedom-of-foreign-movement practices, especially in neighboring states, might affect a trafficker's expectations of being caught and prosecuted.

To our minds, however, there is an important gap in this literature—a failure to connect human trafficking to the larger and more established literature on human rights. Although Cho (2013) did look at the relationship between women's rights and trafficking, and Bell and Banks (2018) highlighted the relationship between women's rights organizations and trafficking, there has been very little work connecting other human rights violations and human trafficking. As with other rights, there has been a large international effort to discuss and develop an international definition of human trafficking, a connection to the 1948 Universal Declaration on Human Rights and coordinating efforts at protecting victims, preventing future trafficking, and punishing traffickers. The international efforts around these "three Ps" have been codified in reports by the UN Office on Drugs and Crime, the United States' annual Trafficking in Persons Report, US Congressional legislation, as well as the 1999 Palermo Protocol. Overall, there are echoes of a norm cascade akin to those seen with other human rights (Keck & Sikkink, 1998).

Therefore, we think more attention is needed on human rights, both how protection from human trafficking is a type of human right and also how human rights laws and practices within a country play a role in forming a more or less conducive set of conditions for human trafficking. The human right that is most obviously connected to human trafficking (and regularly a concern of activists and policymakers) is the freedom of movement. Although not discussed in the context of human rights, Sassen (2000) argued that state immigration policy restricting movement can leave women vulnerable and make trafficking more likely.

The work described above is important in providing the foundations for much of the theory that we present below. However, the existing research has not considered theoretically and empirically both a state's own restrictions on freedom of foreign movement and how those interact with the policies established in neighboring states to impact human trafficking. We believe taking this into account is necessary for fully understanding the role that freedom of foreign movement plays in human trafficking outcomes. In the following section we examine how freedom-of-movement practices might affect the vulnerability of populations and the incentives of traffickers.

Freedom of movement and human trafficking

The freedom of movement is a human right outlined in Article 13 of the 1948 Universal Declaration of Human Rights: "Everyone has the right to freedom of movement and residence within the borders of each state. Everyone has the right to leave any country, including his own, and to return to his country." Therefore, people have freedom of movement within their own country as well as the right to travel abroad and return. Freedom of foreign movement is

frequently connected to concerns about human trafficking. Although states' freedom-of-movement practices are not the only factor that inhibits movement across borders (geography and infrastructure are also relevant), state restrictions on movement are indicative of other governmental restrictions. Here we focus on how both a state's local practices in restricting freedom of foreign movement and the practices of states in its geographic neighborhood affect the probability of being a source for human trafficking. We cannot develop a complete understanding of this human right's role without considering both local and neighborhood practices. We focus here on the effect that freedom of foreign movement has on whether a state is a source country for human trafficking. To distinguish between an individual state's practices and its neighbors, we define "local practices" as the foreign movement practices of the potential source state. "Neighborhood practices" are the foreign movement practices of the geographically surrounding states. These two practices affect the probability of being a human trafficking source at two stages of the trafficking process.

As noted, there is growing attention to the links between freedom of movement and human trafficking among policymakers and activists, but there is much less attention within the scholarly literature (Sassen, 2000). We first present the logic for two competing arguments for how freedom of movement might affect trafficking from a particular state. We then discuss how neighborhood levels of freedom of foreign movement have both independent and conditional effects. In considering the effects of freedom-of-foreign-movement practices of governments, it is necessary to consider how the behavior of both traffickers and those at risk of trafficking are affected. A focus on how they are affected by government respect for freedom of foreign movement also helps us understand the divergent expectations from policymakers, scholars, and activists. Law enforcement organizations like Europol focus more on the traffickers. Some scholars have focused more on the victims. In developing our first two hypotheses, it is worthwhile to work through the logic of how restrictions on movement influence the incentives for traffickers and potential victims. Following that, we present a more nuanced theory that incorporates both freedom-of-foreign-movement policies locally and in the surrounding neighborhood.

Human trafficking activists and the limited academic literature on movement and trafficking have given greater attention to the factors that make individuals vulnerable to trafficking. In a wide-ranging critique of anti-trafficking laws, Hathaway (2008, p. 33) argued that greater restrictions on movement across borders actually increases the market for smuggling and brings more organized crime involvement to smuggling. To Hathaway, greater restrictions on movement across borders will place more individuals into the hands of traffickers. As noted, Sassen (2000) also argued that restrictive immigration policies can leave women more vulnerable to being trafficked.

The existing literature already identifies a number of factors that make people more vulnerable to trafficking, and it shows that conditions that produce vulnerable populations lead to greater trafficking outflows (Akee et al., 2014; Bettio & Nandi, 2010; Cho, 2015; Long, 2004). A consideration of how freedom of movement is likely to affect potential victims suggests that restrictions on freedom of foreign movement are likely to make individuals from vulnerable populations even more vulnerable to being trafficked out of a country. The logic here is that there are logistical challenges and costs involved with any sort of international movement. Restrictions may place people in situations in which they have to rely on smugglers for transport. For example, restrictions on movement from North Africa have led to a number of deaths from illegal smuggling operations and raised migrants' trafficking risks, as witnessed in spikes in the number of Nigerian trafficking victims in Italy (US Department of State, 2020, p. 279). Put simply, the need to rely on extra-legal pathways to move across borders places individuals into a position in which they are more likely to be trafficked.

Hypothesis 1: High levels of government respect for freedom of foreign movement decrease the probability that a state is the source of human trafficking flows.

Unsurprisingly, the focus of law enforcement is on how traffickers are likely to be motivated by open borders and freedom of movement. There are two main pathways through which freedom-of-movement practices by a government might influence the incentives of traffickers. First, the literature suggests that human traffickers often operate along similar paths as legal migration (Akee et al., 2014; Mahmoud & Trebesch, 2010). Recruiting techniques often rely on the stories of legal migrations from source areas doing well abroad. Detection is also more difficult along more popular routes. Second, existing literature has already made the claim that increasing the potential costs to traffickers should decrease the likelihood of trafficking (Cho, 2015, Cho et al., 2013; Jac-Kucharski, 2012). Consistent with this logic, restrictions on movement should raise expected costs for traffickers and force them to change routes. In sum, the opportunity that freedom of movement offers and the lower probability of paying a cost for engaging in trafficking lead to a greater likelihood of trafficking out of states that have more open borders. This focus on the perpetrators by law enforcement and some policymakers suggests that freedom of foreign movement will actually increase the likelihood and level of human trafficking. This leads to a counterhypothesis to our first:

Hypothesis 2: High levels of government respect for freedom of foreign movement increase the probability that a state is the source of human trafficking flows.

The logics presented in Hypotheses 1 and 2 could also simply be applied to the relationship between freedom-of-movement practices in neighboring states and human trafficking. However, there is another possible more nuanced theoretical relationship between freedom of movement and trafficking. The theoretical explanations described above focused on an individual state's practices of freedom of foreign movement in isolation. A consideration of a state's own levels of respect for freedom of movement, the practices in neighboring states, and how these might interact or condition one another, allows us to paint a more nuanced and complete picture. In this discussion we refer to a state's own freedom-of-foreign-movement practices as local practices and practices in bordering states as neighborhood practices.[4] A consideration of both local and neighborhood freedom of foreign movement helps to show that, under some conditions, both sets of expectations might be correct.

Consistent with the activist school of thought, local freedom-of-foreign-movement practices are likely to have their most immediate effects on potentially trafficked persons. This is the first impediment with which a person who wants to leave his or her country is faced. As a result, a state's own (local) restrictions on moving in and out of its borders are likely to have a more direct effect on whether a vulnerable person winds up in a position to be trafficked. In other words, having restrictions on movement out of a state increases the supply of persons to be trafficked.

This, however, is not the complete picture. Whether or not traffickers capitalize on this increasingly vulnerable population will depend, in part, on the ease of entering and exiting neighboring states. The openness of neighboring borders and the ease of travel into neighboring states provide traffickers an opportunity to exploit the pool of vulnerable persons and engage in trafficking out of a state. As a result, when freedom of movement is restricted locally, but there are open borders in neighboring states, we expect increases in human trafficking out of a state. Restrictions on foreign movement make the local population vulnerable, but it is easier to move people into neighboring locations when neighbors have greater freedom. As both local practices and neighboring practices become more open to freedom of movement and domestic vulnerability decreases, trafficking out of a state should decrease. In sum, when there is a divergence in policies between a state's local freedom-of-foreign-movement practices and its neighbors', we expect to observe the combination of a vulnerable population with some opportunity for traffickers to exploit them.

Hypothesis 3a (freedom of foreign movement divergence): State (local) restrictions on freedom of foreign movement increase the probability that a state is a source for human trafficking when neighboring states have few restrictions on freedom of foreign movement.

However, when both the local and neighboring practices are open, there is little reason for people to place themselves in a position to be trafficked in the first place, as they can move more freely.

Hypothesis 3b (freedom of foreign movement convergence): As state (local) and neighboring freedom of foreign movement converge toward fewer restrictions, the probability that a state is a source for human trafficking decreases.

Aspects of both the trafficker-focused and victim-focused perspectives are supported if these hypotheses receive empirical support. The focus on trafficker incentives would be partly supported because under the condition where there are constraints locally, openness in the neighborhood should lead to greater trafficking. However, the victim-focused perspective, which focuses more on the potentially trafficked persons, would also be supported as restrictions locally produce a heightened risk when there is openness in the neighboring states.

It should be noted, however, that under the condition in which there is freedom of foreign movement, both locally and in the neighborhood, we do not expect to observe trafficking. This is certainly more in line with the perspective that focuses on victims and advocates for fewer restrictions on movement. Hypotheses 3a and 3b take into account the incentives and effects of freedom of foreign movement on both traffickers and populations that are vulnerable to trafficking. This more nuanced story provides a more complete picture of the role that freedom of foreign movement plays in the trafficking process. The key point we are seeking to make is that it is difficult to understand the impact of freedom-of-movement policies on trafficking flows without a consideration of the policies being implemented by both a state and its neighbors.

Research design

This section outlines our research design to test our hypotheses. The unit of analysis is the country-year. The sample consists of all states for which data are not missing from 2001 to 2017. This includes as many as 182 states in 2012. The available time frame is determined by the overlap between our trafficking and human rights data sources. The sample relying on the CIRI data to measure freedom of movement is limited to the years 2001 to 2011. Where we rely on the V-Dem data to measure freedom of movement, we can expand the sample to 2017.

Dependent variable

To measure sources of human trafficking, we use trafficking data from Frank (2013), which we update to include data from 2012 to 2017. This data collection is based on US State Department Trafficking in Persons reports, and these data have previously been used by Bell and Banks (2018), Bell et al. (2018), Blanton et al. (2020), and others. The main dependent variable is Frank's (2013) dichotomous measure "source," which captures whether there was evidence of a state being a source for any type of trafficking victims in a given country year.[5]

Trafficking is difficult to measure due to incentives to avoid detection, and as a result, the quantification of trafficking flows is also a source of debate in the literature (Laczko, 2007; Tyldum & Brunovskis, 2005). We prefer Frank's (2013) dichotomous measure to the alternative count measures for a few reasons. First, it has greater temporal and cross-sectional coverage. Second, given incentives to hide human trafficking and the challenges of detecting it, we are more comfortable with a dichotomous measure than a measure that claims to capture the actual number of individuals. This is because there are likely to be systematic biases in terms of where

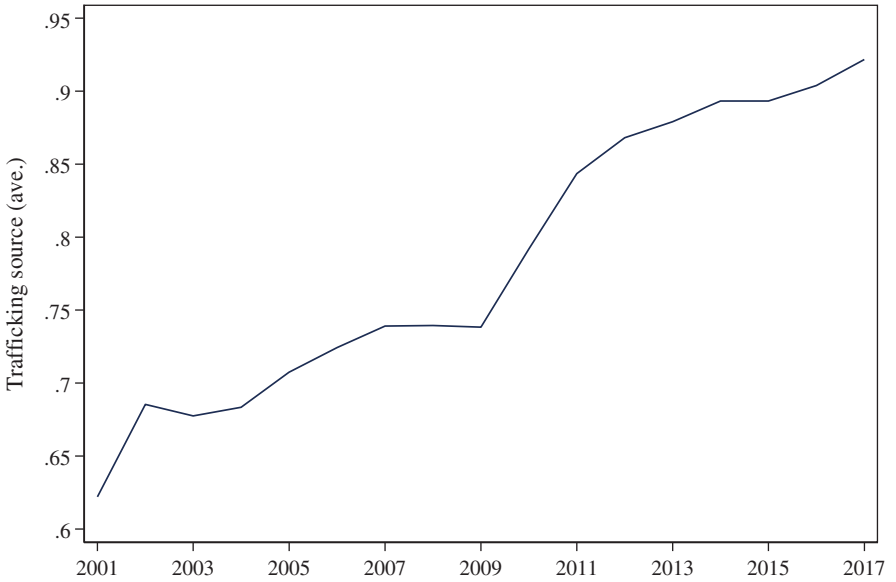

Figure 1. Trafficking sources as a percentage of countries in TIP reports.

it is easier to reliably measure the number of individuals trafficked.[6] For example, any conditions that make it easier to catch traffickers will likely lead to higher reported numbers of trafficked individuals. A simpler dichotomous coding of whether there is trafficking out of a state or not is less likely to be subject to those biases.

There are, of course, tradeoffs in this choice. Moving to a dichotomous measure means there is less information to inform the statistical model. We believe this is a more conservative and cautious approach to measuring trafficking. Turning to the distribution of our dependent variable, Figure 1 suggests the growing prevalence of countries as sources of trafficking. Given the dichotomous nature of the dependent variable, we estimate a probit model with robust standard errors clustered by country.

Independent variables

We rely on two measures of freedom of movement. First, we us an ordinal, three-category (0, 1, 2), measure from the Cingranelli-Richards (CIRI) human rights dataset (Cingranelli & Richards, 1999). It is a cross-sectional measure and is coded for from 1981 to 2011. A 0 is assigned to any government that "restricts all or nearly all the foreign travel of its citizens," (Cingranelli et al., 2014, p. 46). These countries are relatively indiscriminate in who they prevent from movement across borders. Cases that are coded as a 1 place "modest restrictions" on foreign travel and typically target specific groups like religious leaders, human rights activists, journalists, small ethnic minorities, and others (Cingranelli et al., 2014, p. 47). A case can also be coded as a 1 when travel is restricted to and from specific locations. Finally, a case is coded as a 2 when travel is "unimpeded" or "free." Cases received this score when there are no restrictions except for those placed on minors, refugees from other countries, or restrictions for national security (Cingranelli et al., 2014, p. 48). Figure 2 shows how countries' scores have fluctuated over time, and Figure 3 shows how they differ across space.

The second measure comes from the Varieties of Democracy (V-Dem) project (Coppedge et al., 2020). This measure starts as an expert survey question, with four possible responses reflecting whether freedom of foreign movement is "not respected by public authorities" (0), "weakly respected by public authorities" (1), "somewhat respected by public authorities" (2),

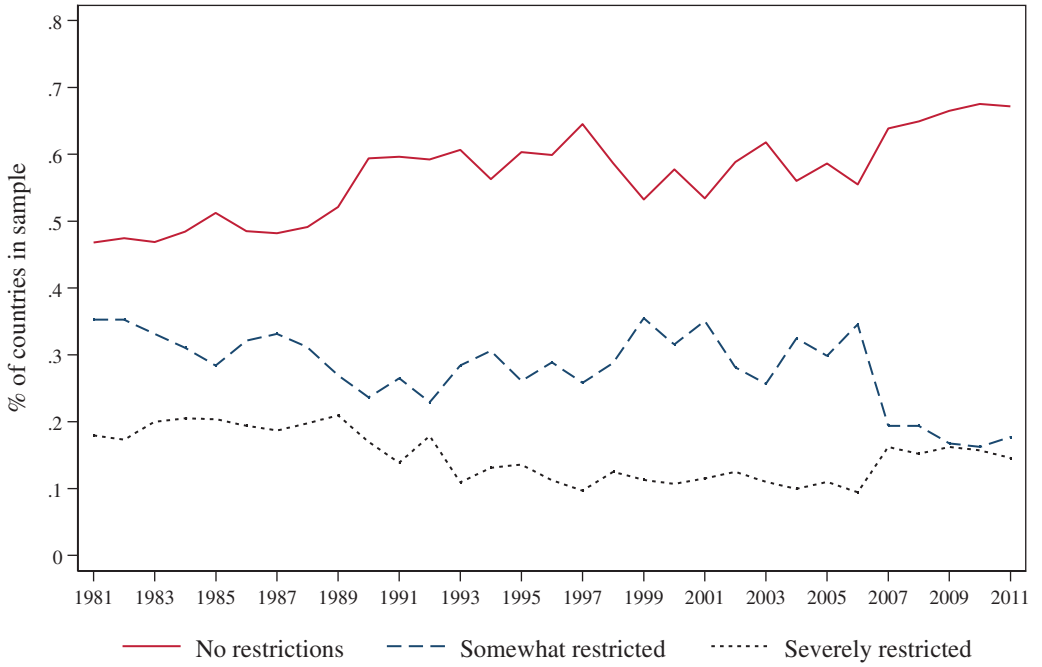

Figure 2. CIRI freedom of foreign movement over time.

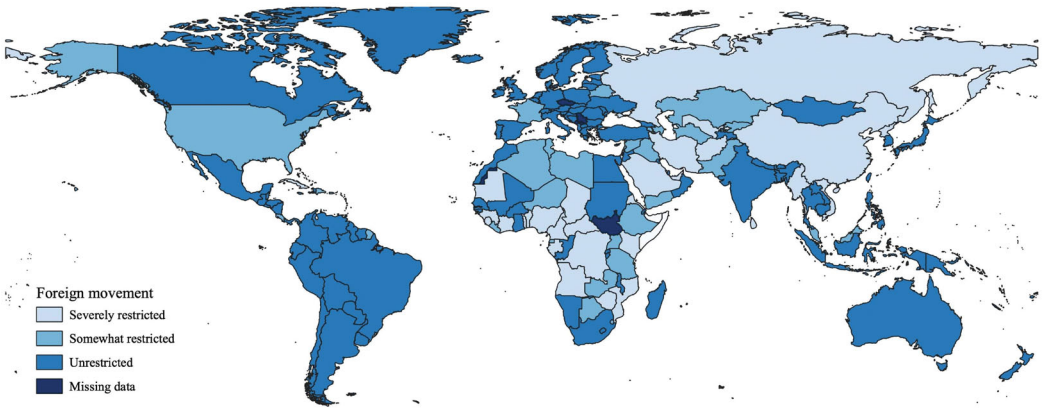

Figure 3. CIRI freedom of foreign movement restrictions, 2011.

"mostly respected by public authorities" (3), or "fully respected by public authorities" (4; see Coppedge et al., 2020, p. 171). The roughly five expert responses per country-year are aggregated to a single measure generated by a Bayesian item response theory (IRT) measurement model. This aggregated IRT score ranges from −3.6 (e.g., North Korea in 2016) to 2.6 (e.g., Spain in 2017).

There are several reasons to focus on both CIRI and V-Dem data. CIRI has an established track record in human rights data research and a clear and easily understood categorization of the variable of interest. However, CIRI is no longer being updated; the last year coded was 2011.V-Dem's data are much more comprehensive (they stretch from 1789 to 2020), and V-Dem uses a latent variable approach, which can account for differences in how experts apply the 4-point ordinal scale as well as rater error. However, V-Dem's measures of human rights are relatively new and are not as commonly used in the literature as CIRI, and their continuous measure

may be less intuitive. Finally, although both datasets have their strengths, recent research by Cope et al. (2020) found their human rights measures are not as correlated as you may expect (.585), due to significantly different conceptualization and measurement approaches. Given these differing approaches, we use both measures of freedom of foreign movement. If our results are substantively similar across data sources, we can have more confidence that our underlying argument and results are not artifacts of data sourcing.[7]

Using both sources for the freedom of foreign movement, we then generate spatial measures of these variables consisting of the mean value of the freedom of foreign movement in neighboring states. To identify the set of contiguous states across time, we use the Correlates of War (COW) contiguity data (Stinnett et al., 2002). They provide a directed dyadic dataset of all contiguous states, which we can use as contiguity matrix for generating the spatial measures.[8] With our directed dyadic contiguity data and the freedom-of-foreign-movement data, we generate the spatial measure of freedom of foreign movement for neighboring countries either directly connected to a country or within 12 km distance of water (Neumayer & Plümper, 2009).[9] The connectivity matrix is row standardized. The eventual interval-level measure that is generated is the mean of all contiguous states' freedom of foreign movement.[10]

It is important note that this is a measure of a citizen's ability to come and go from the surrounding states. However, in places where borders are reasonably easy to cross and there is freedom of movement for citizens, it is likely that there will be relatively free movement for all persons. In places where there are tight restrictions on citizens moving across borders, there is likely to be monitoring and security in place that would also make it difficult for a trafficker to move freely in and out of that state. This does not mean there will be the same level of freedom of foreign movement for citizens and noncitizens in a state, but that across countries the restrictions on citizens are likely to correlate with the restrictions and impediments for noncitizens. For example, consider EU countries. The characteristics that make it easy to move across borders for EU citizens also make it easy for noncitizens to move across the borders of those states. In addition, even though the EU states are more restrictive of a noncitizen entering the European Union, they are less restrictive than the average state is on noncitizens entering the EU area. On the more restrictive side, consider the United States. The rules that prohibited a US citizen from traveling to and from the United States to Cuba will also limit the ability of a noncitizen to travel to and from Cuba. The same is true of a more repressive state like North Korea. The restrictions North Korea places on its citizens to move in and out of the country also make it difficult for a noncitizen to move in and out of the country.

To test Hypotheses 3a and 3b, we generate an interaction term between a state's freedom of foreign movement and the neighborhood measure. The expectation is that when both are at high values, indicating local and neighborhood freedom of foreign movement, trafficking should be less likely. However, when local freedom of foreign movement is restricted, neighboring openness will increase the probability of a state being a source of trafficking.

Control variables

We include two control variables that are linked to human trafficking in existing literature, but more importantly that might serve as confounding variables in the relationship between movement and trafficking. The level of economic development of the state is controlled for with a measure of GDP from the World Bank (2020). This controls for the likelihood that places with low levels of economic development are more likely to have vulnerable populations that seek exit and become trafficked. We also control for population size (World Bank, 2020) to account for the overall opportunity and supply of potential trafficked persons. We include a minimum number of control variables in our initial analysis for theoretical and practical reasons. Theoretically, the quantitative human trafficking literature has not coalesced around a concise number of

theoretically relevant control variables to include in trafficking models. Practically, we use two initial control variables to maximize the number of observations in our initial models as well as reduce the risk of multicollinearity among our control variables. Nevertheless, readers might, with good reason, worry that our findings are a result of omitting an important predictor. Therefore, in our sensitivity analyses section, we use more than a dozen other potential control variables in hundreds of additional sensitivity analyses, and our main results hold.

Results

The results for our four models testing our hypothesis are summarized in Table 1. Models 1 and 3 estimate the unconditioned effect of freedom of movement on trafficking and tells us whether the local and neighborhood levels of freedom of foreign movement have an unconditioned impact on trafficking. They include freedom of foreign movement, neighborhood freedom of movement, and the two control variables.[11] The only substantive difference between Models 1 and 3 is the source of the foreign movement variable: Model 1 uses CIRI, whereas Model 3 uses V-Dem. In both models, the coefficients for both local and neighboring freedom of foreign movement variables are positive and statistically significant. Therefore, our results suggest (consistent with Hypothesis 2's expectation) that as people's movements outside their home country are less restrictive, the likelihood of their home country being a human trafficking source increases.

Furthermore, as neighboring states' policies related to freedom of movement become less restrictive, the probability of trafficking increases. However, this finding should be treated as tentative, as these models do not account for the potential conditional relationship between local and neighborhood freedom of foreign movement. We discuss those findings in detail below. The two control variables are consistent with existing findings in these and subsequent models. The coefficient for GDP coefficient is negative and statistically significant, which suggests that poorer states are more likely to be sources of trafficking flows, all else being equal. Larger populations are found to consistently (and statistically significantly) increase the probability of being a trafficking source, which is consistent with the literature's finding that larger populations increase the supply of potential trafficked persons.

Table 1. Trafficking source probit results.

	CIRI		*V-Dem*	
	(1)	(2)	(3)	(4)
Freedom of foreign movement	.374**	.839***	.219*	.301**
	(.139)	(.254)	(.100)	(.106)
Neighbors' freedom of foreign movement	.378*	1.056**	.316*	.498***
	(.149)	(.351)	(.132)	(.148)
Foreign movement* neighbors' freedom of foreign movement		−.429*		−.132*
		(.201)		(.063)
GDP	−.953***	−.949***	−.929***	−.914***
	(.0828)	(.084)	(.083)	(.084)
Population	1.117***	1.112***	1.130***	1.121***
	(.104)	−.949***	(.100)	(.103)
Constant	5.514***	4.859***	5.398***	5.129***
	(1.210)	(1.150)	(1.069)	(1.093)
Log-pseudolikelihood	−457.5	−452.2	−643.6	−639.0
Observations	1,556	1,502	2,297	2,297
# countries	151	151	152	152
Years	2001–2012	2001–2012	2001–2017	2001–2017
AIC	925.02	916.31	1297.28	1289.9
BIC	951.77	948.41	1325.98	1324.36

Notes: *$p < .05$, **$p < .01$, ***$p < .001$, two-tailed test.

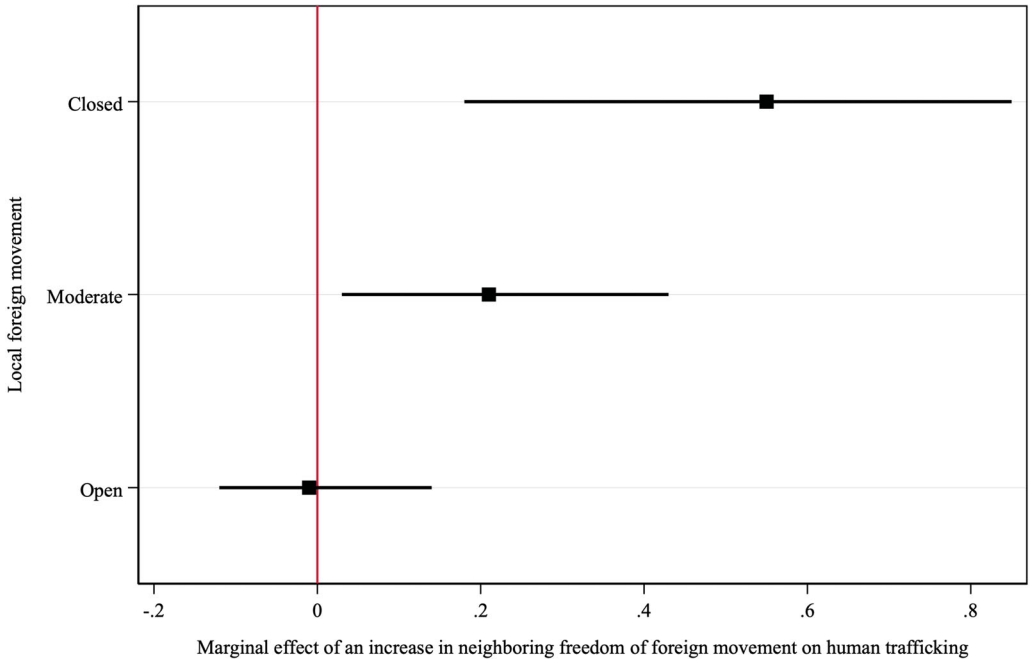

Figure 4. Model 2's conditional effect on trafficking.

Models 2 and 4 are identical in form (and substantive results) to Models 1 and 3, except for the additional interaction term between local and neighborhood freedom of foreign movement. This interaction term allows for testing Hypotheses 3a and 3b. Across models, both the local and neighborhood measures of freedom of foreign movement are positive and statistically significant, whereas the interaction term is negative and statistically significant. However, given that this is a nonlinear model, the constituent terms and the interaction term are not directly interpretable (Brambor et al., 2006).[12] The constituent terms only allow us to evaluate the impact of one independent variable on the dependent variable, whereas the other constituent term in the interaction is set to 0. For example, this means that we can only interpret the coefficient on freedom of foreign movement as indicating that when neighborhood foreign movement is at 0 (fully restricted), increases in local freedom of movement increase the probability of trafficking out of that state. However, this direct interpretation of the constituent terms is limited to just the cases in which there are full restrictions in the neighborhood (the conditioning variable is at 0). We are ultimately interested in the impact of one variable across the full range of values on the other foreign movement variable. The negative coefficient on the interaction term indicates that the positive relationship between freedom of foreign movement and trafficking is attenuated as neighborhood movement becomes more open (increases from 0 to 1 or 2). However, to fully evaluate the interaction across the range of values on the two constituent terms, and its statistical significance across the full range on the conditioning variable, it is necessary to plot out the substantive conditional effects graphically (Brambor et al., 2006).

Figure 4 shows how the effect of neighboring foreign movement changes across varying levels of local freedom of foreign movement. The *x*-axis is the size of the marginal effect of an increase from completely restricted neighborhood freedom of foreign movement to completely unrestricted neighborhood freedom of foreign movement. These values are changes in probabilities and range between −1 and 1. The *y*-axis identifies the local level of freedom of foreign movement: closed (0), moderate (1), and open (2). The plot's three squares show the effect of a change in neighborhood movement from closed to open.[13]

The plot lines show the 95 percent confidence interval. Starting with the condition in which local freedom of foreign movement is restricted, an increase in neighboring foreign movement produces an increased probability of a state being a source for trafficking. That effect is diminished at moderate local levels of freedom of foreign movement. However, it is important to note the overlap between the confidence intervals here. The most interesting finding illustrated in this figure is that when local freedom of foreign movement is completely open, freedom of foreign movement in the neighborhood no longer has a statistically significant or positive effect on trafficking. The predicted probability actually becomes negative, although not statistically significant.

These findings are consistent with both Hypotheses 3a and 3b. Under the condition in which a state is restrictive of foreign movement, greater openness in neighboring states increases the probability of a state being a source for trafficking (Hypothesis 3a). This is consistent with the theoretical claim that in states where there are restrictions on movement, vulnerable populations are more likely to be driven into the hands of traffickers, and traffickers can more easily move them into neighboring states. However, when a state's local freedom of foreign movement is relatively open, having relatively free movement in neighboring countries no longer increases the probability of being a source for trafficking (Hypothesis 3b). This is consistent with the idea that, even with relatively open borders in neighboring states, the relative openness locally makes it less likely that there is a vulnerable population to be trafficked in the first place.[14] Overall, our results suggest that open borders lead to increased trafficking when there is some divergence between what a state and its neighbors allow. As long as a state and its neighbors are less restrictive in their freedom of foreign movement, there is no increase in the probability of a state being a source of trafficking.[15]

Sensitivity analysis

In our initial four models, our results are consistent with our hypotheses that expected higher trafficking outflows in countries with divergent freedom of foreign movement patterns than their neighbors. In estimating these models, we were minimal in our modeling approach, especially in our choice of two control variables. In doing so we follow the advice of a number of researchers, from George Box (1976)[16] to Christopher Achen (2005). Whereas Box and others suggested that all models may be wrong, the key is to try and make them applicable to the task at hand. Our initial models simply captured the theoretical dynamic at the heart of this article; however, it clearly left in the error term other country-level factors the literature suggest are important to understanding why some countries are more or less likely to be sources for human trafficking.

Therefore, in this section we conduct a series of sensitivity analyses to systematically evaluate the robustness of our three main independent variables as well as other explanatory factors. We do this in two ways. First, we address the sensitivity of our main results to the inclusion of other factors in our models using extreme bounds analysis. Second, we address model uncertainty more generally by Bayesian model averaging.

Leamer (1985, p. 308) said that "a fragile inference is not worth taking seriously," so we use his method of sensitivity analysis to see if our variables are fragile or robust to a battery of additional variables as well as see what other variables are also significant. We look at more than a dozen additional variables found to be significantly associated with trafficking push factors in Cho (2015).

Cho (2015) is the most influential article with which we are familiar that looked at quantitative models of human trafficking. She found 13 push variables and 13 pull variables robustly associated with trafficking. We use the same method as Cho (2015) to see if our variables are robust to a series of additional variables, and to see given the HTI data these same variables are significant.[17] The functional form of this model is $\boldsymbol{Y = \beta_i I + \beta_m M + \beta_z Z + u}$, where $\boldsymbol{Y}$ is the dependent variable (a trafficking source dummy), $\boldsymbol{I}$ is a vector of focus variables included in all

Table 2. Sensitivity analysis.

	Model 2 using CIRI's freedom of foreign movement				Model 4 using V-Dem's freedom of foreign movement			
Variable	Coef. (mean)	s.d.	CDF % > 0	Robust	Coef. (mean)	s.d.	CDF %> 0	Robust
Free variables								
Freedom of foreign movement	.863	.147	1.000	**yes**	.239	.106	1.000	**yes**
Neighboring freedom of foreign movement (ave.)	1.184	.288	1.000	**yes**	.544	.142	1.000	**yes**
Interaction term	−.587	.140	.000	**yes**	−.181	.100	.052	**yes**
GDP (ln)	−1.122	.139	.000	**yes**	−1.079	.140	1.000	**yes**
Population (ln)	1.240	.137	1.000	**yes**	1.234	.134	1.000	**yes**
Auxiliary variables								
3P Index	.131	.020	1.000	**yes**	.104	.014	1.000	**yes**
Corruption	−.050	.052	.136	no	−.060	.045	.030	**yes**
Crime (homicides)	.248	.075	1.000	**yes**	.181	.104	.970	**yes**
Europe dummy	.058	.251	.636	no	.051	.230	.621	no
Food/beverage/tobacco (% GDP)	−.012	.004	.000	**yes**	−.003	.006	.348	no
Globalization index	.029	.017	.955	**yes**	.041	.015	1.000	**yes**
Infant mortality	−.015	.006	.000	**yes**	−.019	.008	.000	**yes**
Middle East/North Africa	−.763	.377	.045	**yes**	−.638	.370	.076	**yes**
Muslim population (%)	−.012	.002	.000	**yes**	−.010	.002	.000	**yes**
Physical integrity rights index	−.014	.054	.591	no	−.072	.044	.924	**yes**
Polity2	.025	.016	.939	no	.029	.022	.848	no
Rule of law	−.133	.207	.227	no	−.152	.178	.121	no

Notes: Extreme bounds analysis with focus variables included in all 286 models and all combinations (66) of auxiliary variables considered in groups of three. Robustness considered at .95 level, one tailed-test using Sala-i-Martin's (1999) criteria.

models (GDP), $\boldsymbol{M}$ is the variable of interest, $\boldsymbol{Z}$ is a set of three controls, and $\boldsymbol{u}$ is the error term (Sala-i-Martin 1997). For our sensitivity analysis, we have five focus variables (freedom of foreign movement, neighboring freedom of foreign movement, the interaction term of the first two variables, GDP (ln), and population (ln)), and 12 variables that are alternately a variable of interest and a control. These models chose one of the 12 auxiliary variables and put them in a series of models with the five variables and every possible unique combination of three other auxiliary variables. This means that each auxiliary variable is included in 66 models, and the focus variables are included in all 286 models. Variables that are considered robust have the vast majority (95 percen) of their cumulative distribution function of their coefficients either all above 0 (as we expect freedom of foreign movement to have) or below 0 (the interaction term). To be sure the results are not contingent on the choice of foreign movement data source, we run these models using both CIRI and V-Dem foreign movement data.

The results from our 286 EBA models are summarized in Table 2. The first two columns in Table 2 show the average coefficient and standard deviation for each variable. The next column shows the percentage of a variable's cumulative density function is above 0. If this number is above .95 or below .05, the variable is considered a robust predictor of being a human trafficking source. The top line result is that all five of our focus variables, including our three main independent variables, are still significant and in the expected direction. We take this to be an important finding. Our initial results hold up even when we include a systematic additional series of predictors. Turning to the dozen auxiliary variables, nine are robust predictors using either CIRI or V-Dem data, and most are for both. The three that are significant for one of two series of models are corruption, food and beverage production as a percentage of GDP, and the CIRI physical integrity rights index. The three factors that are not significant are the Europe dummy, Polity2, and the rule of law.

As a further effort at gauging the robustness of our main results, we use the Bayesian model averaging (BMA) approach introduced by Magnus et al. (2010) to fit a classical linear regression model with uncertainty about the choice of the explanatory variables.[18] This estimates models' posterior

Table 3. Bayesian model averaging results.

	CIRI			V-Dem		
Variable	Posterior mean (st'd error)	*t*	PiP	Posterior mean (st'd error)	*t*	PiP
Free variables						
Constant	.742 (.405)	1.83	**1.00**	1.954 (.524)	3.73	**1.00**
Freedom of foreign movement	.169 (.051)	3.32	**1.00**	.012 (.032)	.39	**1.00**
Neighboring freedom of foreign movement (ave.)	.237 (.073)	3.20	**1.00**	.084 (.041)	2.04	**1.00**
Interaction term	−.127 (.041)	−3.10	**1.00**	.063 (.022)	2.87	**1.00**
GDP (ln)	−.221 (.027)	−8.25	**1.00**	−.270 (.036)	−7.56	**1.00**
Population (ln)	.249 (.031)	8.10	**1.00**	.287 (.037)	7.71	**1.00**
Auxiliary variables						
Globalization	.017 (.003)	5.91	**1.00**	.015 (.003)	4.60	**1.00**
Crime (homicides)	−.067 (.020)	3.40	**.99**	.009 (.018)	.49	.24
Rule of law	−.188 (.046)	−4.05	**.99**	−.153 (.090)	−1.70	**.80**
EU dummy	−.208 (.054)	−3.86	**.98**	−.237 (.058)	−4.10	**1.00**
% Muslim population	−.002 (.001)	−2.26	**.91**	−.001 (.001)	−1.28	**.70**
CIRI physical integrity rights	.011 (.014)	.79	.45	−.000 (.002)	−.00	.04
Infant mortality	−.001 (.002)	−.49	.24	−.003 (.003)	−1.02	**.58**
3-P Index	.000 (.002)	.16	.16	.000 (.002)	.14	.06
Europe dummy	−.009 (.033)	−.26	.10	−.266 (.067)	−3.97	**1.00**
Middle East/North Africa dummy	−.005 (.031)	−.16	.08	−.013 (.043	−.30	.13
Corruption	−.001 (.008)	−.16	.06	−.021 (.033)	−.64	.34
Food, beverage, and tobacco as a % of GDP	−.000 (.000)	−.15	.05	−.003 (.002)	−1.68	**.82**
Polity 2	.000 (.001)	.03	.05	−.000 (.001)	−.06	.05

Notes: 8192 model space. PiP above .5 in bold. Variables sorted by PiP value for CIRI models.

probabilities (e.g., what is the likelihood of a model given our observed data) and then computes a weighted average of these conditional estimators (Magnus et al., 2010, p. 140). Four important statistics are generated by this process. The main one is the posterior inclusion probability (PiP)—the likelihood that the models will include a variable and suggests robustness. We follow the literature in concluding that a variable with a posterior inclusion probability above .5 is likely to be in the true model of human trafficking. The second and third are the posterior mean parameter and its standard error. The fourth is the ratio of the posterior mean and standard error, which is comparable to a frequentist *t*-statistic and captures the estimate's precision. We use the standard estimate of 1 as threshold of being robustly correlated with outcome (De Luca & Magnus 2011).

The BMA results are summarized in Table 3. We run BMA using both CIRI and V-Dem data for our three main independent variables. As previously noted, these models allow for different time periods and different conceptualizations of freedom of foreign movement. As in the EBA results, our five main variables (three related to freedom of foreign movement and GDP and population) all have posterior inclusion probabilities of 1, and all but freedom of foreign movement are precisely measured. This provides further evidence that our main results are not driven by idiosyncratic modeling decisions or case inclusion. Five auxiliary variables are both robust and precisely measured in the CIRI models (globalization, rule of law, an EU dummy, the percentage of the population that is Muslim, and crime). The V-Dem models suggest that the first four are robust, but crime is not. The V-Dem analysis also suggests that the Europe dummy, food and beverage production, and infant mortality are also robust and precisely measured.

Taken as a whole, our sensitivity analysis provides further evidence for the robustness of the results in the previous section regarding the interactive effect of local and neighboring freedom of foreign movement. These results hold even when including a dozen other factors that existing literature suggests are also push factors for human trafficking.

Conclusion

This article provides insight into a question that has received limited academic theoretical attention and no quantitative empirical attention. It also addresses a question that has been at the center of a hotly contested policy dispute. That dispute has mainly been between policymakers, especially in law enforcement, who claim that open borders create an opportunity for trafficking, and activists and academics, who see restrictions on movement as likely to make people more vulnerable to trafficking. We show here that the relationship is likely more complex and requires consideration of both a state's own levels of freedom of foreign movement and the level of respect for freedom of foreign movement in neighboring states. More specifically, openness of borders in a regional neighborhood is really only shown to have a systematic effect on trafficking out of a state when that state places restrictions on movement of its own population. In addition, when a state adopts open policies on freedom of foreign movement, and its neighbors do as well, there is no increased probability of trafficking. This contradicts the sort of policy recommendations and concerns from the UK Home Office and Europol that we described in the introduction.

This article is also an important contribution to the growing literature on human trafficking. This evidence is consistent with existing research that focuses on vulnerability (Cho, 2015) of potential trafficked individuals and the criminal calculation of traffickers (Jac-Kucharski, 2012). It also compliments and extends existing work on the links between human trafficking and domestic political institutions (Potrafke, 2016), borders (DiRienzo & Das, 2017), and legal frameworks (Cho et al., 2013). It also contributes to the work on neighborhood spatial dynamics of human rights observance (Bell et al., 2014) as well as establishes another outcome affected by the freedom of foreign movement (Barry et al., 2014; Miller & Peters, 2020). In addition, although work like that of Sassen (2000) has suggested that we might expect a connection between immigration policy and trafficking flows, to our knowledge, this is the first piece to provide quantitative evidence that addresses that connection.

Finally, we see three areas for future research. First, freedom of movement is not the only human rights violation that is likely to be related to human trafficking. Physical integrity rights abuses, workers' rights, and other empowerment rights warrant specific attention in future work, as our argument suggests that governments' policies shape both trafficking perpetrators' and potential trafficking victims' incentives to cross borders. Second, it is possible that there are other ways to identify the openness and ease of crossing borders. In particular, certain geographic features (e.g., the size of a state's territory or the number of potential border crossings) might serve as impediments or opportunities to trafficking. States also have different border orientations (Simmons & Kenwick, 2021) that might help in identifying where human trafficking flows are likely to be a problem. Third, our theoretical argument can also speak to how freedom of movement affects the probability of trafficking to destination states. This article focuses on trafficking from source countries, but freedom-of-movement policies and practices potentially have similar effects on the probability of trafficking to destination states.

Notes

1. We define freedom of movement here consistent with the International Covenant of Civil and Political Rights (1966: Article 12). This definition includes four parts: (a) "Everyone lawfully within the territory of a State shall, within that territory, have the right to liberty of movement and freedom to choose his residence." (b) "Everyone shall be free to leave any country, including his own." (c) "The above-mentioned rights shall not be subject to any restrictions except those which are provided by law, are necessary to protect national security, public order (*ordre public*), public health or morals or the rights and freedoms of others, and are consistent with the other rights recognized in the present Covenant." (d) "No one shall be arbitrarily deprived of the right to enter his own country." In this article we focus on the parts of this definition that speak to restrictions on foreign movement.

2. We use the definition of human trafficking given by the 1999 Palermo Protocol. This definition can incorporate trafficking for forced labor and for sexual exploitation. Most of the literature has focused on sexual exploitation, but a 2012 International Labor Organization (ILO) report found that three-quarters of trafficking is for forced labor in industries that are not sexually related.
3. To clarify our theoretical argument and because of space constraints, we focus this article on freedom of movement and trafficking from source countries. We leave it to future research to link freedom of movement policies to destination and transit countries' trafficking flows, but we do think our argument would likely also apply to destination states.
4. Local practices are not to be confused with freedom of domestic movement, which is a different concept.
5. It is important to note that this measure does not relate to the well-known TIP tier rankings, which measure "how well other governments complied with the minimum standards for the elimination of trafficking laid out in the law" (US Department of State, 2020, p. 3). These tier rankings have been criticized in the past for political interference (e.g., Harmon et al., 2020). Rather, we use a measure of being a source country—a measure of the nature of human trafficking rather than government response.
6. There is a long and robust debate about the estimate of and use of human trafficking flow numbers (e.g., Bales et al., 2015, 2020; Durgana & van Dijk, 2021; Farrell et al., 2010; Laczko, 2005; Silverman, 2020; Tyldum & Brunovskis, 2005; Whitehead et al., 2021).
7. Both freedom of movement measures include elements of both *de jure* and *de facto* restrictions. Therefore, it is not possible in this study to isolate the effects of either formal restrictions or in practice restrictions' effects on human trafficking.
8. Five different levels of contiguity were considered: direct contiguity, within 12 miles of water, and within 24, 150, and 400 miles. Given that many migration flows occur across water, it is necessary to examine our hypotheses with more than just direct territorial contiguity. In Models 1–4 we use 12 km of water. The Appendix includes models with different thresholds of contiguity. Our results hold regardless of contiguity level.
9. Spatial data generated using Stata 16.1's spmon command.
10. Figure A2 shows this variable's distribution using CIRI.
11. We also estimated models controlling for domestic freedom of movement. The results (reported in the Online Appendix, Table A2) remain substantively the same.
12. Previous work (e.g., Berry et al., 2012; Braumoeller, 2004; Brambor et al., 2006; Hainmueller et al., 2019) suggested not directly interpreting the coefficients in on interaction terms in nonlinear models.
13. Statistical significance levels are the same for 0–1 and 1–2.
14. These models were also estimated with a control for EU membership. This variable is not statistically significant and does not change our main results. See Table A3.
15. The V-dem plot (Figure A4) looks substantively the same.
16. "Since all models are wrong the scientist cannot obtain a 'correct' one by excessive elaboration. On the contrary following William of Occam he should seek an economical description of natural phenomena" Box (1976, p. 792).
17. Cho (2015) also used TIP data to estimate time-series trafficking models.
18. Using linear regression with a dichotomous dependent variable violates several of OLS's underlying assumptions—specifically, that the residuals will not be normally distributed, and some model predictions would fall outside of realistic range. This is mitigated somewhat by our use of robust sandwich standard errors. Nevertheless, the BMA results should be indicative and not definitive. Given that our focus is on model averaging not the results of any specific model nor prediction, we use BMA analysis as a complement to our sensitivity analysis. Therefore, the BMA results should be considered part of the larger effort to evaluate the sensitivity of our main independent variables' results given various model specifications.

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