Immigration Demand and the Boomerang of Deportation Policies

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Abstract

What causes the demand for migration into the United States? We argue for, and demonstrate the existence of, a vicious cycle of US immigration policy and migration between the United States and countries from Latin America and the Caribbean. Our argument is simple: deportation of convicts from the United States leads to violence in the deportee's home country which, in turn, increases the demand for that country's natives to seek entry into the United States. We test this argument utilizing a nested research design based on both cross-country panel data for Latin America and the Caribbean as well as subnational administrative and individual survey data from the case of El Salvador. At the cross-country level, we first estimate the effect of deportations on home country violence and find a strong positive effect of the lagged inflow of convicts on violence, but not for the inflow of non-convicts. In the second step, we show that the predicted level of home country violence helps explain the demand for entry into the United States. Municipal level and survey data from El Salvador complement the cross-country study and illustrate the export of gangs from the United States as one specific mechanism of how the deportation boomerang works. In the first step regression, we predict the contagion of gangs along migration corridors following large-scale deportations to El Salvador. In the second step regression, we use survey data to explain migration intentions as well as high rates of actual migration as a result of gang-related violence in El Salvador.

JEL: F22, J68, K37

Keywords: deportations, violence, homicides, gangs, migration, nested research design, Latin America and the Caribbean, El Salvador, two-step regression

I. Introduction

Immigration—especially the demand for entry across the Southern Border of the United States—is perhaps the dominant political, economic, and cultural issue during Donald Trump's presidency. While economic incentives to migration continue being an important factor, widespread violence in migrants' countries of origin have played a critical role in explaining the surge in the demand for entry into the United States. For example, in surveys of migrants from Central America's Northern Triangle – Honduras, Guatemala and El Salvador – almost 40% cited attacks or threats to themselves or family as the reason for leaving home (Médecins Sans Frontières (MSF) 2018). Violence pushed many, including women and children, to join the Central American migrant caravans that crossed Mexico in autumn 2018 on its way to the United States. This is hardly surprising as these three countries are among the most violent places in the world. In Honduras and El Salvador, homicide rates were at 64 (Honduras) and 109 (El Salvador) per 100 thousand in the year 2015 - compared to an average rate of 1.2 in high income OECD countries (UNODC). In parallel to increasing violence in these countries, the number of refugees and asylum seekers from the three Northern Triangle countries has increased ten-fold between 2011 and 2017, according to the UN High Commissioner for Refugees (UNHCR 2017). Research by Michael Clemens (2017) finds that many of almost two hundred thousand unaccompanied minors from Central America apprehended in the US between 2011 and 2016 fled a sustained rise in homicide rates in their communities of origin.

The case of the Northern Triangle may be extreme, but it is hardly unique: we demonstrate that there is a robust and substantively important link between violence and the demand for entry into the United States. We argue that at least a portion of this relationship is driven by US policies. Specifically, we provide evidence that the policy of deporting foreign born back to their homeland drives the demand for others to seek entry into the United States.

This paper makes three contributions to our existing understanding of the dynamics of population mobility. First, unlike the majority of the literature on immigration (e.g. Clark, Hatton, and Williamson 2007) we focus on unregulated migration into the United States; that is, entry into the United States outside of the formal visa system. This allows us to understand the demand for entry which may exceed the number of visas allocated to residents of a

particular country. Second, we estimate how violence translates into demand for emigration. Since both violence and emigration are affected by a host of social, political and economic variables that are sometimes hard to observe, we identify a causal estimate by using the number of individuals deported from the United States to a particular country of origin as an exogenous instrument.

Third, the use of an instrumental variables approach also allows us to trace a vicious migration cycle whereby deportations from the United States leads to violence in the deportee's home country which, in turn, spurs subsequent demand for entry into the United States. This has immediate policy relevance as one pillar of US immigration policy since the mid-1990s has been a tough stance on immigrants who have committed criminal offenses while in the US (Chishti and Mittelstadt 2016). Between 1996 and 2015, the US deported 5.4 million individuals back to their homelands. Forty percent of these—2.2 million - had committed a felony while in the US[1] (US Department of Homeland Security, Yearbooks of Immigration Statistics). In cases such as Honduras and El Salvador, the cumulative number of deportees with a criminal background corresponds to between 1.3% and 1.5% of these countries' total population measured in 2015. By deporting convicted felons, the US returns home persons likely to have developed connections with transnational organized crime upon incarceration in the US (Farah and Phillips Lum 2013). Moreover, the literature on parole in the United States points to the existence of a "revolving door" whereby once released, criminal offenders who are incarcerated are more likely to commit crime once paroled than those who are sentenced to probation (e.g. Western 2006).

We test our argument utilizing a nested research design leveraging both cross-country data from twenty Latin American and Caribbean (LAC) countries and subnational data from the case of El Salvador. In the cross-country analysis, we estimate a first stage model of homicide rates as a function of deported felons from the United States along with a set of covariates

[1] It is important to note that unauthorized entry to the United States or overstaying one's visa does not constitute a felony; these are misdemeanors. A criminal deportation hearing is initiated for a migrant — whether or not they are in the United States legally — if they have committed a felony; not all migrant felons are subject to deportation hearings.

drawing on Ambrosius and Leblang (2018). We also provide placebo regressions that show that neither leading values of deported convicts nor the inflow of non-convicts affect homicide rates at origin. In the second stage, we us predicted homicide rates to explain the demand for entry into the United States from Latin American and Caribbean countries.

Municipal level data from El Salvador complements the cross-country analysis, focusing on export of gangs from the US as one specific mechanism of how the vicious migration cycle works. When deported convicts were sent back to El Salvador in large numbers, the gangs spread along migration corridors that had emerged when initially Salvadorans fled civil war in the 1980s. Following Ambrosius (2018), we use migrants' exposure to violent crime as a predictor for gang-related violence using both administrative as well as survey data in the first stage regression. In the second stage regression, we explain both migration intentions and actual emigration rates as a result of predicted gang-related violence.

We focus on the United States as a destination country as well as a source of deportations for two reasons. First, the US is the largest destination for migrants in the world, with an estimated population of undocumented migrants approximating 11.2 million (Passel and Cohn 2016). Second, the United States is the country that deports the largest number of migrants or attempted migrants through legal means in the world. Countries of Latin America and the Caribbean are the largest source countries of legal and undocumented migration in addition to being the origin of the bulk of asylum seekers in the United States. Over our period of study from 2004 to 2015, Latin America and the Caribbean countries accounted for 98% of annual apprehensions at the US Southern border, 43% of annual asylum requests, and the region received 97% of all deportations.

Two main messages emerge from our analyses. First, we confirm and generalize the stylized facts relating local violence to the demand on the part of a nation's citizens to emigrate. Second, we demonstrate both theoretically and empirically that one of the drivers of local violence is the stream of criminals deported from the United States back to their home country. This combination of deportations and the subsequent demand for entry into the United States generates what we term the migration boomerang of deportation policies.

The rest of the paper is organized as follows: Section two situates our argument and empirical approach in the existing literature. Sections three and four detail the empirical model and

results for the cross-country analysis. The empirical model and results for the case study of municipalities in El Salvador is contained in sections five and six. Section seven concludes.

II. The Argument

We argue that deportations from the United States generate violence in the deportee's home country. This violence, in turn, often leads individuals to leave their homeland in search of safety, prosperity, or both. Two strands of literature are relevant to this argument. On the one hand, this paper is related to the determinants of migration; our contribution is to highlight the effect of deportation-induced violence on emigration. Second, because deportations are a form of forced return migration, we contribute to an emerging literature that examines the effect(s) of return on the migrant's homeland.

Regarding the former, a large theoretical and empirical literature identifies the drivers of both labor migration and the demand for asylum[2]. These studies focus on pull factors such as family reunification, labor market and educational opportunities, and greater political rights in the destination. Models of labor migration often include measures of economic opportunity in the source and destination country, arguing that migration occurs primarily because the migrant is attempting to maximize a stream of future wages. Empirical models of asylum include measures of civil and/or international conflict along with some measure of democracy as a means to capture the home country's support (or lack thereof) for human rights.

The importance of violence—as distinct from civil or interstate war—as a factor pushing people to leave their homeland has been relatively ignored in empirical research. This may be due to the fact that violence that is neither state-sanctioned and is not associated with civil war does not presently qualify as sufficient to achieve refugee status under the United Nation's 1951 Convention on the Status of Refugees; consequently, individuals fleeing from gang violence face high hurdles in successfully claiming asylum.

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[2] On the former, see Stark (1984); Clark, Hatton, and Williamson (2007); Hatton and Williamson (1994); and Fitzgerald, Leblang, and Teets (2014). On the latter, see Hatton (2016), Hatton and Williamson (2005), and Moore and Shellman (2004).

What little empirical work exists, however, finds that domestic violence—conceived of in terms of homicide rates—does result in both domestic displacement (Engel and Ibañez 2007; Ibañez and Vélez 2008) and international migration. Regarding the latter, Michael Clemens (2017) studies the factors that drive emigration of unaccompanied minors from Guatemala, Honduras and El Salvador, using confidential data that matches children's municipalities of origin to homicide rates. He finds that a sustained increase of one homicide per year over the six years under study caused about 3.7 additional apprehensions of unaccompanied minors. For the case of El Salvador, Sviatchi (2008) evaluates data on the origin of deported migrants and finds that a stronger presence of gangs (defined as municipalities from where incarcerated gang leaders came) is associated with more recent emigration. In a different context, Shrestha (2017) observes that Maoist insurgency in urban areas of Nepal raised the rate of emigration to India, Malaysia, and the Gulf by 0.8 percentage points.

A second strand of literature relevant to our research is related to the direct and indirect consequence of deportations. Several recent contributions have analyzed post-deportation experiences of migrants, in particular their difficult re-integration at home (e.g. Schuster and Majidi 2013; Brotherton and Barrios 2009) that often results in re-migration (Schuster and Majidi 2013; D. E. Martínez, Slack, and Martínez-Schuldt 2018; Amuedo-Dorantes and Pozo 2014). Beyond its immediate effect on the returnees themselves, we argue that important indirect effects of deportations exist at the level of countries and communities via the transnational transmission of violence. The argument of an export of violence via the deportation of convicts has frequently been made in journalist investigations and qualitative research for the case of Central America (see for example Arana 2005; Cruz 2013; Lineberger 2011; Rodgers, Muggah, and Stevenson 2009; Zuñiga Nuñez 2016). Recent research has substantiated this claim using econometric techniques. At the cross-country level, Blake (2014) relies on a cross-country panel of 34 advanced and developing countries over the period 1970 to 2004 and attributes a fourth of the increase in homicide rates in developing countries in the 1980s and 1990s to the inflow of deported felons. Ambrosius and Leblang (2018) extend this research to a larger set of 123 countries up to the year 2015. Addressing causality via an instrumental strategy that exploits variation in migrants' exposure to immigration policies at the level of US states, they find that, over two-year periods, an inflow

of ten deported convicts per 100 thousand persons on average translates into two additional homicides per 100 thousand.

Three recent case studies on El Salvador—each using a different methodological approach to assess the effect of deportations on violence—conclude that US deportation policies since the 1990s have been responsible for a rise in gang-related violence in El Salvador. Sviatchi (2008) and Kalsi (2018) both use the timing of deportation policies as an identifying variable. The rise in homicides in municipalities with a strong presence of gangs in parallel to the inflow of convicts is taken as a sign that deportations fueled violence. Following a different empirical strategy, Ambrosius (2018) uses migrants' exposure to violence at destination as an independent variable and observes a contagion of gang-related violence along migration corridors.

In the sections that follow we tie these literatures together. We argue that, even after controlling for a battery of other variables, violence in the homeland increases demand for migration to the United States. This is our outcome or second stage model. In the first stage of the model we show that deportations of migrants with some prior criminal history in the United States increase violence in the migrant's homeland. Together, these two models demonstrate a causal effect of deportations on subsequent demand for entry into the United States.

III. Data and Model: Cross-Country Analysis

We argue that violence in LAC countries increases the demand for entry into the United States. Using measures of legal migration, however, would underestimate demand for entry as legal migration is constrained by visa caps. In our cross-national LAC sample, we measure demand for entry using two different variables: applications for asylum which counts the number of individuals from country i requesting refugee status in the United States in year t and apprehension at the US border which measures the number of individuals captured while attempting to enter the United States outside the formal visa system.[3]

[3] Optimally we would use unauthorized entry as our measure of demand for entry. However, we cannot directly observe the number of unauthorized entrants into the US, our approach is

Figure 1 shows trends in legal migration (new arrivals), asylum requests, and apprehensions from LAC countries into the United States. In this figure, and in the empirical work that follows, we drop Mexico as a source country. Due to proximity, the demand for Mexicans to enter the US is often fifty to one hundred times that of other LAC countries; its inclusion biases the results for apprehensions, though not for asylum applications.

Figure 2 illustrates the relationship between the deportation of convicts, homicide rates and asylum requests for a sample of 20 countries from Latin America and the Caribbean in the year 2015. The left hand plot shows a correlation between homicide rates on the y axis and the inflow of deported convicts per capita. The right hand side shows a correlation between homicide rates and asylum requests per capita. All variables are in logs. The figure reveals that the deportation of convicts per capita is associated with more violence (higher homicide rates). At the same time, more violence is associated with more asylum requests. The empirical model below assesses more systematically the relationships between these variables and provides evidence of causal links from deportations to demand for entry via the export of violence.

[Figure 1: Deportations, Violence and Asylum Requests]

[Figure 2: Trends in Demand for Entry into the US]

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to proxy for the demand for unauthorized entry by using data on the number of people attempting to enter the US without inspection at air and sea ports of entry and at the Southern border of the US. We obtain data on the number of individuals apprehended by Customs and Border Patrol (CBP) each year, broken down by country of origin, and use this as our measure of the demand for unauthorized entry into the US. While imperfect, assuming "that the *apprehension rate* is constant, changes in apprehensions are a direct indicator of changes in illegal inflows" (US Department of Homeland Security 2017).

In the cross-country stetting, we estimate the following two equations using two-stage least squares:

$$(eq.1)\ homicide\ rates_{i,t-1} = \beta_1 deported\ convicts_{i,t-2} + \beta_2\ X_{i,t} + v_i + \tau_t + \varepsilon_{i,t}$$

$$(eq.2)\ demand\ for\ entry_{i,t} = \beta_3 \widehat{homicide}\ rates_{i,t-1} + \beta_4\ X_{i,t} + v_i + \tau_t + \varepsilon_{i,t}$$

The first step equation (eq. 1) builds on Ambrosius and Leblang (2018), where $homicide\ rates$ are homicides per 100 thousand persons in country i in year $t-1$. The explanatory variable $deported\ convicts$ in this equation is the (lagged) inflow of deported convicts per 100 thousand persons in $t-2$. Returnees—especially if they left their homelands due to civil conflict or economic crisis—are returning to an environment where economic, political, and social opportunities are likely limited. In some cases, gang membership provides those who return with a sense of community along with access to illicit economic opportunities (Dudley 2012). Moreover, those released from prison may have acquired additional criminal skills upon incarceration, for example by having developed connections to transnational organized crime (Farah and Phillips Lum 2013). Literature on parole in the United States criminal offenders who are incarcerated are more likely to commit crime once paroled than those who are sentenced to probation (e.g. Western 2006). We therefore expect a positive coefficient β_1. See Ambrosius and Leblang (2018) for a detailed discussion and additional empirical evidence including an instrumental variable for the deportation of convicts. v represents country fixed effects that control for time-constant differences between countries and τ are year fixed effects that capture common time trends. X refers to a vector of time-varying control variables, ε refers to the usual error terms, and β are the estimated coefficients.

The second step regression (eq. 2) explains the demand for entry—either asylum requests per 100 thousand or apprehensions per 100 thousand of the home country population—as a result of the lagged predicted homicide rates from (eq.1). As a system of equation, this means that deported convicts in $t-2$ affect homicide rates in $t-1$, and homicide rates in $t-1$ affect asylum requests in t.

In the framework of a simple OLS regression, coefficient β_3 (the effect of homicide rates on demand for entry) could be biased. For example, both the levels of violence and demand for entry may respond to other social, political or economic factors. If these other factors are unobserved, it may be difficult to correctly assign the demand for entry to levels of violence as distinct from other factors: Is demand for entry responding to violence or are other omitted factors causing both a rise in homicide rates and a demand for emigration? For example, social conflict may spur both a higher desire to emigrate and more violence, but is hard to capture in quantitative analysis. We respond to this challenge using an instrumental variable approach, exploiting exogenous variation in the inflow of deported convicts in (eq. 1) that permits isolating the causal effect of homicide rates on $demand\ for\ entry$ in (eq. 2).

The exclusion restriction requires that the instrumental variable ($deported\ convicts$) affects the variable of interest ($demand\ for\ entry$) only via the deportation of convicts. A threat to the validity of the instrument would consist if tougher immigration policies (more deportations from the US) also affect the decision to demand entry into the US. However, research suggests that migration decisions respond little or slowly to changes in immigration policies (e.g. Crawley and Hagen-Zanker 2018). Moreover, the common time trend τ captures changes in US immigration policies—such as changes in the size of the border patrol or the number of judges hearing asylum cases--that affect all countries. It also captures any US-specific pull factor such as changes in unemployment rates, wage rates, or educational opportunities that only vary over time. A relationship between demand for entry and deportation policies (if not captured by common time trends) would bias the estimated coefficient downward: Tougher immigration policies would deter migrants from attempting to enter the US. We could therefore interpret the instrumented coefficient as a lower bound.

Data on homicide rates comes from the United Nations Organization for Drugs and Crime. Data for asylum requests comes from the United Nations High Commission for Refugees and data for both apprehensions and the deportation of convicts comes from the Statistical Yearbooks of the US Department of Homeland Security.

The vector of control variables X includes the log of population size, average years of schooling, inflation rates as a measure of economic instability, the log of per capita GDP as a measure of economic development, annual GDP growth to capture recent economic

performance, the polity IV democracy scale ranging from most authoritarian (-10) to most democratic (10), the size of the bilateral migrant stock as a share of the sending country's population as way to capture the role that social networks play in driving bilateral migration, and the log of the country-specific wait time for an asylum hearing. See Annex 1 for sources and data descriptions of all variables.

IV. Evidence from Cross-Country Regressions

Building on prior research by Ambrosius and Leblang (2018), we first provide results from a first step regression where we explain homicide rates as a result of the inflow of convicts for a a panel of LAC countries observed annually from 2004, the earliest date when data on homicide rates is available, through 2015, the latest year when data is available. Columns 1 and 2 explain homicide rates as a result of the lagged inflow of deported convicts for different sets of variables. Addressing the possibility of common trends in homicide rates and deportation rates, we also show the effect of a change in deportation rates on homicide rates in Column 3 and 4. All tables from the cross-country regression control for country and time fixed effects, in addition to a battery of time-varying control variables.

The coefficient of 0.17 in Column 2 tells that an inflow of 10 deported convicts per 100 thousand in $t = 0$ increases expected homicide rates in $t = 1$ by almost 2 per 100 thousand.[4] In the alternative specifications 3 and 4, a change in the inflow of deported convicts by a magnitude of 10 convicts per 100 thousand increases the expected homicide rates by a magnitude of 3. Few of the control variables in the first step regression are statistically significant. Higher levels of schooling and stronger growth are associated with lower

[4] See Ambrosius and Leblang (2018) for additional tests, including the use of exogenous instrumental variables that exploit variation in migrants' exposure to state-level migration policies in the US. Comparing coefficients from the instrumented and the un-instrumented regression, Ambrosius and Leblang (2018) reject endogeneity of the deportation variable. We are therefore confident that the inflow of deported convict is indeed an exogenous variable. Differences in the size of the coefficient is mainly due to the fact that they use two-year intervals, while this research relies on annual periods.

homicide rates, confirming the expectation that weaker performances on social or economic indicators are associated with higher levels of violence.

Table 2 shows results from several placebo regressions. Using specifications that are otherwise identical to those in Table 1, the effect of the lagged inflow of non-convicts in Column 1 and 2 is not different from zero at conventional levels of statistical significance. The change in deportation rates for non-convicts has a negative sign in Column 3 and 4. Seemingly, the return of non-convicts may have positive effects on levels of crime, a finding that is in line with recent research by Bucheli et al. (2019) in the Mexican context. Columns 5 and 6 confirm that leading values of the inflow of convicts have no effect on homicide rates. As expected, causality runs from deportations to homicide, and not the other way round.

Tables 3 and 4 shows second step results for two different dependent variables. In table 3, we examine the effect of lagged homicide rates on the demand for asylum requests in the United States. Table 4 repeats the analysis using apprehensions of undocumented migrants at the Southern border as the dependent variable. In both tables, we show results for two alternative instrumental variables: The lagged inflow of convicts (Column 1 and 2) and changes in the inflow of convicts (Column 3 and 4), and for different sets of control variables, following specifications in Tables 1 and 2.

Consider first the effect of homicide rates on asylum applications in Table 3. Recall that both of these variables are measured per hundred thousand of country i's population and that all models include both country and year fixed effects. Hence, all time-constant differences v (institutional factors and other historical legacies as well as geographical variables including proximity to the US) are controlled for, as well as common time trends τ (in particular, changes in US immigration policies or other pull factors like employment situations that vary over time).

All coefficients for homicide rates are large and positive, meaning that violence is an important driver of demand for asylum. The local average treatment effect of 3.5 for the lagged homicide rate in Column 2 suggests that one additional homicide per 100 thousand in $t = 0$ leads to 3.5 additional asylum applications from this country per 100 thousand in $t = 1$, or to 1.8 additional asylum applications per capita in the more conservative specifications using the change in deportation rates rather than their levels as an instrument (Columns 3 and

4). Repeating the same analysis on apprehension rates in Table 4 confirms the effect of violence on demand for entry into the US: An additional homicide per 100,000 in $t = 0$ leads to more than 10 additional apprehensions per 100 thousand persons of home country population in $t = 1$ in Columns 2 and 4.

The effect of lagged homicide rates on demand for entry into the US is large and statistically strong, considering a sample of only 20 countries from LAC over eleven years. Using the inflow of deported convicts as an instrumental variable underlines that this effect is causal and not due to other omitted variables that may drive both emigration demand and levels of violence. We report results from the un-instrumented regression[5] in Annex 3.

What is the expected effect of the deportation of convicts on the demand for entry via the export of violence? The coefficient ≈ .17 in Column 5 of Table 2 predicts almost two additional homicides per capita in response to the inflow of 10 deported convicts per capita in the previous year. Hence, an inflow of 10 deported convicts per capita in $t = 0$ would generate more than three additional asylum requests per capita in the most conservative estimation of Column 4 ($1.7 * 1.8 \approx 3$) and more than 18 additional apprehensions per capita ($1.7 * 11 \approx 18$) in $t = 2$.

Few of the control variables in the second step results are statistically significant. This is likely due to the inclusion of country fixed effects and the fact that many of these variables vary only little over time in the period under study. Economic variables paint an ambivalent

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[5] Coefficients for the effect of homicide rates on the demand for entry in the un-instrumented regression have the same positive sign, but are smaller than in the instrumented regression. This is likely due to the fact that we measure a local average treatment effect LATE (i.e. the effect of treatment on treated) not an average treatment effect (ATE for the entire population, cp. Angrist and Pischke 2009). Since countries like Uruguay or Chile may not respond to variation in treatment assignment (i.e. our instrument), these could be considered "never-takers" in the language of instrumental variable regressions. Because we are not necessarily comparing the same sample of populations, we refrain from a direct comparison of coefficients in the instrumented and un-instrumented regression.

picture. Economic growth in countries of origin is associated with a stronger demand for entry, and the variable is statistically significant for the regression on asylum requests. Logged per capita GDP has a negative effect on apprehension rates and is statistically insignificant in the regression on asylum requests. More years of schooling are associated with higher apprehension rates. This supports the view from the literature that economic variables do not have a straightforward effect on the demand for migration. On the one hand, income differentials are often seen as a push factor for migration. On the other hand, due to migration costs and barriers, emigration rates tend to be higher for middle-income countries than for low-income countries (de Haas 2007).

The log of the asylum requests backlog shows a strong positive correlation with apprehension rates. This could signal that apprehension rates reflect a strong overall demand for entrance and that US authorities respond to this demand with delays in responding to asylum requests. It could also indicate that difficulties of accessing the US via asylum requests incentivizes migrants to search for alternative ways of entry outside the asylum system.

[Table 1: Effect of Lagged Deportation of Convicts on Homicide Rates. First Step Regression]

[Table 2: Deportations and Homicide Rates: Placebo Regressions]

[Table 3: Effect of Violence on Asylum Requests. Instrumented 2nd Step Results]

[Table 4: Effect of Violence on Apprehensions at the US Border. Instrumented 2nd Step Results]

V. Data and Model: Case Study Analysis

The aggregate cross-country perspective is complemented by a case study on El Salvador. Within the larger universe of country observations, El Salvador constitutes an extreme case: As can be seen in figure 1, El Salvador was the most violent country of the sample in 2015, with a homicide rate of 109 per 100 thousand. It was also the country with the highest inflow of convicts (113 per 100 thousand) and the highest number of asylum requests per capita (299 per 100 thousand) that same year.

The goal of the case study is twofold: First, the case study provides an additional test of causality: El Salvador lies on the regression line because it is a typical case, not because of spurious correlation. We do observe an export of violence from the US to El Salvador and we can show that it was this export of violence from the US that increased demand for emigration. Second, deported convicts may affect homicide rates and relate to criminal networks in many ways, depending on country contexts. The Salvadoran case highlights the export of gangs as one specific mechanism behind the relationships identified at the aggregate levels.

Large-scale emigration from El Salvador began with the outbreak of the civil war in 1982 between the US supported military regime and the guerilla movement. The signing of a peace accord in 1992 ended ten years of war that had left a death toll of 70,000 (Buergenthal 1994), a deeply divided country that has been marking the country's political landscape until recently, as well as a large Salvadoran Diaspora. In 2013, almost 2 million people of Salvadoran origin and 1.2 million Salvadoran-born - roughly a fifth of El Salvador's population of 6 million - resided in the US (Pew 2015). Remittances sent by migrants to their families at home contributed to 17% of Salvadoran GDP in 2016 (World Bank 2017) and have been an important factor in reducing poverty, improving education outcomes, providing liquidity to the financial sector, and financing the current account deficit, among others (Cox Edwards and Ureta 2003; Anzoategui, Demirgüç-Kunt, and Martínez Pería 2014; Gammage 2006). On the dark side of international migration lies the spread of gang-related violence across Central America.

The epidemic violence that drives high recent emigration rates from El Salvador has been attributed to the activity of two rivaling gangs: The 18th Street gang (M-18) and the *Mara*

Salvatrucha (MS-13). Both have their roots in US metropoles, principally in Los Angeles, once the "gang capital of the world" (Vigil 2010). Gangs control significant parts of the Salvadoran territory, where they inflict terror via homicides, extortions, sexual violence and by limiting the physical mobility of its inhabitants (see Wolf 2012; Savenije 2009; Cruz 2013 for detailed discussions of the phenomenon of Salvadoran gangs). One specific feature of Salvadoran migration is a highly concentrated Diaspora. Salvadoran migrant communities often settled in urban areas, with the largest communities developing in the poorer urban districts of Los Angeles, Washington D.C., New York and Houston (Pew 2015; MPI 2010) where they were socialized into an environment of high pre-existing violence as well as an existing gang culture. Partly as a response to the involvement of immigrant population in drug trafficking and other illegal gang activities, large-scale deportations of Central Americans began in the mid-1990s. Removals intensified with passage of the Illegal Immigrant Reform and Immigrant Responsibility Act (IIRIRA) in 1996 (cp. Seelke 2011). Following the IIRIA act in 1996, any foreigner who served a longer-than-a-year sentence became subject to removal from the US after completion of their prison term (Cruz 2013, 5). As a result, gang members were directly sent from US jails to El Salvador. Ranking second only after Mexico in absolute amounts, the US deported a total of 244 thousand Salvadorans over the 17-year period from 1997 to 2015. Of these, more than 90 thousand - roughly a third or 1.5% of the population stock of El Salvador in 2015 - had a criminal background. Social exclusion, lack of employment opportunities and weak state capacities posed fertile grounds for the extension of gangs in El Salvador. Within Salvadoran gangs, deportees took leading roles and recruited new gang members from the streets and in prisons (Demoscopía 2007; Ranum 2006). The case study relates the deportation of convicted gang members to recent emigration: First, by tracing the export of gangs from the US to El Salvador and then by studying the effect of gang-related violence on recent emigration.

In the same spirit as in the cross-country analysis, we estimate a system of two regressions. We do this for both individual-level survey data as well as for aggregate municipal level data. At the individual level, we estimate the following regressions for each person p:

$$(eq.3a)\ perception\ gangs\ _p = \beta_5 exposure\ US\ crime_m + \beta_6\ X_p + \ \varepsilon_p$$

$$(eq.4a)\ emigration\ intention_p = \beta_7 \widehat{perception}\ gangs_p + \beta_8\ X_p + \ \varepsilon_p$$

The dependent variable $perception\ gangs$ in the first step regression (eq. 3) refers, alternatively, to three variables that capture the presence of gangs in the community of respondent p. Respondents were asked whether their neighborhood was strongly affected by gangs, whether they had been victim of crime during the previous twelve months, and whether respondents feel safe in their neighborhood. Data comes from the Latin American Public Opinion Project (Lapop), a cross-sectional survey that is repeated biannually. We use a maximum of around 7,500 observations sampled out of 86 Salvadoran municipalities covering the years 2006 to 2016.

The first step regression (eq. 3a) faces the challenge that data on the inflow of deported convicts at the subnational level is not only hard to come by but is also subject to selection bias, because returnees choose their municipality of residence upon return. Instead, we trace the roots of gang-related violence by observing the contagion of violence along migration corridors. To this end, we use information on different migration patterns that historically emerged across different regions of El Salvador. Because existing networks reduce the costs of migration, these change only slowly over time (McKenzie and Rapoport 2007). In El Salvador, migration corridors can be identified up to the level of Salvadoran municipalities and US counties. Following Ambrosius (2018), migration corridors can then be used to construct the instrumental variable $exposure\ US\ crime$ that measures the average exposure of the migrant population from each municipality m to pre-existing levels of violent crime in US counties where they settled. Diaspora shares sum up to 100% for each Salvadoran municipality. This assures that it is not the size of the diaspora, but the average exposure of its migrant population to violent crime at destination that provides variation in crime exposure.

Violent crime includes murder & non-negligent manslaughter, legacy rape, revised rape, robbery, and aggravated assault (US Department of Justice, Federal Bureau of Investigation) and refers to the earliest available year, which is 1981 (i.e. before the arrival of Salvadoran migrants who fled the civil war starting in 1982). The rationale for this instrumental variable is that children of Salvadoran emigrants often grew up in high-crime environments where

they were socialized into existing gang cultures. When they were deported as young adults, they returned to their places of birth. Hence, municipalities whose migrants settled in high-crime environments should have registered a higher inflow of deported convicts and should suffer from a higher probability of gang presence today. Data on migration corridors is based on documents issued by the Salvadoran consulates in the US who register place of birth and current residence for all Salvadorans requesting documents. The cross-sectional data has been assembled by the North American Integration and Development (NAID) Center at the University of California Los Angeles[9]. The variable $exposure\ US\ crime$ has been normalized to the range [0,1] to facilitate interpretation. X refers to a vector of person-level socioeconomic and demographic controls, ε is the error term and β are the estimated coefficients.

The second step regression (eq. 4a) estimates migration intentions ($emigration\ intent$) as the result of the presence of gangs, using the predicted values $\widehat{perception\ gangs}$ from the first step regression.

For reasons similar to those mentioned in the cross-country analysis, an un-instrumented regression of gang-related violence on migration intentions could be biased if the presence of violence is also related to other unobserved social, economic or political factors that are also correlated with migration intentions. For example, poverty and a lack of social mobility may explain both migration intentions and violence. Instead, using migrants' exposure to pre-existing crime at US destinations as an instrumental variable isolates the causal effect of gang-related killings on emigration intensities.

Satisfaction of the exclusion restriction requires that the emergence of migration corridors does not affect the demand for emigration other than via the exposure to crime at destination and the deportation of convicts back to migrants' municipalities of origin. It is unlikely that migrants' exposure to US violent crime in 1981 affected emigration intensity between 2011 and 2015 other than via the transmission of crime along migration corridors (and the inflow of deported convicts along these corridors). Migration corridors emerged during the civil war in the 1980s, whereas gang-related violence is a relatively recent phenomenon that only

[9] See Hinojosa (2011). We are indebted to Jesse Acevedo for sharing the data.

appeared from the late 1990s onwards in response to the inflow of deported convicts, as qualitative research and journalistic investigations have emphasized (e.g. Arana 2005; Cruz 2013; Lineberger 2011; Rodgers, Muggah, and Stevenson 2009; Zuñiga Nuñez 2016).

As an alternative to individual-level observations, we also look at the presence of gangs and actual emigration rates at the aggregate municipal level, using cross-sectional data from 255 (out of 262) Salvadoran municipalities[10]. The two municipal-level regressions are as follows:

$$(eq.3b)\ gangs_m = \beta_9 exposure\ US\ crime_m + \beta_{10} X_m + \varepsilon_m$$
$$(eq.4b)\ emigration_m = \beta_{11} \widehat{gangs}_m + \beta_{12} X_m + \varepsilon_m$$

Here, the dependent variable $gangs$ in the first step regression (eq. 3b) refers to gang-related violence in municipality m. At the level of municipalities, the presence of gangs can't be observed directly. We therefore follow Ambrosius (2018) and Kalsi (2018) in constructing an estimate of gang-related killings, that serves as a proxy for the presence of gangs. In march 2012, the government brokered a truce between rivaling gangs in prison, in exchange for privileges granted to incarcerated gang leaders. The truce was initially negotiated secretly but was later uncovered by the newspaper elfaro.net (Ó. Martínez et al. 2012). The truce brought average homicide rates considerably down to around 35 per 100,000 people between March 2012 and March 2013, halving the average rate of around 70 during the years before. Although ineffective in the long term – homicide rates jumped back to levels higher than before once the truce was weakened and faded out after mid- 2013 (Valencia 2015) – the policy experiment allows approximating the spatial distribution of gangs in El Salvador. In some municipalities, homicide rates were hardly affected, whereas others registered a drastic decline. The variable $gangs$ measures how much homicide rates dropped during march 2012

[10] Seven municipalities are dropped due to lack of data. Six Salvadoran municipalities have repeated names and could not be clearly assigned in the data. One municipality reported no data on migrants.

and march 2013, assuming that a larger drop in violence during the truce reflects a stronger presence of gangs.

The second step regression (eq. 4b) estimates actual out-migration rates ($emigration$) as the result of the presence of gangs, using the predicted values $\widehat{gangs}$ from the first step regression. Although outmigration rates are not directly measured at the level of municipalities, it is possible to construct an indirect measure of emigration intensities from the *Encuesta sobre Migración en la Frontera*, a survey filed by the Mexican *Colegio de la Frontera Norte* at the Northern Mexican border (EMIF-Norte) and at the Southern Mexican border to Guatemala (EMIF-Sur). Surveys are asked to deportees who have been returned either from the US to Mexico or from Mexico to Central America. For the years 2011 to 2015, questions on the previous residence of respondents allows constructing a measure of out-migration rates at the municipality level. This data comes with a caveat. Samples have not been designed to estimate total migrant population and the data used only captures the subpopulation of emigrants who have been caught on their emigration intents and are being returned to their countries of origin. Hence, they should not be interpreted as a precise estimate of emigration rates. Therefore, rather than calculating emigration rates, we use this data to create an indicator of emigration intensity at the level of Salvadoran municipalities on a scale from 0 to 100, with 100 being the highest rates of out-migration. The distribution of emigration intensities is strongly skewed towards zero, with several municipalities reporting very large rates of out-migration.

In order to control for eventual self-selection of migrants into more violent destinations (e.g. the possibility that some municipalities posed a more fertile terrain for the spread of gangs and these factors also explained destination choice), control variables in X include a large number of social and demographic pre-treatment characteristics from the 1992 census (cp. Ambrosius 2018). The list of control variables includes average household size, population size (logged in the regression), and population density as controls for differences in demographic conditions. A measure on the share of households with at least one member above the age of 15 who does not know how to read or write is included as a measure of levels of human capital. A composite indicator of average housing quality on a scale between 0 and 1 captures differences in poverty levels, where higher values indicate worse housing quality. The indicator on housing quality gives equal weights to four binary housing

measures, following definitions used by the National Statistics Office Digestyc (2015). In addition, regressions control for the share of households in which children under the age of 15 were working. Two variables are related to levels of migration and remittances: The share of households in a municipality that reported emigrants, and the share of households who reported international remittances from migrants abroad. Levels of historical data on homicides at the municipal level are hard to get. Carcach (2008) made an effort of estimating municipal level homicide rates for earlier decades by evaluating homicides reported in the printing press. Although these estimates are biased towards urban municipalities with better press coverage, the data functions as a rough proxy for historical differences in violence across regions in El Salvador, controlling for longer historical trends and patterns. Logged historical homicide rates measure the average number of homicides per 100,000 as reported in the years 1965, 1975 and 1995. In addition, alternative specifications include variables from later periods. These include an average of per capita value added tax paid in each municipality over the periods 2001 to 2012, the share of household with emigrants, the share of households receiving remittances as reported in the 2007 census, as well as the 2005 poverty head count at the municipal level. Again, ε are the error terms.

Indicators for low-frequency events such as homicides are more volatile and estimates therefore less precise for small municipalities, with a population size of less than several thousands in some cases. Therefore, municipal-level regressions include precision weights that give lower importance to less populated municipalities in the regressions.

See Annex 2 and 3 for data description, summary statistics, and sources for the individual and municipal level data. A more detailed discussion of the first-step regression using municipal-level data with additional tests and alternative model specifications can be found in Ambrosius (2018).

VI. Evidence from El Salvador

Tables 5 and 6 summarize results from the person-level analysis. Table 5 refers to first-step coefficients from a logit regression on binary outcome variables, explaining individual perceptions of violence and victimization as a result of municipalities' exposure to US violence. Each of the three indicators of violence at the person-level are explained with and

without the inclusion of additional person-level controls. The instrument of an exposure to US crime along migration corridors is measured at the municipality level. Second step results in Table 6 explain migration intentions, using predicted values from the first step regression. Following advice by Angrist and Pischke (2009, 191), we chose the approach of lower complexity and opt for ordinary least square regressions on binary endogenous variables to avoid issues of "forbidden regressions" (Wooldridge 2002, 236).

Table 5 indicates a strong effect of migrants' exposure to US violence in the early 1980s on current person-level perceptions of violence in El Salvador (presence of gangs, the probability of having been victim of crime, and a sensation of insecurity in their neighborhood). Since exposure to crime is a normalized variable, the coefficient can be interpreted as the expected drop in homicide rates in the most exposed municipality (migrant corridors towards the most violent destinations in the US) compared to the least exposed (migrant corridors towards the least violent destinations). In order to express logistic coefficients as marginal effects, we can fix predictors at their mean and take the year 2008 as a baseline. In terms of marginal effects, the logistic coefficient for exposure to US crime in Column 2, for example, corresponds to a 10% higher probability that respondents identified a strong presence of gangs in their neighborhood when living in those municipalities of the sample that were most exposed to violence at destination, compared to the least exposed municipality. The instrument accounts for a considerable part of the variation in responses, considering that an average of 17% of respondents claimed to live in a neighborhood strongly affected by gangs.

The principal mechanism behind the coefficient for migrants' exposure to US crime is the deportation of convicts. Although we can't observe deportations to municipality of origin directly, this assumption is supported by qualitative evidence and journalistic accounts (e.g. Arana 2005; Cruz 2013; Lineberger 2011; Rodgers, Muggah, and Stevenson 2009; Zuñiga Nuñez 2016) as well as by statistical analysis (Kalsi 2018; Sviatchi 2008; Ambrosius 2018). Ambrosius (2018) observes that the inflow of deported convicts increased homicide rates in municipalities with migrant corridors around violent destinations, whereas the inflow of non-convicts did not. Here, we rely on cross-sectional data in the first step regressions because we lack time variation in emigration intensity, the dependent variable in the second step regression. With respect to person-level control variables, we see that more economic difficulties ("income not enough") is associated with a more pessimistic assessment of

violence. On average, younger respondents were victims of violence less often and saw gangs as less of a concern. Those married (and those with children) feel less safe, but are victims of crime less frequently.

Second step results in Table 6 reveal that the contagion of gang-related violence is a strong and robust predictor of migration intentions in all specifications. Columns 1 and 2 use the municipality-level predictor of gang-related killings as a predictor of migration intentions. Columns 3 to 8 rely on the person-level assessments of violence as predicted in Table 5. The latter permits taking into account within-municipality differences in violence, i.e. the possibility that not all neighborhoods and not all individuals within a municipality are equally affected by violence. All indicators are large and statistically significant. Since we use OLS regressions, coefficients can be interpreted as marginal effects. That is, the presence of gangs increases migration intentions by more than 40%, having a victim of crime in the household increases migration intentions by 25% and feeling unsafe increases migration intentions by more than 60%. These results are based on averages over a ten-year period (2006 to 2016) and a sample of 86 municipalities. Weak instrument F-test are above convention thresholds (Stock and Yogo 2002) in all specifications[11].

Migration intentions do not necessarily translate into actual emigration. We therefore also evaluate actual out-migration as a result of gang-related violence at the level of 255 municipalities. Table 7 shows results from first and second step regression at the municipal level. Columns 1 and 2 report first step regression results. These estimate the effect of migrants' exposure to violent crime at destination on gang-related killings, following Ambrosius (2018). Column 1 includes a set of pre-treatment control variables based on the 1992 census as well as historical homicide rates as reported in the printing press. Column 2 adds additional controls from later periods. In addition to fixed effects for the 14 departments of El Salvador, all regressions use precision weights that take account of lower imprecision of the estimate for small municipalities. Similar to person-level results in Table 5, first-step results show that migrants' exposure to pre-existing violent crime at their destination increases the expected presence of gangs, measured as a drop in homicide rates during the

[11] For comparison, Annex 5 provides un-instrumented logit regression results.

temporary truce between rivaling gangs: When migrants settled in high crime environments in the US, these contaminated municipalities of origin. It is striking that few pre-treatment control variables based on the 1992 census predict well the contemporary presence of gangs and that historical rates of violence are negatively correlated with recent gang-related killings. Partly, the negative sign should reflect an urban bias in the indicator based on crime reported in the printing press with better coverage of urban areas. With that limitation in mind, available data provides no evidence that historical rates of violence predict current rates of gang-related killings. The one variable that is statistically significant and large in all regression is the exposure to violence at destination: Knowing where Salvadoran migrants went during the civil war is a reliable predictor for the contemporary presence of gangs.

Columns 3 and 4 show second step results of gang-related killings on an indicator of emigration intensity, based on the first step regressions from Columns 1 and 2. In line with the estimates of person-level migration intentions in Table 6, gang-related killings have a strong and statistically significant effect on actual emigration.[12] It is noteworthy that violence as a driver of emigration dominates other social and demographic predictors: Poverty rates, income levels approximated by value added taxes per capita, as well as prior migration rates are all statistically insignificant. Population size is the only other variable that is statistically significant, with stronger out-migration rates observed in smaller municipalities. As would be expected from migration network theories, stronger migration networks measured as the share of households with migrants in 2007 is associated with larger rates of out-migration (whereas the inflow of remittances in 2007 has the opposite sign).

What is the magnitude of the estimated effect? The independent variable on gang-related activities measures the drop in homicide rates during the truce. Hence, a coefficient of ≈ .3 for gang-related killings means that a drop in homicide rates of around 50 per 100 thousand during the truce – indicative of municipalities with a strong presence of gangs - would increase the expected value for emigration intensity by a value of 50*.3 =15. The indicator of

[12] With only 255 observations, the first-step F-statistics is below the Stock-Yogo thresholds (Stock and Yogo 2002). We therefore also report Anderson-Rubin confidence intervals for weak instrument robust interference in Table 7.

migration intensity ranges from zero to 100, and is strongly skewed towards zero with a median value of 1.7. Only 25% of all municipality have a value above 2.9 and only 12% have a value above 5. Hence, the presence of gangs pushes municipalities expected emigration intensity into the upper quantile of municipalities.

These observations are in line with our expectations. After the truce broke in 2013, gang-related killings sky-rocketed and reached the highest ever registered level in El Salvador in 2015. This overlaps with the period in which we observe strong levels of out-migration from gang-ridden municipalities (2011 to 2015), an observation that is in line with Clemens (2017) and Sviatchi (2008) using different approaches (and no instrumental variables), as well as with aggregate trends in asylum requests by Salvadorans. The instrumental variable regression assures that the observed effect is causal and not biased by unobserved omitted variables or other sources of endogeneity. Our two-step approach also reveals a causal link from the contagion of violence in the US to emigration via an increase in homicides, confirming the same pattern we observed at the aggregate cross-country level[13].

[Table 5: Effect of Migrants' Exposure to Violence in the United States on Gangs and Violence in El Salvador (Logit)]

[Table 6: Effect of Gangs and Violence on Migration Intentions, by Municipality. Instrumented Second Step Results (OLS)]

[13] Annex 6 provides results from the un-instrumented regression of gang-related killings on emigration intensity.

[Table 7: Effect of Gang-Related Killings on Emigration Intensity in Salvadoran Municipalities: Two-Stage Least Squares]

VII. Conclusion

Intense debates have been led on whether migrants that have tellingly been stigmatized as "bad hombres" by president Donald Trump bring violence to their host countries. As a change in perspective, our intention was to draw attention to a channel that has received little attention in policy and academia so far: The effect of immigration policies – notably, the deportation of convicts – on levels of violence and, in consequence, on emigration intentions in migrants' countries of origin.

This paper has two main findings: First, violence generates a strong demand for emigration. Using the inflow of deported convicts as an exogenous instrument, we are able to obtain a causal estimate for the effect of violence on the demand for emigration. Second, the deportation of convicts from the US generates a vicious migration cycle, by exporting violence to migrants' countries of origin. To our knowledge, this is the first paper that relates the demand for emigration to the export of violence in a two-step approach.

Both findings are substantiated by complementary evidence both from cross-country regressions and subnational data from the case of El Salvador. The cross-country analysis reveals that violence has a systematic average effect on demand for entry measured via asylum requests and apprehensions per capita. This pattern holds beyond the case of Central American refugees that have made headlines recently. The case study on El Salvador – an extreme case within the larger universe of country observations - provides additional evidence for the pattern we observed at the aggregate level and illustrates the export of gangs to Central America as one specific mechanisms of how the vicious migration cycle works. Using the contagion of gangs along migration corridors as an instrument, we show that the presence of gangs has a strong effect on levels of out-migration in Salvadoran municipalities.

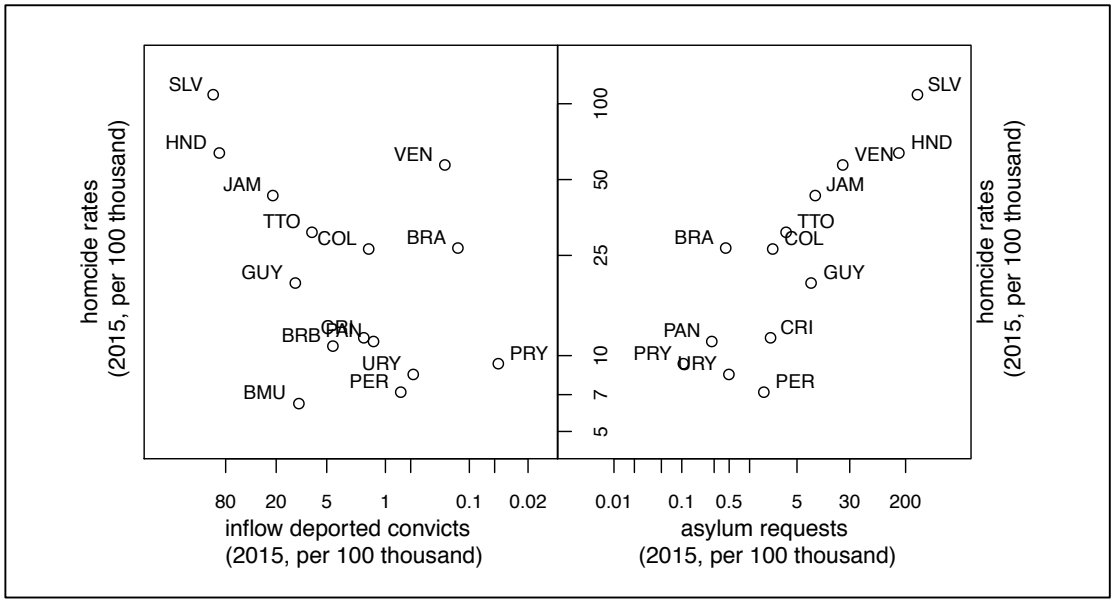
Our research bears important policy implications. First, the deportation of convicts has huge social, human and economic costs in migrants' countries of origin, largely borne by innocent people. US deportation policies feed violence in countries who often lack adequate social and

institutional mechanism to control the spread of violence. The deportation of convicts also falls on fertile grounds where deportees face strong social stigmas and limited economic opportunities. Depending on country contexts, the way how deported felons relate to criminal networks at home can take different forms. A danger they all share is that they nourish and eventually trans-nationalize criminal activities and networks. Second, these policies may easily turn into a boomerang that creates new migration cycles. Hence, as a policy intended to disincentive new migration, it is self-defeating.

Our findings are based on the US as a source of deportation as well as a main destination for migrants. Even so, the results should be read as a warning against the deportation of convicts (including those considered potential terrorist threats) in other countries and contexts. An application and test of these mechanisms in other contexts is left for future research.

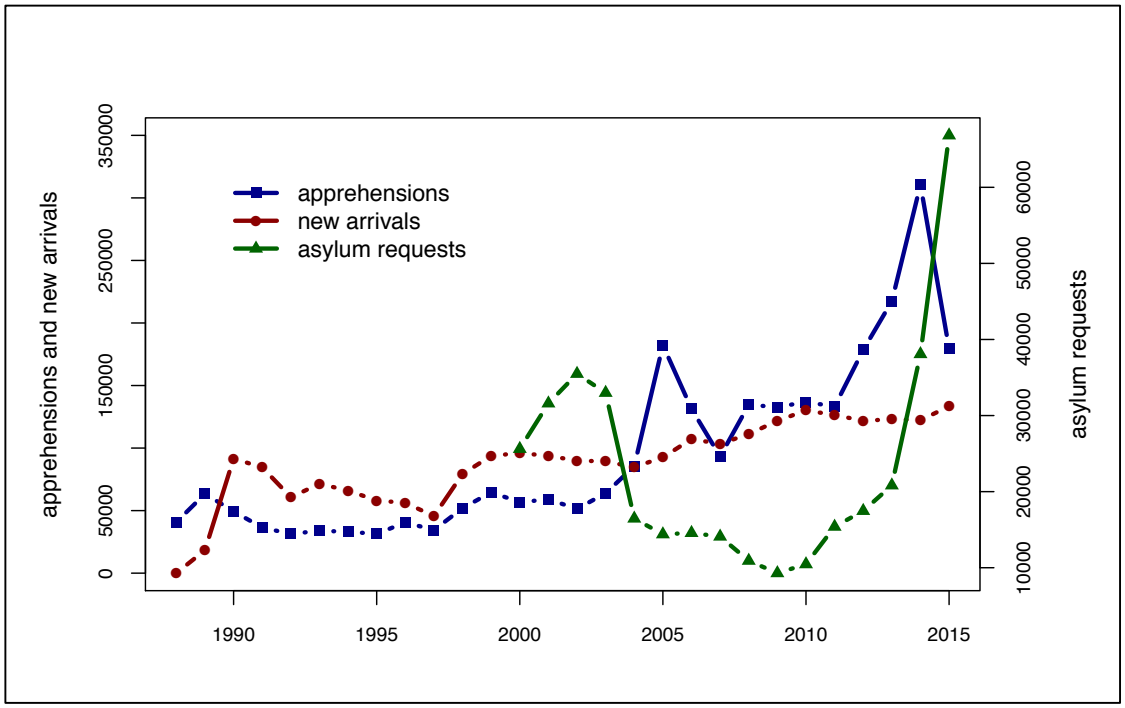
VIII. Tables and Figures

Figure 1: Deportations, Violence and Asylum Requests



The figure plots logged homicide rates against logged asylum requests (right) and against the logged inflow of deported convicts (left) in 2015, for a sample of 20 Latin American and Caribbean countries excluding Mexico. Source: Homicide rates calculated from the United Nations Office of Drugs and Crime; Deportation rates calculated from the Department of Homeland Security; Asylum Requests calculated from the United Nations High Commission for Refugees.

Figure 2: Trends in Demand for Entry into the US



The figure shows annual trends of three immigration indicators from Latin American and Caribbean countries, excluding Mexico, for the period 1988 to 2015. Apprehensions are the number of individuals captured at the US border while attempting to enter the United States outside the formal immigration system. New arrivals are annual new legal admissions (green cards or issuance of permanent residency visas). Data for asylum requests is reported for the years after 2000 only. Source: Apprehensions and new arrivals calculated from the Department of Homeland Security; Asylum requests calculated from the United Nations High Commission for Refugees.

Table 1: Effect of Lagged Deportation of Convicts on Homicide Rates. First Step Regression

	Homicide Rates			
	(1)	(2)	(3)	(4)
Lagged Dep. Rate (Convict)	0.14**	0.17***		
	(2.08)	(3.04)		
Change Dep. Rate (Convict)			0.3***	0.29***
			(3.5)	(3.66)
Avg Yrs Schooling		-3.1*		-3.3*
		(-1.9)		(-1.68)
Corruption Score		-1.9		-2.4
		(-1.2)		(-1.18)
Democracy Score		-0.29		0.11
		(-0.76)		(0.21)
Economic Growth	-0.33***	-0.31**	-0.38***	-0.34*
	(-2.7)	(-1.97)	(-2.72)	(-1.88)
ln(Per Capita GDP)		6.9		-3.5
		(0.88)		(-0.26)
Inflation		0.14		0.17
		(0.85)		(1.25)
ln(Asylum Hearing Backlog)	3.5	2.6	2.5	1.9
	(0.98)	(0.71)	(0.84)	(0.58)
ln(Population)	4.1	-16	39	33
	(0.11)	(-0.44)	(0.66)	(0.61)
Migrant Stock	-1.10E-03	-9.00E-04	6.30E-04	3.50E-04
	(-1.32)	(-0.83)	(0.47)	(0.27)
R^2	0.23	0.3	0.2	0.24
F-Stat	3.52	3.6	2.84	2.71
Observations	221	219	219	217

Heteroscedasticity robust t-values in parenthesis. All results are based on ordinary least squares regressions with country and year fixed effects, for 20 countries from Latin America and the Caribbean over the period 2004 to 2015. Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 2: Deportations and Homicide Rates: Placebo Regressions

	Homicide Rates					
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged Dep. Rate (Non-Convict)	0.0054	0.013				
	(0.17)	(0.36)				
Change Dep. Rate (Non-Convict)			-0.12**	-0.12***		
			(-2.53)	(-2.65)		
Chng. Dep. Rate (Convict, Leading Value)					-0.046	-0.041
					(-1.33)	(-0.99)
Control variables	reduced set	full set	reduced set	full set	reduced set	full set
R^2	0.14	0.19	0.24	0.28	0.17	0.21
F-Stat	1.88	1.94	3.59	3.34	2.39	2.29
Observations	221	219	219	217	221	219

Heteroscedasticity robust t-values in parenthesis. All results are based on ordinary least squares regressions with country and year fixed effects, for 20 countries from Latin America and the Caribbean over the period 2004 to 2015. The set of control variables are as in Table 1. Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 3: Effect of Violence on Asylum Requests. Instrumented 2nd Step Results

	Asylum Application Rate			
	(1)	(2)	(3)	(4)
Instrument	Lagged Dep. Rate (Convicts)		Change Dep. Rate (Convicts)	
Lagged Homicide Rate	5.9*	3.5***	1.8**	1.8***
	(1.69)	(3.74)	(2.29)	(2.89)
Avg Yrs Schooling		9.4*		4.4
		(1.82)		(1.41)
Corruption Score		8		4
		(1.45)		(1.14)
Democracy Score		0.95		1.1
		(0.55)		(1.01)
Economic Growth	2**	1.2**	0.61	0.65
	(2.33)	(2.33)	(1.46)	(1.34)
ln(Per Capita GDP)		-41		-47**
		(-1.21)		(-2.13)
Inflation		-0.54		-0.27
		(-0.9)		(-0.84)
ln(Asylum Hearing Backlog)	-42	-21	-25**	-15**
	(-1.12)	(-1.56)	(-2.21)	(-2.49)
ln(Population)	-130	72	120	170**
	(-0.55)	(0.6)	(1.32)	(2.15)
Migrant Stock	0.01**	3.10E-03	0.014*	0.0045***
	(2.01)	(1.03)	(1.77)	(2.87)
Weak instrument F-Stat	22.58	28.78	16.73	11.88
Observations	221	219	219	217

Heteroscedasticity robust t-values in parenthesis. All results are based on ordinary least squares regressions with country and year fixed effects, for 20 countries from Latin America and the Caribbean over the period 2004 to 2015. Two-year lags of deportation of convicts are used as an instrument for one-year lag of homicide rates (see Table 2). Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 4: Effect of Violence on Apprehensions at the US Border. Instrumented 2nd Step Results

	Apprehensions Rate			
	(1)	(2)	(3)	(4)
Instrument	Lagged Dep. Rate (Convicts)		Change Dep. Rate (Convict)	
Lagged Homicide Rate	20	13**	8.5**	11***
	(1.62)	(2.55)	(2.2)	(3.86)
Avg Yrs Schooling		36*		28
		(1.81)		(1.59)
Corruption Score		16		9.3
		(0.58)		(0.35)
Democracy Score		8.1		8.4
		(1.16)		(1.26)
Economic Growth	4.9	2.9	0.89	2
	(1.36)	(1.39)	(0.46)	(1.14)
ln(Per Capita GDP)		-220*		-230*
		(-1.74)		(-1.8)
Inflation		-1.7		-1.3
		(-0.59)		(-0.58)
ln(Asylum Hearing Backlog)	-260**	-210***	-210***	-200***
	(-2.17)	(-3.6)	(-3.05)	(-3.46)
ln(Population)	-200	380	550	530
	(-0.2)	(0.59)	(0.9)	(0.8)
Migrant Stock	0.033**	1.10E-02	0.045**	1.40E-02
	(2.28)	(0.66)	(2.38)	(1.12)
Weak instrument F-Stat	22.58	28.78	11.88	11.88
Observations	221	219	219	217

Heteroscedasticity robust t-values in parenthesis. All results are based on ordinary least squares regressions with country and year fixed effects, for 20 countries from Latin America and the Caribbean over the period 2004 to 2015. Two-year lags of deportation of convicts are used as an instrument for one-year lag of homicide rates (see Table 2). Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 5: Effect of Migrants' Exposure to Violence in the United States on Gangs and Violence in El Salvador (Logit)

	Neighborhood Strongly Affected by Gangs?		Victim of Crime Last 12 Months?		Feels Unsafe?	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-3.2***	-3.1***	-2.3***	-1.3***	-0.77***	-1.3***
	[0.17]	[0.21]	[0.16]	[0.21]	[0.11]	[0.15]
Exposure US Violence	2.3***	2.4***	2.7***	2.8***	0.74***	0.9***
	[0.34]	[0.34]	[0.35]	[0.36]	[0.24]	[0.24]
Age		-0.0086***		-0.024***		-0.00062
		[0.0023]		[0.0026]		[0.0017]
Children		-0.12		-0.16*		0.013
		[0.079]		[0.083]		[0.06]
Income Not Enough		0.26***		0.085		0.48***
		[0.069]		[0.07]		[0.052]
Male		0.053		0.08		0.017
		[0.068]		[0.071]		[0.052]
Married		0.022		-0.4***		0.19***
		[0.064]		[0.067]		[0.049]
Observations	7459	7356	6010	5912	7520	7416
# Municipalities	86	86	86	86	86	86
Years covered	2006-2016	2006-2016	2010-2016	2010-2016	2006-2016	2006-2016
AIC	6678	6563	6065	5851	10203	9953

Logistic regression coefficients, with standard errors in brackets. All regressions control for LAPOP survey years (held every two years). Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 6: Effect of Gangs and Violence on Migration Intentions. Instrumented Second Step Results (OLS)

	Intention to Migrate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.18*** [0.038]	0.37*** [0.047]	0.21*** [0.019]	0.39*** [0.032]	0.19*** [0.031]	0.3*** [0.054]	-0.044 [0.12]	0.26*** [0.08]
Gang-Related Killings (municipal)	0.0018** [9e-04]	0.0019* [0.00096]						
Affected by Gangs			0.44*** [0.16]	0.44*** [0.16]				
Victim Crime					0.25** [0.12]	0.26** [0.12]		
Feels Unsafe							0.76*** [0.3]	0.66*** [0.24]
Age		-0.0054*** [0.00032]		-0.0049*** [0.00041]		-0.0041*** [0.00052]		-0.0053*** [0.00045]
Children		-0.001 [0.011]		0.0058 [0.014]		0.0098 [0.012]		-0.0028 [0.014]
Income Not Enough		0.054*** [0.009]		0.037*** [0.011]		0.054*** [0.01]		-0.022 [0.028]
Male		0.068*** [0.01]		0.065*** [0.011]		0.059*** [0.01]		0.066*** [0.013]
Married		-0.095*** [0.011]		-0.096*** [0.0095]		-0.061*** [0.014]		-0.12*** [0.017]
Observations	7508	7401	7418	7315	5971	5874	7476	7373
# Municipalities	86	86	86	86	86	86	86	86
Years covered	2006-2016	2006-2016	2006-2016	2006-2016	2010-2016	2010-2016	2006-2016	2006-2016
Weak instr. F-test	536.88	535.03	67.95	72.14	73.75	78.05	10.03	14.34

Second Step results are using migrants' exposure to pre-existing violent crime at destination as an instrument for indicators of violence and gang presence. Survey data from LAPOP. Heteroscedasticity robust standard errors clustered at the municipal level in parenthesis. Results are based on ordinary least squares regressions. Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Table 7: Effect of Gang-Related Killings on Emigration Intensity in Salvadoran Municipalities: Two-Stage Least Squares

	First Stage Gang-Related Killings		Second Stage Emigration Intensity	
	(1)	(2)	(3)	(4)
Exposure US Violence	130.0**	113.4***		
	(51.56)	(43.29)		
Gang-Related Killings			0.302***	0.301***
			(0.0867)	(0.0965)
Ln(Hist Homicide Rate)	-6.213**	-5.952**	-1.318	-1.273
	(2.494)	(2.461)	(0.938)	(0.887)
Housing Quality	-107.7	-76.23	-18.46	-9.265
	(68.93)	(64.93)	(39.32)	(42.50)
Migration Rate 1992	-206.1	-228.4*	-73.70	-80.78
	(125.2)	(118.5)	(55.03)	(55.29)
Remittances 1992	191.3	288.5**	45.00	49.65
	(119.8)	(117.7)	(44.65)	(48.19)
Ln(Population 1992)	-24.92***	-20.61***	-4.462	-4.091
	(7.649)	(6.514)	(3.073)	(2.939)
Population Density 1992	4.367	3.658	-4.061	-4.015
	(5.792)	(5.570)	(2.805)	(2.658)
Analphabetism 1992	90.60	120.8	-56.92	-56.23
	(83.21)	(91.82)	(41.64)	(44.50)
Child Work 1992	146.2	157.2	-9.181	-11.64
	(133.5)	(127.5)	(32.35)	(33.59)
Household Size 1992	-18.68	-24.20*	8.153	7.311
	(14.64)	(14.03)	(5.401)	(5.496)
Migration Rate 2007		307.3**		56.12
		(134.8)		(58.43)
Remittances 2007		-139.5**		-8.110
		(63.41)		(29.96)
VAT Per Capita 2000s		-3.25e-04		-0.00163
		(6.56e-03)		(0.00265)
Poverty Rate 2007		-120.4		-18.39
		(94.48)		(34.06)
Constant	307.9***	301.3***	30.80	30.87
	(110.7)	(111.4)	(49.68)	(49.93)
First stage F-Test			7.81	6.83
Anderson-Rubin 90% CI for Gang-Related Killings			[0.03, 0.44]	[0.07, 0.50]
Observations	251	251	251	251

Robust standard errors clustered by department in parentheses. All models include fixed effects for 14 departments and all models include precision weights for population size.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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X. Annex

Annex 1: Data Description and Sources: Cross-Country

Variable	Description	Mean [s.d.]
Apprehensions	Number of individuals captured at the US border while attempting to enter outside the formal immigration system per 100,000 of home country population [a)]	87.24 [182.76]
Asylum Requests	Number of individuals requesting asylum status in the United States per 100,000 of home country population [b)]	8.45 [18.21]
Homicide Rates	Homicides per 100,000, according to data of the United Nations Organization for Drugs and Crime (UNODC), covering the years 2014 to 2015 [c)]	25.50 [19.60]
Deportation Rates (convicts)	Annual inflow of deported persons from the US with a penal record, per 100,000 of home country population [d)]	20.28 [34.89]
Corruption Score	A composite measure of corruption within the political system considered a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process. Ranges between 0 (most corrupt) and 6 (least corrupt) [e)]	2.23 [0.80]
GDP growth	Per capita annual GDP growth [f)]	4.19 [3.35]
Ln(GDP pc)	Log of per capita GDP in constant 2010 USD [f)]	8.52 [0.76]
Migrant Stock	Number of individuals gaining legal entry into the United States via issuance of a green card or visa [d)]	7,128 [9,294]
Ln(Asylum Hearing Backlog)	Log of the average wait time (in days) before decision is made about applications for asylum from each sending country [g)]	6.10 [0.31]
Inflation	Annual change in the consumer price index [f)]	6.82 [6.22]
Democracy Score	Regime type indicator, ranging from most authoritarian (-10) to most democratic (+10) [h)]	7.78 [2.35]
Avg. Yrs. Schooling	Average years of schooling of the adult population [i)]	8.05 [1.51]
Ln(Population Size)	Log of population size [f)]	15.93 [1.20]

Mean values and standard deviations in brackets for 220 observations, for a sample of 20 Latin American and Caribbean Countries (excluding Mexico) over the period 2004 to 2015. Sources: [a)] Department of Homeland Security's Annual Report (URL: https://www.cbp.gov/newsroom/media-resources/stats?title=Border+Patrol); [b)] United Nations High Commission on Refugees (URL: http://popstats.unhcr.org/en/asylum_seekers); [c)] United Nations Organization on Drugs and Crime (UNODC). Data series on homicide and other criminal offences (URL: http://www.unodc.org/unodc/en/data-and-analysis/statistics.html); [d)] US Department of Homeland Security. Yearbook of Immigration Statistics. Various Years (URL: https://www.dhs.gov/immigration-statistics/yearbook); [e)] International Country Risk Guide. The PRS Group (URL: https://www.prsgroup.com/); [f)] World Development Indicators Online Database (URL: wdi.worldbank.org); [g)] Transactional Records Access Clearing House (URL: http://trac.syr.edu/im migration/); [h)] Integrated Network for Societal Conflict Research (INSCR), Polity IV Project, Political Regime Characteristics and Transitions, 1800-2016; [i)] Barro and Lee (2001)

Annex 2: Data Description and Sources: El Salvador, Person Level

Variable	Description	Mean [s.d.]
Migration Intentions	Binary indicator whether respondent has intention to migrate to a different country over the next three years	0.38 [0.49]
Affected by Gangs	Binary indicator whether respondent considerd that her or his neighborhood was strongly affected by gangs	0.17 [0.37]
Victim Crime	Binary indicator whether the respondent has been a victim of crime (robbery, theft, aggression, fraud, extortion, threat or any other act of delinquency) during the previous 12 months	0.21 [0.41]
Feels Unsafe	Binary indicator whether respondent feels very or somewhat unsafe in her or his neighborhood	0.43 [0.50]
Age	Age of respondent	39 [16.4]
Children	Binary indicator whether respondent has own children	0.43 [0.50]
Income Not Enough	Binary indicator whether respondent says that household revenue is not enough	0.65 [0.48]
Married	Binary indicator whether respondent is married	0.46 [0.50]
Male	Binary indicator whether respondent is male	0.52 [0.50]

Mean values and standard deviations in brackets for the survey years 2006, 2008, 2010, 2012, 2014 and 2016, for up to 10,976 observations sampled from 86 Salvadoran municipalities. The question on victimization was not asked in the survey rounds 2006 and 2008. All data comes from the Latin American Public Opinion Project LAPOP (URL: www.LapopSurveys.org).

Annex 3: Data Description and Sources: El Salvador, Municipal Level

Variable	Description	Mean [s.d.]
Gang-Related Killings	Difference in homicide rates during the truce between rivaling gangs (03/2012 to 03/2013) and homicide rates before and after the truce (01/2009 to 12/2015) [a)]	33 [32]
Exposure US Violence	Average exposure of migrants from municipality j to crime rates at US destination county i, normalized to the range [0,1]. For each Salvadoran municipality m, the share of its Diaspora D in each destination county k is multiplied with crime rates C in destination county k in the year 1981, and summed up across all destinations K using the formula $exposure\ US\ violence_m = \sum_{k=1}^{K} C_k\, D_{k,m}$. Crime rates are defined as violent crime known to police, including murder & non-negligent manslaughter, legacy rape, revised rape, robbery, and aggravated assault. Crime data at the US county level refers to 1981. [b) c)]	0.38 [0.13]
Emigration Intensity	Indicator on emigration intensity ranging from zero to 100, with 100 indicating the strongest levels of out-migration. Based on surveys asked to adult migrants who are returned from the US to Mexico or from Mexico to Guatemala. The indicator is calculated from a question on previous residence of deported migrants over the years 2011 to 2015, and weighted by population size of municipalities [d)]	3.50 [8.61]
Ln(Hist. Homicide Rates)	Log of homicide rates per 100 thousand as reported in the printing press, as an average over the years 1965, 1975 and 1995 [e)]	1.44 [1.52]
Analphabetism 1992	Share of households in 1992 in which at least one person at the age of 15 or higher does not know how to read or write [f)]	0.6 [0.13]
Child Work 1992	Share of households in 1992 with working minors under the age of 15 [f)]	0.073 [0.059]
Population Density 1992	Population density in 1992, defined as 1,000 persons per square kilometer [f)]	0.4 [1.1]
Ln(Population Size 1992)	Log of total population size of municipality in 1992 [f)]	9.16 [1.13]
Housing Quality 1992	Composite indicator of housing quality from the 1992 census with equal weights along four binary indicators: Whether tenure was uncertain, whether housing was overcrowded, whether roof was in a bad shape, and whether floors were in a bad shape. Higher values indicate worse housing conditions [f)]	0.4 [0.078]
Household Size	Average number of persons living in a household in 1992 [f)]	6.3 [0.42]
Migration Rate 1992	Share of households in 1992 in which a member emigrated to a different country [f)]	0.13 [0.077]
Remittances 1992	Share of households in 1992 that had received international remittances during the previous 12 months [f)]	0.15 [0.084]

Annex 3: Data Description and Sources: El Salvador, Municipal Level (Cont'd)

Variable	Description	Mean [s.d.]
Migration Rate 2007	Share of households in 2007 in which a member emigrated to a different country [g)]	0.059 [0.044]
Remittances 2007	Share of households in 2007 that had received international remittances during the previous 12 months [g)]	0.24 [0.14]
VAT Per Capita 2000s	Average annual per capita value added tax paid in each municipality over the periods 2001 to 2012 [h)]	68.28 [443.62]
Poverty Rate 2005	Share of households in 2005 living below the poverty line [i)]	0.18 [0.062]

The table provides mean values and standard deviations in squared brackets for a maximum of 262 Salvadoran municipalities. Sources: [a)] *Mesa tripartida* (Policia Nacional, the Instituto de Medicina Legal and the public prosecutor's department *fiscalía*) in El Salvador; [b)] NAID at UCLA, see Hinojosa (2017); [c)] US Department of Justice-Federal Bureau of Investigation, via US Counties Online Database (URL: https://www.census.gov) [d)] Encuestas sobre la Migración en las Fronteras Norte y Sur de México, Colegio de la Frontera Norte (URL: https://www.colef.mx/emif/); [e)] Carcach (2008); [f)] Digestyc, Censo de Población y Vivienda 1992; [g)] Digestyc, Censo de Población y Vivienda 2007; [h)] Ministerio de Hacienda de El Salvador, Dirección de Impuestos Internos; [i)] FISDL-FLACSO (2005)

Annex 4: Effect of Homicide Rates on Demand for Entry in Latin America and the Caribbean (OLS, un-instrumented)

	Asylum Application Rate	Apprehension Rate
	(1)	(2)
Homicide Rate	0.271***	1.891**
	(0.0822)	(0.875)
ln(Population)	257.3***	1032.2*
	(86.63)	(541.4)
Avg Yrs Schooling	-0.560	1.352
	(2.300)	(15.63)
Inflation	0.0151	0.225
	(0.135)	(1.184)
ln(Per Capita GDP)	-55.33*	-274.1*
	(27.50)	(134.1)
Economic Growth	0.195	-0.619
	(0.272)	(1.639)
Democracy Score	1.361	9.551
	(0.825)	(6.666)
Migrant Stock	0.00566	0.0204*
	(0.00330)	(0.0101)
Corruption Score	0.536	-10.74
	(3.297)	(25.76)
ln(Asylum Hearing Backlog)	-9.979	-166.0**
	(6.517)	(74.12)
Constant	-3670.9**	-13652.4
	(1319.0)	(8440.4)
F-Stat	11.34	36.74
R^2	.71	.89
Observations	219	219

Robust standard errors clustered by country in parentheses. All models include a set of year and country fixed effects. The sample consists of 20 Latin American and Caribbean countries over the period 2004 to 2015.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Annex 5: Effect of Gangs and Violence on Migration Intentions. Un-Instrumented Logit Regression

	Intention to Migrate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-1.2*** [0.076]	0.22 [0.15]	-1.2*** [0.06]	0.25* [0.14]	-1.4*** [0.064]	-0.16 [0.16]	-1.3*** [0.064]	0.18 [0.14]
Gang-Related Killings (Municpal)	0.0022* [0.0012]	0.0021* [0.0012]						
Affected by Gangs			0.56*** [0.072]	0.55*** [0.076]				
Victim Crime					0.81*** [0.075]	0.66*** [0.078]		
Feels Unsafe							0.38*** [0.058]	0.45*** [0.061]
Age		-0.041*** [0.0025]		-0.04*** [0.0026]		-0.037*** [0.0029]		-0.041*** [0.0026]
Children		-0.12 [0.078]		-0.12 [0.079]		-0.071 [0.09]		-0.12 [0.079]
Income Not Enough		0.34*** [0.065]		0.32*** [0.066]		0.38*** [0.075]		0.29*** [0.066]
Male		0.39*** [0.066]		0.39*** [0.067]		0.38*** [0.076]		0.39*** [0.066]
Married		-0.6*** [0.061]		-0.61*** [0.062]		-0.47*** [0.071]		-0.62*** [0.062]
#obs	7632	7524	7542	7438	6068	5970	7600	7496
#mun	86	86	86	86	86	86	86	86
years covered	2006-2016	2006-2016	2006-2016	2006-2016	2010-2016	2010-2016	2006-2016	2006-2016
AIC	7302	6694	7174	6582	5434	5043	7244	6633

Logistic regression coefficients, with standard errors in brackets. All regressions control for LAPOP survey years (held every two years). Stars denote significance at the 10% (*), 5% (**) and 1% (***) level

Annex 6: Effect of Gang-Related Killings on Emigration Intensity in Salvadoran Municipalities (OLS, un-instrumented)

	Emigration Intensity	
	(1)	(2)
Gang-Related Killings	0.167***	0.157***
	(0.0428)	(0.0397)
ln(Hist Homicide Rate)	-1.873**	-1.829**
	(0.795)	(0.749)
Housing Quality	-35.83	-28.88
	(26.44)	(27.40)
Migration Rate 1992	-97.79**	-106.6**
	(45.87)	(45.45)
Remittances 1992	69.52*	97.36**
	(39.89)	(42.24)
ln(Population 1992)	-7.663***	-6.456***
	(2.247)	(1.915)
Population Density 1992	-2.459	-2.501
	(2.225)	(2.069)
Analphabetism 1992	-16.87	-6.547
	(31.52)	(34.97)
Child Work 1992	-9.538	-1.028
	(26.02)	(25.61)
Household Size 1992	3.327	1.307
	(4.926)	(4.869)
Migration Rate 2007		79.65**
		(37.72)
Remittances 2007		-37.03*
		(20.10)
VAT Per Capita 2000s		-3.5e-4
		(2.2e-3)
Poverty Rate 2005		-36.28
		(30.15)
Constant	2.308	76.48**
	(1.790)	(30.65)
F-Test	1.80	1.70
R^2	.64	.66
Observations	258	258

Robust standard errors clustered by department in parentheses. All models include a set of department fixed effects and all models include precision weights for population size.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$