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In Search of Peace: Structural Adjustment, Violence, and International Migration

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Abstract

The authors analyze the effects of structural adjustment and violence on international migration from selected countries in Latin America by estimating a series of event history models that predicted the likelihood of initial migration to the United States as a function of the murder rate, economic openness, and selected controls in the country of origin. Although several theories posit a connection between structural economic change and violence, such a pattern held only in Nicaragua, where the homicide rate increased as the economy was opened to trade and average incomes deteriorated. Moreover, only in Nicaragua was lethal violence positively related to out-migration. In Mexico, Costa Rica, and Guatemala, rising violence reduced the likelihood of emigration. Violence does not appear to have uniform effects on patterns of international migration but depends on broader social and political conditions within particular countries.

Keywords

international migration; political violence; homicide

Violence in Latin America, as in other developing regions of the world, is of a degree and kind quite distinct from that prevailing in the developed world. Indeed, the four nations we focus on here—Mexico, Guatemala, Nicaragua, and Costa Rica—are linked by more than a common tradition, culture, and language; they also share weak judiciaries and inefficient police forces, making it difficult, and sometimes impossible, to prevent violent offenses. In two of these countries (Guatemala and Nicaragua), decades of armed internal conflict and postconflict instability have produced unusually high levels of violence that are seared into the public consciousness. In the other two countries (Mexico and Costa Rica), economic restructuring and the shift to neoliberalism were followed by a surge in criminality and violence (Sanchez 2006).

Although violence has held a tight grip on the lives of Latin Americans for many years, migration theorists and researchers have yet to investigate its potential effects on international migration. We seek to fill this gap by assessing the role of a particularly extreme form of violence—homicide—on the likelihood of migrating to the United States. We chose homicide to indicate violence for two reasons: first, because of all crime indicators, it is the most reliably measured across nations and, second, because as a sensational event, it is bound to be salient to decision makers (Gartner 1990; LaFree 2005; Lynch 1995; Pratt and Godsey 2003). Using the homicide rate as our leading indicator, we measured the independent effect of violence on the odds of initial departure for the United States while controlling for other socioeconomic and demographic factors previously shown to have a strong influence on migration decisions (Lundquist and Massey 2005).

To accomplish this goal, we constructed a database of homicide rates within the region by piecing together statistics published by the United Nations (UN) and the World Health Organization (WHO), various national and international police records, and data from published work (Pebley and Rosero-Bixby 1997). We then merged this information with event history data compiled from the Mexican Migration Project (MMP) and the Latin American Migration Project (LAMP). By combining longitudinal homicide trends with histories of emigration from selected nations, we could directly assess the effect of deadly violence on the odds of initiating migration to the United States. In our analysis, we focused on households and predicted whether and when each household would first send a migrant to the United States. We undertook pooled as well as country-specific analyses to understand how violence affects migration across the region as well as within specific nations.

Violence and International Migration

The literature reflects a paucity of research on the relationship between violence and migration. A systematic online search yielded just thirty-seven published articles in the fields of sociology and public health. Of these, only five were relevant to the current project, and none dealt directly with how violence, by itself, affected migration in any part of the world. No doubt this gap at least partially reflects the lack of data and other methodological constraints rather than a lack of interest in violence as a factor influencing migration. Indeed, the enormous literature on refugees, asylum seekers, and displaced persons clearly suggests that people are interested in connections between violence and migration (Bariagaber 1997; Moore and Shellman 2006; Schmeidl 1997; Zolberg, Suhrke, and Aguayo 1989). Nevertheless, the two phenomena are seldom modeled together directly.

Our aim here is to illuminate the influence of violence—in its most extreme form and at the macro level—on the decision to leave one's place of origin in search of a more secure future elsewhere. We situate our analysis within world systems theory, which views migration in the context of macro-level economic restructuring and hypothesizes that migration and violence are common byproducts of societal transformations associated with the globalization of markets. This perspective stands in contrast to that of neoclassical economics, which conceptualizes migration as an individual decision to maximize earnings and thus equilibrate labor supply and demand between regions (Borjas 1989; Todaro 1969, 1976, 1980; Todaro and Maruszko 1987). In terms of decision making, our analysis is modeled more closely on the new economics of labor migration, which views migrants not as atomized agents but as members of larger social units such as households and communities (Stark 1991).

Each nation has its own specific history of economic development and violence. In Guatemala and Nicaragua, prolonged armed conflict and U.S.-led covert operations conform to world systems theory's military links hypothesis, which holds that military interventions undertaken by core nations to protect overseas investments and guarantee free trade inevitably establish ancillary social and political ties upon which migration later develops (Massey et al. 1998). In addition to displacing people directly from areas of violent conflict, military interventions create social connections and moral debts that displaced persons can draw upon to gain entry to core nations. At the same time, intervention plants seeds for future violence and emigration by distributing arms, materiel, and training to large numbers of people whose violent acts subsequently disrupt local markets.

Costa Rica and Mexico exemplify another hypothesis derived from world systems theory, the market penetration hypothesis, which argues that the transformative effects of markets on local social and economic structures displaces people from traditional livelihoods to

create a pool of people prone to migration. The North American Free Trade Agreement (NAFTA) and the Central American Free Trade Agreement (CAFTA) are clear examples of how market mechanisms imposed from outside end up promoting not only cross-border movements of goods, capital, commodities, and resources but also of people (see Massey, Durand, and Malone 2002, Massey et al. 1998).

A critical mechanism by which violence occurs in the context of market penetration is the consolidation of landholding and the mechanization of production, which together create a population of economically marginalized and socially displaced agrarian workers. These dislocations are often accompanied by violent acts, as elites use force to impose market-oriented policies from above and the poor resist these impositions. Societal dislocations also promote violence by reducing the number of local jobs, causing people to turn to various black-market activities, including crime, as a means of survival. Societal transformations associated with the growth and elaboration of markets also undermine traditional mechanisms of social regulation and control.

Modernization theory also hypothesizes a strong connection between crime and economic transformation and takes as its point of departure Durkheim's ([1893]1947) work on the consequences of modernization. Durkheim argued that as societies shift from traditional to modern modes of economic organization, older social practices and norms come to be at odds with those of the new market economy, yielding a period of social instability and anomie (Clinnard and Abbot 1973; LaFree and Drass 2002; Neuman and Berger 1988; Shelley 1981). Modernization theory thus posits that instability and dislocation are direct results of the introduction of modern economic relations into a developing-country context.

Merton (1938), Messner and Rosenfeld (1997), and Savolainen (2000) have taken Durkheim's concept of anomie and applied it to study modernization's influence on rates of crime and social deviance. Likewise, Davies (1962) and Smelser (1962) have adopted the notion of social disorganization to explain the association between modernization and social deviance. Still others have applied the concept of social breakdown to the fundamental process rooted in Durkheim's work on the social costs of modernization (Tilly, Tilly, and Tilly 1975; Useem 1985). Finally, the closely related concepts of tension (Lodhi and Tilly 1973) and strain (Agnew 1992; Cloward and Ohlin 1960) have also worked their way into the literature to explain how the transition to modernity has the power to weaken traditional social bonds and disrupt long-established social norms.

Modernization theory's two major weaknesses are its lack of specificity about the term *modern* and its assumption that all societies transit from one regime to the other at the same rate. Nonetheless, by predicting violence as a by-product of economic development, it offers a conceptual framework for theorizing the effect of violence on migration. In combination with world systems theory, modernization theory suggests a mechanism by which economic change leads to emigration through the intervening variable of violence. Increases in social dislocation, anomie, and crime stemming from economic development increase the potential for social marginalization, criminality, and violence, which in turn lead to increased migration. It is this logic, derived from both world systems theory and modernization theory, that leads us to hypothesize an increase in homicide rates over time and a corresponding rise in the likelihood of migration to the United States.

Data and Methods

Definitions of variables used in our analysis are presented in Table 1. To measure the level of violence prevailing in each country during each year from 1979 to 2003, we turn to homicide data published by the United Nations and the World Health Organization, national

police records, and information compiled by Pebley and Rosero-Bixby (1997). Several authors (Neapolitan 1997;LaFree 1999;Aebi, Killias, and Tavares 2003) have reviewed in some detail the strengths and weaknesses of these data sources.

The United Nations Crime Survey (UNCS) data are generally considered flawed because they depend on reports from each member nation's criminal justice systems. These data provide information on homicides during the period 1970 through 1994. In his review, Neapolitan (1997) concluded that the fourth wave of the UN Crime Trends Survey, from 1986 through 1990, was most suitable for meaningful research given major advances in the construction of the survey and the collection of the data. The UN provided assistance to developing nations in record keeping, which resulted in more consistent and trustworthy homicide data. The fourth UNCS included rich data from one hundred nations about total homicides, total intended homicides, attempted intended homicides, nonintentional homicides, and other major criminal offenses (Neapolitan 1997). The WHO, in contrast, tabulates yearly cause of death information from actual death certificates collected by public health agencies, which are published each year in *World Health Statistics Annual*. These data do not rely on police records and therefore do not suffer from institutional constraints on record keeping.The WHO (1995) defines homicide as "any act performed with the purpose of taking human life, in whatever circumstances." The cause category from which we take our data is "homicide and injury purposely inflicted by other persons," ignoring the ambiguous category "other violence." The consensus among researchers who study cross-national crime trends and homicide rates is that the WHO data are the most reliable (Kalish 1988; Messner and Rosenfeld 1997; Neapolitan 1997), so whenever possible we relied on that data. We drew on the UN and other sources mainly to fill gaps in the WHO series.

National police records have historically been condemned as the least reliable source of homicide data because of their reliance on police chiefs and captains to report the crimes and because of a lack of governmental oversight. Still, police records allowed us to fill in some of the few gaps that remained after looking at UN and WHO data. Last, we included data from Pebley and Rosero-Bixby (1997) to complement the foregoing sources. Using these sources together with national police records, we were able to fill in gaps in homicide data for the primary conflict years in Nicaragua (1980–1987). Combining information from all sources, we derived a data set that was almost complete for all countries and years between 1979 and 2003 save for 1979 in Costa Rica and Nicaragua and 1982, 1983, and 1985 in Guatemala. We filled in these gaps using linear interpolation. We then smoothed the resulting series by taking three-year moving averages to control for random year-to-year fluctuations.

We merged the homicide data series with data from the MMP and LAMP. The MMP is a retrospective longitudinal study begun in 1982 that annually surveys a representative sample of households in selected Mexican communities to identify and study persons with migratory experience in the United States. The 118 communities surveyed to date were chosen to represent a diverse range of population sizes, economic bases, ethnic compositions, and regions to ensure that, though not randomly selected, they nonetheless provide a broad cross section of the population at risk of migrating to the United States. In addition to gathering basic data on the social, demographic, and economic characteristics of households and individuals, the survey ascertained the dates of the first and most recent trips to the United States for each household member, and the household head and spouse also provided complete life histories that yielded a year-by-year record of changing individual and household circumstances.

The LAMP was modeled on the MMP and used the same design and survey instruments to gather information on international migration from other countries in Latin America. From

the LAMP, we used data from communities surveyed in Costa Rica, Guatemala, and Nicaragua to assess how migration processes differ between Mexico and other Spanish-speaking nations in the same geographic region. The LAMP data set, which began in 1998, also allows for a year-by-year analysis of migration patterns controlling for relevant social, demographic, and economic characteristics.

Following Lundquist and Massey (2005), we constructed an event history for each household in each community. Households were followed from their inception until the survey date or the date of the first U.S. trip, whichever came first. We identified the year in which any household member undertook a first U.S. trip. Whereas in Mexico first trips are most frequently undertaken by household heads, in Central America they are more often made by older children of the head, especially sons. Moreover, since first migration in both settings is a male-dominated phenomenon, we restricted our analyses to male departures only (see Cerrutti and Massey 2001; Massey, Fischer, and Capoferro 2006). The construction of household-year files for the entire household rather than person-year files for household heads allowed for a more direct comparison among settings. It also yielded greater variance on the dependent variable.

In addition to developing overall indicators of violence, we assessed changing conditions in the national political economy. We measured overall economic performance by expressing each nation's gross domestic product (GDP) per capita relative to that of the United States, yielding an indicator of the relative size of the earnings gap—the leading theoretical predictor of neoclassical economics. To measure the extent to which neoliberal economic policies were functioning each year, we drew on Heston, Summers, and Aten's (2006) index of economic openness, which is defined as the value of total trade divided by national GDP. Finally, in the case of Nicaragua, where U.S. intervention has been shown to have been critical in promoting emigration to the United States, we use the indicator of U.S. Contra involvement developed by Lundquist and Massey (2005), which is essentially a yearly count of mentions of Contras or Contra violence in U.S. papers and magazines.

Table 1 also defines the household-level independent variables we included in our model. Demographic predictors of first U.S. migration include the head's age and its square to capture the characteristic inverted parabolic distribution of migration over the life course (Sjaastad 1962). We also include the number of minors in the household to measure household dependency. Indicator variables for assets include whether or not during the year in question the household owned farmland, real estate, or a business enterprise. We control for human capital by including years of schooling for both the head and the spouse. Social capital is measured by counting the number of immediate family members of the head (parents and siblings) with prior experience in the United States and the head's labor force status by a series of dummy variables indicating whether he undertook unskilled manual work or skilled manual work or was unemployed, leaving agricultural work as the reference category. We also measure whether or not the spouse was unemployed during the person-year in question.

Table 2 shows means, standard deviations, minima, and maxima for each covariate in our pooled sample. These statistics reveal substantial variation in homicide rates across the sample, with the crude rate ranging from a low of 6.6 to a high of 213.5 murders per 100,000. Although we do not show figures for individual countries in the table, variation in the sample is both geographic and temporal. The average murder rate was lowest in Costa Rica at 10.1, followed by 32.9 in Mexico, 44.9 in Nicaragua, and 54.4 in Guatemala. Thus, the average risk of lethal violence was more than five times greater in Guatemala than in Costa Rica. Homicide rates in Costa Rica were not only the lowest but also the most consistent over time, varying within a narrow range from 8.5 to 12.1. In contrast,

Guatemala's rate ranged from a high of 213.5 to a low of just 6.6, and Nicaragua's ranged from 81.9 to 6.2. Across all household-years, heads averaged 34 years of age and lived in a home with 1.7 minors. Around 12 percent owned farmland, 49 percent possessed urban real estate, and 13 percent had a business enterprise. Household heads averaged 6.6 years of schooling; their spouses reported an average of 6.1 years. In the average person-year, the typical household head was employed, with most working in agriculture or services, and fewer than a quarter of heads reported having an employed spouse.

To assess the independent influence of violence on the likelihood of initial migration to the United States, we undertook a series of multivariate discrete-time event history analyses of first U.S. departure from households in Mexico, Costa Rica, Guatemala, and Nicaragua. Multiple imputation provided us with complete data for all covariates and allowed us to estimate models that averaged the coefficients and corrected the standard errors for distinct regression analyses run on the five multiple imputed data sets (Allison 2002; Royston 2005; Rubin 1987, 1996; Schafer 1999; Schafer and Graham 2002). The data were organized in a time-to-event format that followed each household year by year up to the point of initial migration or right-hand censoring, rendering discrete-time analysis appropriate for estimating survival models (Hosmer and Lemeshow 1999).

Discrete and continuous time methods produce nearly identical results, and estimated standard errors suffer little from the loss of information associated with not knowing the exact time when an event occurs (see Allison 1984, 14–22). Since our data are organized into yearly intervals, we refer to each record as a household-year. We define the onset of risk for migration to begin in 1979 and the end of risk at the time of first migration or survey date. All models are lagged so that the dependent variable—the migration of the first household member to the United States—is defined in year t and independent variables in year $t - 1$. All variables except education and country are time varying. Although education in theory is time varying, in practice, it is fixed prior to household formation. We estimate a pooled model for all countries combined, including dummy variables to control for country fixed effects, as well as country-specific models to allow for country-specific interactions.

Trends in Structural Adjustment, Violence, and Migration

We summarize each nation's structural transformation from import substitution industrialization to neoliberalism in Figure 1, which plots economic openness (the solid lines) and relative GDP (the dashed lines) by year from 1979 to 2002. All four nations were subject to import substitution restrictions and remained substantially closed to international trade through the early to mid-1980s, when there was a pronounced shift toward neoliberalism. Mexico, for example, remained substantially closed to trade, with an openness index that hovered around 20 percent, through 1986, when it joined the General Agreement on Tariffs and Trade. After 1986 its openness index began to rise steadily to the point where international trade accounted for more than 60 percent of GDP by 2002.

Although Costa Rica has always been more open to trade and investment than Mexico, its trend toward greater openness over time is quite similar. The openness index for Costa Rica fluctuated between 40 and 50 percent until 1986 and then rose to peak at values above 90 percent at the end of the century. In contrast, both Guatemala and Nicaragua experienced declining openness between 1979 and the end of the 1980s. In Nicaragua, for example, the period between when the Sandinista regime took control in 1979, when the region was engulfed in civil strife, and 1987, when the Contra War began to wind down, there was a sustained reduction of economic openness. Then there was a sudden surge toward openness from 1987 through 1989, which fell back temporarily in 1991 before rising once again and ultimately coming to exceed that observed in Mexico. Although neoliberal reforms were

also applied in Guatemala, the transition to an open economy was slower and less complete, with the openness index going from around 27 percent in 1986 to just 49 percent in 2001, the lowest level of any of the four countries.

Despite national differences in the timing and ultimate achievement of an open economy, in terms of relative economic performance the story was quite similar across countries. As Figure 1 shows, there was a steady decline in relative GDP in each nation from the early 1980s onward. The deterioration in relative earnings was notably marked in Guatemala and Nicaragua. Even though Costa Rica and Mexico fared better, the size of the national income gap with the United States still widened in both places. Thus, the shift toward neoliberalism was accompanied by falling relative incomes in Mexico and Central America.

Some observers have associated the dislocations of structural adjustment and the concomitant deterioration in earnings with a rise in crime and social disorder, but the plots shown in Figure 2 offer little support for this hypothesis. The figure shows trends in smoothed homicide rates from 1979 through 2002 for each of the four nations. In Guatemala, the peak of lethal violence occurred in the early 1980s when the economy was still closed; whereas in Mexico, the homicide rate actually *fell* slightly through the later 1990s as the economy shifted toward openness and incomes deteriorated. In Costa Rica, meanwhile, there is little or no trend in homicide at all, despite a strong shift toward openness. Only in Nicaragua is there a gradual rise in lethal violence that corresponds in time with the shift toward economic openness and deteriorating incomes. If there is a relationship between structural adjustment and violence, therefore, it appears to be more complex than a simple one-to-one correspondence and likely contingent on country-specific conditions.

Yearly migration probabilities are shown in Figure 3. These were calculated by estimating an event history model that predicted out-migration from households in year *t* from dummy variables defined to indicate each year. Once again these figures suggest no simple correspondence between structural adjustment or violence and out-migration to the United States. In Guatemala, the likelihood that a household would initiate international migration rose and fell in three oscillations between 1980 and 2000, none of which corresponds in any straightforward way to surges of violence or to shifts toward economic openness. In Costa Rica, migration probabilities peaked in 1988 and then declined steadily, even though most of the shift toward openness occurred after this date and violence remained flat. In Mexico, migration probabilities held fairly steady between 1980 and 1998 despite the radical transformation of its political economy, and then migration fell even as economic openness moved upward and lethal violence trended downward. Only in Nicaragua do we observe any prima facie evidence for an association between violence and migration. Here, peak migration to the United States clearly occurred between 1984 and 1988, a period that corresponds both to the peak of the U.S. Contra intervention and to a detectable surge in the homicide rate.

Structural Adjustment, Violence, and Migration

Sorting out the relationship between indicators of structural adjustment, violence, and international migration is difficult using graphs alone because these factors vary simultaneously over time and because migratory behavior also depends on a host of other individual and household characteristics that are unmeasured. To assess more precisely how homicide, openness, and relative GDP affect the likelihood of migration to the United States, we estimated a discrete-time event history model to predict the likelihood of sending out a household member on a first trip to the United States. As mentioned earlier, we followed each household year by year from its inception to the survey date and noted its

characteristics and national conditions with respect to openness, homicide, and GDP in year $t - 1$. We then used this information to predict whether or not a member left on a first trip to the United States in year *t*. All household years subsequent to the first recorded trip were excluded from analysis.

Pooled Model

Table 3 shows results for a model estimated for all four countries pooled together, incorporating dummy variables to control for fixed country-level effects. Here, we use two different specifications of the violence indicator: raw and smoothed homicide rates. The first model shows results for the raw homicide rates and finds a significant negative relationship between lethal violence and out-migration from Latin American households—as the murder rate rises, the rate of out-migration falls. In general, then, lethal violence seems to function as a deterrent rather than a stimulant to emigration, with a decline in public safety apparently creating barriers to international movement. The next model shows that this basic result holds for smoothed homicide rates as well.

Both models also tell the same story about broader structural influences in the political economy. The level of U.S. Contra involvement had no significant effect on out-migration across the region generally, which is not surprising since it is specific to Nicaragua. Likewise, the shift toward a neoliberal economy had no effect, in and of itself, on the likelihood of initial migration to the United States. To the extent that economic conditions matter, it appears that relative income is most relevant. As predicted by neoclassical theory, the higher a nation's GDP relative to that in the United States, the lower the odds that a household will send out a member on a first U.S. trip. Thus, the shift from import substitution industrialization to neoliberalism appears to have had no direct effect on the likelihood of emigration, at least as measured by the openness index. To the extent that structural adjustment leads to out-migration, it does so indirectly, through its effect on a nation's relative GDP and perhaps also its influence on violence. As expected, the effect of relative GDP is negative, so that rising national income reduces emigration; but contrary to the position of many observers of conditions in Latin America, violence seems to have a negative rather than a positive effect on the odds of initiating international movement.

The remaining effects in the model are generally consistent with prior research on international migration in Latin America as well as with leading theoretical models. The effect of age is curvilinear, rising through the young adult ages before peaking and then falling at older ages, as predicted by human capital theory (Sjaastad 1962). Households that already own real estate or business enterprises are less likely to send out migrants because they have no need to self-finance their acquisition through international wage labor, as hypothesized by the new economics of labor migration theory (Stark 1991). Given that there are few returns on education for undocumented migrants working in the United States but that education does confer benefits for social mobility at home, the negative effect of education on international migration is consistent with human capital theory (Taylor 1987). Likewise, the very strong effect of having family members in the United States is consistent with social capital theory (Massey 1990). Table 3 shows that in terms of labor force status, migrants from these four nations are selected disproportionately from among unskilled manual workers and are very unlikely to migrate if they are unemployed—which is an interesting finding in itself since one would assume that unemployment would increase the likelihood to migrate, not decrease it.[1] As one would expect, other things being equal, households in the three Central American nations have a lower propensity to send out

[1]We estimate similar negative associations between unemployment and likelihood of migration in the individual country analyses as well.

migrants than do households in Mexico, where U.S. migration is far more established and institutionalized (Massey and Sana 2003).

Mexico and Costa Rica

Given similar results for the raw and smoothed homicide rates in the pooled model, we estimate the remaining country-specific models using the smoothed rates, as they are likely more reliable and less affected by random error. Table 4 shows the results of discrete-time event history models estimated for Mexico and Costa Rica, two relatively developed and stable nations that underwent similar transition from important substitution industrialization to neoliberalism during the 1980s and 1990s but did not experience significant civil violence or armed interventions or rising homicide rates during the transition.

In both Mexico and Costa Rica, violence has a significant negative effect on the likelihood of out-migration to the United States, acting to deter rather than instigate movement north of the border. In the case of Costa Rica, moreover, the effect is strong, robust, and highly significant. Although homicide in that country is rare and varies little over time, migratory decision making within households nonetheless appears to be quite sensitive to even small perturbations in the level of lethal violence over time.

While the direction of the effect of violence is the same in both Costa Rica and Mexico, the effect of relative GDP works in opposite directions. Whereas rising relative GDP (a declining gap with the United States) lowers the odds of out-migration from Mexico, it *raises* the odds of out-migration from Costa Rica. Thus, whereas structural transformation in both nations was associated with a relative deterioration in economic performance, in Costa Rica this deterioration reduced the likelihood of international migration (since the relative GDP coefficient is positive, a decline in GDP lowers the odds of out-migration), but in Mexico structural transformation increased the odds of leaving for the United States (since the GDP coefficient is negative, a decline raises the odds of out-migration). In addition, whereas the shift to economic openness had no direct effect on international migration in Mexico, the effect was significant and positive in the case of Costa Rica.

We also found cross-national differences in the effect of several control variables. Although social capital theory is vindicated in both settings by the strong and powerful effect of having family members with prior U.S. migratory experience, and whereas the unemployed are extremely unlikely to emigrate from either nation, departure to the United States is more highly selective of demographic characteristics, wealth, and human capital in Mexico than in Costa Rica. In the former country, we observe the characteristic curvilinear effect of age on the odds of international migration, whereas in the latter we do not. Likewise, possession of physical capital assets such as a business enterprise and real estate, as well as human capital assets such as education, substantially lowers the probability of out-migration among Mexican households but not those in Costa Rica.

In sum, although both Costa Rica and Mexico underwent similar transitions to a neoliberal economic order over the past twenty years, the migratory response was quite different in the two settings. In Mexico, the structural economic transformation had no direct effect on migration but was accompanied by lagging national income that promoted migration to the United States, whereas in Costa Rica the transformation itself had a direct effect in promoting emigration but the accompanying stagnation of income decreased rather than increased the likelihood of migration to the United States. Among those who did leave, moreover, emigrants from Mexico tended to come from younger households that lacked property, business enterprises, and educational resources; whereas emigrants from Costa Rican households were not selective of these characteristics. The principal points of similarity concerned the effects of social capital and violence. Having relatives with prior

U.S. experience greatly increased the odds of out-migration from both places, whereas increases in lethal violence reduced the probability of emigration to the United States in both places. Although households in both countries were sensitive to variations in the murder rate, in neither country was structural change itself associated with any increase in lethal violence.

Guatemala and Nicaragua

Unlike Mexico and Costa Rica, both Guatemala and Nicaragua experienced violent civil wars and mass killings in addition to structural economic change during the 1980s and 1990s. Table 5 presents event history analyses of out-migration from these two nations. In the model for Nicaragua, we included the index of U.S. Contra involvement developed by Lundquist and Massey (2005), as their earlier work showed it to be a critical determinant of out-migration from that country. Our preliminary analyses indicated that the Contra intervention had no significant effect on emigration from Guatemala or the two other countries under consideration.

Despite extreme variations in the level of lethal violence over time in Guatemala, the likelihood of international migration was not significantly predicted by variations in the homicide rate; nor were the odds of U.S. emigration related to either of the political-economic indicators. Guatemala, of course, experienced the least marked economic transition of the countries considered here, and migration to the United States was tied more to variations in the circumstances of individual households, with emigration being concentrated among younger families headed by a skilled worker who did not own a business enterprise and had immediate family members with U.S. experience.

In Nicaragua, in contrast, the likelihood of migration to the United States was quite strongly connected to macroeconomic conditions and lethal violence. Recall that Nicaragua was the only country where the transition to neoliberalism appeared to be associated in time with declining incomes and rising violence. The results shown in Table 5 also reveal that in contrast to the other countries, emigration is strongly and positively related to homicide rates in Nicaragua, even after controlling for the significant effect of the U.S. Contra intervention; but the shift to openness itself had a negative rather than a positive effect on the odds of out-migration, though it was relatively weak and of marginal significance statistically. Moreover, although the likelihood of international migration evinced the expected curvilinear effect with respect to age, the pattern of class selectivity was quite distinct from that prevailing in other countries. Among Nicaraguan households, those sending out migrants tended to own businesses and have well-educated spouses, unemployed heads and spouses, and access to migration-specific social capital in the form of family members with U.S. experience.

Conclusions and Implications

In this article, we examined the effect of structural adjustment and violence on international migration originating in four Latin American countries. We drew on a variety of sources to compile annual data on the homicide rate in Mexico, Costa Rica, Guatemala, and Nicaragua and on the Penn World Tables to measure the openness of each nation’s economy and its economic performance relative to the United States. We then merged these annual data series with household-year event histories constructed from the LAMP and MMP and used the resulting data set to estimate a series of discrete-time event history models to predict the likelihood that a household in each country sent out a family member on a first trip to the United States from 1979 to 2002. The models controlled for household traits and characteristics that prior theory and research had suggested influence the process of

international out-migration, including demographic circumstances, asset ownership, human capital resources, access to social capital, and labor force status.

Both world systems theory and modernization theory posit a connection between structural economic change and violence, but such a pattern held only for Nicaragua, where the homicide rate increased as the economy was opened to trade and average incomes deteriorated. Although incomes also generally deteriorated as their economies were opened up during the 1980s and 1990s, the homicide rate was not correlated in time with these structural economic trends. In Mexico the murder rate fell slightly, and in Costa Rica it remained fairly constant, fluctuating within a narrow range. Guatemala experienced the slowest and least complete transition to a neoliberal economic regime, and its rate of lethal violence swung markedly between extremes in response to civil conflicts rather than broader economic trends.

Whatever the origins of violence—structural or civil—the most common effect of rising homicide was to reduce the likelihood of international out-migration, as shown in Figure 4, which graphs predicted probabilities of first U.S. migration as the homicide rate ranges from its minimum to its maximum value in each country and other variables are held constant at their means. In Mexico and Costa Rica the coefficient linking the rate of lethal violence and emigration to the United States was significant and negative, as it was also in the pooled model. In Guatemala the coefficient was negative but not statistically significant. Only in Nicaragua was a rising homicide rate associated with a higher likelihood of out-migration to the United States, and emigration from Nicaragua was also characterized by a very different pattern of class selectivity, being concentrated among the bourgeoisie rather than the lower classes.

In general, the direct effect on international migration of the structural shift from import substitution industrialization to a neoliberal political economy open to trade and investment was small and insignificant. Figure 5 graphs predicted migration probabilities as openness moves from its minimum to its maximum within each country. As can be seen, the curves are relatively flat and slightly downward sloping in Mexico, Nicaragua, and Guatemala. The corresponding regression coefficient is significant only in the case of Nicaragua, and then only marginally, at the 10 percent level. In the pooled model, moreover, the effect of openness is close to zero. Only in Costa Rica is there a significant direct effect of openness, and it is strongly positive. Other things being equal, the opening of the Costa Rican economy to global trade and investment led to more rather than less migration to the United States.

The most common effect of structural adjustment on emigration was indirect, through its association with declining national income, but again the effect in Costa Rica was anomalous compared with other countries. Figure 6 graphs changes in predicted probabilities of U.S. migration as relative GDP shifts from its minimum to its maximum value in each country to reveal that, unlike the other cases, rising GDP is associated with a sharp increase in the odds of out-migration to the United States. In Costa Rica, therefore, greater economic openness and a falling income gap with the United States are associated with more international migration.

As shown earlier, in the pooled mode of Table 3, the general effect of falling national income was to increase the odds of U.S. migration, although the country-specific models indicate that this pattern is most characteristic of Mexico. The sharp downward slope of the Mexican curve stands out from the relatively flat curves plotted for Nicaragua and Guatemala, whose models yield insignificant coefficients. Indeed, the probability of out-migration from Mexican households is halved, moving from lowest to highest relative GDP.

In Mexico, therefore, structural adjustment produced falling incomes, a larger income gap with respect to its northern neighbor, and more international migration.

As noted earlier, each country has its own particular history of economic transformation and violence, and our results indicate that each country also has a unique response to changes in economic openness, relative income, and violence. Costa Rica is a stable democracy with relatively strong institutions, well-developed social services, and a high GDP per capita by third-world standards. There the shift to a neoliberal economic regime did not spawn an increase in violence, and in contrast to hypotheses derived by some critics of neoliberalism, the increases in violence that did occur at various junctures were negatively rather than positively related to international migration. Moreover, the direct effect of a more open economy was to encourage emigration, though this positive effect was partially offset by a negative indirect effect through relative GDP. As relative GDP fell in concert with greater openness, it correspondingly pushed the odds of migration downward.

Mexico also has relatively strong national institutions and is affluent by third-world standards, and even though it has only recently made the transition to full democracy, it has long been characterized by peaceful transitions of power after regular elections. In this setting, the shift toward neoliberalism likewise does not seem to have led to a systematic increase in the homicide rate, and, as in Costa Rica, what increases we do observe are associated with less rather than more migration to the United States. Unlike Costa Rica, however, greater openness was not itself associated with a higher likelihood of U.S. migration, but the associated decline in relative GDP was.

Compared with Costa Rica and Mexico, Guatemala experienced more frequent and severe cycles of violence in response to civil conflicts, its transition to neoliberalism was less complete, and its GDP per capita was much lower. Here, U.S. migration was not related to either violence or structural economic conditions but rooted in household characteristics such as age, property ownership, occupational skill, and access to social capital in the form of ties to close relatives with U.S. experience.

In most countries, international migration is concentrated in the lower reaches of the class distribution (though not usually the bottom), among those with less education, less property, and lower occupational status. In Nicaragua, however, emigrants to the United States came from the middle and upper classes and left in response to the economic turmoil, social dislocations, and violence associated first with the U.S. Contra intervention and later with the rising tide of lethal violence associated with the shift to a more open economy. Although the transition to neoliberalism had a small, marginally significant effect in reducing the probability of emigration, the accompanying rise in lethal violence acted as a stronger stimulus for the movement of middle-class families to the United States. Only in Nicaragua did the hypothesized connection between neoliberalism, violence, and emigration postulated by some critics of globalization materialize.

Thus, violence appears not to have uniform effects on patterns and processes of international migration but depends on broader social and political conditions within particular countries. In Nicaragua, where the Sandinista revolution threatened bourgeois interests and led to the selective departure of middle-class migrants, the rising tide of violence associated with the later shift to a more open economy motivated further out-migration by those who possessed the resources and social capital to make a move to the United States. Absent a progressive political revolution to threaten bourgeois interests, emigration from Mexico, Costa Rica, and Guatemala occurred mostly among lower-class households who lacked the resources to undertake international migration when violence increased, either in response to economic restructuring or for other reasons. In other words, whereas greater violence acts as a stimulus

to out-migration among middle-class households, it acts as a barrier to international movement for poor working-class or agrarian households.

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Biographies

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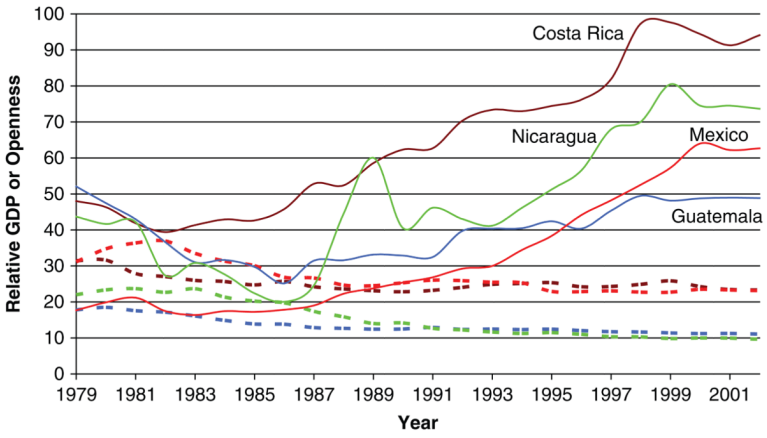

FIGURE 1.
Economic Openness (Solid Lines) and Relative GDP (United States = 100; Dotted Lines) in Selected Latin American Nations

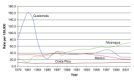

FIGURE 2.
Smoothed Homicide Rates in Selected Latin American Countries

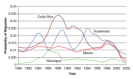

FIGURE 3.
Smoothed Probabilities of Taking a First Trip to the United States from Selected Latin American Countries

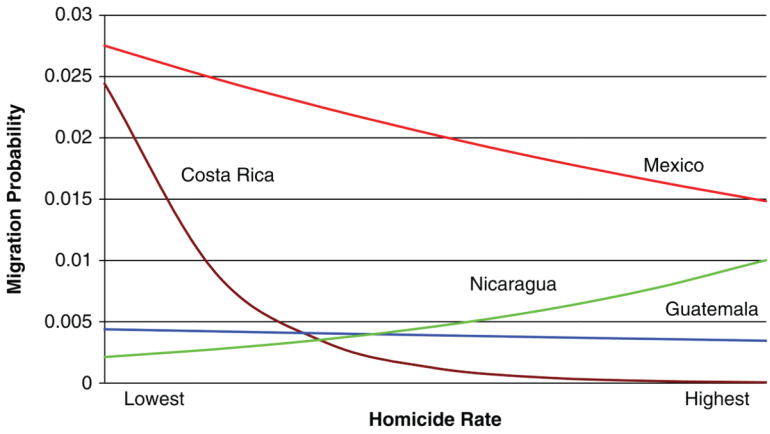

FIGURE 4.
Predicted Probabilities of First U.S. Migration by Homicide Rate

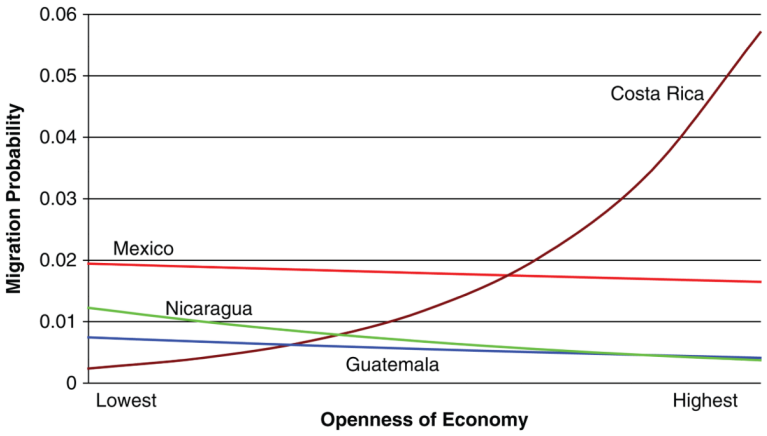

FIGURE 5.
Predicted Probabilities of First U.S. Migration by Economic Openness

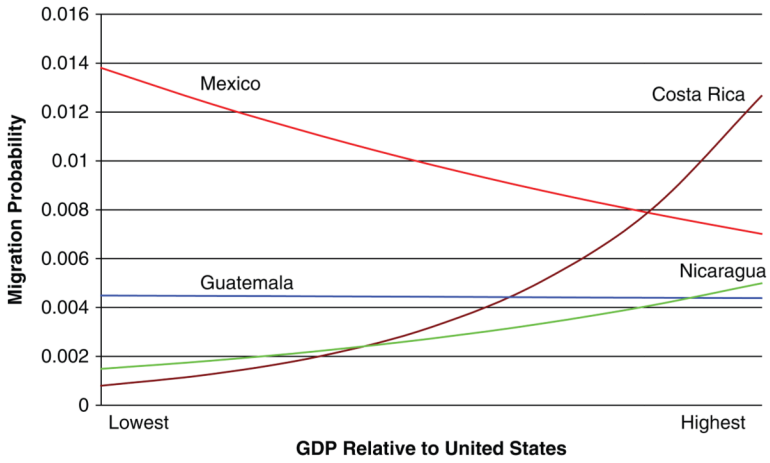

FIGURE 6.
Predicted Probabilities of First U.S. Migration by Relative GDP

TABLE 1

Description of Covariates Used in Model of Violence and Emigration to the United States

Violence indicator	
Raw homicide	Raw homicide rates with linear interpolation for missing
Smoothed homicide	Three-year moving averages of raw homicide rates
Political economy	
GDP relative to U.S.	Gross domestic product relative to U.S.
Economic openness	Total trade as a share of GDP
U.S. Contra involvement	News article count from Lundquist and Massey (2005)
Demographic status	
Age	Age of household head
Age squared	Squared term for age of household head
Minors in household	Number of children under age of eighteen in the household
Assets owned	
Farmland	Dichotomous indicator of land ownership
Real estate	Dichotomous indicator of property ownership
Business	Dichotomous indicator of business ownership
Human capital	
Schooling	Number of years of education for household head
Spouse's schooling	Number of years of education for spouse of household head
Social capital	
Family in U.S.	Number of immediate family ties to the U.S.
Head's occupation	
Agriculture	Dichotomous indicator for agricultural worker
Unskilled manual	Dichotomous indicator of manufacturing/repair unskilled worker
Skilled manual	Dichotomous indicator of manufacturing/repair skilled worker
Unemployed	Dichotomous indicator of unemployed/not in labor force
Spouse's labor force status	
Spouse employed	Dichotomous indicator of spouse in the labor force
Country	
Mexico	Dichotomous indicator for Mexico
Costa Rica	Dichotomous indicator for Costa Rica
Guatemala	Dichotomous indicator for Guatemala
Nicaragua	Dichotomous indicator for Nicaragua

TABLE 2

Descriptive Statistics for Variables Used in Model of Violence and Emigration to the United States

Variable	Mean	SD	Min	Max
Violence indicator				
Interpolated homicide	33.752	15.138	6.6	213.5
Smoothed homicide	33.761	13.221	8.4	160.8
Political economy				
GDP relative to U.S.	25.740	6.288	9.65	36.92
Economic openness	46.34	—	17.67	97.6
U.S. Contra involvement	32.338	57.095	0	225
Demographic status				
Age	34.101	15.866	0	99
Minors in household	1.714	1.981	0	15
Assets owned				
Farmland	0.119	0.323	0	1
Real estate	0.489	0.500	0	1
Business	0.135	0.341	0	1
Human capital				
Schooling	6.649	4.593	0	23
Spouse’s schooling	6.109	4.177	0	22
Social capital				
Family in U.S.	0.188	0.499	0	4
Head’s occupation				
Agriculture	0.266	0.442	0	1
Unskilled manual	0.076	0.265	0	1
Skilled manual	0.151	0.358	0	1
Unemployed	0.154	0.361	0	1
Spouse’s labor force status				
Spouse employed	0.228	0.420	0	1
Country				
Mexico	0.762	0.426	0	1
Costa Rica	0.0930	0.290	0	1
Guatemala	0.039	0.194	0	1
Nicaragua	0.106	0.308	0	1
Person-years	233,248			

TABLE 3

Effect of Deadly Violence on the Likelihood of Taking a First Trip to the United States from Selected Latin American Countries: 1979–2002

	Raw Homicide Rate		Smoothed Homicide Rate	
	B	***SE***	***B***	***SE***
Violence indicator				
Interpolated homicide rate	−0.008***	0.003	—	—
Smoothed homicide rate	—	—	−0.006**	0.003
Political economy				
GDP relative to U.S.	−0.027****	0.007	−0.026****	0.007
Economic openness	0.002	0.002	0.003	0.003
U.S. Contra involvement	0.001	0.001	0.006	0.004
Demographic status				
Age	0.096****	0.012	0.096****	0.024
Age squared	−0.002****	0.001	−0.002****	0.001
Minors in household	−0.028*	0.015	−0.028*	0.015
Assets owned				
Farmland	0.084	0.206	0.084	0.077
Real estate	−0.218****	0.050	−0.217****	0.050
Business	−0.608****	0.088	−0.608****	0.088
Human capital				
Schooling	−0.038****	0.006	−0.038****	0.006
Spouse’s schooling	0.011	0.007	0.010	0.007
Social capital				
Family in U.S.	0.722****	0.024	0.722****	0.024
Head’s occupation				
Agriculture	—	—	—	—
Unskilled manual	0.231****	0.062	0.234****	0.237
Skilled manual	0.010	0.057	0.010	0.062
Unemployed	−0.832****	0.097	−0.831****	0.097
Spouse’s labor force status				
Spouse employed	−0.038	0.051	−0.038	0.051
Country				
Mexico	—	—	—	—
Costa Rica	−0.817****	0.125	−0.785****	0.128
Guatemala	−0.772****	0.161	−0.774***	0.164
Nicaragua	−1.249****	0.123	−1.254****	0.257
Constant	−3.739****	0.349	−3.810****	0.358
Chi-square	2,395.61****		2,390.78****	

	Raw Homicide Rate		Smoothed Homicide Rate	
	B	***SE***	***B***	***SE***
Pseudo *R*-squared	.086****		.087****	
Person-years	233,248		233,248	

* $p < .10$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.

TABLE 4

Effect of Deadly Violence on the Likelihood of a Household Sending Out a Migrant on a First Trip to the United States from Mexico and Costa Rica: 1979–2002

	Mexico		Costa Rica	
	B	***SE***	***B***	***SE***
Violence indicator				
Smoothed homicide rate	−0.035**	0.015	−1.007****	0.271
Political economy				
GDP relative to U.S.	−0.038***	0.009	0.231**	0.126
Economic openness	−0.004	0.005	0.054***	0.017
Demographic status				
Age of head	0.100****	0.013	0.042	0.055
Age squared	−0.002****	0.001	−0.001	0.001
Minors in household	−0.021	0.016	−0.042	0.076
Assets owned				
Farmland	0.058	0.084	0.378	0.266
Real estate	−0.260****	0.054	0.090	0.205
Business	−0.747****	0.107	−0.478*	0.269
Human capital				
Schooling	−0.044****	0.007	−0.022	0.028
Spouse's schooling	0.005	0.008	−0.046	0.030
Social capital				
Family in U.S.	0.707****	0.026	0.889****	0.148
Head's occupation				
Agriculture	—	—	—	—
Unskilled manual	0.232****	0.064	0.005	0.327
Skilled manual	−0.017	0.062	0.369	0.248
Unemployed	−0.885****	0.103	−1.195**	0.502
Spouse's labor force status				
Spouse employed	−0.019	0.055	0.135	0.198
Constant	−2.274**	0.893	−3.945*	2.111
Chi-square	2,059.6****		−115.3****	
Pseudo *R*-squared	.087		.070	
Person-years	178,519		21,348	

* $p < .10$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.

TABLE 5

Effect of Deadly Violence on the Likelihood of Taking a First Trip to the United States from Guatemala and Nicaragua: 1979–2003

	Guatemala		Nicaragua	
	B	***SE***	***B***	***SE***
Violence indicator				
Smoothed homicide rate	−0.002	0.008	0.052***	0.021
Political economy				
GDP relative to U.S.	−0.002	0.130	0.101	0.070
Economic openness	−0.033	0.021	−0.020*	0.011
U.S. Contra involvement	—	—	0.007****	0.002
Demographic status				
Age of head	0.285***	0.095	0.168***	0.064
Age squared	−0.005***	0.001	−0.002***	0.001
Minors in household	0.081	0.100	−0.089	0.080
Assets owned				
Farmland	0.040	0.408	−0.224	0.441
Real estate	−0.425	0.297	0.197	0.238
Business	−0.910**	0.372	0.424*	0.252
Human capital				
Schooling	0.020	0.037	−0.017	0.028
Spouse's schooling	0.062	0.039	0.135****	0.034
Social capital				
Family in U.S.	0.639***	0.225	0.922****	0.110
Head's occupation				
Agriculture	—	—	—	—
Unskilled manual	1.280	0.796	0.032	0.526
Skilled manual	0.878***	0.312	−0.304	0.365
Unemployed	−0.184	0.825	0.625*	0.360
Spouse's labor force status				
Spouse employed	−0.496	0.346	−0.442**	0.225
Constant	−8.222****	1.833	−12.787****	2.417
Chi-square	69.7****		158.6	
Pseudo *R*-squared	.095****		.124****	
Person-years	9,154		24,227	

* $p < .10$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.