

Individual Decisions to Migrate During Civil Conflict

Pratikshya Bohra-Mishra
Douglas S. Massey

Office of Population Research
Princeton University

Paper submitted for the Annual Meeting of the Population Association of America (PAA)
Detroit, Michigan April 30 – May 2, 2009

Abstract

The existing literature on forced migration limits our understanding of a deterring effect of violence on migration. Furthermore, there is no study that looks at the impact of violence on migration to competing locations such as internal versus international destinations. The paper therefore adds a new perspective to the literature on forced migration by studying individual migration patterns from Chitwan in South-Central Nepal, which was undergoing low to moderate level of violence from civil conflict. First, it shows that lower level of violence during conflict instead restricts movement rather than resulting in forced migration, and the effect of violence on mobility increases as the distance of the move increases. The paper also makes a significant contribution to the literature on forced migration by examining the influence of violence on micro-level decision-making in the presence of determinants of forced migration at multiple levels. The significant effects of determinants of migration at the individual, household and neighborhood level were mostly consistent with the leading hypotheses derived from contemporary theories of voluntary migration. Although individual differences in physical capital and neighborhood characteristics do not affect the impact of violence on migration, violence interacts with gender, marital status and to some extent human capital leading to different effects of violence on migration by gender, marital status and human capital.

Civil violence is seemingly endemic to the contemporary world, and no region is immune. In the Americas, guerilla warfare surged in Nicaragua, El Salvador, and Guatemala during the 1980s and continues today in Colombia. In Europe, waves of violence have washed over the Balkans and former Soviet Republics while Africa has been repeatedly stained by bloody conflicts in places such as Rwanda, Liberia, Sierra Leone, Sudan, Congo, Somalia, and Zimbabwe. In Asia, violence has erupted in the Philippines, Thailand, Malaysia, Myanmar, Indonesia, and parts of China. All these conflicts have produced significant displacements of people, both within and across national borders. According to the U.N. High Commissioner for Refugees, at the end of 2005 the number of forced migrants included 8.7 million external refugees and 6.6 million internally displaced persons (UNHCR 2007).

A number of aggregate-level studies have examined the effect of violence on migration and have generally confirmed a strong connection between the two, though debate remains about whether the effect is direct or indirect. After his analysis of emigration from El Salvador to the United States, Jones (1989) concluded that the effect was indirect, with violence producing local economic downturns that, in turn, led to emigration. Likewise, Morrison (1993) and Morrison and May (1994) found that conflict-related economic turmoil was more important than violence in predicting out-migration between provinces in Guatemala. Schultz (1971) found that rural violence was significant in predicting migration to Colombian cities, but that its effect was small compared with other socioeconomic and demographic variables.

Most other aggregate-level studies have concluded there is a direct connection between violence and migration. Shellman and Stewart (2007), for example, found that trends in Haitian emigration to the United States were strongly predicted by surges in political violence, even after the influence of economic conditions was held constant. Morrison (1993) likewise found that out-migration between provinces in Guatemala was strongly predicted by violence as well as economic

conditions, and Morrison and Lafaurie (1994) obtained similar results in Colombia. Morrison and May (1994) found, however, that violence produces significant migration only above a certain threshold. Stanley (1987) also found that military sweeps rather than killings per se were more strongly associated with variations in the flow of undocumented migrants from El Salvador to the United States.

In addition to the foregoing country studies, cross-national comparative analyses also suggest a direct connection between violence and migration. A pooled time series analysis by Schmeidl (1997) found that violence predicts international refugee flows more strongly than national economic conditions; and the fixed effects model of Davenport, Moore, and Poe (2003) revealed that genocide, political violence, and civil war, each strongly predicted refugee migration independent of economic circumstances. Another study by Moore and Shellman (2006) found that state violence toward civilians tended to produce international refugees whereas high levels of dissident violence and civil warfare tended to produce internally displaced people (IDPs). Melander and Öberg (2007) suggest that migration is more a product of the geographic scope of violence and the extent to which it touches urban areas rather than its overall intensity. In her review of the macro-level literature, Schmeidl (2001:85) concluded “that refugee flows are affected by state implosions and or the formation of new states and internal struggles, particularly those fueled by foreign military adventures.”

In contrast to the relative abundance of aggregate studies, few analyses have examined the connection between violence and migration at the individual or household level. Engel and Ibáñez (2007) surveyed displaced and non-displaced persons in Colombia in 2000 and found that the threat of violence and the presence of paramilitary and guerilla groups were strongly associated with out-migration, associations that held up well under a variety of controls (Ibáñez and Vélez 2008). Lundquist and Massey (2005) undertook a discrete time event history analysis of out-migration

from some 1,500 households surveyed in Nicaragua and found that violence during the U.S.-sponsored Contra War strongly predicted out-migration to the United States whereas conflict-related economic distress promoted migration to neighboring Costa Rica. Alvarado and Massey (2010) showed that Nicaraguan migration to the United States also rose in response to the increase in lethal violence that accompanied the imposition of structural economic adjustment policies in the 1990s. In Mexico and Costa Rica, however, they found that increases in lethal violence were associated with lower probabilities of migration to the United States.

In general, research to this point suggests a clear connection between civil violence and migration, even though the connection may be partially indirect through the effect of conflict on economic conditions. Less clear is whether the effects of violence are the same for short- and long-distance moves, or for internal versus international movement. It is also unclear whether the influence of violence is characterized by threshold effects, being substantially different at different levels of intensity, or whether under certain circumstances violence might actually reduce the odds of movement. Finally, few studies to date have examined the influence of violence on micro-level decision-making and no study has yet considered the determinants of forced migration at multiple levels.

In this paper we seek to rectify these shortcomings by undertaking a systematic event-history analysis of how violence unleashed during Nepal's Maoist insurgency of 1996-2006 affected the likelihood that people moved locally, internally, or internationally, holding constant other individual, household, and neighborhood characteristics. Nepal offers a good test case for estimating the influence of violence on migration because its insurgency lasted a full decade during which the scope and intensity of the conflict fluctuated considerably, thereby yielding substantial variation in the variable of interest.

Our study improves on existing research in several ways. First, we consider competing geographic destinations in the same model. To date, most studies have either modeled the movement of refugees internationally (see Apodaca 1998; Schmeidl 1997; Shellman and Stewart 2007; and Iqbal 2007) or focused on internal displacements (see Morrison 1994; Morrison and Lafaurie 1994; Ibanez and Velez 2008; Schultz 1971). Few studies have considered both kinds of migration at the same time (see Davenport et al. 2003; Moore and Shellman 2004; and Melander and Oberg 2007) and so far none have distinguished between short and long-distance internal moves. Our analysis also controls for the effects of human capital, social capital, physical capital, neighborhood development, and demographic characteristics because these factors can be expected to continue to promote voluntary migration even during periods of civil conflict.

We begin with a brief history of the Maoist insurgency in Nepal and then introduce the study site and describe its connection to the conflict and introduce the multi-level longitudinal survey from which we take our data. After presenting the analytic model and discussing the operationalization of key variables, we offer new findings about how violence affects migration to local, internal, and international destinations and draw relevant theoretical, substantive, and policy conclusions.

THE PEOPLE'S WAR IN NEPAL

The history of Nepal as a nation state begins with King Prithvi Narayan Shah's conquest of several smaller scattered kingdoms and their consolidation into a single state in 1768. Prime Minister Jung Bahadur Rana usurped absolute power in 1846, though he left the monarchy in place as a figurehead. For the next 104 years, the Rana family ruled the country as a private fiefdom, an arrangement that persisted until the Delhi Compromise of February 1951, in which King Tribhuvan, the Rana family, and the Nepali Congress Party agreed to end Rana rule (Thapa 2004). Just as the country began moving toward reform and development, however, King Mahendra dissolved

parliament in 1959 and took control. In December of 1962, he established the Panchayat system, which abandoned party politics for his version of a “guided democracy,” ushering in three decades of absolute rule.

After 30 years of autocracy, the people’s movement for democracy won a new constitution in 1990 that reinstated democracy and transformed the King into a constitutional monarch. The new constitution did not fully meet the demands of long-suppressed groups, however, which continued to chafe at domination by higher castes. Even worse, the democratic government seemed in many ways to extend the Panchayat system and was characterized by corruption, bitter power struggles, and the continued exploitation of peasants and ethnic minorities. Nepal remained a multiethnic country run by higher caste Bahuns and Chhetris who continued to subjugate other ethnicities, religions, and castes under a Hindu theocracy (Thapa 2004).

In response to this history of inequality of exploitation, the Communist Party of Nepal, a Maoist organization, submitted demands for change to the government on February 4th, 1996, and when these demands were ignored, it launched an armed insurgency known as the “people’s war” on February 13, 1996. Owing to the neglect and marginalization of minorities and the poor under a feudal system that actually worsened under democratic rule, communist ideology became rooted in the far-western district of Rolpa, which became the stronghold from which the Maoists launched their insurgency to establish a “People’s Republic of Nepal.” In the mid-western region, the districts of Rukum, Salyan, Pyuthan and Jajarkot also became Maoist strongholds.

Although inequality and discrimination along ethnic and caste lines were major causes of the conflict (Murshed and Gates 2005), one cannot ignore spatial aspects of the insurgency. In a country where more than 80% of the population was rural, development efforts historically were focused primarily on urban areas. Among Nepal’s five development regions, for example, the central and eastern regions, which contain the country’s most important commercial centers,

received the lion's share of development assistance while the mid- and far-western regions, which had few natural resources, were neglected and evinced high rates of poverty and low levels of human development. Once the insurgency began, they also experienced the most intense violence (see Do and Iyer 2006). Empirical analyses by Murshed and Gates (2005) reveal that the intensity of the insurgency across Nepal's 75 local districts was positively and significantly related to the degree of income inequality.

Violence began to escalate on September 25, 2000 when Maoists overran Dunai, the headquarters of Dolpa district, killing 14 police personnel (Hutt 2004). Still, until November 21, 2001 the conflict was only of medium intensity and involved mainly insurgents and the police. After peace talks failed, and the government proclaimed a state of emergency and denounced the Maoist rebels as terrorists in November 2001, the insurgency however grew into a high intensity conflict involving the Royal Nepalese Army (Murshed and Gates 2005). According to Murshed and Gates (2005), a low intensity conflict is one with fewer than 25 battle-related deaths per year and no more than 1,000 battle-related in total; a medium-intensity conflict has between 25 and 1,000 battle-related deaths per year and accumulated deaths in excess of 1,000; whereas a high-intensity conflict has more than 1000 battle-related deaths per year.

By late 2002, violence between the Maoists and government forces was reported in 73 of Nepal's 75 districts (Kok 2003). The insurgency finally ended on November 21, 2006 with the signing of a Comprehensive Peace Agreement, making the "people's war" in Nepal one of the longest high intensity conflicts in contemporary times. Between February 1996 and December 2006, 8,377 people were killed by government forces and another 4,970 were killed by Maoist insurgents, yielding a total of 13,347 deaths (Informal Sector Service Center 2008). The civil war was also characterized by widespread human rights abuses such as abduction, forced conscription, torture, rape, extortion, use of civilians as human shields, forced billeting and taxation, as well as

local strikes, which together created a state of terror, resulting in the displacement of thousands of people.

Displacements linked to the conflict were both internal and international. Some moved to district capitals and large cities such as Kathmandu and Nepalgunj whereas others went across the border to India (see Martinez 2002). According to Indian Embassy officials, around 120,000 displaced Nepalese crossed the border into India in January 2003 alone because of the insurgency (Kok 2003). Although exact figures on forced migration do not exist, evidence from many sources suggests that migration to both internal and international destinations surged dramatically as a consequence of the civil conflict, owing not only to the threat of violence but also because of declining agricultural and economic production.

THE CHITWAN STUDY SITE AND SURVEY

The Chitwan Valley lies in the central development region of Nepal and shares a border with India to the South. It is one of the most developed and fertile areas of the country. As recently as the early 1950s, however, the valley was covered by dense forest, which was subsequently cleared by the government to make land available to settlers. The favorable climate, flat terrain, and fertile soil were attractive to people in nearby hills and mountains, who migrated to the newly cleared area in large numbers in search of opportunity. In the late 1970s, Narayanghat, Chitwan's largest town, was connected by road to other cities throughout the country, including the capital Kathmandu, as well as to India. As a result, the city began to attract government services, business investments, and jobs and development spread throughout the valley, with the degree of influence falling with distance from Narayanghat.

Given its relatively high level of economic development, Chitwan was exposed to lower levels of violence during the decade-long civil war compared with other districts, especially those in the mid and far western regions of Nepal. The insurgency resulted in a total of 200 deaths in

Chitwan district over a decade while the number of deaths in some of the hardest hit districts reached over 900 (Informal Sector Service Center 2008). Chitwan thus offers a unique opportunity to study real-time migratory responses to ongoing low-to-moderate violence from a civil conflict while controlling for individual, household, and neighborhood characteristics.

Our data come from the Chitwan Valley Family Study (CVFS), which used a combination of ethnographic and survey methods to create a detailed multi-level database on social, economic, and demographic processes. The western portion of the valley was divided into a set of mutually exclusive neighborhoods of 5-15 households and 171 neighborhoods were selected on an equal probability basis using multi-stage cluster sampling (Barber et al. 1997). The migration data come from a prospective monthly panel survey that began in February 1997 and ended in January 2006. Instead of the 171 original neighborhoods, however, only 151 were followed in the panel owing to budget constraints. Household members from these 151 neighborhoods were followed month by month even if they left the sample neighborhood in Chitwan, except when the entire household moved outside of Nepal. The panel survey yields accurate monthly data on place of residence, age, ethnicity, gender, and marital status.

We pair this dataset with corresponding individual, household, neighborhood and census datasets conducted in 1996, thereby creating a longitudinal data file that connects individual migratory behavior to fixed and time-varying independent variables defined at the individual, household, and neighborhood levels. In our sample, we include only those 3,848 respondents between the ages of 15 and 69 who resided in the 151 neighborhoods at the outset of the panel survey. After merging the different datasets, the final event history file contains less than 2 percent of person months with missing values for one of the variables used in our analyses. We therefore do not believe that this is likely to cause any significant bias in our analysis.

In order to measure violence from the civil conflict, we compiled monthly data on violence from the Maoist insurgency, relying on data on Maoist violence recorded by the South Asia Terrorism Portal (SATP) and the Informal Sector Service Center (INSEC). Data on Maoist violence compiled by SATP was directly downloaded from their website while data from INSEC was manually compiled from their yearly publication of human rights yearbook to supplement and corroborate data derived from SATP. The first source kept monthly tallies of incidents of violence such as bomb blasts, landmine explosions, and major clashes between government and insurgent forces, along with the casualties from these various incidents. The second source reported dates of events of Maoist violence by districts. Both these sources however only recorded incidents of violence from January of 2002 onwards and do not provide data between February 1997 and December 2001, mostly because violence from Maoist activities was not a countrywide phenomenon until the declaration of state of emergency by the Nepalese government at the end of 2001. Given that Maoist violence was at a minimal in more developed areas such as Chitwan, we use imputed values of zeroes for the monthly index of violence between February 1997 and December 2001.

We matched monthly counts of violence with monthly data derived from the CVFS to create a comprehensive person-month file of individuals that ran from March 1997 through January 2006, structured so that time-varying independent variables were defined in month t whereas mobility was observed in month $t+1$. This person-month file was then used to estimate a series of multinomial logit models that predicted the likelihood of migration to three competing destinations: within Chitwan, outside of Chitwan but in Nepal, and outside Nepal.

MODELING FORCED MIGRATION

The literature on forced migration generally distinguishes between three kinds of determinants---root causes, proximate conditions, and intervening factors---and in Table 1 we

classify our independent variables using these same rubrics, along with demographic control variables. The outcome of interest is defined as 0 if no move was observed between month t and t+1; 1 if a respondent moved to a different neighborhood in Chitwan from t to t+1; 2 if he or she moved outside of Chitwan but within Nepal during this time; and 3 if he or she left the country entirely. All person months spent outside the survey neighborhoods in Chitwan are excluded from the analyses until the respondent returns to the place of origin if she or he returns, yielding a total of 297,297 person months for our analyses. Our set of independent variables includes time-varying factors defined in month t as well as those fixed at the beginning of the observation period.

TABLE 1 ABOUT HERE

Using the foregoing person-month file, we estimate multinomial logit models to predict the effect of independent variables in month t or the baseline on the migration outcome in month t+1.

The model can be written as:

$$\ln\left(\frac{P_{ij}(t+1)}{P_{i0}(t+1)}\right) = \beta_{0j} + \beta_{1j} X_{1i}(t) + \beta_{2j} X_{2i}(t) + \beta_{nj} X_{ni} + \varepsilon_{ij}$$

where i denotes individuals; j represents the three possible values for migration destinations 1, 2 and 3 versus 0, which is the reference category representing no migration; and t represents time period which is month in our study. The multinomial regression will produce separate regression equations for the three different migration destinations represented by j. The migration outcome is a nonlinear transformation or the natural logarithm of the predicted value of the odds or relative probability, p/1-p of migrating to three competing (j=1, 2 or 3) destinations versus not migrating. β_{0j} is the constant, β_{1j} to β_{nj} represent the coefficients; ε_{ij} is the error term for individual i with migration outcome j; and finally X_{1i} to X_{ni} represent the explanatory variables, which are grouped under four categories – proximate causes, root causes, intervening factors, and demographic variables.

Proximate Causes

The proximate cause of migration of central interest is the intensity of violence during month t . Rational choice theory suggests that as the risk to physical safety rise with the intensity of violence, people will seek to reduce this risk by moving somewhere else (Edwards 2008). Although the theoretical literature is unanimous in predicting a positive relationship between violence and migration, some empirical studies suggest the relationship is not monotonic but discontinuous because of threshold effects (Edwards 2008:348). Morrison (1994) found, for example, that low levels of violence had no effect on internal migration in Guatemala, and Alvarado and Massey (2010) found that modest levels of violence may even deter migration if people seek to minimize risk by withdrawing to the home and limiting outside mobility. Such an outcome could easily characterize Chitwan, which experienced low-to-moderate levels of violence during the Maoist insurgency.

Owing to data limitations, most studies define the intensity of violence in terms of the number of reported deaths (see Heger and Salehyan 2007; Lacina 2006; Schultz 1971; Stanley 1987; and Alvarado and Massey 2010). Here, however, we adopted a more comprehensive index based on six indicators of violence in Chitwan and surrounding districts, in the belief that violence in adjacent areas also influences decisions made in Chitwan. These bordering districts, which include Parsa, Makwanpur, Dhading, Gorkha, Tanahu, and Nawalparasi, also experienced low to moderate levels of violence during the insurgency. Not much different from Chitwan, which experienced 200 deaths from Maoists-related violence, the six neighboring districts averaged 158 deaths over the decade-long war while the highest number of deaths were recorded in Gorkha (259 deaths) (Informal Sector Service Center 2008).

Our six measures of violence include the monthly number of bomb blasts in Chitwan; the number of bomb blasts in neighboring districts; the number of casualties from bomb blasts in

Chitwan; the number of casualties from bomb blasts in neighboring districts; the number of casualties in Chitwan from major clashes between government and Maoist forces, major attacks by either party, and major landmine explosions; and the number of casualties in neighboring districts from major clashes between government and Maoist forces, major attacks by either party, and major landmine explosions. Major clashes and attacks are defined as those with more than two casualties.

We employed the factor analytic method of Sahn and Stifel (2000, 2003) to construct an index of insurgent violence using the principal components factor method. Since the indicators of violence were at different scales, we standardized by converting them into z-scores before weighting to create the final scale. The factor loadings associated the first factor, which explains 43% of the variance, providing the weights to compute the composite score. The top panel of Table 2 shows large factor loadings for the number of bomb blasts in Chitwan, the number of bomb blasts in neighboring districts, and the number of casualties from bomb blasts at each location. The number of casualties from major attacks, clashes, or landmines did not load as highly on the violence factor and are accordingly given less weight in the overall index.

TABLE 2 ABOUT HERE

Root Causes

The root causes of migration are generally hypothesized to be poverty, unemployment, and low wages, which yield economic hardship that prompts people to look elsewhere for material advancement. Conventional economic theory suggests that access to physical capital helps mitigate the costs of migration and thus raises the probability of out-migration (Massey et al. 1998) whereas the new economics of labor migration holds that households move to self-finance the acquisition of assets so that the possession of physical capital is associated with a lower likelihood of movement (see Massey and Espinosa 1997). In either case, ownership of physical capital should be controlled in studying how violence influences migration decisions.

In our analysis, among indicators of physical capital, we consider ownership of the house plot, goods owned, livestock owned, and amenities in the household. Ownership of the house plot is indicated by a dichotomous variable whereas access to other assets (goods, livestock, and household amenities) is indicated by the factor scales summarized in the second, third, and fourth panels of Table 2, which show factor loadings derived using principal components factor methods and applied as weights to z-scores to compute the relevant scales.

The weights for household amenities, goods owned, and livestock owned from factor analysis have expected signs. The weights are positive for all except for “no drinking water” and “no toilet,” which indicate lower physical capital relative to the reference variables that represent higher level of physical capital. Among the household amenities, types of materials used to build the floor of the house, availability of electricity, lack of drinking water, and lack of toilet are assigned large weights while types of materials used to build the roof and wall of the house have small and in the latter case no weight assigned at all. Similarly, among goods owned, slightly larger weights are placed on ownership of gobar gas plant, TV, and motorcycle compared to other goods such as pumpset for irrigation, cart, bicycle, etc. Finally, among the livestock variables, sheep and goats, female buffaloes, bullocks and cows carry relatively larger weights compared to chickens, ducks, pigeons, male buffaloes and pigs.

Among the economic causes of migration, neoclassical economics places special emphasis on low wages, arguing that in the presence of a geographic wage differential, migrants will move to maximize expected lifetime earnings (Todaro and Maruszko 1987). In contrast, the new economics of labor migration sees migration as tied to missing or imperfect markets for capital, futures, credit, and insurance rather than geographic differences in wages (Stark 1991). The latter model also views migration as a collective decision rather than an individual decision by which households

send out migrants to diverse locations to minimize risk, accumulate capital, and overcome credit constraints.

Although we do not have data on wages or employment rates in origin and destination areas, we do have information on personal characteristics that are known to determine wages (Sjaastad 1962). We therefore introduce selected measures of human capital as control variables in our analysis of how violence influences migration. We measure education as years of school completed by 1996 (see Table 1). As a measure of occupational skill, we include a dummy variable indicating whether the respondent qualified for a salaried job in 1996, and age in years offers a proxy labor force experience, with a squared term added to capture nonlinear curvature in the relationship.

We also include controls for neighborhood development, as the neoclassical economic model generally posits that communities with better infrastructure and more opportunities will deter migration whereas the new economics of labor migration suggests that local economic development creates opportunities for investment and consumption that motivate households to migrate in order to overcome capital and credit constraints. We measured access to infrastructure by constructing a factor scale of the time taken to travel to the nearest clinic, bus stop, school, market, bank, police station, and job source. In general, the lower the travel time to these amenities the more developed the neighborhood. As can be from the bottom panel of Table 2, the principal components analysis assigned relatively large weights to travel times associated with accessing banks, healthcare services, bus services, and place of employment.

Intervening Factors

The third category of influences on forced migration includes intervening factors, originally introduced by Lee (1966) in discussing voluntary migration and later applied by Clark (1989) to refugee migration. Alternatives to international migration such as possibility of migrating internally

or locally, hindrances to international movement, membership in an insurgent group, and seasonal factors can increase or decrease the likelihood of forced migration (see Schmeidl 1997).

The Nepalese economy heavily relies on agriculture, which employs 76% of the workforce while unemployment rate is very high and consequently, there is a long tradition of seasonal migration in Nepal. Martinez (2002) suggests that 60 to 80 percent of the male population in Western Nepal live away from home during the winter season, yielding a culture of seasonal movement for subsistence. We therefore control for potential seasonality in the risk of migration by specifying 11 monthly dummies.

Perhaps the most important intervening factor influencing the migration decision is social capital, a term coined by Loury in 1977 and expanded by Bourdieu in 1986 to refer to resources available through membership in social networks and organizations. A social tie to a current or former migrant constitutes a potential source of social capital because someone with migratory experience can provide information, resources, and assistance to lower the costs of movement of a potential migrant (Massey et al. 1998). In our analysis, we measure social capital by introducing three dummy variables to indicate whether the respondent had at least one member in his or her household who had migrated within Chitwan, to other districts in Nepal, or to other countries in 1996. Irrespective of the level of violence, we expect to observe strong destination-specific effects of social capital on migration, with ties to international migrants predicting international migration, ties to internal migrants predicting internal migration, and ties to local migrants predicting migration within Chitwan.

Finally, in our analysis we hold constant the influence of demographic variables such as gender, marital status, household size, and ethnicity. Prior work has revealed significant ethnic differences in decision-making with respect to migratory outcomes (Bohra and Massey 2009) so we measure ethnicity using dummy variables to indicate high caste Hindus, low caste Hindus, Hill

Tibeto-Burmese, Newar and other, leaving the Terai Tibeto-Burmese as the reference category. The Terai Tibeto-Burmese are the local indigenous people of the Chitwan Valley, and if prior migratory experience yields migration-related human and social capital, then other groups should be more likely to possess such resources than the Terai Tibeto-Burmese. As for gender, we expect variation in migration frequency especially to international locations by gender because in 1998, the Nepalese government imposed a ban on migration of women workers to the Gulf region which lasted throughout our observation period (Graner 2001).

DESCRIPTIVE STATISTICS

Table 3 presents means, standard deviations, and ranges for the measures used to create composite indicators of violence, physical capital, and neighborhood characteristics. During the 108 months of civil conflict that we study, there were 0 to 3 bomb blasts in a month in Chitwan, with an average of .2 bomb blasts in a month. There were 0 to 5 casualties from such bomb blasts in a month with an average of .21 casualties in a typical month. The number of casualties from major attacks in Chitwan ranged from 0 to 38 with an average of .53 casualties in a month.

TABLE 3 ABOUT HERE

Similarly, number of bomb blasts in a month in neighboring districts ranged from 0 to 9, with .8 bomb blasts on average in a typical month. The monthly casualties from such bomb blasts ranged from 0 to 12, with .75 casualties on average in a month. The number of casualties from major attacks in neighboring districts ranged from 0 to 86 with an average of 3 casualties in a month.

TABLE 4 ABOUT HERE

Table 4 presents means, standard deviations, and ranges for the predictors of migration and the counts for migration to different destinations. In terms of physical capital, an astounding 86% of the households to which the respondents belong owned a house plot. As for the household

amenities, Table 3 shows that on average 59% of the households to which the respondents belong had the walls of their house made of brick, cement or wood; 49% had their roof made of slate, tin or concrete; while only 25% had their floor made of concrete. All of these materials used represent better quality materials versus materials such as cane mud, mud, stone or other material for wall; thatched or other material for roof; and mud, brick or wood for floor. The use of the former materials that are not affordable to people with lower socioeconomic status therefore, reflects a better economic status of such respondents. However, on average, 46% of households to which the respondents belong did not have their own source of drinking water while 36% had no toilet and 66% had no electricity.

Among the goods owned by households, although 52% have a radio and 62% have a bicycle, only 12% have a TV and 3% have a motorcycle. 7% have a cart and 5% have a gobar gas plant while only 1% and 3% of households have a tractor and a pump set for irrigation respectively. Respondents' households on average owned 20.2 chickens and ducks, 1.15 pigeons, .57 bullocks, .36 cows, .16 male buffaloes, 1.25 female buffaloes, 1.46 sheep and goats, and .06 pigs.

Finally, among the variables used to create a factor index of neighborhood development, within the sampled neighborhoods on average, time on foot to nearest school, healthcare facility and bus service were 9.2, 20.5 and 12.3 minutes respectively. On average, distance by bus to Narayanghat was 80.5 minutes while minutes on foot to nearest market, nearest bank, nearest place of employment and nearest police station were 12.1, 58.2, 20.6 and 64.3 minutes respectively.

The variables described above from Table 3 are used in creating factor index of violence (under proximate cause), and physical capital and neighborhood development (under root cause). Each of the factor index thus derived is standardized for ease of interpretation and reported in Table 4 as index with mean of 0 and variance of 1. Next, education, which is a measure of human capital, is generally quite low. Although the number of years of education of respondents ranges from 0 to

16, in the average person months when the respondent was not living away from home, respondents averaged only 3.6 years of schooling. Another measure of human capital is whether or not the respondent holds a salary job in 1996. Only 6 percent of the person months represent respondents with a salary job in 1996. Age, which is used as another measure of human capital shows that in the months when respondents were exposed to the risk of migrating, the average person was around 38.7 years old although people ranged from 15 years to 69 years of age.

Similarly, based on the statistics on social capital, 7% of the person months represent respondents with at least one house member who had migrated within Chitwan in 1996. Another 10% of person months represent respondents with a member in their household who had migrated to other districts within Nepal while an additional 10% had an international migrant in their household in 1996. When migration to other districts and other countries are combined, 20% of person months represent respondents with a member in their household who had migrated to either other districts within Nepal or to other countries in 1996. Another source of intervening factor, months leading up to the first trip was almost equally distributed. 7% of the person months were January; February, March and April contributed 9% of person months each; and the remaining months from May to December contributed 8% of person months each.

Among the demographic variables, 57% of the person months represented females. An extremely high proportion, i.e. 87 percent of person months represented respondents who were married at least once. On average, respondents had 6.7 members in their household although the number of household members varied from 1 to 26 members. Finally, in keeping with the rough composition of the Valley, in person months leading up to the end of the survey, the largest share of respondents were upper caste Hindus (47%), followed by Terai Tibeto-Burmese -- the original inhabitants of the Valley (22%), Hill Tibeto-Burmese (14%), Lower Caste Hindus (10%), and

Newar and other caste (7%). Thus most residents of Chitwan either migrated in from outside the Valley or are descendent from someone who did.

EFFECT OF VIOLENCE ON MIGRATION

As described earlier, we followed respondents month-by-month from March of 1997 up to the point of the survey date and defined independent variables as time varying in month t or fixed in 1996 and used them to predict migration in month $t+1$. Table 5 presents the results of a multinomial regression we estimated to measure the effect of violence in Chitwan and surrounding districts on migration to three possible destinations while controlling for relevant individual, household, and neighborhood characteristics.

TABLE 5 ABOUT HERE

Prior work has generally hypothesized and found a strong connection between violence and migration, though some studies have uncovered threshold effects and at least one study found that low-to-moderate levels of violence negatively influenced the odds of movement. Given that the Maoist insurgency was centered in other districts of Nepal and civil violence never went beyond moderate levels in Chitwan, we earlier raised the possibility of observing negative effects in this analysis, and this is precisely what we find. Our composite index of violence significantly lowers the odds of out-migration to destinations within Chitwan as well as to other districts in Nepal and international locations, controlling for other predictors of movement, with p -values below 0.01 in all three cases. The deterrent effect of violence also seems to rise as the distance of the move increases. Thus a one standard deviation increase in violence reduces the odds of migrating within Chitwan by 27.4% ($1-e^{-.32}=0.274$); to other districts in Nepal by 48.5% ($1-e^{-.663}=0.485$); and to other countries by 75.4% ($1-e^{-1.402}=0.754$).

Other independent variables generally have effects that are consistent with prior theory and research. Like Massey and Espinosa (1997), we find that ownership of physical capital in general

reduces the odds of migration. Ownership of house plot, for example, significantly lowered the odds of moving within Chitwan and to other districts in Nepal, while increased the odds of migrating internationally although this effect is only marginally significant. Similarly, access to household amenities lowered the odds of moving to all three destinations while ownership of livestock reduced the odds of moving locally but had no significant effect on internal or international migration. Interestingly, ownership of goods on the contrary, increased the odds of migrating to all three destinations although migration to within Chitwan location is insignificant. This seems to suggest that ownership of more liquid assets such as goods owned by household compared to household amenities or ownership of house plot, can facilitate migration by providing easier liquidity which could potentially be used to finance the cost of travel.

The effect of human capital was generally positive, with education and occupational skill increasing the likelihood of movement to all three destinations (though the effect of occupational skill was not significant in predicting international migration). Age generally had decelerating negative effect on the likelihood of migration irrespective of destination. As expected, social capital evinced strong place-specific effects on mobility, with ties to local movers most strongly predicting migration within Chitwan, ties to internal migrants most strongly predicting migration to other districts in Nepal, and ties to international migrants strongly predicting emigration outside the country.

Schmeidl (1997) identified seasonality as an important intervening factor that can play a significant role in increasing or decreasing refugee migration and the dummy variables for month does indeed reveal distinct patterns of seasonal migration for different kinds of moves. Within-Chitwan migration is elevated during all months except June and September, whereas migration to other districts in Nepal is less likely to occur in January, and departures for international destinations are most likely to occur in February, March and November. In terms of personal

demography, men and women appear to have the same odds of migrating within Chitwan and to other districts in Nepal. As expected, however, women are much less likely to migrate internationally than men, with females having 84.4 percent lower odds of migrating to other countries ($1 - e^{-1.86} = 0.844$). Holding the effect of gender constant, marital status was a significant predictor of migration in all case, increasing the odds of migration within Chitwan by 64% ($e^{0.495} = 1.64$), to other districts in Nepal by 77% ($e^{0.571} = 1.77$) and international migration by 69.4% ($e^{0.527} = 1.694$).

Rising household size decreased the odds of migration. Each additional person in the household lowered the odds of migrating within Chitwan by 2% ($1 - e^{-0.0203} = .02$), to other districts by around 4.7% ($1 - e^{-0.0485} = 0.047$) and to other countries by 11.7% ($1 - e^{-0.124} = 0.117$). Finally, in terms of caste, Hindus and Hill-Tibetoburmese are far more likely to move internationally than other groups and the Hill-Tibetoburmese generally seem to be the most mobile, with an elevated risk of migration to all three destinations. Thus, consistent with the earlier results of Bohra and Massey (2009), those who belong to ethnic groups with prior migratory experience are more likely to migrate than Terai Tibetoburmese, the indigenous people of the Chitwan Valley, whatever the level of violence.

As a follow up to the analysis of Table 5, we estimated another set of regressions that introduced interaction terms between violence and each of the root causes and demographic factors to see whether variables affected migration differently in the presence of violence. Given the small number of respondents who left Nepal, however, we had to collapse migratory categories two and three into a single grouping for migration outside of Chitwan, one that included both internal and international migrants. Our estimates showed that the effects of physical capital did not vary according to the level of violence, but that the effects of gender and marital status along with one of the measures of human capital were significantly altered in the presence of civil conflict. In Table

6, we therefore show regressions that include the relevant three interactions in addition to the main effects already described.

TABLE 6 ABOUT HERE

As before, the main effect of violence is to reduce the odds of migration and the effect is significantly greater for moves outside Chitwan compared to those within the district. However, the significant interaction terms indicate that the effect of violence differs for ever married and never married individuals and for males and females. Overall, males and females display the same likelihood of migrating both within and outside Chitwan. During periods of heightened violence, however, women are much more likely to move outside the district than men. With each standard deviation increase in the level of violence, the odds that a woman will leave Chitwan goes up by 7.1% ($e^{.539}=1.71$) compared with men. In terms of marriage, those who have ever married are generally more likely to migrate within Chitwan as well as leave Chitwan than those who have never married. However, the inclination toward decision to leave Chitwan for ever married is dampened during periods of violence such that married people are less likely to migrate outside of Chitwan during periods of violence, perhaps out of worry and a reluctance to leave a spouse left behind in risky circumstances. Finally, having a salary job increases one's odds of migrating within Chitwan irrespective of violence while increase in violence instead seems to lower the odds of leaving Chitwan for those with a salary job although the latter effect is only significant at 10 percent level.

SUMMARY AND CONCLUSION

This paper sought to improve on prior studies of the relationship between civil violence and migration in several ways. First, we developed a more comprehensive model that allowed us simultaneously to assess the effects of individual as well as household and community characteristics, and to estimate the effects dynamically using longitudinal rather than cross-sectional

data. Specifically, we estimated a series of multi-level discrete time event history analyses that incorporated both fixed and time-varying effects. Second, we were able to define a more comprehensive and reliable index of civil violence than earlier studies by including not just counts of deaths within the home district, but also the number of bomb blasts and major conflicts and casualties from these both in the home district as well as all surrounding districts.

Third, we were able to measure the independent effect of violence on the decision to migrate locally, internally, and internationally. So far the literature on forced migration has tended either to study movement to one destination at a time or to lump all destinations together. We found that the effect of violence on the likelihood of migration was different for different destinations, increasing as the distance of the move increased. Fourth, we specified a more complex model of individual decision-making that estimated the effects of violence while controlling for leading predictors of voluntary migration, which we found influenced migration whatever the level of civil violence. Interactive models found that effects of physical capital did not vary by the level of violence, but that the effects of gender and marital status and to some extent human capital did. Specifically, during periods of heightened violence, married persons were less likely to move outside of Chitwan; and holding marital status constant, females were more likely than males to leave the valley during periods of violence. Finally, those with salary jobs were less likely to leave Chitwan during periods of escalated violence.

Our results are also novel in showing that civil violence affects migration differently at different levels of intensity. Whereas most prior work has found a positive effect of violence on out-migration, our results are consistent with those few studies that either have found violence to have no influence on migration below a certain threshold or to reduce the likelihood of movement at moderate levels. Conflict associated with the Maoist insurgency mostly unfolded in districts in the Far and Mid Western regions of Nepal while in Chitwan violence surged after 2001 but never

exceeded moderate levels. Within the observed range of variation, the effect of rising violence was to reduce the probability of migration, and to reduce it more strongly the longer the distance of the potential move. In other words, as violence increased from low to moderate levels, the general effect was to reduce the odds of population mobility, weakly in the case of local moves, more strongly for moves outside of Chitwan, and most strongly for international moves.

Our results thus support a threshold theory of migration and violence. Apparently only in situations characterized by high levels of violence do people see no option but leaving. Under conditions of extreme violence, threats to safety are perceived to exceed the risks of travel to a new and unfamiliar destination. At lower levels of violence, however, the risks of movement outweigh those associated with staying home for a variety of reasons. First, levels of violence may be much higher in other parts of the country and by staying home people avoid elevated risks elsewhere. Second, actions taken by insurgents and the state often create unsafe traveling conditions owing to a proliferation strikes, protests, and blockades, security checks, curfews, and roadblocks. Third, civil conflict is often associated with a breakdown of formal authority, creating a dangerous public sphere through which people must travel, one in which robbery, looting, assault, kidnapping, and other violations are common. For these reasons, unless violence reaches very high levels people are more likely to confine themselves to the safety of their homes, family networks, and surroundings they know and trust

REFERENCES

- Alvarado, Steven E., and Douglas S. Massey. 2010. "In Search of Peace: Structural Adjustment, Violence, and International Migration." *Annals of the American Academy of Political and Social Science*, forthcoming.
- Apodaca, Clair. 1998. "Human Rights Abuses: Precursor to Refugee Flight?" *Journal of Refugee Studies* 11:80-93.
- Barber, Jennifer S., Ganesh P. Shivakoti, William G. Axinn, and K. Gajurel. 1997. "Sampling Strategies for Rural Settings: A detailed example from the Chitwan Valley Family Study, Nepal." *Nepal Population Journal* 6:193-203.
- Bohra, Pratikshya & Douglas S. Massey. 2009. "Processes of Internal and International Migration from Chitwan, Nepal." *International Migration Review*, forthcoming.
- Clark, Lance. 1989. "Early Warning of Refugee Flows." Refugee Policy Group, Washington, D.C.
- Davenport, Christiana, Will H. Moore; and Steven C. Poe. 2003. "Sometimes You Just Have to Leave: Domestic Threats and Forced Migration, 1964-1989." *International Interactions*.
- Do, Quy-Toan, and Lakshmi Iyer. 2006. "An Empirical Analysis of Civil Conflict in Nepal." Center on Institutions and Governance Working Paper No. 12.
- Edwards, Scott. 2008. "Computational Tools in Predicting and Assessing Forced Migration." *Journal of Refugee Studies* 21(3).
- Engel, Stefanie, and Ana Maria Ibanez. 2007. "Displacement Due to Violence in Colombia: A Household-Level Analysis." *Economic Development and Cultural Change* 55:335-365.
- Graner, Elvira. 2001. "Labor Markets and Migration in Nepal." *Mountain Research and Development* 21:253-59.
- Heger, Lindsay, and Idean Salehyan. 2007. "Ruthless Rulers: Coalition Size and the Severity of Civil Conflict." *International Studies Quarterly* 51:385-403.
- Hutt, Michael. 2004. *Himalayan People's War-Nepal's Maoist Rebellion*. Indiana University Press.
- Ibáñez, Ana Maria, and Carlos Eduardo Vélez. 2008. "Civil Conflict and Forced Migration: The Micro Determinants and Welfare Losses of Displacement in Colombia." *World Development* 36(4):659-676.
- Informal Sector Service Center. 2008. Retrieved 12/08/08:
http://www.inseconline.org/hrvdata/Total_Killings.pdf
- Iqbal, Zaryab. 2007. "The Geo-Politics of Forced Migration in Africa, 1992-2001." *Conflict Management and Peace Science* 24:105-119.

- Jones, Richard C. 1989. "Causes of Salvadoran migration to the United States." *The Geographical Review* 79:183-94.
- Kok, Frederik. 2003. "Nepal: Displaced and Ignored." Norwegian Refugee Council, Geneva, Switzerland.
- Lacina, Bethany. 2006. "Explaining the Severity of Civil Wars." *Journal of Conflict Resolution* 50(2):276-289.
- Lee, Everett S. 1966. "A Theory of Migration." *Demography* 3:47-57.
- Lundquist, Jennifer H., and Douglas S. Massey. 2005. "Politics or Economics? International Migration during the Nicaraguan Contra War." *Journal of Latin American Studies* 37(1): 29-53.
- Martinez, Esperanza. 2002. "Conflict-Related Displacement Nepal."
- Massey, Douglas S., Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, and J. Edward Taylor. 1998. *Worlds in Motion: Understanding International Migration at Century's End*. Oxford: Oxford University Press.
- Massey, Douglas S. and Kristin E. Espinosa. 1997. "What's Driving Mexico-US Migration? A Theoretical, Empirical, and Policy Analysis." *American Journal of Sociology* 102:939-9.
- Melander, Erik, and Magnus Oberg. 2007. "The Threat of Violence and Forced Migration: Geographical Scope Trumps Intensity of Fighting." *Civil Wars* 9(2):156-173.
- Moore, Will H., and Stephen M. Shellman. 2004. "Fear of Persecution – Forced Migration, 1952-1995." *Journal of Conflict Resolution* 48:723-745.
- Moore, Will H., and Stephen M. Shellman. 2006. "Refugee or Internally Displaced Person? To Where Should One Flee?" *Comparative Political Studies* 39(5):599-622.
- Morrison, Andrew R. 1993. "Violence or Economics: What Drives Internal Migration in Guatemala?" *Economic Development and Cultural Change* 41(4):817-831.
- Morrison, Andrew R., and Rachel A. May. 1994. "Escape from Terror: Violence and Migration in Post-Revolutionary Guatemala." *Latin American Research Review* 29(2):111-132.
- Morrison, Andrew R., and Miguel Perez Lafaurie. 1994. "Elites, Guerrillas and Narcotraficantes: Violence and Internal Migration in Colombia." *Canadian Journal of Latin American and Caribbean Studies* 19(37-38):123-154.
- Murshed, Mansoob S., and Scott Gates. 2005. "Spatial-Horizontal Inequality and the Maoist Insurgency in Nepal." *Review of Development Economics* 9(1):121-134.
- Sahn, David E. and David C. Stifel. 2000. "Poverty Comparisons Over Time and Across Countries in Africa." *World Development* 28(12): 2123-2155

- Sahn, David E. and David C. Stifel. 2003. "Progress Toward the Millennium Development Goals in Africa" *World Development* 31(1): 23–52,
- Schmeidl, Susanne. 1997. "Exploring the Causes of Forced Migration: A Pooled Time-Series Analysis, 1971-1990." *Social Science Quarterly* 78: 284-308..
- Schmeidl, Susanne. 2001. "Conflict and Forced Migration: A Quantitative Review. Pp. 62-94 in Aristide Zolberg und Peter Benda, eds., *Global Migrants, Global Refugees: Problems and Solutions*. Providence, RI: Berghahn Books.
- Schultz, Paul T. 1971. "Rural-Urban Migration in Colombia." *The Review of Economics and Statistics* 53(2):157-163.
- Shellman, Stephen M., and Brandon M. Stewart. 2007. "Predicting Risk Factors Associated with Forced Migration: An Early Warning Model of Haitian Flight." *Civil Wars* 9(2):174-199.
- Sjaastad, Larry A. 1962. "The Costs and Returns of Human Migration." *The Journal of Political Economy* 70(5.2):80-93.
- Stanley, William D. 1987. "Economic Migrants or Refugees From Violence? A Time-Series Analysis of Salvadoran Migration to the United States." *Latin American Research Review* 22(1):132-154.
- Stark, Oded. 1991. *The Migration of Labor*. Cambridge: Basil Blackwell.
- Thapa, Deepak, and Bandita Sijapati. 2004. *A Kingdom Under Siege-Nepal's Maoist Insurgency, 1996 to 2004*. The Printhouse, Kathmandu.
- Todaro, Michael P., and Lydia Maruszko. 1987. "Illegal Migration and US Immigration Reform: A Conceptual Framework." *Population and Development Review* 13(1):101-114.
- United Nations High Commissioner for Refugees. 2007. *Statistical Yearbook 2005*. New York: United Nations

TABLE 1

Definition of Variables	
Variable	Definition
Outcome Variables	
Migration to three competing locations	Whether respondent migrates to three locations in month t+1: within Chitwan = 1, to other districts = 2, to other countries = 3, and 0 if doesn't migrate at all in month t+1
Migration to two competing locations	Whether respondent migrates to two locations in month t+1: within Chitwan = 1, to other districts or other countries = 2, and 0 if doesn't migrate at all in month t+1
Proximate Causes	
Standardized Index of violence in Chitwan & neighboring districts	A composite indicator of level of violence in Chitwan and districts surrounding Chitwan derived through factor analysis using six indicators of violence - number of bomb blasts; number of casualties from bomb blasts; number of casualties from major clashes
Root Causes	
Physical Capital	
Owens house plot	1 if respondent's household owns the land where they have their house as reported in the survey conducted in 1996, 0 otherwise
Standardized Index of household amenities	A composite index of household characteristics derived through factor analysis using data on the materials used to build the wall, floor and roof of the respondent's house; and whether household has a toilet, access to own drinking water source, and elec
Standardized index of goods owned	A composite index of assets owned derived through factor analysis using data on durables owned by the household such as ownership of a radio, TV, bicycle, motorcycle, cart, tractor, pumpset, and gobar gas plant as reported in the survey conducted in 1996
Standardized index of livestock owned	A composite index of livestock owned derived through factor analysis using data on number of chicken, pigeons, buffalo, cows, sheep, goats, pigs, etc. owned by households in the survey conducted in 1996
Neighborhood Development	
Standardized index of neighborhood development	A composite index of neighborhood level of development derived through factor analysis using data on average hours on foot to nearest resources such as health care, bus service, school, market, bank, employment and police station as recorded in the survey
Human Capital	
Education	Number of years of schooling completed by the respondent as recorded in the survey conducted in 1996
Salary job	1 if respondent holds a salary job, 0 otherwise as recorded in the survey conducted in 1996
Age	Respondent's age, monthly event
Age squared	Respondent's age square, monthly event
Intervening Factors	
Social Capital	
House member migrated within Chitwan	1 if any member from the respondent's household has migrated within Chitwan in 1996 before the respondents are observed, 0 otherwise
House member migrated to other districts	2 if any member from the respondent's household has migrated to other districts in 1996 before the respondents are observed, 0 otherwise
House member an international migrant	3 if any member from the respondent's household has migrated to other countries in 1996 before the respondents are observed, 0 otherwise
House member migrated to other districts or other countries	2 if any member from the respondent's household has migrated to other districts or other countries in 1996 before the respondents are observed, 0 otherwise
Demographic Variables	
Female	1 if respondent is a female, 0 otherwise
Married	1 if respondent was ever married, 0 otherwise, monthly event
Number of household members	Number of people in the household as recorded in the 1996 household census
Ethnicity	
Hindu upper caste	1 if hindu upper caste, 0 otherwise
Hindu lower caste	1 if hindu lower caste, 0 otherwise
Hill Tibetoburmese	1 if hill tibetoburmese caste, 0 otherwise
Newar and other	1 if newar or other caste, 0 otherwise
Terai Tibetoburmese	1 if terai tibetoburmese caste, 0 otherwise

Table 2	
Index Weights for the Composite Index of Violence, Physical Capital and Neighborhood Characteristic Variables	
	Index Weights
<u>Violence Variables</u>	
<i>Chitwan and Neighboring Districts Violence</i>	
Number of bomb blast in Chitwan	0.331
Number of casualties from bomb blasts in Chitwan	0.253
Number of casualties from major attacks in Chitwan *	0.013
Number of bomb blasts in neighboring districts	0.318
Number of casualties from bomb blasts in neighboring districts	0.294
Number of casualties from major attacks in neighboring districts *	0.159
<i>Variance explained by first factor</i>	<i>0.431</i>
<u>Physical Capital Variables</u>	
<i>Household Amenities</i>	
Walls of house is made of brick, cement or wood	0.000
Roof of house is made of slate, tin, or concrete	0.075
Floor of house is made of concrete	0.502
No own drinking water source	-0.197
No toilet	-0.205
Has electricity	0.219
<i>Variance explained by first factor</i>	<i>0.708</i>
<i>Goods owned</i>	
Household has a radio	0.190
Household has a TV	0.198
Household has a bicycle	0.184
Household has a motorcycle	0.200
Household has a cart	0.165
Household has a tractor	0.184
Household has a pumpset for irrigation	0.135
Household has a gobar gas plant	0.210
<i>Variance explained by first factor</i>	<i>0.459</i>
<i>Livestock owned</i>	
Number of Chickens and ducks	0.081
Number of pigeons household has	0.237
Number of bullocks household has	0.300
Number of cows household has	0.271
Number of male buffaloes household has	0.211
Number of female buffaloes household has	0.328
Number of sheep and goats household has	0.422
Number of pigs household has	0.141
<i>Variance explained by first factor</i>	<i>0.217</i>
<u>Neighborhood Characteristic Variables</u>	
<i>Neighborhood Development</i>	
Minutes on foot to nearest school	0.190
Minutes on foot to nearest healthcare	0.235
Minutes on foot to nearest bus service	0.234
Distance by bus to Narayanghat	0.188
Minutes on foot to nearest market	0.183
Minutes on foot to nearest bank	0.250
Minutes on foot to nearest place of employment	0.208
Minutes on foot to nearest police station	0.153
<i>Variance explained by first factor</i>	<i>0.364</i>

*Major attacks refer to clashes between the Maoists and the state, major attacks by either party, and major landmine explosions whenever the number of casualties from such incidents exceed 2.

TABLE 3					
Descriptive Statistics for the Measures used to Create Composite Index of Violence, Physical Capital, and Neighborhood Characteristics					
	Count	Min	Max	SD	Mean
Proximate Causes					
<i>Chitwan and Neighboring Districts Violence</i>					
Number of bomb blast in Chitwan	108	0	3	0.59	0.20
Number of casualties from bomb blasts in Chitwan	108	0	5	0.80	0.21
Number of casualties from major attacks in Chitwan *	108	0	38	3.74	0.53
Number of bomb blasts in neighboring districts	108	0	9	1.79	0.80
Number of casualties from bomb blasts in neighboring districts	108	0	12	2.26	0.75
Number of casualties from major attacks in neighboring districts *	108	0	86	10.32	3.00
Root Causes					
Physical Capital					
<i>Household Amenities</i>					
Walls of house is made of brick, cement or wood	1391	0	1	0.49	0.59
Roof of house is made of slate, tin, or concrete	1391	0	1	0.50	0.49
Floor of house is made of concrete	1391	0	1	0.43	0.25
No own drinking water source	1391	0	1	0.50	0.46
No toilet	1391	0	1	0.48	0.36
Has electricity	1391	0	1	0.47	0.34
<i>Goods Owned</i>					
Household has a radio	1391	0	1	0.50	0.52
Household has a TV	1391	0	1	0.33	0.12
Household has a bicycle	1391	0	1	0.48	0.62
Household has a motorcycle	1391	0	1	0.18	0.03
Household has a cart	1391	0	1	0.26	0.07
Household has a tractor	1391	0	1	0.09	0.01
Household has a pumpset for irrigation	1391	0	1	0.18	0.03
Household has a gobar gas plant	1391	0	1	0.21	0.05
<i>Livestock Owned</i>					
Number of Chickens and ducks	1391	0	2210	121.64	20.16
Number of pigeons household has	1391	0	150	7.01	1.15
Number of bullocks household has	1391	0	7	0.94	0.57
Number of cows household has	1391	0	8	0.91	0.36
Number of male buffaloes household has	1391	0	4	0.51	0.16
Number of female buffaloes household has	1391	0	8	1.35	1.25
Number of sheep and goats household has	1391	0	24	1.98	1.46
Number of pigs household has	1391	0	8	0.35	0.06
Neighborhood Development					
Minutes on foot to nearest school	151	0	30	6.55	9.17
Minutes on foot to nearest healthcare	151	0	90	18.06	20.48
Minutes on foot to nearest bus service	151	0	75	14.91	12.31
Distance by bus to Narayanghat	151	0	195	51.74	80.49
Minutes on foot to nearest market	151	0	120	16.41	12.13
Minutes on foot to nearest bank	151	0	150	35.83	58.22
Minutes on foot to nearest place of employment	151	0	180	22.95	20.58
Minutes on foot to nearest police station	151	2	240	38.93	64.32

TABLE 4					
Descriptive Statistics for the Dependent and Independent Variables					
	Count	Min	Max	SD	Mean
Outcome Variables					
Migration to within Chitwan locations	1,759				
Migration to other districts	1,339				
Migration to other countries	361				
Proximate Causes					
Standardized Index of Violence in Chitwan & neighboring districts	108	-0.47	3.99	1.00	0.00
Root Causes					
Physical Capital					
Owns house plot	1391	0.00	1.00	0.35	0.86
Standardized Index of Household amenities	1391	-1.18	1.80	1.00	0.00
Standardized index of goods owned	1391	-1.22	4.74	1.00	0.00
Standardized index of livestock owned	1391	-1.04	10.12	1.00	0.00
Neighborhood Development					
Standardized index of neighborhood development	151	-1.83	4.92	1.00	0.00
Human Capital					
Education	297297	0.00	16.00	4.21	3.56
Salary job	297297	0.00	1.00	0.24	0.06
Age	297297	15.00	69.00	13.36	38.65
Age squared	297297	225.00	4761.00	1087.68	1672.66
Intervening Factors					
Social Capital					
House member migrated within Chitwan	297297	0.00	1.00	0.25	0.07
House member migrated to other districts	297297	0.00	1.00	0.30	0.10
House member an international migrant	297297	0.00	1.00	0.31	0.10
House member migrated to other districts or other countries	297297	0.00	1.00	0.40	0.20
Months					
January	297297	0	1	0.26	0.07
February	297297	0	1	0.28	0.09
March	297297	0	1	0.28	0.09
April	297297	0	1	0.28	0.09
May	297297	0	1	0.28	0.08
June	297297	0	1	0.28	0.08
July	297297	0	1	0.28	0.08
August	297297	0	1	0.28	0.08
September	297297	0	1	0.28	0.08
October	297297	0	1	0.28	0.08
November	297297	0	1	0.28	0.08
December	297297	0	1	0.27	0.08
Demographic Variables					
Female	297297	0.00	1.00	0.49	0.57
Married	297297	0.00	1.00	0.34	0.87
Number of household members	297297	1.00	26.00	3.43	6.67
Ethnicity					
Hindu upper caste	297297	0	1	0.50	0.47
Hindu lower caste	297297	0	1	0.30	0.10
Hill Tibetoburmese	297297	0	1	0.35	0.14
Newar and other	297297	0	1	0.25	0.07
Terai Tibetoburmese	297297	0	1	0.42	0.22

TABLE 5						
Multinomial Logistic Regression Output for Predicting the Competing Risks of Taking A Trip to Three Competing Locations in month t + 1						
	<u>Within Chitwan</u>		<u>To Other Districts</u>		<u>To Other Countries</u>	
INDEPENDENT VARIABLES IN MONTH t	B	SE	B	SE	B	SE
<u>Proximate Causes</u>						
Standardized Index of violence in Chitwan & neighboring districts	-0.320***	0.042	-0.663***	0.072	-1.402***	0.28
<u>Root Causes</u>						
<u>Physical Capital</u>						
Owns house plot	-0.708***	0.069	-0.417***	0.089	0.467*	0.24
Standardized Index of household amenities	-0.0923***	0.035	-0.0880**	0.039	-0.160**	0.077
Standardized index of goods owned	0.0258	0.031	0.102***	0.033	0.155**	0.069
Standardized index of livestock owned	-0.0742***	0.028	0.0298	0.028	-0.0994	0.069
<u>Neighborhood Development</u>						
Standardized index of neighborhood development	0.137***	0.027	0.00818	0.035	-0.0302	0.07
<u>Human Capital</u>						
Education	0.0458***	0.008	0.0863***	0.0092	0.0465**	0.018
Salary job	0.553***	0.087	0.461***	0.097	0.0759	0.17
Age	-0.191***	0.013	-0.224***	0.015	-0.166***	0.03
Age squared	0.00190***	0.0002	0.00233***	0.0002	0.00143***	0.0004
<u>Intervening Factors</u>						
<u>Social Capital</u>						
House member migrated within Chitwan	0.351***	0.087	-0.00671	0.13	0.0252	0.29
House member migrated to other districts	0.0492	0.083	0.837***	0.072	0.413**	0.19
House member an international migrant	-0.128	0.086	0.13	0.095	1.502***	0.13
<u>Months</u>						
January	0.239*	0.14	-0.352**	0.15	-0.650*	0.37
February	0.609***	0.12	0.187	0.13	0.626**	0.27
March	0.408***	0.13	-0.172	0.14	0.560**	0.27
April	0.410***	0.13	0.0188	0.13	0.371	0.28
May	0.323**	0.13	-0.0145	0.14	0.279	0.28
June	0.134	0.14	-0.036	0.14	0.0256	0.3
July	0.665***	0.12	-0.0773	0.14	0.487*	0.27
August	0.530***	0.13	0.184	0.13	-0.0206	0.31
September	-0.0372	0.15	-0.111	0.14	-0.00372	0.31
October	0.270**	0.13	0.244*	0.13	0.425	0.28
November	0.461***	0.13	0.196	0.14	0.769***	0.27
December	—		—		—	
<u>Demographic Variables</u>						
Female	0.0181	0.055	0.00437	0.062	-1.860***	0.15
Married	0.495***	0.075	0.571***	0.083	0.527***	0.16
Number of household members	-0.0203**	0.0097	-0.0485***	0.012	-0.124***	0.027
<u>Ethnicity</u>						
Hindu upper caste	0.148*	0.077	0.376***	0.099	0.828***	0.22
Hindu lower caste	0.161*	0.098	0.462***	0.13	1.087***	0.23
Hill Tibetoburmese	0.375***	0.086	0.610***	0.11	0.856***	0.24
Newar and other	0.0528	0.13	0.572***	0.13	0.241	0.33
Terai Tibetoburmese	—		—		—	
Constant	-1.589***	0.25	-1.826***	0.29	-4.419***	0.63
LR chi2 (93)	3433.55***					
No. of person months	297297					
*** p<0.01, ** p<0.05, * p<0.1						

TABLE 6				
Multinomial Logistic Regression Output for Predicting the Competing Risks of Taking A Trip to Two Competing Locations in month t + 1 with Significant Interaction Terms				
INDEPENDENT VARIABLES IN MONTH t	<u>Within Chitwan</u>		<u>To Other Districts or Other Countries</u>	
	B	SE	B	SE
Proximate Causes				
Standardized Index of violence in Chitwan & neighboring districts	-0.305**	0.14	-0.705***	0.17
Root Causes				
Physical Capital				
Owens house plot	-0.721***	0.069	-0.305***	0.083
Standardized Index of household amenities	-0.0923***	0.035	-0.107***	0.035
Standardized index of goods owned	0.0275	0.031	0.116***	0.03
Standardized index of livestock owned	-0.0722**	0.028	0.0175	0.026
Neighborhood Development				
Standardized index of neighborhood development	0.135***	0.027	-0.00863	0.031
Human Capital				
Education	0.0459***	0.008	0.0809***	0.0082
Salary job	0.565***	0.096	-1.2	0.87
Age	-0.192***	0.013	-0.216***	0.013
Age squared	0.00191***	0.00016	0.00220***	0.00017
Intervening Factors				
Social Capital				
House member migrated within Chitwan	0.353***	0.087	0.0224	0.12
House member migrated to other districts or other countries	-0.0399	0.064	0.657***	0.056
Months				
January	0.239*	0.14	-0.402***	0.14
February	0.609***	0.12	0.277**	0.12
March	0.409***	0.13	-0.00223	0.12
April	0.410***	0.13	0.0926	0.12
May	0.324**	0.13	0.0445	0.12
June	0.134	0.14	-0.0245	0.13
July	0.666***	0.12	0.0453	0.12
August	0.531***	0.13	0.154	0.12
September	-0.0369	0.15	-0.0967	0.13
October	0.270**	0.13	0.278**	0.12
November	0.461***	0.13	0.315***	0.12
December	-	-	-	-
Demographic Variables				
Female	0.0226	0.061	-0.122	0.085
Married	0.483***	0.09	0.374***	0.097
Number of household members	-0.0210**	0.0097	-0.0630***	0.011
Ethnicity				
Hindu upper caste	0.145*	0.077	0.434***	0.09
Hindu lower caste	0.155	0.098	0.585***	0.11
Hill Tibetoburmese	0.364***	0.086	0.609***	0.1
Newar and other	0.0524	0.13	0.531***	0.12
Terai Tibetoburmese	-	-	-	-
Interactions				
Violence*Salary	0.0371	0.14	-3.491*	1.86
Violence*Female	0.0144	0.087	0.539***	0.16
Violence*Married	-0.0306	0.14	-0.394**	0.16
Constant	-1.558***	0.26	-1.620***	0.27
LR chi2 (66)	3118.4***			
No. of person months	297297			
*** p<0.01, ** p<0.05, * p<0.1				