

**Betting on Life and Livelihoods:
The Role of Employment and Assets in the Decision to Migrate During
Armed Conflict**

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Nathalie Williams

*Department of Sociology
Population Studies Center
University of Michigan*

* Direct correspondence to Nathalie Williams at the Institute for Social Research,
University of Michigan, 426 Thompson St., Ann Arbor, MI 48106-1248, email:
natw@umich.edu.

ABSTRACT

This study examines how employment and household assets moderate the relationship between armed conflict and migration. Using event history models and data from the Maoist insurrection in Nepal I empirically test a new multi-dimensional theoretical model of individual migration during conflict. Results indicate that location-specific, non-saleable assets such as working a salaried job and owning farmland decrease the likelihood of migration after violent events. This provides evidence that individuals likely make cost-benefit calculations, weighing the expected danger of staying where they are against the likelihood of losing their employment or assets from migrating. On the other hand, results show that saleable assets, such as livestock and household goods, provide the financial ability and thereby increase the likelihood of migration. Because individuals with financial means are more likely to migrate away during conflict, rural communities are likely experiencing capital flight as a result of the conflict.

INTRODUCTION

Sociologists have long identified conflict as a source of social change (Coser 1957; Dahrendorf 1959; Marx [1848] 1967)). We understand that conflict changes the context within which people live and shapes the social dimensions of daily life. In order to cope with this changing social environment, people develop new behaviors and ideas that can persist long after a conflict ends. Although we understand the theoretical reasons for expecting conflict to instigate social change, sociologists have relatively little empirical insight into the nature and breadth of change that we might expect during and after any given conflict. Much social research focuses on the leaders and participants in conflict processes and how they affect change (Gould 1991; Muller, 1985; Myers, 1997; Snyder and Tilly, 1972; Pitcher, Hamblin, and Miller, 1978; Fearon and Laitin, 2003). There is less attention paid to the general population, whose behavior and ideas might change in response to conflict, regardless of their level of participation in the conflict itself. This leaves a crucial gap in our understanding of conflict and social change, a gap this paper is designed to address by focusing explicitly on the general population and their responses to a context of violent conflict.

Towards this end, this study focuses on one important and easy to observe behavioral response to conflict—out-migration. Migration is an important dimension of social change; research has shown that it can shape family relationships, it can affect economic resources and livelihood strategies, and it can serve as a conduit for the spread of new ideas and behaviors (Donato 1993; Durand et al. 1996; Massey 1988; Stark and Lucas 1988). On a macro level, migration plays a role in globalization, nationalism, security, and environmental degradation (Castles 2003; Jacobsen 1997; Kibreab 1997;

Richmond 1994; Weiner 1996). Although the evidence consistently shows that conflict affects migration on an aggregate level, we understand little about the individual- and community-level determinants of migration during conflict. As a result, though we know that many people migrate away from conflict, we have less understanding of the specific characteristics or circumstances that lead some people to migrate and others to remain where they are. Consequently, we have little ability to predict either migration responses during times of conflict or the social change likely to ensue.

In this study, I develop a new theoretical framework to understand migration from conflict affected areas. Departing from much of the literature that treats conflict as a single and homogenous event, I evaluate how specific violent events, such as major gun battles and bomb blasts, have different effects on out-migration. Furthermore, going beyond previous work that focuses almost entirely on physical threat as the prime consideration and motivation to migrate during conflict, my theoretical framework examines the role of individual and household economic status in the relationship between conflict and migration. This multidimensional view of the migration decision process allows us to understand how people must weigh the expected cost of losing their livelihoods and investments against the expected threat to their lives. This constitutes an important advance in theories of forced migration and provides an opportunity to understand how individual characteristics systematically alter the way different people react to the same kinds of violent events.

I use the recent Maoist insurrection in Nepal as a case study to empirically investigate this theoretical framework. A unique combination of data, including records of violent events such as gun battles and bomb blasts, and a prospective panel survey of

individuals and households make direct empirical documentation of these relationships possible. The individual surveys from Nepal that span the entire period of conflict provide records of individuals' migrations on a monthly basis, thereby allowing precise comparisons between violent events each month and out-migration. These surveys also provide records of individuals' employment and household surveys from the same study provide information on the economic status of each household, including indicators such as ownership of land, livestock, and household goods. This combination of data provides the means to empirically test hypotheses linking individual migration to macro-level armed conflict and individual-level employment and investments in the local area. Because these data cover the period of time from three years before the insurrection began, through the six years of the violence, they provide an unprecedented opportunity to investigate differences in migration patterns during times characterized by armed conflict and by relative peace.

THEORY

The study of migration during conflict has advanced significantly in the last few decades; however both theory and empirical research are largely limited to the study of aggregate groups and use a structuralist perspective to explain how the macro-level context—armed conflict—determines micro-level behavior—migration. There is a general assumption that armed conflict places absolute constraint (and thereby lack of agency) on the behavioral choices of the individual, regardless of their circumstances. It is precisely through this assumption that people have no choice in the context of conflict that we use the term 'forced migration'. Because this model does not consider individual agency and the complexity of the migration decision at the individual level, it is not able to explain

the individual variability in migrants leaving any given conflict or to predict the magnitude of migration flows from conflict affected areas.

To address this gap, my theoretical framework focuses on individual decision-making. I use a cost-benefit framework to analyze factors that encourage or discourage migration during conflict. This type of framework has long been an important analytical tool in understanding migration during times of relative peace (Harris and Todaro 1970; Sjaastad 1962; Todaro 1969) and more recently during conflict in Colombia (Ibanez and Velez 2003). Most theory and empirical studies of migration during conflict focus largely on the benefit of migration (increased physical safety) and tend to ignore the possible costs that can affect the migration decision. Thus research in this field allows us to understand why people flee conflict, but has thus far failed to address the question of why many people do not flee conflict? This is important given that in most conflicts a large proportion, if not the majority, of the population do not migrate away¹.

In this study, I focus on four specific individual and household characteristics that can affect the costs and benefits of migration—salaried employment and ownership of land, livestock, and household goods. I first address the effects of these characteristics on migration during periods of relative peace. Then I describe how armed conflict changes the context within which individuals make their migration decisions. Finally, I provide specific empirical predictions about how each of these four characteristics will affect migration during conflict.

¹ For example, in the severe on-going conflicts in Afghanistan, Iraq, and Darfur, large proportions of the population have not migrated. According to UN data sources, about 90% of the Afghan population, 82% of Iraqis, and 43% of the population of Darfur are not officially displaced (OCHA 2006; UNFPA 2003; UNHCR 2006, 2007).

Employment and Assets in the Cost-Benefit Calculation during Peace

The study of migration has been particularly successful in the examination of the economic determinants of migration. Theory and empirical research have shown that both employment status and household assets are important predictors of migration (Massey and Espinosa 1997; Massey et al 1987; Shrestha 1989; VanWey 2003).

According to neo-classical economic theory of migration, geographic differentials in wages drive migration (Todaro 1969; Todaro and Maruszko 1987). This model describes how individuals decide to migrate based on cost-benefit calculations, comparing their current wages with expected wages at another location, given their specific skill set. If the expected wages at a destination are higher then they are likely to migrate. Predictions based on this theory are of course contingent upon the type of employment and skill set an individual possesses. For example, an individual working a salaried job would migrate if they could expect better wages from a salaried job elsewhere. In rural areas, where salaried jobs are often remunerated worse than in urban areas, we would expect a salaried employee to have a higher likelihood of out-migration. Farmers however, who likely do not have the skills to obtain a salaried job elsewhere, would make this calculation by comparing their farming and wage labor income with the expected income from wage labor elsewhere. Thus neo-classical economics theory would not predict an increased likelihood of migration for farmers.

In the case of farmers, other theories treat land and livestock as a form of employment (Durand and Massey 1992; Stark and Taylor 1991; VanWey 2005; Zhao 1999). Raising livestock requires daily attention; farming land requires seasonal attention, especially during the planting, growing, and harvest seasons. Thus migration

could necessitate that an individual or household forego income from land or livestock; in other words ownership of land or livestock can increase the costs of migration. Thus, we would expect ownership of land and livestock to decrease the likelihood of (temporary) migration.

The new economics theory of migration uses a different approach, treating land, livestock, and farm or household goods as assets. This approach treats these items as investments in agricultural livelihoods, positing that people in rural areas migrate in order to fund the purchase of land, livestock, and other farm and household goods. In this scenario, earning capital in order to purchase any of these investment items is a potential benefit of migration. If a household already owns these items there is less benefit to migrating. Thus, we would expect any one individual in the household to be less likely to migrate.

Employment and Assets in the Cost-Benefit Calculation during Conflict

During armed conflict, the context within which individuals make their migration decisions is very different. Periods of armed conflict are characterized not just by violence, but also political instability. The very existence of the current government and legal structures can be threatened. A new governing body might or might not uphold the norms and legal obligations of the old government. This instability, along with labor strikes, conscription, and forced labor can affect the economy. Research has shown the conflict can lead to increasing commodity prices and unemployment. In agricultural areas, where the timing of planting and harvest is crucial, instability, strikes, and conscription can threaten the ability to productively farm. Thus a wide variety of livelihoods and investments can be threatened by armed conflict.

Because periods of armed conflict create a very different context from periods of relative peace, we can expect that the value of employment and assets to people and the effect they have on migration will also be different (Ibanez and Velez 2003). During periods of armed conflict, I argue that cost-benefit calculations will still influence migration decisions. In this context, the risk of physical danger from violence enters into the calculation; the higher the expected future danger, the greater the benefit to migrating. Notably, it is the *probability* or *risk* of future danger that is important here. There is no certainty that one will be subjected to harm in the future.

On the other hand, the costs of migrating can include whatever an individual or household will lose or leave behind, including those assets upon which their livelihood is based. With employment and some assets, the cost is not a probability; if one decides to migrate, they will definitely lose or compromise their ownership of assets or employment. Thus, during times of armed conflict, the migration decision can involve weighing the *possibility* of risk to one's safety against the *certainty* of losing or compromising their livelihood or certain investments.

In this context, there are two types of 'assets' that I examine: 1) location-specific, non-saleable assets and 2) saleable assets. Location-specific, non-saleable assets are items or employment that cannot be easily moved or sold. In other words, they will be lost if an individual migrates during conflict. Individuals with more location-specific assets will have more to lose. In other words, the costs of migration will be higher. We would expect them to be less likely to migrate away from violence in order to protect

their assets and livelihoods². Saleable assets are items that can be more easily moved or sold. The value of these items need not be lost if an individual migrates. People with more saleable assets will not be faced with higher costs of migrating. In addition, in selling their assets they not only recoup at least part of the value, but they also gain liquid cash that can be used to finance the journey and resettlement at a destination (Durand and Massey 1992). Thus I predict that those with more saleable assets will be more likely to migrate away from violence.

In this scenario, working a salaried job is a location-specific, non-saleable ‘asset’. It is possible to obtain a salaried job elsewhere. However, during times of conflict with increasing unemployment and instability, it is unlikely that an individual working a salaried job will be able to obtain another salaried job elsewhere. If they chose to move, they stand to lose their job and the income they derive from it. This increases the cost of migrating. Thus, I predict that individuals working salaried jobs will be less likely to migrate during conflict than those not working salaried jobs.

Land ownership might function in the same way to decrease the likelihood of migration during conflict. Land is obviously a location specific asset. In addition, I argue that during times of conflict, it can also be functionally non-saleable. During times

² Individuals or households that own very large amounts of assets, especially assets or wealth that are visible to others, are often specifically targeted for violence. This was the case during the Maoist insurrection in Nepal, as well as other conflicts around the world (Ibanez and Velez; South Asia Terrorism Portal 2006a; South Asia Terrorism Portal 2006b; Sharma 2004; United People’s Front 1996). Because of this, those in the highest wealth categories might be more likely to migrate. We would expect a curvilinear effect of wealth on migration during conflict. However, in the sample I use for this study there are few very wealthy people to which this would apply. For this reason, it is unlikely that there will be a curvilinear effect in this analysis.

of relative peace a potential migrant might be able to sell their land or retain ownership when they are not present through legal land titles. However during armed conflict, these options are less viable. Because of increased out-migration and political instability it can be very difficult, if not impossible, to sell land. In addition, although land titles officially ensure that land owners retain legal rights to their land whether or not they are present, they might not be viable recourse in times of conflict when the government and legal system that issued the titles are insecure or absent. Research has shown that in many places returning refugees have had problems regaining rights to their land, even in cases where they had legal titles (Myers 1994; Unruh 1995; Unruh and Turray 2006; Wily 2003). Thus if an individual or family migrates during conflict, they risk losing their land. I predict that those who own more land will be increasingly less likely to migrate during conflict.

Saleable assets, such as livestock and household goods could have the opposite effect of actually increasing the likelihood of migration during conflict. First, these items can be sold on the market, thus a migrant would not lose their total investment on these goods. While land may be difficult to sell, smaller items, especially livestock that can be sold as food, are easier to sell. Second, through the sale of these items, migrants can transfer their value into liquid cash or other goods that provide the means to undertake a journey and settle in a destination (Sjaastad 1962; Todaro 1969). This is particularly important in contexts of subsistence agriculture where relatively few people have savings and keeping large amounts of liquid cash is uncommon. Therefore, I predict that those who own more livestock or saleable household goods will be more likely to migrate during conflict than those who do not.

CONTEXT AND SETTING

The Maoist Insurrection

The context of this study is the Maoist insurrection in Nepal which began in 1996. Following a relatively unsuccessful political campaign, the Communist Party of Nepal (Maoist) made a formal declaration of “People’s War” on February 13, 1996, with the aim to unseat the current constitutional monarchy and install a democratic republic. They charged the government with poor administration, corruption, unfair taxation, and neglect of poor rural areas of the country.

The earlier stages of the insurrection were contained primarily in several mid-western districts (around Rolpa, Rukum, Jajarkot, Salyan, Pyuthan, and Kalikot) and aimed at damage to government installations and communication infrastructure, capturing weapons, and threatening government security forces. From mid-2000 however, the Maoists progressively expanded their campaign nationwide, spreading first into the far eastern districts where there was little government presence, and then across rural areas of most of the country. In January 2001, the Nepalese government responded by creating a special armed police force to fight the Maoists. After that, the government generally maintained control of cities and large towns, and the Maoists have controlled a majority of the rugged countryside of Nepal, where communication and transportation are difficult. By 2001, they were operating in 68 of Nepal’s 75 administrative districts (South Asia Terrorism Portal 2006a). The Maoists came close to the capital, when in March 2006 they launched a successful week-long blockade of Kathmandu. In June 2006 serious peace talks commenced and on November 21, 2006, the government and Maoists signed a comprehensive peace agreement declaring an end to the conflict.

Because this conflict was staged mainly as a guerrilla war, there was generally no ‘frontline’, it was largely unknown where fighting would break out, and civilians were often unintentionally caught up in firefights and bomb blasts. In addition, both Maoists and government forces intentionally used civilians for political purposes. Reported violent acts by the Maoists and Nepalese government security forces against civilians include torture, extra-judicial killings (both discriminate and indiscriminate), bombings, gun fights, abductions, forced conscription, billeting, taxing, and general strikes (South Asia Terrorism Portal 2006b; Hutt 2004; Pettigrew 2004). Three ceasefires have been called and subsequently broken. The government called a State of Emergency and instituted martial law twice, in 2001 and 2005. From 2000 until the end of 2006, the Maoists were responsible for a total of 4312 deaths and the government forces were responsible for 7544 deaths (Informal Sector Service Center 2006).

Throughout the conflict, the Chitwan Valley has remained one of the less violent districts in Nepal, mainly because it is located far from the western regions of the country where the Maoist insurrection started and has raged the strongest and far from the capital and government stronghold Kathmandu. This of course is relative to other areas. Between 1996 and April 2006, Chitwan experienced 194 conflict related fatalities (Informal Sector Service Center 2006). This is just higher than the average number of fatalities of all districts, but much lower than the fatality toll of the most-affected western districts that have experienced from 300 to 950 deaths throughout this same time period (Informal Sector Service Center 2006). Other violent disturbances in Chitwan have been infrequent. There were a few bomb blasts, the great majority in 2003 and 2004, the largest of which injured or killed 17 people. There was one major gun battle between

Maoists and security forces in June 2005 that resulted in 34 civilian fatalities. There were no abductions of large groups, but a few single people were abducted in 2003 and 2004. Along with these visible and countable disturbances, the people of Chitwan Valley have been subjected to taxes, billeting, conscription (by both Maoists and the government), curfews, and general strikes.

The Chitwan Valley of Nepal

My data analysis is based in the Chitwan Valley of south-central Nepal. The administrative district of Chitwan borders India and is about 100 miles from Kathmandu. There is one large city, Narayanghat, and the rest of Chitwan's population, like much of Nepal, lives in small, rural villages. Most villages are connected to other villages and larger roads by paths or dirt roads.

The valley is flat, fertile, and dominated by agriculture. 82% of households in the study area of the Chitwan Valley Family Study³ are involved in farming or animal husbandry. Most of these households operate on a subsistence level, owning small amounts of land and livestock. Except for new varieties of seeds and fertilizers, there has been little improvement on indigenous farming technology (Shrestha, Velu, and Conway 1993). For example, oxen-driven wooden plows are still common and much of the labor is done by hand. Most of the households involved in agriculture in this study area own their land. In addition, some also sharecrop, mortgage, or rent the land they use. Land that is owned is often passed through the family as a form of inheritance (Bhandari 2004). Thus as well as financial value, it can have emotional value and be tied to one's individual and family identity.

³ Further details about the Chitwan Valley Family Study are provided in the Data and Measures section below.

Migration in the Chitwan Valley

Historically, there has been a large amount of migration from the Chitwan Valley to other areas of Nepal, but also notably to nearby areas of India. Much of the migration is seasonal and is viewed as a strategy to supplement regular farm and household incomes during low periods of the harvest and planting cycle (Kollmair et al 2006; Thieme and Wyss 2005). For domestic migrants, agricultural work is common (HMG et al 2004), as well as urban wage labor jobs in factories and other informal jobs (Graner 2001).

International migration is also common. Most Nepalese who migrate to other countries go to India where they can work as seasonal laborers in the larger wage labor markets in rural and urban areas (Kollmair et al 2006). Nepal and India share an open border, so there are no restrictions on Nepalese cross-border travel to India, making this international migration no more difficult than migration to other areas of Nepal. The 2001 census estimated that 2.5-5% of Chitwan residents were living abroad in 2001 (HMG et al 2002) and 77% of them were in India. Data from a nationally representative sample survey allow us to estimate that about as many Chitwan residents are internal migrants (HMG et al 2004).

Figure 1 shows the monthly rate of out-migration, including internal and international migration, from the Chitwan Valley from June 1997 through January 2006. Out-migration steadily declines from a high of about 3% per month in early 1997 until about the middle of 2000. After this time, the percent of the population that moved out of the area in each month remains at a relatively stable, but low rate of around 0.6% per month.

[Figure 1 about here]

Past research in this study area shows that the Maoist insurrection significantly impacted migration trends (Williams 2008). Specifically, in months following gun battles, which impose a high level of danger, there were higher rates of migration. However, in months following bomb blasts, which impose much lower danger, there were lower rates of migration. This evidence indicates that individuals feel safer staying within their own homes and communities during low levels of violence; but when events become more dangerous, they choose instead to migrate to other places to escape the violence.

DATA AND MEASURES

I use two separate kinds of data in this study- survey data about individuals, and data about violent events involved with the conflict. For measures of violent events, I use the South Asia Terrorism Portal (SATP), an Indian-based NGO that compiles records of all violent events in Nepal and other south Asian countries. For measures of individual and household characteristics, I use the Chitwan Valley Family Study (CVFS), a large-scale multidisciplinary study of the western part of the Chitwan Valley of Nepal, designed to investigate the impact of macro-level socioeconomic changes on micro-level individual behavior (Axinn, Barber, and Ghimire 1997; Axinn, Pearce, and Ghimire 1999; Barber et al. 1997).

The CVFS includes a variety of data sets, including an individual interview and life history calendar that were collected in the end of 1996, a prospective demographic event registry that has been collected monthly, beginning in 1996 and continuing through 2008, and household agriculture and consumption surveys in 1996 and 2001. Overall, the CVFS includes 171 separate neighborhoods that were selected with an equal probability,

systematic sample. All individuals between the ages of 15 and 59 and their spouses within these neighborhoods were included in the survey. At 97% of the original sample, the response rates are exceptional.

Although 171 communities were sampled for the 1996 individual and life history calendar surveys, only 151 of these communities were included in the prospective demographic event registry. I use data from this registry; therefore my sample includes those individuals who were resident in these 151 neighborhoods of the Chitwan Valley survey area in 1996. Furthermore, I restrict my sample to those who were between the ages of 18 and 59 at the beginning of this study in June 1997⁴. This age range excludes those who are likely too young or too old to be living independently and have significant power to make migration decisions for themselves. It also excludes the vast majority of young people who may still be enrolled in school, which past research in this area has shown to be a strong and significant predictor of migration (Williams 2006).

Measures of Violent Events

I use two measures of violent events—major gun battles and bomb blasts. In this context gun battles represent a high level of violence or threat. On average, 31 people died in each major gun battle in Nepal (South Asia Terrorism Portal 2006b). Gun battles tended to last for a longer period of time, up to several hours. In addition, reports indicate that nearby civilians were used as human shields and forced to clear dead and wounded

⁴ This period of time that this study covers begins in June 1997. Although the prospective demographic event registry (which I use to measure migration) began in February 1996, the migration data during the first few months of data collection is likely biased. The initial interviews were collected in the latter half of 1996. Several months after this, the prospective demographic event registry was started. Thus those individuals who migrated during the several months between the time they were initially interviewed and the beginning of the registry were recorded as migrants during the first few months of the registry. For this reason, migration rates during these first few months are likely biased. I present results in this paper of models that begin in June 1997, however I tested these models using February 1997 as a start date. Results from these tests were substantively equivalent to what I present here.

bodies. In comparison, in this context bomb blasts represent a much lower level of violence. Bombs are small, often homemade devices that have much less destructive power than the bombs used in other current conflicts such as Iraq. During this conflict in Nepal, bomb blasts killed or injured an average of 3 people (South Asia Terrorism Portal 2006b).

SATP provides records of the date and place of each major gun battle and bomb blast in Nepal. The data for major gun battles covers 51 months, from November 2001 through January 2006. The data for bomb blasts covers 49 months, from January 2002 through January 2006. With this data, I create variables for the number of major gun battles and the number of major bomb blasts per month in the local area. I define the local area that can influence Chitwan residents' perceptions of threat as Chitwan district and the six neighboring districts (Nawalparasi, Tanahu, Gorkha, Dhading, Makwanpur, and Parsa).

For the time period that this data does not cover, from the beginning of my study in June 1997 until November 2001 or January 2002 (for gun battles and bomb blasts respectively), I impute the number of major gun battles and bomb blasts to be zero. While it is likely that there were some gun battles and bomb blasts during this time, news reports and research indicate that the conflict was at a very low intensity (Hutt 2004) and CVFS research staff who are resident in the area indicate that there were very few of these violent events before 2002. Furthermore, in 2002 there was exactly one bomb blast and one gun battle in the local area. Thus this imputation strategy for the period before

2002 is likely the closest representation of reality⁵. It is also a conservative approach that is more likely to underestimate than overestimate the effect of violent events on migration.

Major gun battles in this area were sporadic. There were gun battles in 12 of the 51 months of records. The largest number of major gun battles in one month in this area was four, in April 2005. Bomb blasts occurred more routinely. For example, from September 2003 there was at least one bomb blast in almost every month until August 2005. Of the 49 months of data about bomb blasts, there were 24 months in which there was at least one bomb blast. The largest number of bomb blasts in any one month was 12, in July 2004.

All of these event records from SATP were “compiled from official sources and the English language media in Nepal.” (South Asia Terrorism Portal 2006b). The accuracy, or more to the point- the inaccuracy, of these news reports should be examined, particularly in the case of Nepal, a country that has been repeatedly accused of severely restricting freedom of the press (Amnesty International 2005; International Federation of Journalists 2006; United Nations Office of the High Commissioner for Human Rights 2005). The government was been accused of falsifying official figures of casualties from the insurgency (Dixit 2002; Hutt 2004). In fact, it is argued that “for greater precision government casualties be doubled and Maoist losses be halved against official figures.” (Mehta 2002). However, while news reports of the number of deaths or injuries are likely less accurate, reports that a violent event happened and the time and date of the

⁵ I also tested my models using with variables created by imputing all the missing data with 1's, the mean of each variable for the 2002-2006 time period, and random numbers within one standard deviation of the mean. The results of these tests were very similar to the models that I present here that use variables with missing data imputed with 0's.

event are likely to be more accurate. It is easier to misrepresent the size or impact of an event such as a gun battle than it is to misrepresent that it happened at all. For this reason, I use records of events (bomb blasts and major gun battles) and not the number of people that were involved in each event.

I also use a measure that delineates the period of nationwide violence that affected the lives of civilians from the period before the outbreak of this violence. There is no official starting date for the violence of the Maoist insurrection. However September 2000 approximately marks a “turning point” in the insurrection (Hutt 2004), when the Maoists escalated their violent campaign and began to expand nationwide and the government created the armed police force specifically to fight the Maoists. The number of fatalities from this time on changed the insurrection from a low-intensity, to a high-intensity conflict (Pettigrew 2004; Wallenstein and Sollenberg 2000). Thus, I create a dichotomous variable ‘during war’ that is coded as ‘1’ for the period from September 2000 until the end of my study in January 2006. From 1997 through August 2000, when there was little generalized violence, this variable is coded ‘0’

Migration

My measure of migration during the study period comes from the CVFS prospective demographic event registry. This is a panel study where interviewers visited each household in the study sample on a monthly basis from 1996 through the present. Thus the CVFS registry has residence records for each individual in the sample on a monthly basis. I define a migration as a one month or longer absence from an individual’s original 1996 residence. This measure captures short- as well as long-term migration. This is especially important in the case of conflict, where research has shown that much

of migration is temporary. Over the 104 month period of this study, 59% of the sample population migrated at least once. Table 1 shows the descriptive statistics for this and all other variables used in this study.

[Table 1 about here]

Location Specific Assets

My measure of land ownership is from the CVFS Agriculture and Consumption surveys. These are household based surveys that were undertaken in 1997 and again in 2001. Respondents were asked how much land their household owned. Answers were coded in kattha, a standard Nepali unit of measurement that is equal to 0.0338 hectares. For the years 1997-2000, I used the measure of land ownership from the 1996 survey; for the years 2001-2006, I used the measure from the 2001 survey. 43% of households owned some land. The average amount of land owned was 4.63 kattha (0.16 hectares) and the range was from 0 to 35 kattha.

My measure of working a salaried job comes from the CVFS Life History Calendar in 1996. Respondents were asked if they were working a salaried job at any time during that year. I use a dichotomous measure that is coded '1' if an individual worked a salaried job at any time during 1996, and '0' if not. 11% of respondents were working a salaried job.

Saleable Assets

My measures of ownership of livestock and household goods also come from the CVFS Agriculture and Consumption Surveys. To measure livestock ownership respondents were asked how many cows, water buffaloes, sheep, goats, and pigs their household owned. I created a single measure of livestock ownership by using standard livestock

unit conversions for each type of animal and then summing the total number of livestock units that each household owned. I used the following conversions: 1 livestock unit = 1.2 cows = 1 water buffalo = .30 pigs = .25 goats = .20 sheep (Agrawal and Gupta 2005). For the years 1997-2000, I used the measure of livestock ownership from the 1996 survey; for the years 2001-2006, I used the measure from the 2001 survey. 84% of households owned some livestock. The average livestock ownership was 2.97 livestock units and the range was from 0 to a maximum of 15.

Similarly, I created a summary measure of saleable household and farm goods that includes: motorcycles, bicycles, carts, tractors, farm implements (such as threshers, chaffers, or other farm tools), refrigerators, televisions, radios, phones, rice cookers, fans, and sewing machines. In the 2001 survey, respondents were asked if their household owned each of these items, and then they were asked “How many years ago did you first get X?” Thus from 1997-2001, my measure of household goods is updated annually; for the years 2001-2006 I used the measure from the 2001 survey. I weighted each type of item according to its relative worth as follows: 1 household good unit = 1 motorcycle, farm implement, or refrigerator = 0.5 carts, televisions, or sewing machines = 0.25 radios, phones, rice cookers, or fans. The average household goods ownership was 1.25 and the range was from 0 to a maximum of 6.

Control Variables

In order to accurately estimate the effects of violence and household assets on migration, I include in my models a variety of individual characteristics that may confound the relationship I am studying. Many of these measures have been shown to affect regular migration patterns in this setting and in other countries. These measures include age, sex,

ethnicity, marital status, children, urban proximity, past migration experience, education, and months of the year. Most of these measures come from the CVFS Individual Interview in 1996; only the time-varying measure of marital status comes from the prospective panel study.

I use a spline function to measure age that allows my models to be sensitive to rates of migration that change non-linearly with age. I use six age categories as follows: 15-20, 21-25, 26-30, 31-40, 41-50, and 51 years and older. I use dichotomous variables for sex, and to measure if an individual has ever migrated before 1997 or had any children in 1996. I use a series of dichotomous variables to control for the five functional ethnic groups in this area: Upper-Caste Hindu, Lower-Caste Hindu, Newar, Hill Tibeto-Burmese, and Terai Tibeto-Burmese. Similarly, I measure marital status with four time-varying dichotomous variables including never married, married and living with spouse, married and not living with spouse, and post married (divorced, separated, or widowed). I use an interval level variable for educational attainment that records the number of years of education an individual has completed by 1996. I also use an interval level variable for urban proximity that records the distance of an individual's community from the urban area of Narayanghat. Finally, in order to control for regular seasonal migration patterns in the Chitwan Valley, particularly in relation to the harvesting and planting cycles, I use a series of twelve dichotomous variables for each month of the year.

ANALYTIC STRATEGY

I use a series of discrete-time event history models to predict out-migration from the Chitwan Valley in any given month. I use person-months as the unit of exposure to risk. The models test the monthly hazard of moving out of the Chitwan Valley neighborhood

after June 1997, contingent upon violent events and household characteristics. I lag all both violent event variables by one month in order to assure that the result I am measuring (migration) occurred chronologically after the event. For example, the models test the effect of a bomb blast in April on out-migration in May.

I use the logistic regression equation given below:

$$\ln\left(\frac{p}{1-p}\right) = a + \sum (B_k)(X_k)$$

where p is the probability of migrating out of the Chitwan neighborhood, $\frac{p}{(1-p)}$ is the odds of migrating out, a is a constant term, B_k is the effect of independent variables in the model, and X_k is the value of these independent variables.

Model 1 (presented in Table 2) tests the effects of violent events and household characteristics on out-migration. It includes all control variables. Because this model controls for violent events, it tests the effects of employment and ownership of land, livestock, and household goods independent of violent events. In other words, we can say that this model approximates the effects of these measures on migration during times of relative peace.

Models 2-6 (presented in Tables 3 and 4) test the moderating effects of household characteristics on the relationship between conflict and migration. Each of these models includes variables for major gun battles, bomb blasts, all household characteristics, all control variables, and one interaction variable. I test the interaction of each individual and household characteristic with major gun battles and bomb blasts in separate models. For example, I test the interaction of livestock ownership with bomb blasts in one model, and the interaction of livestock ownership and gun battles in a separate model. However

not all of these interactions produced statistically significant results. I present only the models that produce statistically significant interactions. The interaction terms in these models test how individuals with or without each of these characteristics responded to violent events differently. Functionally, these models approximate the effects of these measures on migration during times of conflict.

RESULTS

The effects of violent events, gun battles and bomb blasts, on migration are similar to past studies in this research area (Williams 2008). As shown in Table 2 the odds ratio of 1.14 indicates a 14% higher likelihood of migration in any month following a gun battle. Odds ratios are multiplicative, so that in a month following two major gun battles there was a 30%⁶ higher rate of migration. Bomb blasts, had the opposite effect of gun battles; they decreased the likelihood of migration. The odds ratio of 0.96 for bomb blasts indicates a slightly lower rate of migration in the month following a bomb blast. Again, these effects are multiplicative, so that with increasing numbers of bomb blasts, we would expect a progressively decreasing rate of migration. For example, in a month following five bomb blasts, we would expect 0.81 odds of migration, and for ten bomb blasts 0.66 odds. Similar to bomb blasts, the general period of conflict had a negative effect on migration. During the conflict the rate of migration was reduced by about 44% compared to before the conflict (see Williams 2008 for further discussion on this topic).

[Table 2 about here.]

The effects of working a salaried job in 1996 are also as expected. Model 1 (in Table 2) shows the effect of working a salaried job on migration, controlling for violent

⁶ Calculated by squaring the odds ratio for gun battles: $1.14 * 1.14 = 1.30$.

events and other asset indicators. In other words, this model tests the effect of working a salaried job, independent of violent events, and we would expect the result to approximate the effect of this measure on migration during times of relative peace. This is what happened in this model. Those who were working a salaried job in 1996 had about 85% higher likelihood of migration than those who were not. In this context, a salaried job indicates that an individual possesses a specific (and not common) set of skills and experience that could be used to get a salaried job elsewhere. Salaried jobs in Chitwan, and especially rural parts of the study area, are likely to pay much less than salaried jobs in Kathmandu and other urban areas of the country. This higher likelihood of migration for salaried workers is consistent with past research in other countries and the neo-classical economic theory of migration.

Tables 3 and 4 show the results of models that include interaction terms for salaried job and gun battles and salaried job and bomb blasts. The interaction terms test how working a salaried job in 1996 moderates the effect of violent events on migration, or how individuals with a salaried job may react differently to violent events than those without a salaried job. As expected, working a salaried job produced a significant and negative interaction with both gun battles and bomb blasts. In the case of gun battles, the negative interaction term (0.78) is stronger than the positive effect of gun battles (1.18). Thus, individuals with a salaried job experienced progressively decreasing rates of migration with increasing numbers of gun battles per month. This effect is shown in Figure 2 which presents the predicted probability of migration after gun battles for those with and without salaried jobs.

[Table 3 about here.]

[Figure 2 about here.]

In the case of bomb blasts, both the effect of bomb blasts and the interaction of bomb blasts and salaried jobs were negative. As shown in Figure 3 which presents the predicted probability of migration after bomb blasts, those without salaried jobs had a progressively decreasing rate of migration after bomb blasts, but the rate of migration decreased even quicker for those with salaried jobs. The negative effects of both of these interaction terms provide evidence for the hypothesis that individuals who are working salaried jobs will be less likely to migrate in response to violent events than those who are not working salaried jobs. This supports the theory that even in times of armed conflict, people make cost benefit calculations and sometimes choose to not migrate and to face possible future danger in order to keep their salaried jobs.

[Table 4 about here.]

[Figure 3 about here.]

I find similar results for land ownership. As shown in Model 1 which tests the effect of land ownership on migration independent of violent events, there was a negative effect of land ownership. The more land that a household owned the less likely was any one individual in the household to migrate away. This is consistent with past research in the context of relative peace and supports theories that view land ownership as both a form of investment and employment (Durand and Massey 1992, Stark and Taylor 1991, VanWey 2005, Zhao).

In addition, land ownership also moderated the effect of gun battles on migration. As shown in Table 3, the interaction between these two measures was negative. Figure 4, shows the predicted probability of migration after gun battles for those who owned 0, 10,

20, and 30 kattha of land (0, 0.338, 0.676, and 1.014 hectares). For those who owned no land, the effect of gun battles on migration progressively increased. For those who owned 10 kattha of land, there was almost no effect of gun battles on migration, and for those who owned more than 10 kattha, there was a progressively negative effect of gun battles on migration. Similar to the moderating effect of salaried jobs, this provides evidence that during times of armed conflict, land ownership might enter into the cost benefit calculation and with individuals choosing not to migrate away from possible danger in order not to lose their land.

[Figure 4 about here.]

As shown in Model 1, ownership of livestock, and household goods both had a negative effect on out-migration, independent of violent events. The more of these assets a household owned, the less likely was any one individual in the household to migrate. This is consistent with past research on migration during times of relative peace (VanWey 2003; Massey, Axinn, and Ghimire 2007; Zhao 1999) and predictions of the new economics theory of migration.

In addition, livestock and household goods both had a positive moderating effect on migration after violent events. The interaction term for livestock and gun battles is positive, indicating that while the likelihood of migration increased with increasing numbers of gun battles, it increased even more for those who owned more livestock. Household goods produced a significant interaction with bomb blasts. Figure 5 shows the predicted probability of migration after bomb blasts for those who owned 0, 2, 4, and 6 units of household goods. For those who owned up to two units of household goods, bomb blasts produced a progressively decreasing rate of migration. However, for those

who owned four or six units of household goods, bomb blasts produced a progressively increasing rate of migration. Again, these positive interactions are consistent with my predictions. These results provide evidence that because it is possible to sell these items, ownership does not discourage migration and in fact may encourage migration through providing the means to undertake the journey and resettlement at a destination.

[Figure 5 about here.]

CONCLUSION

Prior research on forced migration has shown that periods of armed conflict increase migration on an aggregate level. However, this subject is more complex than previous models reveal. Armed conflict is rarely a single or homogenous event and migration streams are composed of individuals who experience these conflict events in diverse ways. The main contribution of this paper is the construction and empirical evaluation of a theoretical model of *individual* migration during armed conflict, taking into account *specific conflict events* that constitute a period of armed conflict and individual characteristics that affect how people make migration decisions.

Using data from the Chitwan Valley of Nepal, this study provides evidence that not everyone has the same likelihood of migrating (or not migrating) when faced with the same violent events. Specific characteristics of individuals and their households systematically altered the propensity of individuals to migrate in response to violent events. For example, characteristics such as working a salaried job and owning land, both of which are location-specific and non-saleable, decreased the likelihood of migration after violent events. These results support the theory that potential migrants

undertake cost benefit calculations, weighing the expected danger to their lives against the expected likelihood of losing their livelihood and investments if they move. In other words, they are betting their lives against their livelihoods. The fact that livelihood factors actually decreased migration rates indicates that not only do potential migrants consider their livelihoods, but in many cases they are prioritizing their livelihoods over the expected danger to their lives. These results highlight an important and often ignored factor in the study of conflict-induced migration – the costs of migration. In our conceptualization of migration during conflict, the possible benefits of migration (reducing the threat to one’s life) are so clear that it is all too easy to forget the possible costs, which in many cases can also have significant affects on an individual’s future survival.

In addition, results from this study show that characteristics such as owning livestock and household and farm goods also moderate the relationship between violent events and migration. These types of saleable items actually increase the likelihood of migrating in response to violence. Potential migrants are able to sell these items, not only recouping their investment but also gaining the liquid cash that provides them greater *ability* to undertake a migration. These results highlight another dimension of conflict migration that is often ignored- the ability to migrate. Independent of an individual’s desire to migrate, they must also have the ability, in this case the financial means, to do so. Without the ability, one cannot migrate.

This argument, that both the cost of migration and the ability to do so are important factors in the migration decision is not new in the conceptualization of new behavior choices. This argument draws directly from Coale (1973) and Lesthaeghe and

Vanderhoeft (2001) who propose that in order to adopt a new behavior, an individual must be ready, willing, and able to do so. Lesthaeghe and Vanderhoeft write “Readiness refers to the fact that the new forms of behavior must be advantageous to the actor; that is, their utility must be evident and outweigh their disutility ... The notion of ability then refers to the accessibility of these innovations... this access may have a cost that reduces ability...” (Lesthaeghe and Vanderhoeft 2001:240-241). While Coale first developed this model for the study of fertility transition, evidence in this study indicates that it is also pertinent to the study of migration.

This highlights a need to extend the theories we work with to include a more comprehensive understanding of the mechanisms through which conflict affects behavior changes in the general population. New theories must acknowledge that even when faced with high levels of violence, individuals are strategic and knowledgeable actors and the behavioral choices they make are complex, involving considerations of their future economic wellbeing as well as physical safety. In this regard, a multi-dimensional approach has much to offer in advancing our understanding of the full range of consequences of armed conflict on people’s lives and livelihoods and how these consequences interact with the broader context within which people live.

The micro-level data about individual characteristics used here provides a detailed and nuanced documentation of variations in migration behavior in response to conflict. To date, the study of the causes of conflict-induced migration has been heavily influenced by aggregate, often country-level, studies, which has hampered the ability to understand systematic micro-level variation in migration rates. The analyses presented here demonstrate that such micro-level documentation can substantially advance the study of

both conflict-induced migration, and also inquiries into other consequences of conflict on individuals, families, and communities.

In addition to the theoretical and empirical contributions of this article to understanding migration decisions on an individual level, these micro-level results also point towards key macro-level long term consequences of conflict in the general population. In this case, evidence shows that migration patterns during the Maoist insurrection in the Chitwan Valley were not random. Instead there was a systematic redistribution of the population, partially contingent upon the resources available to each individual and household. Specifically, individuals with the financial ability to leave were more likely to do so. As a result, it is likely that following the conflict, rural communities lost some of their capital and resources and were left further disadvantaged than before. This result is not altogether different from the city to suburb 'flight' of people and capital in the second half of the 1900's that so crippled many older US cities (Cullen and Levitt 1999; Frey 1979; Massey and Denton 1993; Wilson 1987). Just as in the US, this population redistribution will likely shape the social context of post-conflict Nepal, affecting future security, poverty, livelihood strategies, and social and economic networks, and (Castles 2003; Donato 1993; Durand et al. 1996; Jacobsen 1997; Massey 1988; Stark and Lucas 1988; Weiner 1996). This is an important example of how the responsive behaviors of the general population, regardless of their participation or leadership in a conflict process, can play a significant role in determining the future course of a post-conflict society.

REFERENCES

- Axinn, William G., Jennifer S. Barber, and Dirgha J. Ghimire. 1997. "The Neighborhood History Calendar: A Data Collection Method Designed for Dynamic Multilevel Modeling." *Sociological Methodology* 27(1): 355-392.
- Axinn, William G., Lisa D. Pearce, and Dirgha Ghimire. 1999. "Innovations in Life History Calendar Applications." *Social Science Research* 28:243-264.
- Agrawal, Arun, and Krishna Gupta. 2005. "Decentralization and Participation: The Governance of Common Pool Resources in Nepal's Terai." *World Development* 33(7): 1101-1114.
- Barber, Jennifer S., Ganesh P. Shivakoti, William G. Axinn, and Kishor Gajurel. 1997. "Sampling Strategies for Rural Settings: A Detailed Example from Chitwan Valley Family Study, Nepal." *Nepal Population Journal* 6(5):193-203.
- Bhandari, Prem. 2004. "Relative Deprivation and Migration in an Agricultural Setting of Nepal." *Population & Environment* 25(5):397-527.
- Coale, Ansley J. 1973. "The Demographic Transition Reconsidered" In IUSSP- Proceedings of the International Population Conference. Liege, Belgium.
- Cullen, Julie B. and Steven D. Levitt. 1999. "Crime, Urban Flight, and the Consequences for Cities." *The Review of Economics and Statistics* 81(2):159-169.
- Durand, Jorge, and Douglas S. Massey. 1992. "Mexican Migration to the United States: A Critical Review." *Latin American Research Review* 27(2): 3-42.
- Frey, William H. 1979. "Central City White Flight: Racial and Nonracial Causes." *American Sociological Review* 44(3):425-448.
- Graner, Elvira. 2001. "Labor Markets and Migration in Nepal." *Mountain Research and Development* 21(3):253-259.
- Harris, John R. and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review* 60(1):126-142.
- HMG, His Majesty's Government of Nepal, National Planning Commission, Central Bureau of Statistics. 2004. *Nepal Living Standards Survey 2003/04*. Kathmandu: Central Bureau of Statistics.
- HMG, His Majesty's Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, and United Nations Population Fund Nepal. 2002. *Population Census 2001: National Report*. Kathmandu: UNFPA.
- Hutt, Michael. 2004. "Monarchy, Democracy and Maoism in Nepal." In eds Michael Hutt *Himalayan People's War: Nepal's Maoist Revolution*. Bloomington Indiana: Indiana University Press.
- Ibanez, Ana Maria, and Carlos Eduardo Velez. 2003. "Forced Displacement in Colombia: Causality and Welfare Losses." CEDE World Bank.
- Informal Sector Service Center. 2006. "Human Rights Violation Data." Kathmandu: Informal Sector Service Center.
- Kollmair, Michael, Siddhi Manandhar, Bhim Subedi, and Susan Thieme. 2006. "New Figures for Old Stories: Migration and Remittances in Nepal." *Migration Letters* 3(2):151-160.

- Lesthaeghe, Ron, and Camille Vanderhoeft. 2001. "Ready, Willing, and Able: A Conceptualization of Transitions to New Behavioral Forms." In ed. John Casterline *Diffusion Process and Fertility Transition*. National Academies Press.
- Massey, Douglas S., William Axinn, and Dirgha Ghimire. 2007. "Environmental Change and Out-Migration: Evidence from Nepal." PSC Research Report No. 07-615.
- Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.
- Massey, Douglas S. and Kristin E. Espinosa. 1997. What's driving Mexico-U.S. migration? A theoretical, empirical, and policy analysis. *The American Journal of Sociology* 102(4): 939-999.
- Massey, Douglas S., Rafael Alarcon, Jorge Durand, and Humberto Gonzalez. 1987. *Return to Aztlan: The social process of international migration from western Mexico*. Berkeley: University of California Press.
- Myers, Gregory W. 1994. "Competitive rights, competitive claims: land access in post-war Mozambique" *Journal of Southern African Studies*, 20(4) : 603-632
- Pettigrew, Judith. 2004. "Living Between the Maoists and the Army in Rural Nepal." In eds Michael Hutt *Himalayan People's War: Nepal's Maoist Revolution*. Bloomington Indiana: Indiana University Press.
- Shrestha, Nanda R. 1989. "Frontier Settlement and Landlessness among Hill Migrants in Nepal Tarai." *Annals of the Association of American Geographers* 79(3): 370-389.
- Shrestha, Nanda R., Raja P. Velu, and Dennis Conway. 1993. "Frontier Migration and Upward Mobility: The Case of Nepal." *Economic Development and Cultural Change* 41(4): 787-816.
- Sjaastad, Larry A. 1962. "The Costs and Returns of Human Migration." *Journal of Political Economy*, 70:80-93.
- South Asia Terrorism Portal. 2006a. *Nepal Terrorist Groups- Communist Party of Nepal- Maoist*. South Asia Terrorism Portal.
- South Asia Terrorism Portal. 2006b. *Major Incidents of Terrorist Violence in Nepal, 1999-2006*. South Asia Terrorism Portal.
- Stark, Oded, and J. Edward Taylor. 1991. "Migration Incentives, Migration Types: The Role of Relative Deprivation." *The Economic Journal* 101:1163-1178.
- Thieme, Susan, and Simone Wyss. 2005. "Migration Patterns and Remittance Transfer in Nepal: A Case Study of Sainik Basti in Western Nepal." *International Migration* 43(5):59-96.
- Todaro, Michael P. 1969. "A Model of Labor Migration and Urban Unemployment in Less Developed Countries." *American Economic Review* 59(1): 138-148.
- Todaro, Michael P., and Lydia Maruszko. 1987. "Illegal Immigration and US Immigration Reform: A Conceptual Framework." *Population and Development Review* 13:101-114.
- Unruh, Jon D. 1995. "Post-Conflict Recovery of African Agriculture: The Role of 'Critical Resource' Tenure." *Ambio*. 24(6): 343-348.
- Unruh Jon D., and Harry Turray. 2006. Land tenure, food security and investment in postwar Sierra Leone" LSP Working Paper 22 Access to Natural Resources Sub-Programme

- VanWey, Leah K. 2003. "Land Ownership as a Determinant of Temporary Migration in Nang Rong, Thailand." *European Journal of Population* 19:121-145.
- VanWey, Leah K. 2005. "Land Ownership as a Determinant of International and Internal Migration in Mexico and Internal Migration in Thailand." *International Migration Review* 39(1): 141-172.
- Wallensteen, Peter and Margareta Sollenberg. 2000. "Armed Conflict 1989-1999" *Journal of Peace Research* 37(5).
- Williams, Nathalie. 2008. "Coping with Conflict: Do Community Organizations Moderate the Effect of Armed Conflict on Migration?" Paper presented at the 2008 Annual Meetings of the Population Association of America, New Orleans, LA.
- Williams, Nathalie. 2006. "Education, Gender, and Migration." Paper presented at the Annual Meetings of the Population Association of America, Los Angeles, CA, March 2006.
- Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.
- Wily, Liz Alden. 2003. "Land Rights in Crisis: Restoring Tenure Security in Afghanistan" Afghanistan Research and Evaluation Unit, Issues Paper Series March 2003
- Zhao, Yaohui. 1999. "Leaving the Countryside: Rural-To-Urban Migration Decisions in China." *American Economic Review*, 89(2):281-286.

Table 1. Descriptive Statistics

Variable		
Violent Events Variables		
	Mean/Median	Std dev
Gun battles	0.19 / 0	0.62
Bomb blasts	0.97 / 0	2.17
Household Economic Status Variables		
Salary Job (0,1)	0.11	0.32
Amount of Farmland Owned (0-35 kattha)	4.63	7.00
Amount of Livestock Owned (0-15 LU)	2.97	2.51
Household Goods Index (0-6)	1.25	1.06
Individual Level Variables		
	Mean	Std dev
Migration	0.59	0.49
Gender (female)	0.54	0.50
Ethnicity		
Upper Caste Hindu	0.47	0.50
Lower Caste Hindu	0.10	0.29
Hill Tibeto-Burmese	0.15	0.36
Terai Tibeto-Burmese	0.21	0.41
Newar	0.06	0.24
Age (in 1997)		
18-20 years old	0.09	0.28
21-25 years old	0.15	0.36
26-30 years old	0.16	0.36
31-40 years old	0.26	0.44
41-50 years old	0.21	0.40
51 + years old	0.14	0.35
Marital Status		
Never married	0.08	0.27
Married, living with spouse	0.54	0.50
Married, not living with spouse	0.31	0.46
Divorced, Separated, Widowed	0.06	0.24
Have any children	0.81	0.39
Educational Attainment (0-16)	3.86	4.45
Ever migrated (before 1996)	0.25	0.43
Distance to Narayanghat	8.59	4.05

Table 2. Violent Events and Migration:
 Logistic Regression Estimates of Discrete-Time Hazard Models of Out-
 Migration from Chitwan Valley

MODEL 1	ODDS RATIO	Z - Statistic
VIOLENCE		
Gun Battles (# per month)	1.14 **	(2.49)
Bomb Blasts (# per month)	0.96 *	(2.24)
During War (0,1)	0.56 ***	(9.01)
HOUSEHOLD ECONOMIC INDICATORS		
Salary Job (0,1)	1.85 ***	(8.02)
Amount of farmland owned	0.99 *	(2.21)
Livestock (# livestock units)	0.97 ***	(3.11)
Household goods Index	0.99	(.30)
CONTROL VARIABLES		
Ever Migrated	1.58 ***	(7.83)
Female	0.87 **	(2.32)
Distance to Narayanghat	1.02 **	(2.38)
Education	1.03 ***	(3.90)
Have Any Children	0.53 ***	(7.49)
MARITAL STATUS		
Unmarried	0.77 **	(2.66)
Married, living w/ spouse	Reference	
Married, not living w/ spouse	1.34 ***	(3.89)
Divorced, widowed, separated	1.40 **	(2.82)
AGE		
Age1	0.86	(1.07)
Age2	0.90 ***	(3.76)
Age3	0.92 ***	(3.69)
Age4	0.95 ***	(4.79)
Age5	1.02 ^	(1.54)
Age6	1.00	(.00)
ETHNICITY		
Upper Caste Hindu	Reference	
Lower Caste Hindu	0.90	(1.13)
Hill Tibeto-Burmese	1.23 **	(2.94)
Terai Tibeto-Burmese	0.73 ***	(4.42)
Newar	0.77 **	(2.44)
MONTHS OF THE YEAR		
January	0.92	(.71)
February	0.79 *	(1.97)
March	0.99	(.09)
April	0.90	(.90)
May	1.04	(.33)
June	Reference	
July	0.92	(.77)
August	1.13	(1.15)

September	1.15	(1.28)
October	0.69 ***	(3.05)
November	0.98	(.22)
December	0.82 *	(1.70)
-2 log likelihood	18551	
No. of Observations (person-months)	179384	

Table 3. Gun Battles, Employment and Assets, and Migration:
 Logistic Regression Estimates of Discrete-Time Hazard Models of Out-
 Migration from Chitwan Valley, Including Interactions with Employment and
 Asset Measures

INTERACTIONS W/ GUN BATTLES	Model 2- Salary Job	Model 3- Farmland	Model 4- Livestock
Interaction- Gun Battles* _____	0.78 ^ (1.56)	0.99 ^ (1.48)	1.03 * (1.70)
Gun Battles (# per month)	1.18 ** (2.94)	1.19 ** (2.97)	1.04 (.54)
Salary Job (0,1)	1.90 *** (8.22)		
Amount of Farmland Owned		0.99 * (1.966)	
Livestock			0.96 *** (3.37)
Household Goods			
-2 log likelihood	18548	18549	18549
No. of Observations (person-months):	179384		
All estimates presented as odds ratios			

Table 4. Bomb Blasts, Employment and Assets, and Migration
 Logistic Regression Estimates of Discrete-Time Hazard Models of Out-
 Migration from Chitwan Valley, Including Interactions with Employment and
 Asset Measures

INTERACTION W/ BOMB BLASTS	Model 5- Salary Job	Model 6- Household Goods
Interaction- Bomb Blasts* _____	0.83 ** (2.38)	1.04 ** (3.06)
Bomb Blasts (# per month)	0.97 ^ (1.53)	0.89 *** (3.50)
Salary Job (0,1)	1.94 *** (8.48)	
Household Goods		0.97 ^ (1.00)
-2 log likelihood	18543	18543
No. of Observations (person-months)	179384	
All estimates presented as odds ratios		

Figure 2. Predicted Probability of Migration Following Gun Battles, Interacted with Salaried Job

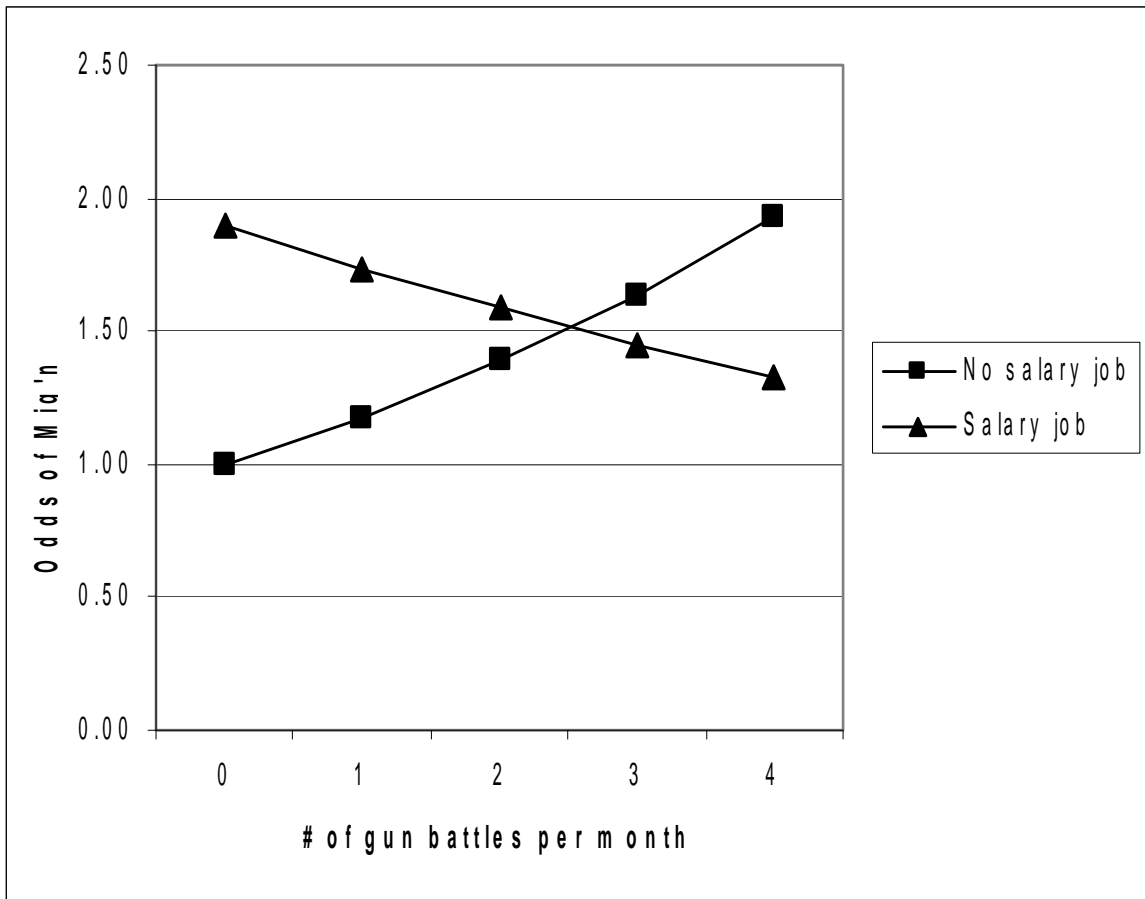


Figure 3. Predicted Probability of Migration Following Bomb Blasts, Interacted with Salaried Job

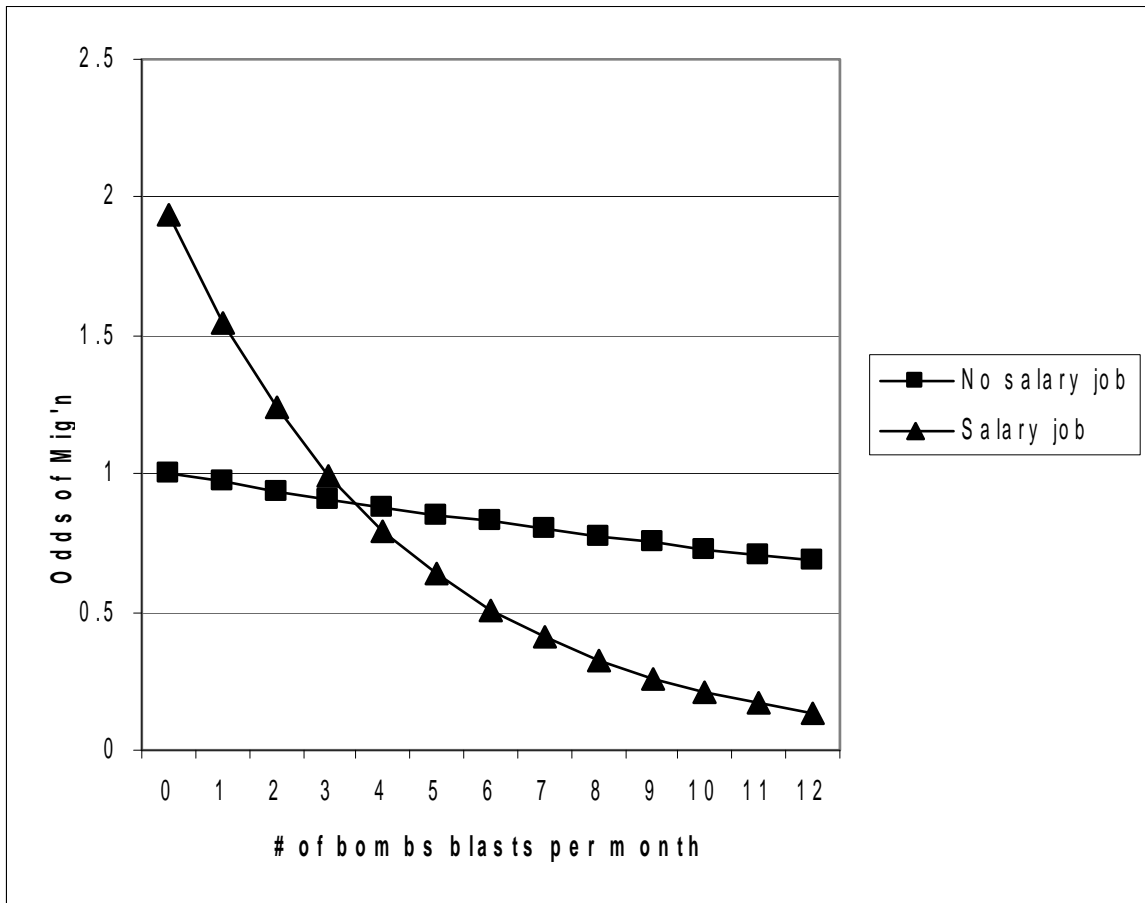


Figure 4. Predicted Probability of Migration Following Gun Battles, Interacted with Ownership of Farmland

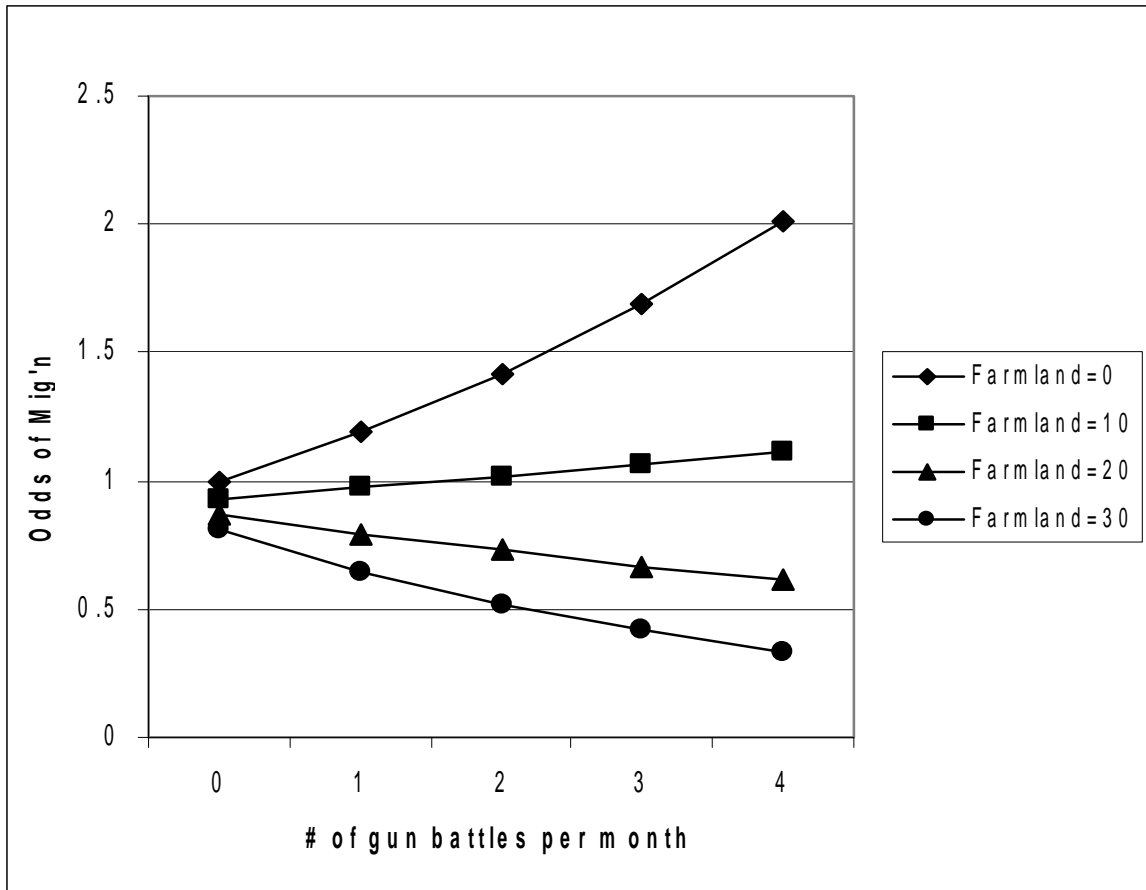


Figure 5. Predicted Probability of Migration Following Bomb Blasts, Interacted with Ownership of Household Goods

