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Push and Pull

A Study of International Migration from Nepal

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Abstract

This paper studies migration choices in the presence of liquidity constraints and varying costs of migration. This paper presents a simple theoretical framework that analyzes migration response to both push and pull factors in such settings. This framework implies that a shock to the push factors in the origin leads to differential observed response to migration to various destinations, as the shocks affect different parts of the wealth distribution. The implications of this framework are tested in the context of international migration from Nepal, using a panel of 452 villages observed at three periods in the 2000s. The analysis uses rainfall shocks and deaths due to conflict as "push" shocks and growth in manufacturing and construction in destination countries as "pull" shocks. The findings show that a rainfall shock that increases household income by US$ 100 increases migration to India by 54 percent but has no effect on migration elsewhere. An increase in conflict, which reduces consumption and amenity of the wealthier more, increases migration abroad, especially from urban areas. An increase in demand from the destination countries, especially the Gulf countries and Malaysia, has strong effects on migration to those destinations. These findings are consistent with the theoretical framework, and suggest the presence of large liquidity constraints. An increase in income can boost migration to India, whereas a reduction in the cost of migration might increase profitable migration elsewhere. The responsiveness to "pull" shocks suggests that households are willing to take advantage of these opportunities.

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Push and pull: A study of international migration from Nepal

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1 Introduction

International labor migration has surged in recent years with an increasing number of workers moving across international borders for work. The stock of international migrants increased from 154 million in 1990 to 244 million in 2015 (UNDESA, 2015). Over 70 percent of international migrants are from developing countries. However, most of the migrants from developing countries migrate to other developing countries, though the returns to migration may be higher in the developed countries. Of the migrants that originate in the least developed countries, only 16 percent migrate to the global North. High costs of migration to and low demand for migrant workers in the developed countries potentially prevent migrants from migrating there.

In this paper, I investigate the migration response to the 'push' and 'pull' shocks, shocks that affect the origin and destination respectively, when destinations have varying costs of migration and individuals are liquidity constrained. For instance, a positive income shock in the origin may increase migration by making it more affordable or it may reduce migration by making it less desirable. The net effect on migration rates depends upon the distribution of households around the affordability and desirability margins. I outline a simple theoretical framework that captures these features and test its implications in the context of international migration from Nepal.

Several features make Nepal a good setting to study the effect of shocks on international migration. First, migration of workers from Nepal is large and crucial to the national economy. Though the historic migration rates are similar to the global average, by 2011 the migrant to population ratio increased to 7.4 percent, more than double the global average (Table 1). Consequently, foreign remittances became one of the largest sources of national income, contributing over a fifth to the national GDP[1]. Second, most work migrants from Nepal choose between two distinct types of destinations that differ in terms of the costs and returns to migration. As seen in Table 1, India has been one of the key destinations for Nepali workers for the past several decades and continues to be the largest destination country. It serves as the low cost and low return destination for Nepali workers. However, the surge in migration in the 2000s was driven by migration to Malaysia and the Persian Gulf countries (especially Qatar, Saudi Arabia and the United Arab Emirates). Most of the migrants, about 90 percent of those who migrate for work, migrate to these destinations. These countries are the high-cost-high-return destinations for Nepali workers. Third, migration to these destination countries is facilitated institutionally. Nepal maintains an open border with India and workers can move across the border with extreme ease. In addition, agreements with Malaysia and the Persian Gulf countries make it relatively easy, though costly, for Nepali workers to migrate for (low-skilled) work in those destinations. Almost 500,000 workers left Nepal in 2014 to work in these destination countries.

However, the destinations chosen by Nepali workers are not unique to migrants from Nepal. Nine Persian Gulf countries, which represent 1 percent of the global population, are destinations to 13 percent of the international migrants in the world (UNDESA, 2015)[2]. Along with India and Malaysia, these destinations account for over 16 percent of international migrants (21 percent of male migrants) in the world. These countries have become the workplace of low-skilled workers from the Philippines and South Asian countries who have been migrating to these countries for

[1] In 2015, this share was 32 percent (The World Bank) making Nepal the country with the largest share of personal remittance to the GDP

[2] The nine countries are Bahrain, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. These are the largest destinations for international migrants in the Persian Gulf excluding the Syrian Arab Republic.

decades.

In the context of international migration from Nepal, I investigate the effect of three types of shocks using a panel of 452 villages across the country and observed in years 2001, 2008 and 2010. The first is the shock to farm income in the origin. Deviation of rainfall from its historic mean generates an exogenous variation in farm income both across the country for a given year and between different time periods for the same village. The second shock is a measure of conflict in origin which creates an income loss as well as utility loss, more so for the richer households. The ten-year long Maoist insurgency, which killed over 13,000 people, generates a variation in conflict intensity experienced by different parts of the country. In addition, the dramatic change in the trajectory of the insurgency gives rise to inter-temporal variation in conflict intensity experienced by a given village. In addition to the two 'push' shocks that affect the origin, I investigate the effect of an increase in the demand for low-skilled workers from abroad. I use the growth in the construction and manufacturing sectors in various destination countries to proxy for these 'pull' shocks from the destination countries. Here as well, different destinations countries that are plausibly in quite different macroeconomic cycles generates the variation that identifies my estimates. Differential effects of the global recession of 2008, further generates variation in growth rates across different destination countries.

Consistent with the theoretical framework, I find that rainfall shocks increases migration to India, but have no effect on migration to non-India destinations. Increase in farm income of US$ 100 due to rainfall increases migration to India by 2.5 percentage points (54 percent increase from its 2010 level) but has no effect on migration elsewhere. Rainfall shocks increases the income of the poor, who rely on agriculture, and enable them to finance low-cost migration to India. However, since rainfall shocks generate income gains that are small in magnitude relative to the costs of migration to other destinations, they do not enable too many households to migrate outside India. Similarly, an increase in conflict intensity by one death per 1000 population increases international migration from urban areas by 3.1 percentage points which is equivalent to the effect of increasing household income by US$ 420 in absence of conflict (after accounting for the average impact of conflict on urban consumption). Conflict reduces the consumption and amenity of the wealthier more, and therefore, induces a larger effect from richer (urban) areas. Lastly, I find that migration responds to increase in growth in the construction and manufacturing sectors in the destination countries, particularly Malaysia and the Persian Gulf countries. These findings suggest that increase in income can boost migration to India whereas a reduction in cost of migration might increase profitable migration outside India as well. Furthermore, the responsiveness to 'pull' shocks suggests that households are willing to take advantage of the profitable opportunities abroad.

This paper contributes to the literature on the effect of income at origin on migration. The canonical model of Harris and Todaro (1970) suggests than an increase in income in the origin reduces migration. Abramitzky, Boustan, and Eriksson (2013) finds evidence consistent with this using historic migration from Norway. Studies in many other contexts, which use shocks to weather as a source of exogenous variation in income, also find evidence consistent with this[3]. Examples of these studies include Munshi (2003) for migration from Mexico to the US, Marchiori, Maystadt, and Schumacher (2012) for migration from Sub-Saharan Africa, and Gray and Mueller (2012) for migration from rural Ethiopia. However, several other studies find the

[3]The practice of using weather shocks as a source of exogenous variation in income is quite common throughout the literature (see Jacoby and Skoufias, 1998; Kazianga and Udry, 2006; Miguel, 2005; Paxson, 1992; Wolpin, 1982, among many others, for instance).

opposite relationship between income shocks and aggregate level of migration and argue that liquidity constraints, particularly for poor households, prevent them from migrating. Examples include Angelucci (2015) for migration from Mexico to the US, Bazzi (2014) for migration from Indonesia, and Halliday (2006) for migration from El Salvador. In a cross-country study, Clemens (2014) also finds the positive relationship between income and migration for very poor countries. My results for migration to India are consistent with the latter studies that find a positive relationship between income and migration. However, I also find that small income shocks are unlikely to affect migration to destinations with very large costs of migration.

This paper also contributes to the literature on the role of conflict on migration. Conflict could affect migration directly as people want to avoid it, or it could affect migration by lowering income at origin through its effect on the economy as a whole. Much of the literature on conflict-associated migration examines the direct channel and argues that the threat of violence is a key push factor behind such migration. Many studies have found empirical evidence for migration in response to such threats of violence (see Davenport, Moore, and Poe, 2003; Moore and Shellman, 2004; Melander and Öberg, 2007, for example). Similarly, Naudé (2008) finds an increase in international migration from Sub-Saharan Africa in response to armed conflict. In a context similar to this study, Williams and Pradhan (2009) find that conflict related events like violence and bomb blasts increased out-migration from the Chitwan valley of Nepal. However, these studies only focus on internally displaced people and refugees and do not consider the effect on the broader set of households who might choose to migrate even though they are not directly forced to move.

Finally, this paper contributes to the relatively scant literature on the role of migrant demand from the destination on migration. A few examples include: Becker, Musabek, Seitenova, and Urzhumova (2005) that find sharp migration response from Kazakhstan to macroeconomic shocks in Russia, Yang (2008) that finds that migrants from the Philippines lengthen their stay when real wages in the destination increases unexpectedly, and McKenzie, Theoharides, and Yang (2014) that find more migrants leave the Philippines in response to positive shocks to the destination country's economy. Similar to these studies, I find that migration from Nepal responds positively to growth in the foreign labor intensive sectors in the destination country. Another, related and consistent evidence in the same context is Shrestha (2017a), where I find high wages due to exchange rate shocks in the destinations increases migration outflow from Nepal[4].

This paper stands out from the literature in two key ways. First, it looks at migration to multiple destinations as a response to the same 'push' shock. Most of the literature investigates migration response to all countries (Bazzi, 2014, for example) or to a specific destination country (Abramitzky, Boustan, and Eriksson, 2013; Angelucci, 2015, for example). This shortcoming exists in the literature because international migration is either dominated by migration to one particular country (for instance, from Mexico to the United States) or because the destinations are not too different in terms of the associated costs and returns to migration. The context of Nepal makes it possible to investigate this because the two types of destinations are starkly different in terms of costs and return and the migration flows to these destinations are substantial. Second, this paper studies the effect of 'push' as well as 'pull' factors in affecting the migration decision, an addition to the literature that focuses on either one of the shocks as reviewed currently.

[4]Besides the actual shocks at destinations, expectations about wages and conditions in the destinations can also influence the migration decision. This aspect of influencing perceived migrant demand is investigated in Shrestha (2017b).

The remainder of the paper is organized as follows: Section 2 outlines a very simple theoretical framework, Section 3 describes the context and the data sources, Section 4 describes the empirical strategy, Section 5 discusses the results, and Section 6 concludes.

2 Theoretical framework

In this section, I outline a very simple model of household migration decision to illustrate the key forces that drive my empirical results.

I assume that all households are farming households and their income depends upon the realized rainfall shock during plantation season. Total wealth of the household represented by $w + r$ where w is a measure of permanent wealth, and r represents income from farming. Households differ from each other only in terms of their permanent wealth which is distributed $F(\cdot)$ in the population.

In addition to total wealth, households value the peace p, of their place of residence. Conflict in the district of residence lowers p and households want to avoid conflict. Consistent with the nature of conflict (as discussed below), I assume that p is valued more by the richer households. Formally, in absence of migration, households receive utility $V(w + r, p)$ increasing in both parameters and that marginal utility of wealth is increasing in peace. That is, $\frac{\partial^2 V}{\partial w \partial p} > 0$.

Households can choose to send some members outside the country. This type of migration serves two purposes: the migrating member can earn income while abroad, and if there is conflict in the origin, migration protects the member as well as the rest of the family from the brunt of conflict. This nature of avoiding conflict is slightly different from the usual conflict associated migration where entire households move, but is consistent with the nature of conflict in this context. By sending the productive members (usually the household 'head') abroad, households can stop them from being forcefully recruited to fight, or from them being used as a means to extort money from the households. If the key income earner migrates, then insurgents would have a harder time harassing the rest of the family and extorting money from them.

Migration is costly and the cost C of migration (and finding a job) depends upon the destination. As discussed in more detail later, there is a large variation in the cost of migration between different destinations with India being the cheap destination compared to the non-India destinations: Malaysia and the Persian Gulf countries. This cost will determine where the migrant can and cannot go.

Once abroad, I assume that migrants always find work. This assumption is different from most studies in migration which focus on the risk associated with finding jobs in the destination (Bryan, Chowdhury, and Mobarak, 2014; Munshi, 2003, for example). This assumption is motivated by the fact that for migration outside India, one needs to have a job lined up before one can actually migrate abroad. For migration to India, I am assuming that, because of the historic nature of this migration, migrants will have sizable networks in India, which will help them find a job (more than 80 percent of migrants to India know someone in the destination city)[5]. Once the individuals migrate, their earning abroad, which depends upon the destination, is high enough to recuperate the cost of migration. The net gain from a migration episode increases with the cost of migration to that destination (as seen in Table 2). I assume a simple parametric form mC for the net income gain from migration with $m > 0$. Once a member migrates, the remainder of the household stay back but farm income suffers a loss. That is, the

[5] Another interpretation is that the search cost of jobs abroad is borne before migration and is embeded in the cost of migration.

household will have αr of farming income where $\alpha < 1$. The case $\alpha = 1$ would represent the case where the migrant member was a surplus in farming. Formally, a household that has a migrant abroad receives value $U(mC + w + \alpha r, p)$ which is increasing in both parameters. As discussed above, I also assume that households are better off with a migrant at time of conflict. That is, $\frac{\partial}{\partial p} V(\cdot) > \frac{\partial}{\partial p} U(\cdot)$.

Further, households are liquidity constrained and cannot borrow to finance migration. This assumption seems extreme as most of the migrants report that they borrowed money, typically from local moneylenders to finance their migration. However, as borrowers cannot credibly commit to repay after migration, lenders do not want to lend without a collateral. Borrowers usually post their house or land, worth more than the size of the loan, as collateral to get a loan. Hence only richer households with total wealth (liquid or illiquid) greater than the cost of migration can actually finance migration. That is, households can migrate only if $w + r > C$.

Hence, households migrate if and only if

$$U(mC + w + \alpha r, p) > V(w + r, p)$$

and

$$w + r > C$$

Households will choose the destination that has the highest return if they can afford it.

In this simple framework, increase in total wealth due to income shocks will have two opposing effects. On one hand, it will enable households to migrate by alleviating liquidity constraint. On the other hand, increased wealth makes migration less desirable by increasing the utility of staying at home. Increasing conflict reduces the value of not migrating more than it reduces the value of migrating. Therefore, households choose to migrate, with richer households more likely to do so. Similarly, increasing the net benefit of migration mC increases migration. To obtain specific predictions about the sizes of the effects, I will make simplifying assumptions on the functional forms.

2.1 Linear functional form

To illustrate the key intuition and generate sharp testable predictions, I assume a linear functional form for the utilities. Specifically, $U(\cdot) = mC + w + \alpha r$, and $V(\cdot) = w + r + wp$. With these functional forms, households migrate if and only if

$$A \equiv C - r < w < \frac{mC - (1 - \alpha) r}{p} \equiv D$$

The left end of the wealth distribution of migrants is bound by the affordability threshold. At this margin are very poor households that cannot afford the cost of migration due to liquidity constraints even though they may desire to migrate. The right end of the wealth distribution of migrants is bound by the desirability threshold (for a given level of conflict). At this margin are the wealthier households that choose not to migrate because the earnings gap between the destination and the origin is too low and, at peaceful times, they get additional premium of staying back. This simple framework predicts a stark inverted-U shape between household wealth and migration rate in the cross-section, a common feature of many models of migration (Bazzi, 2014; McKenzie and Rapoport, 2007, for instance).

Furthermore, this simple framework suggests that poorer households migrate to cheaper destinations (India) and richer households migrate to more expensive destinations. This pattern,

in fact, is borne in the data. Figure 1 plots how the migration probability of households changes with two measures of household wealth, w, separately for India and non-India destinations. The measures used are the highest level of education in the household (bottom figure) and the value of durables currently owned by the household that it had acquired it at least two years ago as the measure of wealth (top figure)[6]. Both plots in this figure shows that poor households are more likely to migrate to India than to other destinations. This figure, particularly the bottom plot, also shows the inverted U pattern as predicted by the framework. The extremely poor cannot afford to migrate and the extremely rich do not desire to do so.

Given the cutoffs above, the total observed migration rate in an economy, or a village, denoted by M is

$$M = F(D) - F(A)$$

for each of the destination types[7].

The following comparative statics immediately follow:

$$\begin{aligned}
\frac{\partial M}{\partial p} &= -f(D)\frac{D}{p} < 0 \\
\frac{\partial M}{\partial r} &= -f(D)\frac{(1-\alpha)}{p} + f(A) \lesseqgtr 0 \\
\frac{\partial M}{\partial m} &= \frac{C}{p} f(D) > 0
\end{aligned}$$

which suggests that the magnitude of the effects depend crucially on the distribution of wealth and the thresholds.

The first comparative static suggests that increase in conflict increases migration. This is driven by the right (desirability) thresholds moving to the right. That is, richer households migrate because they experience a big negative shock to the peace premium. If the migration desirability threshold, D, is sufficiently high, then the effect is likely to be higher for the urban areas than for the rural areas as the proportion of households with wealth close to D will be higher.

The second comparative static suggests that increase in farm income has two counteracting effects. The first one is that the affordability threshold decreases. This effect is driven by liquidity-constrained households who are now able to finance migration due to increased income. Another effect is that the desirability threshold decreases as well. This effect is driven by households who now choose not to migrate because of increased total wealth without migration. The total effect depends, again, in the densities at the thresholds. If the distribution of wealth and the cutoffs for migration to India and non-India destinations are as depicted in Figure 2, then rainfall could have completely different effects on migration to India and migration to other destinations. For India, the fraction of households affected by relaxed liquidity constraints is much higher than the fraction of households for whom increased income makes migration less desirable. The liquidity effect is more likely to dominate, thereby increasing migration to India in response to a higher rainfall. On the other hand, for non-India migration, both thresholds

[6] I choose these measure of wealth as the current consumption is endogenous to migration choice, as is the value of durables recently acquired. Acquisition of durable assets (especially two years ago) and education can be considered to be pre-determined. I get the same pattern with alternative measures of pre-migration wealth such as the value of land owned by the household, and the imputed rental value of their houses.

[7] M is zero if $D \leq A$. I assume that $D > A$, which, in the model, translates to an upper bound on the peace premium. That is, there is only so much utility you can get by staying back when it is peaceful.

have only smaller proportion of households around them and therefore the net effect is likely to be very small and of ambiguous sign. See Appendix A for the details of how this figure is calibrated.

The third comparative static suggests that an increase in demand from abroad is likely to increase the number of households migrating to those destinations. This is also driven by increasing the desirability threshold: the households that chose not to migrate previously will migrate now, as the returns to migration are higher. Following Figure 2 again, the right cutoffs of migration to both destinations move further to the right, increasing migration in both places. For the same unit change in migrant income, the effect for India migration is likely to be larger than the effect for non-India migration. However, the same proportional change in migrant income, may induce larger response to non-India migration due to higher levels of migrant income.

3 Context and Data

3.1 International migration from Nepal

Historically, Nepal has seen reasonable rates of international migration, albeit mostly to India. Between 1961 and 2001, the migrant to population ratio hovered around 3.4 percent, and was almost entirely driven by migration to India (Table 1). This rate was slightly higher than the global international migration rate of 2.9 percent (UNDESA, 2015). The high rate can be attributed to the ethno-linguistic similarity between the two countries as well as the low cost of migration to India. Nepal maintains an open border with India, where citizens from one country are free to enter the other at any time without any restrictions, paperwork or clearances. This allows workers of either country to take advantage of the economic opportunities in the other. Historically, workers, mostly from Far-western and Mid-western regions of Nepal, have been migrating to India to work as daily wage laborers or security guards or in restaurants in Indian cities. Because of frequent migration to India over a long period, there are well-established migration linkages between districts in Nepal and Indian cities that help newer migrants find work in India (Seddon, Adhikari, and Gurung, 2002).

Because of the open border and historical linkages, India serves as the low cost and low return destination for Nepali migrants. A typical migrant worker to India pays Rs. 6,250 (USD 83) to migrate and find a job in India (Table 2). This amount is roughly over two months of per-capita consumption in Nepal. They earn, on average, Rs. 6,400 (USD 85) a month, of which they save almost two-thirds. The median migrant spends about 9 months in India per migration episode. This is consistent with the view that migration to India is seasonal and workers stay home during planting and harvest season and migrate at other times of the year. Almost a third of these migrants finance migration through their own savings while 60 percent take out a loan, mostly from village lenders and then from friends and relatives[8].

On the contrary, migration outside India is a relatively recent phenomenon. Historically, people migrated to non-India destinations mostly through recruitment in the British Army. The numbers were small and directed to destinations like the UK, Hong-Kong, Singapore and Brunei. It was only in the late 1980s that Nepalis have started to migrate to other destinations for work. Foreign migration became easier after democracy was introduced in the country in 1990 and international travel was made easier and more systematic. Only in the mid-1990s, the

[8] Author's calculations from Nepal Migration Survey 2009 and The World Bank (2011).

Government of Nepal allowed private recruitment agencies to recruit workers to a selected set of countries, mostly in the Persian Gulf and a few others like Malaysia, Japan and South Korea, upon obtaining clearance from the Ministry of Labor (Seddon, Adhikari, and Gurung, 2002). This has led way to the surge in migrant outflow from Nepal in the 2000s (see Table 1). This outflow has been dominated by the migration of low-skilled, mostly male, workers to Malaysia, and the Persian Gulf countries, especially, Qatar, Saudi Arabia, and the United Arab Emirates. By 2011, 15 percent of the households had a current migrant in these destination countries.

Most of the current migration to non-India destinations, especially to the Persian Gulf countries and Malaysia, happens through recruitment agents (The World Bank, 2011). Typically, potential migrants contact, or are contacted by, independent local agents that are connected to recruitment firms in Kathmandu. These recruitment firms receive demands for low-skilled workers from firms or agencies abroad and are fully responsible to fill the demands and arrange all necessary paperwork[9]. Migrants to these destinations pay the intermediaries more than Rs.100,000 (US$ 1333) for job-search, intermediation and other related costs (Table 2). This amounts to three years of per-capita consumption in Nepal.

Despite the higher costs, workers earn significantly more in Malaysia and the Persian Gulf countries once they are abroad. Most of these workers (65 percent) work in the booming construction and manufacturing industries. A typical worker in these destinations earns more than Rs.14,000 (US$ 187) in a month. They tend to save almost three-quarters of this income (Table 2)[10]. The median migrant to the Gulf countries and Malaysia spends 2.3 years abroad per migration episode. More than 85 percent of them finance migration by borrowing, mostly from local loan merchants and from friends and relatives[11]. Borrowing from formal financial institutions is, however, quite infrequent with less than 5 percent of the migrants borrowing from banks. Of the remaining 15 percent too, most finance the migration through grants and help from family and friends.

A few key points of international migration from Nepal are worth highlighting, which ties the theoretical framework in the context. The cost of migrating to India and finding a job is much lower than the costs of migrating elsewhere. Interestingly, these costs do not seem to vary by location of origin community or by the education level of the migrants[12]. The returns to migration also seem to follow the same pattern so that migration is quite profitable on average, given the typical duration of migration and the amount of savings while abroad. Jobs, particularly to non-India destinations, are prearranged so that there is no risk of not finding work conditional on migration. The vast majority of the migrants finance their migration by borrowing, but borrowing from formal financial institutions is quite low. Most migrants borrow from local moneylenders against a collateral.

Data on migration rates

The data on migration for this paper comes from three different surveys conducted by the Central Bureau of Statistics (CBS) of Nepal over 2001-2010 period. All three surveys have information on absentee members of the household and because of their unique and circumstantial survey design, forms a panel of nationally representative villages observed thrice during the decade.

[9] For more details, see Shrestha (2017b,a).

[10] Though the earnings in Malaysia seem to be lower than the earnings in the Gulf countries, it is believed that the wages are actually higher in Malaysia. Workers in the Gulf countries tend to work more hours.

[11] Author's calculations from Nepal Migration Survey 2009 and The World Bank (2011).

[12] Author's calculations from Nepal Migration Survey 2009 and The World Bank (2011).

In June 2001, CBS conducted the tenth national population census, which counted individuals and absentee members in the entire country. I use the sample census micro-data, which covers 95 percent of the villages in the country. Within each village, one-eighth of the households are interviewed.

The census of 2001 was used to develop a sampling frame for the Nepal Labor Force Survey-II (NLFS-II) of 2008. This survey selected 800 primary sampling units (PSUs), or village wards, through a stratified random sampling method. In each of these PSUs, they randomly selected and interviewed 20 households.

For the Nepal Living Standards Survey-III (NLSS-III) of 2010, the list of PSUs selected for NLFS-II was used as the sampling frame. Of the 800 PSUs, 500 were selected, again by stratified random sampling to be part of NLSS-III PSUs. This was done to save time in the cartography and listing exercise by the CBS so that they could complete the survey before they began preparing the logistics for the census of 2011. In each of these PSUs, they randomly selected and interviewed 12 households each.

Though households cannot be tracked between these different surveys, 452 village wards are observed in all three datasets. Furthermore, these datasets also have information on the absentee members of the household: individuals that were considered member of the same household but had been absent at the time of enumeration. I use this information at the individual level to construct the migration rates at the village level. My measure of migration rate is the ratio of migrant to resident population in each village.

Additionally, I use district level migration rates from published census tables for years 1981 and 1991 to extend the panel back in time in some cases.

Figure 3 shows the spatial distribution of these PSUs all over the country. There is at least one panel village in 70 of the 75 districts. In all of the estimations, I use the NLSS-III sampling weights of these PSUs to make my estimates nationally representative. The weighted migration rates in the panel are: 9.57 for year 2010, 8.06 for 2008, and 3.47 for year 2001, very close to the rates reported in Table 1. A fuller set of descriptive statistics is presented in Table 3. Figure 4 shows the migration rates to India and non-India destinations for the 3 recent periods. As discussed above, migration to India tends to be more common from the mid and far-western regions of the country whereas migration elsewhere is increasing all over the country.

In the remainder of this section, I describe the context and relevance of the 'push' and 'pull' shocks in this context along with the source of the data.

3.2 Rainfall and income

Nepal is primarily an agricultural country with farm income heavily depending upon rainfall. During the 2001/2010 period, the share of agriculture in total GDP hovered between 35-38 percent (MoAD, 2013). In comparison, the total share of industry and manufacturing in GDP remained below 20 percent in the same period. In 2010, 80 percent of the households own agricultural land and the same proportion of the labor force is involved in agriculture[13]. Since the fraction of land that is irrigated remains low, agriculture depends heavily on rainfall. Rice and maize are the two major crops grown in the country, both of which are grown in the wet monsoon season. Rice is the key staple food and contributes to a fifth of the agricultural GDP (MoAC, 2008). In 2010, 74 percent of farming households grew rice and 61 percent of them grew maize[14]. Therefore, the amount of rainfall the country receives during the monsoon months is

[13] Author's calculations from NLSS-III.

[14] Author's calculations from NLSS-III.

crucial for agricultural production. A one standard deviation increase in monsoon rainfall in a district improves the yield of rice by 2.7 percent, improving total production by 4.5 percent and total rice cultivated area by 1.8 percent. Similarly, maize production increases by 5.9 percent and area of cultivation by 6.8 percent in response to one standard deviation higher rainfall in monsoon[15].

Consequently, increased rainfall in the monsoon months increases farming income and consumption of farming households. I investigate the impact of rainfall directly on measures of income and consumption using three waves of cross-sectional surveys conducted between 1995 and 2010. I find that one standard deviation of rainfall increases farming income by Rs. 2,400 (about 16 percent of total farm income in 2010) and increases consumption in the subsequent year by almost the same amount (Rs. 2,300 or about 7 percent of total consumption in 2010) for households who do not receive any remittance income. Details of this exercise are described in Appendix B.

Data on rainfall

The rainfall data that I use for this paper are provided by the Department of Hydrology and Meteorology (DHM) for years 1972 to 2010. The dataset contains average daily rainfall for each of the months from 1972-2010 collected from over 300 rainfall stations throughout the country. The distribution of these stations is shown in Figure 3. I interpolate these rainfall measures to each of the 452 villages in my dataset using inverse of distance from the stations as weights. For each of the villages in my sample, I compute normalized monsoon rainfall in standard deviation units using historic (spanning 1972-2002) mean and standard deviation of monsoon rainfall in the village. The measure that I use for my analysis is the normalized monsoon rainfall in the year preceding the survey.

There is considerable variation in rainfall between years as well as within a given year. Figure 5 plots the histogram of normalized rainfall for the three survey years. Within each year, the range is well over 2 standard deviations and across the three years, the range is more than 4 standard deviations with considerable overlap between the years. From this graph alone, it looks like rainfall is trending down in the 2000s, but this is driven by exceptionally high rainfall around year 2000. The trend does not hold if rainfall distribution from earlier periods (years, 1981 and 1991) is added.

3.3 Conflict: The Maoist insurgency

When international migration from Nepal began to increase drastically in late 1990s and early 2000s, the ongoing Maoist insurgency took an unexpectedly sharp and violent turn. This led experts to believe that the conflict, which took over 13,000 lives and displaced many more, also pushed individuals outside the country (CBS, 2006; The World Bank, 2011, for instance). In this subsection, I discuss the context of the conflict and my data source.

The Maoist insurgency began, and gained momentum, as an anti-feudal and anti-elite movement. The insurgency, or the "People's War" as they call it, formally began on February 13, 1996 by a splinter faction of the leftist communist parties that was dissatisfied with the lack of

[15]Author's calculations from the historic rainfall data and historic production data for each of the districts for years 1975-2000. The estimated regression includes district fixed effects as well as year fixed effects. The identifying variation comes from geographic variation in rainfall measures within a given year and also inter-temporal variation in rainfall within a given district.

progress since democracy was introduced in the country in 1990. As a sign of their movement, they attacked three police outposts and a a few privately owned firms and banks located in remote parts of the country to symbolize their attack against the feudal government, the capitalists and the elites. Their movement spread gradually to other parts of the country with support from the rural and poor masses. Their expansion and operation included few key features: they seized land from the landlords and let poorer farmers cultivate under cooperative systems, they extorted money from the wealthy, attacked private firms and banks, and encouraged the poor and often marginalized people to join their movement by highlighting their pro-poor agenda (Macours, 2011). Their attacks on government police posts and subsequent retaliation by the police (which involved capturing and torturing people that they believed were militants) made the conflict increasingly violent. By 2001, 2,000 people were killed, mostly in the mid and far-western regions of the country.

An unexpected incident changed the nature of the conflict and made it much more violent after 2001. Before 2001, King Birendra considered the Maoist insurgency to be an internal problem to be dealt by the government and the police force. He refrained from mobilizing the army against the insurgency even upon requests from the government to mobilize the army. On June 1, 2001, King Birendra and his entire family were massacred at a family dinner by the then crown prince, who subsequently turned the gun to himself. In a matter of days, Gyanendra, who was very far in the line of succession to the throne, and who survived as he was not present for the dinner, became the new monarch. King Gyanendra was less reluctant to use the army to suppress the insurgency. The ongoing peace talks with the government broke in late 2001 with the Maoists attacking an army barrack in one of the mid-Western districts. The Nepal Army was deployed overnight and the conflict took a very violent turn. In 2002 alone, over 4,600 people were killed. By 2006, when the insurgency eventually ended, over 13,000 people were killed and more than ten times as many displaced.

Another equally unexpected coalition emerged during the conflict that ended the insurgency in 2006. In a short duration, Gyanendra proved himself unpopular when he dismissed the elected parliament and started ruling the country through his handpicked cabinet of ministers since 2005. This presented an unusual opportunity for the Maoists to become a mainstream political party by teaming up with the other political forces in a fight against the King. This movement led to the demise of the monarchy and an election was held in 2008 to write the constitution for the newly formed republic. The Maoists emerged as the largest party, confirming its transition to mainstream political force.

The geography and the trajectory of the insurgency produces spatial and inter-temporal variation in conflict intensity, which I exploit in my empirical study. Conflict intensity was lower before year 2001, when census data were collected. The conflict took an unexpectedly violent turn after 2001, until its end in 2006. The threat of violent Maoist conflict ended in 2008 when the constituent assembly elections were held, the year when the NLFS-II data were collected. The period between 2008 and 2010 represents a post-conflict peace period after the Maoists emerged as the largest party in the elections. Figure 6 shows the stark increase in conflict intensity before and after 2001. Conflict intensity increased from 0.1 deaths per 1,000 population on average to 0.6 deaths per 1,000 population in this period. The figure also shows large geographic variation in conflict intensity in both periods. Further, post-election peace ended violent conflict in all districts.

Conflict data

My measure of conflict intensity is based on data provided in the annual Human Rights Yearbooks published by the Informal Sector Service Center (INSEC), a Nepali non-governmental organization that monitors human rights issues in the country. INSEC reports the number of deaths due to Maoist conflict in each of the districts in the country. This dataset is identical to the one used by Do and Iyer (2010) in their study of the determinants of the conflict. I use conflict related deaths that occurred in the district between 1996 and 2001 as my measure of conflict intensity for year 2001. For year 2008, I use conflict related deaths that occurred in the district between 2001 and 2006. I set conflict intensity to zero for year 2010. I normalize the conflict deaths by dividing by the population of the district in 1991.

To convert conflict into monetary terms, I do an exercise similar to that with rainfall using three cross-sections of consumption surveys conducted between 1995 and 2010. I find that increase in conflict intensity of 1 death per 1,000 population is correlated with a consumption loss of Rs. 3,490 (10.6 percent of consumption in 2010). This correlation is much stronger for higher end of the wealth distribution, consistent with the nature of the conflict and the assumption in the theoretical framework (Appendix Table B.1 and Appendix Figure B.1)[16].

3.4 Demand for migrant workers

Demand data

Another shock that drives migration in the theoretical framework is the increased demand for workers in the destination countries, which increases migrant income. Since most migrant workers from Nepal work in construction and manufacturing industries, I use a measure of demand that reflects growth in construction and manufacturing industries in the key destination countries. Specifically, I use the growth rate in the levels of carbon dioxide emissions attributed to construction and manufacturing industries in India, Malaysia and the Gulf countries (Qater, Saudi Arabia, and United Arab Emirates). I get this measure from the World Development Indicators database (The World Bank) which reports carbon dioxide emissions calculated by U.S. Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC) using data from the United Nations Statistics Division's (UNSTAT) World Energy Data Set and the U.S. Bureau of Mine's Cement Manufacturing data set. The UNSTAT collects this information from several countries using questionnaires designed to collect information on emissions from various sectors. Cement manufacturing data from the U.S. is used to estimate CO_2 emission from construction. Further, CDIAC continually maintains and updates this database based on supplemental information collected and upon availability of new information.

The variation in this dataset comes from the fact that the destination countries are in different cycles of construction and manufacturing. Further, the great recession of 2008 affected these destination countries quite differently, creating a useful variation in the data on the growth of migrant demand.

[16] See Appendix B for details of this estimation.

4 Empirical Strategy

Push shocks

Ordinary Least Squares estimates of the effect of shocks on migration in a cross-sectional data are fraught with problems. For instance, places with fertile land that is responsive to rainfall might also have more entrepreneurial people who are more likely to migrate. Similarly, places with extremely unequal land ownership might invite conflict as well as force people to migrate due to lack of economic opportunities. These characteristics, which are not always observable, will bias the OLS estimates obtained from cross-sectional data. Panel data solve this problem if such characteristics are time invariant by comparing changes in migration rates with changes in shocks within the same village over different periods.

Given the structure of my migration data, I estimate the following model to study the impact of 'push' shocks on migration:

$$M_{it} = \beta X_{it} + \gamma_t + \mu_i + \varepsilon_{it} \tag{1}$$

where M_{it} is the migration rate in village i observed in time t, γ_t represents the survey year fixed effects which absorbs any national trends common to all villages, μ_i is the village fixed effect which absorbs all time invariant characteristics of the village, X_{it} is the shock that affects village i at time t and ε_{it} represents the error term. I allow the error term to be correlated between different villages within a district as well as over time. X_{it} are either conflict intensity in the district as defined above, or normalized rainfall in very recent past (one or two years ago). The identifying variation for this specification comes from variation within village over time as well as variation across villages in a given year.

Further, my measure of rainfall shock is in standard deviation units relative to the average historic rainfall in the village and is likely to be uncorrelated with any village specific trends in any of the related observed and unobserved variables. More importantly, individuals cannot predict rainfall shocks and engage in anticipatory migration. Hence, the variation in rainfall measure is likely to be uncorrelated with the error term.

Conflict intensity could, however, be driven by village or region specific trends. This could bias the estimates of the effect of conflict intensity. However, the overall trajectory of this conflict, as discussed earlier, suggests that the two big factors that drove conflict intensity were quite unanticipated. The deployment of Nepali Army, which escalated the death toll stemmed from the massacre of the royal family and coronation of a new king who was not in the accession line. Similarly, the end of the conflict was brought together by an unlikely alliance between the mainstream political parties and the Maoists to overthrow the king.

Pull shocks

The regression model in Equation (1) cannot be used to estimate the effect of 'pull' shocks from the destination countries, as they will be completely subsumed by the year fixed effects. To look at whether migration responds to demand from the destination countries, I estimate a slightly different model:

$$M_{ijt} = \delta D_{jt} + \gamma_{ij} + \mu_{it} + \varepsilon_{ijt} \tag{2}$$

where M_{ijt} is the migration rate from village i to country j in time t, γ_{ij} is the destination-village fixed effect, μ_{it} is the village year fixed effect and D_{jt} is the recent growth rate in

manufacturing and construction sector in country j (the Gulf countries, Malaysia, and India). As with equation (1), I allow the errors to be correlated across time and across different villages in the same district.

The identification of this specification comes from variation in demand from different destination countries within a village for a given year as well as from the variation in demand across time for a village-destination pair. The fixed effects remove all other sources of variation that might confound the estimation.

In the next section, I present results of estimating equations (1) and (2) and discuss how the results relate to the theoretical framework outlined in Section 2.

5 Results and discussion

5.1 A 'push': Rainfall shocks

As discussed in the previous section, income shocks due to rainfall could have an ambiguous effect on migration. It increases wealth, making migration less desirable, but also relaxes liquidity constraints, which makes migration affordable. As suggested by Figure 2, the fraction of households that are induced by the rainfall shock in overcoming the liquidity constraints might be very small relative to the fraction of households that now desire migration less when the cost of migration is very high. The former proportion is likely to be higher when the cost of migration is relatively low.

Consistent with this interpretation of the framework, I find that rainfall shocks increase migration to India whereas it has no effect on migration to non-India destinations. As Table 4 shows, a one standard deviation increase in rainfall increases migration to India by 0.8 percentage points. This amounts to 31 percent increase in migration rate from its 2001 level, 19 percent of 2008 level, and 17 percent of 2010 level. On the other hand, rainfall has no impact on migration to non-India destinations. The estimated effects are small and statistically insignificant.

Since I have only three periods, arbitrary trends in normalized rainfall could be driving the results. Indeed, Table 3 and Figure 5 shows that normalized rainfall in the past year has been falling between 2001 and 2010, whereas migration rates have been increasing over this period. To check that the trend in rainfall is not driving my results, I extend the panel further back in time using district level migration rates from the census of 1981 and 1991 to proxy for the migration rates in the village in 1981 and 1991. Table 5 shows the results for this extended panel. The same specification produces almost identical results except for effects on India migration from urban areas (columns 1, 3, and 5). The effect for the urban areas is about half the size of the effect for rural areas. This could be because urban areas are less reliant on rainfall for their income[17] or, according to the theoretical framework, because the fraction of households affected by the liquidity constraint is smaller in urban areas. Adding a linear time trend only slightly reduces the point estimates. This indicates that time trends in rainfall are not driving the results.

In Table 6, I investigate whether rainfall shocks two years before the survey affects migration rates. I do this to capture the effect on migrants who left more than a year ago for whom it is not the last year's rainfall but the rainfall two years ago, that matters. Baseline estimation of Equation (1) shows that normalized rainfall two years ago matters almost as much as the normalized rainfall last year for migration to India (columns 1, 3, and 5). But this relationship is

[17] Only 45 percent of urban households owns agricultural land compared to 87 percent of rural households.

not robust to including region specific linear time trends (columns 2, 4, and 6). The magnitude of the effect of rainfall two years ago becomes much lower with the linear time trends. For non-India migration, the effects seem to be small and negative once I control for linear time trends. The results suggest that rainfall facilitates migration to India but not to other destinations and that, more recent rainfall matters more.

To further ensure that the trends in rainfall are not driving the results, I use a falsification test arising naturally in this setting. Though past rainfall may affect current migration rates, future rainfall should not affect it, as households cannot anticipate future rainfall shocks. A failure of this test would suggest that village specific trends, and not the increase in farm incomes are driving the migration results. Table 7 shows the results of this check. As expected, the coefficients are statistically insignificant with point estimates close to zero. This result is robust to including region specific linear time trends (columns 2, 4, and 6).

Since rainfall measure is essentially exogenous and affects migration only through farm income, I can interpret the rainfall shock as an instrument that shifts household income. Since I do not have income measures for the census data and the NLFS for years 2001 and 2008, I cannot use an instrumental variable estimate directly. However, I do have income measures for three cross-sections of NLSS rounds conducted in 1995/96, 2003/04 and 2010. As described in detail in Appendix B, I find that one standard deviation increase in rainfall increases farming income by Rs. 2,400 and, as seen from results in this section, increases migration to India by 0.008. Scaling the impact of rainfall on migration by the impact of rainfall on income, increase in farm income of Rs. 7,500 (USD 100) increases migration to India by 2.5 percentage points, a large 54 percent increase from its 2010 level. In terms of elasticities, the implied elasticity of migration to India with respect to farm income is 1.1. Similarly, the implied elasticity of India migration with respect to per-capita consumption is 2.5.

5.2 Another 'push': Conflict

As predicted by the theoretical framework, conflict increases international migration in general (Table 8). The increase in conflict intensity of one death per thousand population increases migration by 0.8 percentage points. This represents an increase of 11 percent in migration rates if conflict increased from its pre-2001 level to the post-2001 level. Similar calculations suggest an increase of 9 percent in migration to India and 18 percent in migration to non-India destinations. Most of these results, though in the direction predicted by the framework, are estimated with large standard errors and are not significant at conventional levels.

The theoretical frameworks suggests that the migration response to conflict should be higher for the richer households. Consistent with this, I find that, for each type of destination, the migration response from the urban areas are about 6 times higher than the response in rural areas. An effect of 3.1 percentage points means that an increase in conflict from its pre-2001 level to post-2001 level in urban areas increases international migration by a large and significant 40 percent. This is a third of the observed increase in migration between 2001 and 2008. The corresponding increases are 62 percent for migration to India (two-thirds of the total increase) and 24 percent (one-sixth of the total increase) for migration to non-India destinations. These effects are large, and in case of urban migration to India, explain a large share of migration that happened between 2001 and 2008. These results suggests that the urban households respond more strongly to increased violence by migrating abroad.

As discussed earlier, conflict can affect migration in two broad ways. First, conflict causes a direct loss in income, which affects migration decision by affecting the desirability and afford-

ability of migration. Second, people do not like conflict either because of the threat it poses to their safety or myriad of other reasons, which affects only the desirability of migration. The monetizing exercise, detailed in Appendix B and tabulated in Table B.1 suggests that increase in conflict intensity of 1 more death per 1,000 population *lowers* consumption by Rs. 3,500. Using the results from rainfall shocks as the causal effect of income on migration, a fall in consumption of Rs. 3,500 predicts a *fall* of migration to India from urban areas of 0.65 percentage points [18]. But the observed *increase* in migration from urban areas to India in response to conflict is 1.98 percentage points (Table 8, column (3)). This suggests that the second channel must be more dominant to explain the opposite effect that we observe. The migration to India from urban areas in response to their dislike of conflict would then be 2.63 percentage points. This effect is the size of migration response to India from a rainfall shock that increases household income by Rs. 14,000 (USD 190).

Though useful, this exercise assumes a constant effect of conflict on wealth for everyone. This, however, is not true. As shown in Figure B.1, the effect of conflict on consumption is much higher for the wealthier households. The estimate of US$ 190 is therefore a likely lower bound of the average valuation of conflict by urban households. Repeating the same exercise using the effect of conflict on consumption in urban areas (Rs 21,000 instead of Rs 3,500) suggests that the equivalent increase in household income of Rs 31,000 (US$ 420). That is, the increase in migration rates to India resulting from a unit increase in conflict would be offset by an increase in household income by US$ 420. The offsetting effect, however, comes from different part of the distribution: the liquidity constrained households being able to finance migration rather than the richer households who are affected more severely by conflict.

Furthermore, given the heterogeneous impact of conflict on consumption, the theoretical framework suggests that an increase in migration could be possible following an increase in conflict even through the consumption reduction channel. As Figure B.1 suggests, the effect of conflict on consumption for the bottom 30 percentile is essentially zero. These are precisely the households that are near the affordability margin for migration to India (see Figure 2). An increase in conflict would not change the affordability status for liquidity constrained households, whereas for the slightly richer households around the desirability threshold, it would make migration more desirable and hence increase migration to India. Conflict has similar effects for non-India migration as well. For the households in the desirability threshold for non-India migration, conflict lowers income as well as amenity more than the poorer households, hence, pushing them to migrate (particularly from the urban areas). However, because of the hight affordability threshold for non-India migrants, a negative income shock from conflict reduces their ability to finance migration, which creates a slightly more muted effect.

Hence, the observed effects are consistent with conflict having a direct effect as a reduction in amenity as well as an indirect and heterogeneous impact through income or consumption.

5.3 The 'pull': Migrant demand

According to the theoretical framework, increase in demand for migrant workers, reflected by an increase in migrant income, increases migration by making it more desirable. Migrant demand from a particular destination country affects all of Nepal, which makes it impossible to separate the effect of migrant demand from within country trends in migration. Instead, what I can ask is whether migration responds to differential growths in various destinations. That is, whether

[18] The effect of rainfall on migration to India in urban areas is 0.005 (Table 5, column (6)), and the effect of rainfall on income is Rs 2,400 (Table B.1, column (3)). Hence, the effect of Rs 3,500 is simply $\frac{0.005}{2400} \times 3500$.

migrants are more likely to go to Malaysia when migrant demand in Malaysia is growing faster relative to the Gulf countries.

The results show that migrant supply does respond to changes in migrant demand (Table 9). In particular, the most recent growth rates have the strongest impact in migration outflows. The coefficient of 0.015 in column 1 corresponds to an increase in migration of 3.7 percent (evaluated at the mean) in response to an increase in growth rate of 5 percentage points. The corresponding increase for non-India destinations implied by the coefficient of 0.033 is 14 percent.

The results get stronger when India is removed from the list of destinations. As the last three columns of Table 9 shows, the magnitude without India as a destination is almost twice as when India is included[19]. This suggests that migrant supply is less responsive to increased construction and manufacturing in India. This could be because the same percentage growth rate translates to a much bigger increase in migrant income in non-India destinations than in India. Consequently, in the language of the framework, the share of households that is induced to migrate to non-India destinations is much higher relative to India.

Pre-existing migrant networks does not seem to be the primary channel by which potential migrants learn about the rising migrant demand in the destination countries. To investigate this, I interact the growth rate in destination with the size of migrant network from the village to the destination in the previous period. I find, particularly in cases where India is excluded as a potential destination, that the size of the pre-existing migrant network does not affect the level of response to growth in destination countries. The estimated regression coefficients are negative with p-values higher than 0.80 (results not shown). This suggests that potential migrants find information about migrant demand in Malaysia and the Persian Gulf countries from channels other than the existing local migrant network. The increased demand may be transmitted though recruitment companies and the local agents who seek workers more aggressively when migrant demand abroad is higher.

6 Conclusion

Workers want to move towards better economic opportunities and away from disamenities such as conflict. The 2011 Gallup polls estimates that over 1 billion individuals desire to migrate abroad, at least for temporary work (Esipova, Ray, and Publiese, 2011). But the fact that only 3 percent of the global population are international migrants suggests that many who want to migrate do not, in fact, migrate. Lack of global mobility of workers has been suggested as one of the biggest distortions in the global economy (Clemens, 2011). Workers typically cannot migrate to places where the returns to their skills are highest for two key reasons. First, liquidity constraints may prevent them from being able to afford the costs of migration. And, second, the lack of demand for migrant workers, either economic or institutional, lowers the expected benefit from migration.

In this paper, I investigate how 'push' and 'pull' shocks affects the migration of Nepali workers to destinations that vary in their costs of, and returns to, migration. First, I find that income shocks, arising from positive rainfall shocks, increases migration to a low-cost low-return destination (India), but these shocks do not affect the migration to high-cost high-return

[19]These results are consistent with what I find in Shrestha (2017a) for migrant outflows from Nepal to Malaysia and the Persian Gulf countries. In an exercise in that study, I find that when relative exchange rates between destination changes, causing a shift in the wages that they earn, migrants respond by choosing the destination with a favorable exchange rate. I cannot use the same variation as a measure of a shock to destination wages in this study because Nepal has a fixed exchange rate with India.

destinations such as Malaysia and countries in the Persian Gulf. Second, I find that negative shocks to amenity, measured by violent conflict, push people abroad, particularly from wealthier urban areas. Third, I find that increase in migrant demand from the high-return destination, measured by growth in migrant-employing sectors, increases migration to those destinations.

These patterns are consistent with a simple theoretical framework of migration choices with liquidity constraints and availability of destinations that differ in the costs of and returns to migration. It suggests that different types of households are liquidity constrained to migrate to India and to non-India destinations. Rainfall shocks, which increases the income of the poor farmers more, only allow the liquidity constrained households to afford migrating to India. These shocks, as they are small in size, are not able to push a sizable share of households above the affordability threshold for the expensive but lucrative non-India destinations. Similarly, conflict, which reduces the peace related amenity and the income of the richer more, makes migration more desirable for the wealthier households. Conflict pushes the wealthy households more as they are the ones taking a bigger hit in terms of income and amenity at the origin, and at the same time can also afford to migrate away to avoid conflict. Finally, growth in destinations in migrant-employing sectors translates to higher expected income from migration (either through higher wages, or through higher probability of finding a job) which makes migration more desirable.

My results highlight several aspects of international migration. First, conflict – at least in the context of Nepal – selectively pushes wealthier households to migrate. Second, a large share of households are liquidity constrained and are not able to finance migration to destinations where the returns to their skills are the highest. Small increases in income may help them finance migration, but only to the low-cost and low return destinations. Large transfers might be needed to enable them to migrate to destinations that provide the highest return to their (low) skills. Third, a substantively large share of households are also constrained by the lack of demand from more lucrative destination countries. The large responsiveness to 'pull' shocks suggests that these households are willing to take advantage of the opportunities abroad should the demand increase. The rise in migrant labor demand from Malaysia and the Perisan Gulf countries is perhaps the biggest factor behind the over six-fold increase in migration from Nepal to these destination countries between 2001 and 2011.

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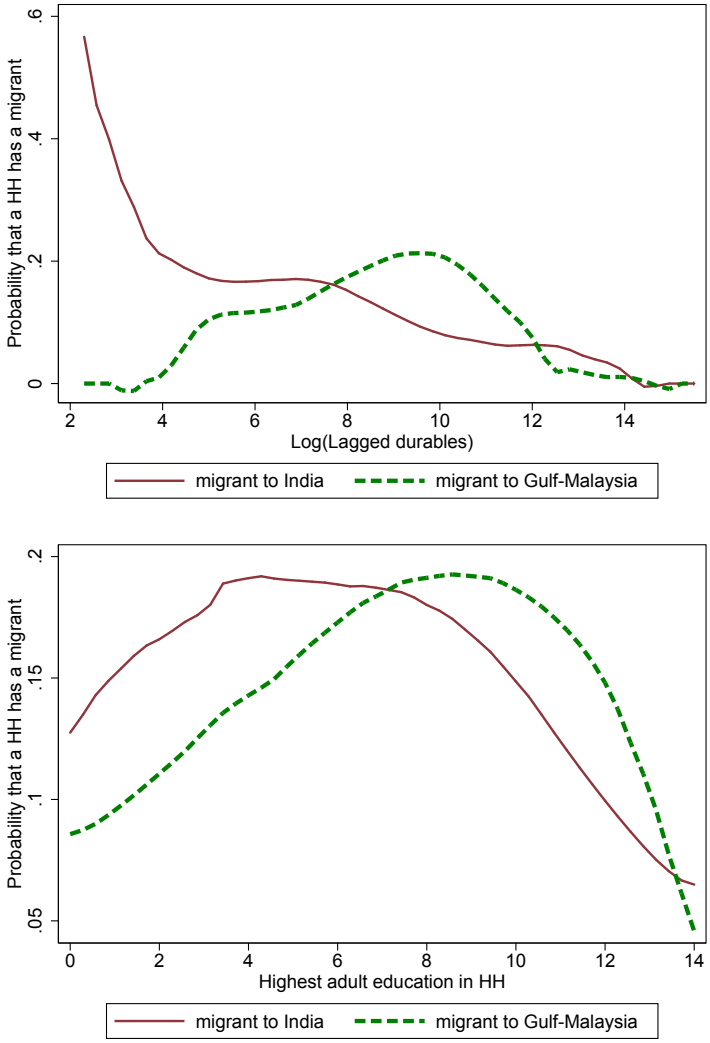
7 Tables and Figures

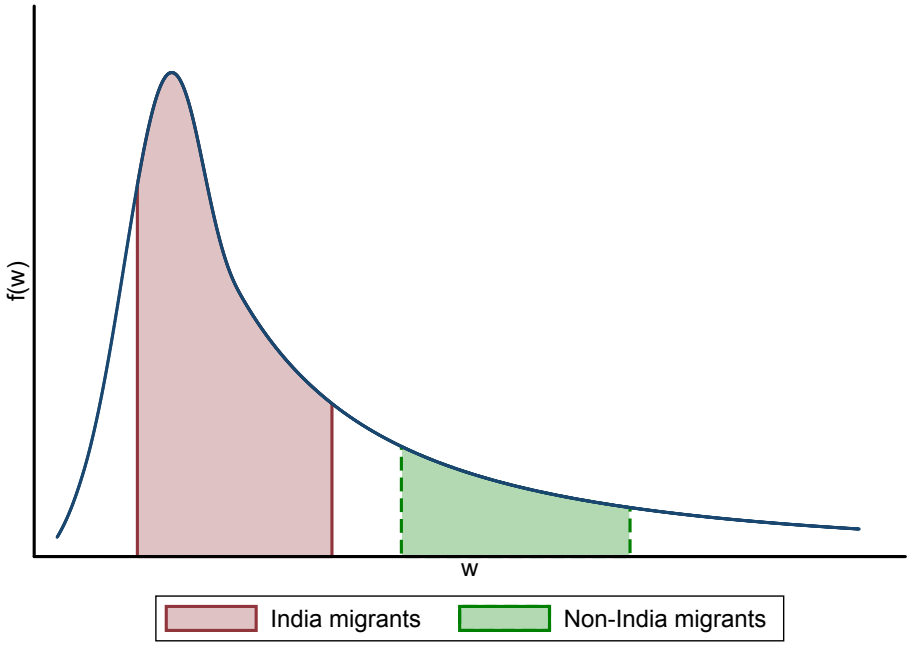
7.1 Figures

Figure 1: Migration probability and measures of household wealth



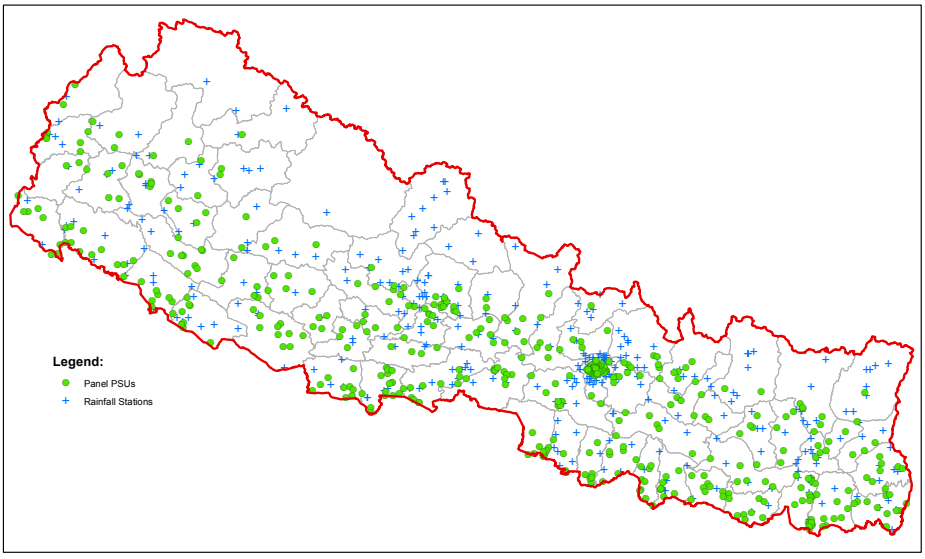
Source: Author's computation from the NLSS-III, 2010.
Note: The top plot shows the relationship between the probability of a household having a migrant and the value of durable assets acquired before the past two years. The bottom plot shows the relationship between the probability of a household having a migrant and the highest adult education level in the household. Both plots are estimated using locally linear regressions. In both plots, the solid (maroon) line shows the probability of a household having a migrant in India, and the dashed (green) line shows the probability of a household having a migrant in Malaysia and the Persian Gulf countries.

Figure 2: Model Illustration



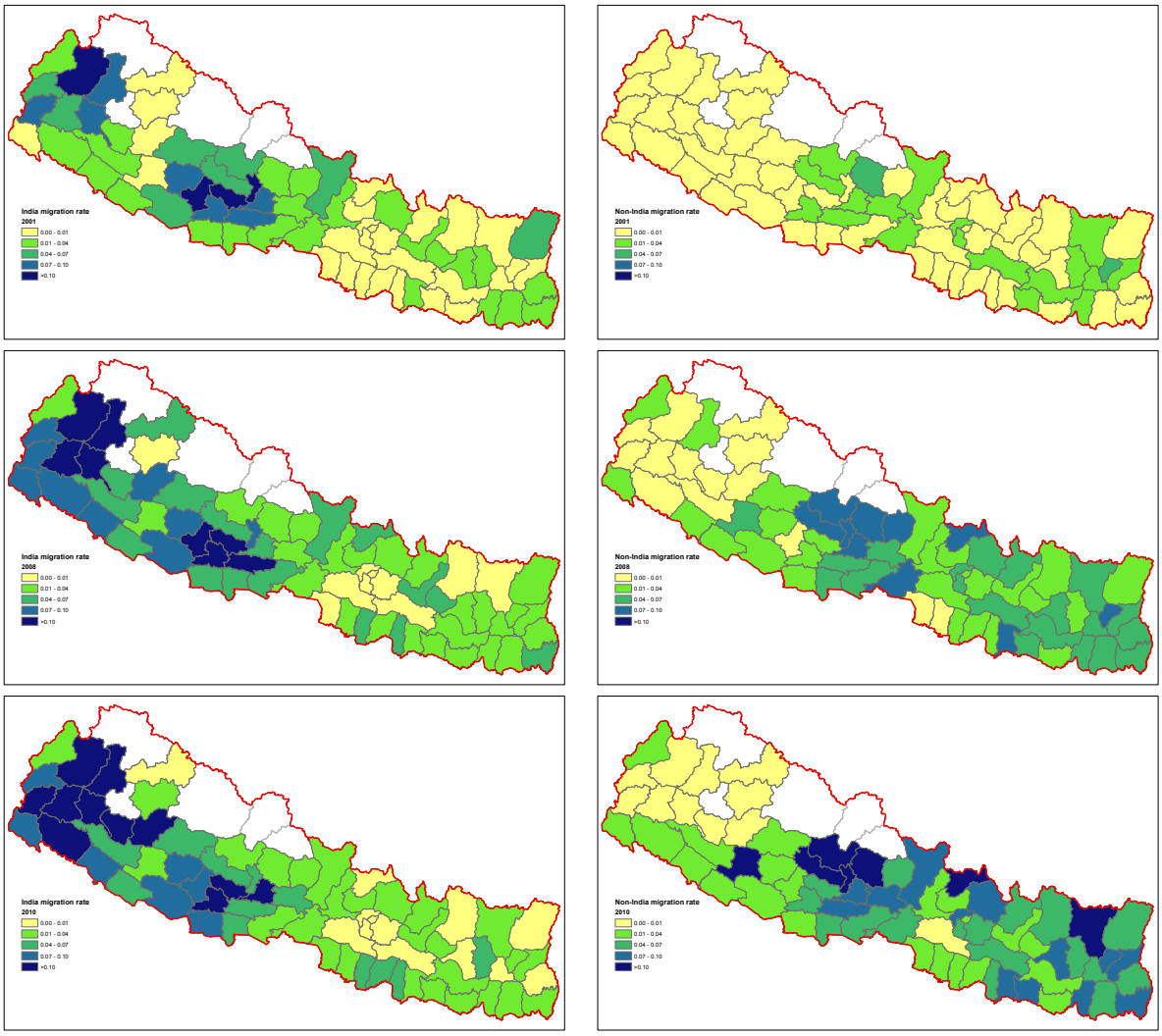
Note: This figures illustrates the plausible set of thresholds for migration to Indi and non-India destinations

Figure 3: Distribution of PSUs (village wards) and rainfall stations



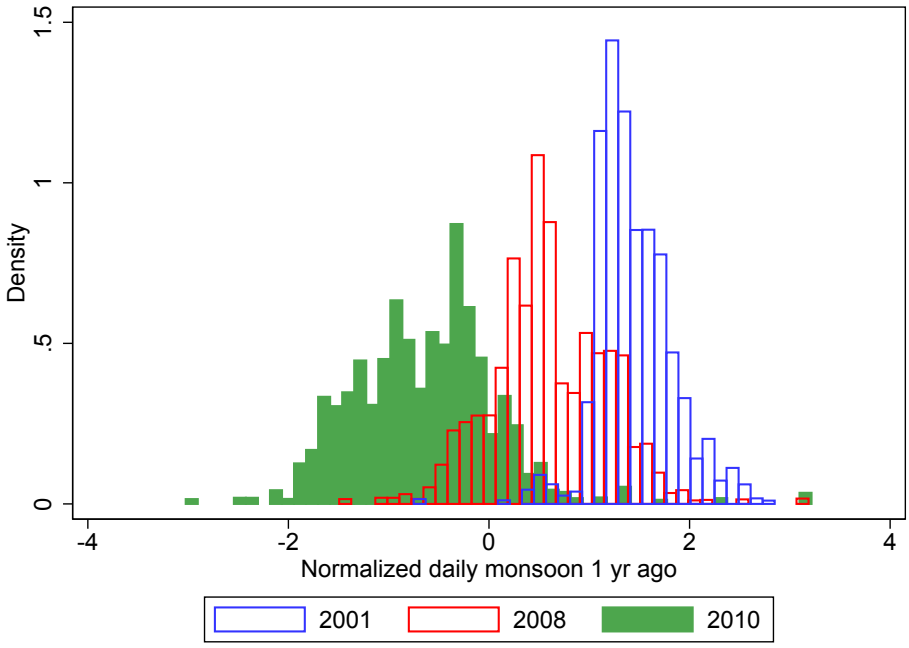
Note: This map plots the distribution of the panel of village wards (PSUs) and the rainfall stations throughout the country.

Figure 4: International migration from Nepal



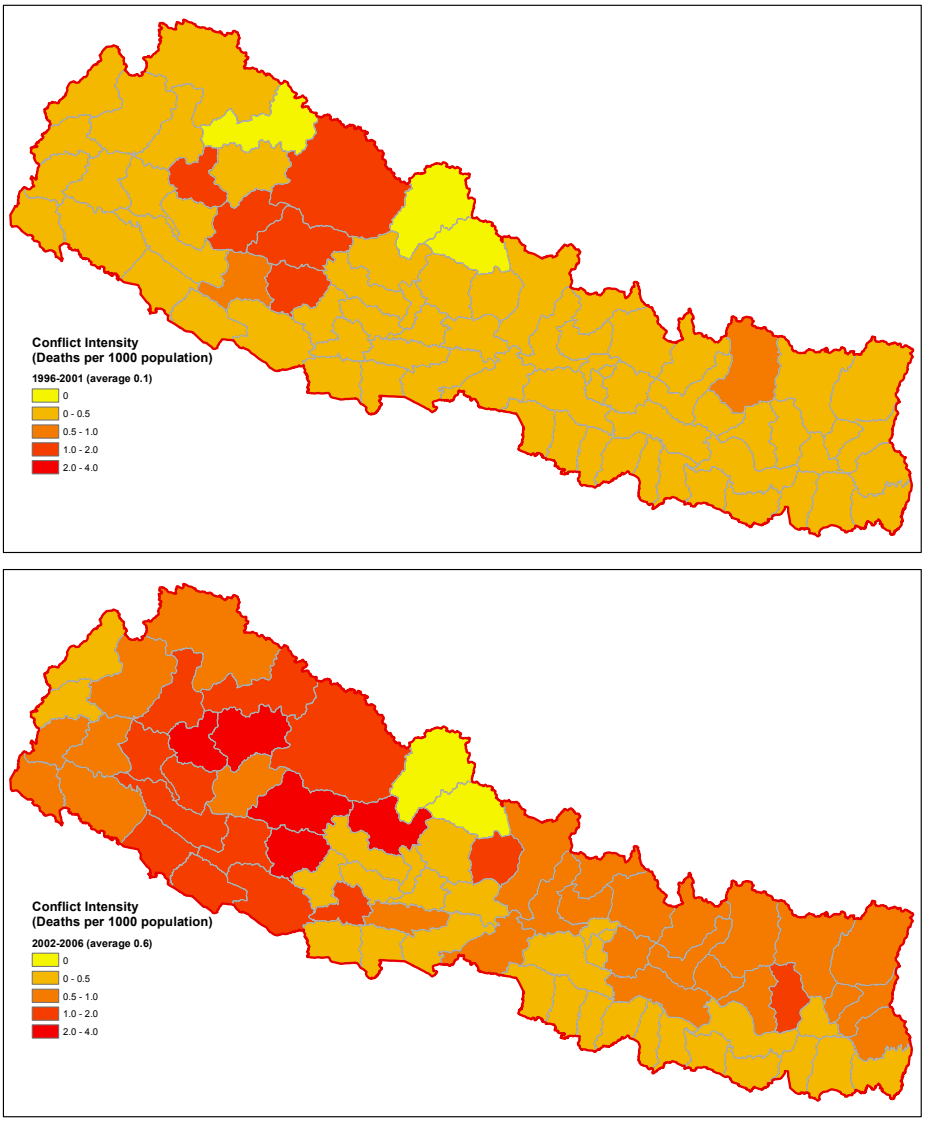
Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: These maps show the migration rates to India (Left panel) and non-India destinations (Right panel). The top row shows the rates for 2001, middle row for 2008, and bottom row for 2010.

Figure 5: Distribution of monsoon rainfall in 2001, 2008, 2010



Source: Author's calculation from the PSU level panel assembled from various surveys and the rainfall data. See text for details.
Note: This figures shows the distribution of past year's monsoon rainfall for the survey years 2001, 2008, and 2010.

Figure 6: Deaths from conflict in 1996-2001 and 2001-2006



Source: Author's calculations from the Conflict data from INSEC. See text for details.
Note: The top map shows the conflict intensity during 1996-2001. The bottom map shows the conflict intensity during 2002-2006 period. Conflict intensity measures the number of conflict related deaths normalized per 1000 population in 1991.

7.2 Tables

Table 1: International migration and remittance

	Migrant/Population			Remittance income
Year	All	India	Non-India	% of GDP
1961	3.49			
1981	2.68	2.48	0.19	
1991	3.56	3.17	0.37	1.5*
2001	3.41	2.61	0.78	2.4
2011	7.43	2.80	4.63	22.4

Source: Migrant/Population shares from the Census reports for respective years; Remittance as a share of GDP from the World Development Indicator database (The World Bank).
Note: * Figure for 1993 (earlier figure not available)

Table 2: Migration costs and incomes

Destination	PC monthly cons (000 NPR)	Cost of migration (000 NPR)	Monthly income (000 NPR)	Monthly savings (000 NPR)
Nepal	2.90			
India		6.25	6.4	3.86
Gulf Countries		102.92	16.21	11.95
Malaysia		133.67	13.51	9.87

Source: Author's calculations from the Nepal Migration Survey, 2009.
Note: Self reported numbers by household members in Nepal. (These numbers are very similar to self-reports by returnees about their own income while abroad). Per-Capita (PC) consumption for Nepal from the Nepal Living Standards Survey-III, 2010

Table 3: Summary statistics

	All	Rural	Urban
	(1)	(2)	(3)
Year 2001			
Migration rate abroad	0.035	0.036	0.027
	(0.004)	(0.004)	(0.003)
Migration rate to India	0.026	0.030	0.011
	(0.003)	(0.004)	(0.002)
Migration rate to non-India	0.008	0.006	0.016
	(0.001)	(0.001)	(0.002)
Conflict related deaths per 1000	0.110	0.124	0.049
	(0.013)	(0.016)	(0.005)
Normalized daily monsoon 1 yr ago	1.441	1.472	1.301
	(0.018)	(0.021)	(0.032)
Normalized daily monsoon 2 yr ago	1.381	1.374	1.409
	(0.020)	(0.022)	(0.045)
Year 2008			
Migration rate abroad	0.081	0.085	0.063
	(0.003)	(0.004)	(0.004)
Migration rate to India	0.043	0.048	0.021
	(0.003)	(0.003)	(0.003)
Migration rate to non-India	0.037	0.036	0.042
	(0.002)	(0.002)	(0.003)
Conflict related deaths per 1000	0.592	0.638	0.392
	(0.028)	(0.034)	(0.029)
Normalized daily monsoon 1 yr ago	0.590	0.648	0.337
	(0.028)	(0.030)	(0.072)
Normalized daily monsoon 2 yr ago	-1.410	-1.401	-1.446
	(0.020)	(0.023)	(0.032)
Year 2010			
Migration rate abroad	0.096	0.098	0.086
	(0.004)	(0.004)	(0.006)
Migration rate to India	0.046	0.051	0.023
	(0.003)	(0.004)	(0.003)
Migration rate to non-India	0.050	0.047	0.063
	(0.003)	(0.003)	(0.005)
Conflict related deaths per 1000	0.000	0.000	0.000
	(.)	(.)	(.)
Normalized daily monsoon 1 yr ago	-0.639	-0.587	-0.865
	(0.036)	(0.042)	(0.059)
Normalized daily monsoon 2 yr ago	0.559	0.627	0.257
	(0.025)	(0.029)	(0.045)

Source: Author's calculation from the village level panel assembled from Census 2001, NLFS 2008, and NLSS-III 2010.
Note: Means are weighted by the NLSS-III sampling weights.

Table 4: Previous year's rainfall and International migration (2001-2010)

	All	Rural	Urban
	(1)	(2)	(3)
All International Migration			
Normalized daily monsoon 1 yr ago	0.007*	0.007	0.005
	(0.004)	(0.005)	(0.005)
Observations	1356	936	420
Adj R-squared	0.276	0.269	0.326
Migration to India			
Normalized daily monsoon 1 yr ago	0.008**	0.008**	0.008*
	(0.003)	(0.004)	(0.004)
Observations	1356	936	420
Adj R-squared	0.052	0.050	0.081
Migration to non-India			
Normalized daily monsoon 1 yr ago	-0.001	-0.001	-0.002
	(0.002)	(0.003)	(0.004)
Observations	1356	936	420
Adj R-squared	0.350	0.364	0.313

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of past year's monsoon on migration rates using Equation (1). The first column shows the effect for all the PSUs. The second and third columns split the sample into rural and urban areas respectively. The top panel shows the effect on all international migration. The second panel shows the effect on migration rates to India. The third panel shows the effect on migration rates to non-India destinations. All regressions are weighted by NLSS-III sampling weights. The explanatory variable measures previous year's average daily rainfall in the village during the monsoon months normalized by the historic rainfall in the village. Only recent years (2001, 2008, 2010) data used. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

Table 5: Previous year's rainfall and International migration (1981-2010)

	All		Rural		Urban	
	(1)	(2)	(3)	(4)	(5)	(6)
All International Migration						
Normalized daily monsoon	0.007**	0.005	0.008*	0.006	0.003	0.002
1 yr ago	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.355	0.359	0.346	0.350	0.414	0.414
Migration to India						
Normalized daily monsoon	0.009***	0.007***	0.009***	0.008***	0.006**	0.005**
1 yr ago	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.071	0.119	0.076	0.117	0.060	0.185
Migration to non-India						
Normalized daily monsoon	-0.002	-0.002	-0.001	-0.001	-0.003	-0.002
1 yr ago	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.415	0.466	0.417	0.474	0.426	0.465

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of past year's monsoon on migration rates using Equation (1). The first pair of columns show the effect for all the PSUs. The second and third pairs of columns split the sample into rural and urban areas respectively. The even numbered columns add linear time trends for each region. The top panel shows the effect on all international migration. The second panel shows the effect on migration rates to India. The third panel shows the effect on migration rates to non-India destinations. All regressions are weighted by NLSS-III sampling weights. The explanatory variable measures previous year's average daily rainfall in the village during the monsoon months normalized by the historic rainfall in the village. Data for all years (1981, 1991, 2001, 2008, 2010) are used with district level rates for 1981 and 1991. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

Table 6: Previous rainfall and International migration (1981-2010)

	All		Rural		Urban	
	(1)	(2)	(3)	(4)	(5)	(6)
All International Migration						
Normalized daily monsoon	0.006*	0.005	0.007*	0.006	0.002	0.002
1 yr ago	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Normalized daily monsoon	0.002	0.000	0.002	-0.000	0.003	0.002
2 yr ago	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.355	0.359	0.346	0.350	0.414	0.413
p-value of joint test	0.123	0.332	0.185	0.344	0.359	0.431
Migration to India						
Normalized daily monsoon	0.007***	0.007***	0.007**	0.007**	0.004*	0.003*
1 yr ago	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Normalized daily monsoon	0.008***	0.002	0.008***	0.001	0.007***	0.004**
2 yr ago	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.079	0.119	0.082	0.117	0.084	0.192
p-value of joint test	0.001	0.008	0.005	0.035	0.001	0.000
Migration to non-India						
Normalized daily monsoon	-0.001	-0.002	0.000	-0.001	-0.002	-0.001
1 yr ago	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Normalized daily monsoon	-0.006***	-0.002	-0.006***	-0.001	-0.005**	-0.002
2 yr ago	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Observations	2260	2260	1560	1560	700	700
Adj R-squared	0.422	0.466	0.424	0.474	0.429	0.465
p-value of joint test	0.000	0.146	0.001	0.472	0.018	0.253

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of past two years' monsoon on migration rates using Equation (1). The first pair of columns show the effect for all the PSUs. The second and third pairs of columns split the sample into rural and urban areas respectively. The even numbered columns add linear time trends for each region. The top panel shows the effect on all international migration. The second panel shows the effect on migration rates to India. The third panel shows the effect on migration rates to non-India destinations. All regressions are weighted by NLSS-III sampling weights. The explanatory variable measures previous year's average daily rainfall in the village during the monsoon months normalized by the historic rainfall in the village. Data for all years (1981, 1991, 2001, 2008, 2010) are used with district level rates for 1981 and 1991. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

Table 7: Future rainfall and International migration (1981-2008)

	All		Rural		Urban	
	(1)	(2)	(3)	(4)	(5)	(6)
All International Migration						
Normalized daily monsoon	0.001	0.000	-0.000	-0.001	0.002	0.003
1 yr later	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	1808	1808	1248	1248	560	560
Adj R-squared	0.296	0.300	0.286	0.289	0.407	0.414
Migration to India						
Normalized daily monsoon	0.002	0.002	0.001	0.001	0.003	0.004
1 yr later	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	1808	1808	1248	1248	560	560
Adj R-squared	0.058	0.093	0.062	0.089	0.068	0.231
Migration to non-India						
Normalized daily monsoon	-0.001	-0.002	-0.002	-0.002*	-0.001	-0.001
1 yr later	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	1808	1808	1248	1248	560	560
Adj R-squared	0.422	0.474	0.425	0.481	0.432	0.472

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of the following year's monsoon on migration rates using Equation (1). The first pair of columns show the effect for all the PSUs. The second and third pairs of columns split the sample into rural and urban areas respectively. The even numbered columns add linear time trends for each region. The top panel shows the effect on all international migration. The second panel shows the effect on migration rates to India. The third panel shows the effect on migration rates to non-India destinations. All regressions are weighted by NLSS-III sampling weights. The explanatory variable measures previous year's average daily rainfall in the village during the monsoon months normalized by the historic rainfall in the village. Data for years 1981, 1991, 2001, and 2008 are used with district level rates for 1981 and 1991. Year 2010 excluded because rainfall data not available for 2011. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

Table 8: Conflict and migration

	All	Rural	Urban
	(1)	(2)	(3)
All International Migration			
Conflict related deaths per 1000	0.008	0.005	0.031**
	(0.006)	(0.006)	(0.015)
Observations	1356	936	420
Adj R-squared	0.275	0.267	0.335
Migration to India			
Conflict related deaths per 1000	0.005	0.003	0.020
	(0.005)	(0.006)	(0.012)
Observations	1356	936	420
Adj R-squared	0.046	0.046	0.077
Migration to non-India			
Conflict related deaths per 1000	0.003	0.002	0.011
	(0.003)	(0.003)	(0.008)
Observations	1356	936	420
Adj R-squared	0.351	0.365	0.314

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of conflict intensity in district on migration rates using Equation (1). The first column shows the effect for all the PSUs. The second and third columns split the sample into rural and urban areas respectively. The top panel shows the effect on all international migration. The second panel shows the effect on migration rates to India. The third panel shows the effect on migration rates to non-India destinations. All regressions are weighted by NLSS-III sampling weights. Data for years 2001, 2008, and 2010 are used in this estimation. The conflict variable measures the conflict related deaths in the district during 1996-2001 for 2001, during 2002-2006 for 2008, and is set to 0 for 2010. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

Table 9: Growth in destination and migration

	All destinations			Non-India destinations		
	(1)	(2)	(3)	(4)	(5)	(6)
1 yr growth in manu	0.015**			0.033***		
and cons CO2 emission	(0.007)			(0.009)		
2 yr growth in manu		0.012*			0.026***	
and cons CO2 emission		(0.006)			(0.007)	
3 yr growth in manu			0.011**			0.011***
and cons CO2 emission			(0.005)			(0.004)
Observations	4068	4068	4068	2712	2712	2712
Adj R-squared	0.179	0.178	0.178	0.466	0.458	0.442

Source: Author's calculation from the PSU level panel assembled from various surveys. See text for details.
Note: This table shows the impact of recent growth in construction and manufacturing sectors in the destination categories on migration rates using Equation (2). The first three columns include India, Malaysia, and the Persian Gulf countries (Qatar, Saudi Arabia, and the UAE) in the destination categories. The last three columns exclude India. All regressions are weighted by NLSS-III sampling weights. Data for years 2001, 2008, and 2010 are used in this estimation. The explanatory variable measures the growth in CO_2 emission by manufacturing and construction in each of the destinations over the previous 1, 2 and 3 year period preceding the survey years. Standard errors, reported in parenthesis, are clustered at the district level. $^{*}: p < 0.1; ^{**}: p < 0.05; ^{***}: p < 0.01$.

A Calibrating migration thresholds

The interpretation of the empirical results in this paper depends upon the wealth distribution and the position of the affordability and desirability thresholds. In this subsection, I describe how the cut-offs for Figure 2 are calibrated. For this exercise, I set $p = 1$, so that the rich get the full peace premium.

Wealth, w, used in the theoretical framework is a measure of pre-migration permanent wealth and is separate from consumption. I use the monetary value of total amount of land owned by the household as a measure of w. I estimate the distribution of this measure in the Nepal Living Standards Survey - I (NLSS-I) of 1995/96 amongst the landed population using a log-normal approximation. Then I scale this distribution to its 2010 level by adjusting for inflation as well as allowing real wealth to grow between these two periods. I used the growth rate of real per-capita consumption amongst landed households without migrants between these periods. Similarly, I get distributions of per-capita consumption and farm income from NLSS-I after appropriate scaling to their 2010 level.

Then I simulate a dataset of 100,000 households with wealth, consumption and farm income drawn randomly from this distribution. I set r equal to the difference between farming income net of consumption. The costs and earnings from migration are as reported in Table 2 scaled by the CPI to year 2010. I assume a migration episode of 2 years. That is, households choose between 2 episodes of migration to India, each lasting 9 months or one episode of migration to the Gulf countries or Malaysia, lasting 2 years. I use NLSS-III to estimate income loss in farming resulting from migration of a member[20].

Using these calibrations and the simple cut-off rule implied by the theoretical framework, I classify each household as a non-migrant household, or a household with India migrant or a household with non-India migrant. I find that about 27 percent of the households choose to have a migrant in India, and 19 percent choose to have a migrant outside India. These numbers are only slightly bigger than the household migration rates observed in NLSS-III in 2010. In the NLSS-III data, about 15 percent of the households have a migrant in India and about 16 percent of the households have a migrant in non-India destinations.

In this simple simulation, I find that 19 percent of the households are below the affordability threshold for India and 23 percent are above the desirability threshold for the Gulf and Malaysia migration. The wealth distribution used for simulation and the resulting average thresholds of migration to India and non-India destinations is plotted in Figure 2.

In this simulated data (with a sample size of 5,000, the expected size of NLSS-III survey), I find that a random drop of Rs 7,500 (USD 100) increases India migration rate significantly by 3.7 percentage points (p-value of 0.004) whereas the cash transfer has an insignificant impact on migration to non-India destinations (p-value of 0.850). This is also consistent with what I find empirically[21].

[20] The estimating equation is $\log(Y_i) = \beta M_i + \varepsilon_i$ where M_i indicates whether a household has a foreign migrant, and Y_i is total farm income for the household. I estimate this specification on a sample of household with agricultural land. The OLS estimate of β is -0.088 with standard error of (0.041).

[21] However, the outcome variables are not identical in the simulated data and the one used in the paper, so I cannot compare coefficients directly. In the simulated data, outcome variable is an indicator of whether the household has a migrant or not. In the paper, the outcome variable is a ratio of migrant to population in the village.

B Monetizing rainfall and conflict

Data and method

In this exercise, I try to monetize the conflict and rainfall shocks using three different cross-sectional surveys with consumption and income measures. I use three different waves of Nepal Living Standards Surveys (NLSS) conducted in 1995/96, 2003/04 and 2010 by the Central Bureau of Statistics using comparable instruments.

In the pooled cross-sectional data, I estimate

$$y_{it} = \beta X_{it} + \gamma_t + \mu_j + \varepsilon_{it}$$

where y_{it} is the consumption per-capita or farm income per-capita for PSU i observed in year t, X_{it} is the conflict or rainfall measure for the PSU for year t; γ_t captures the survey-year fixed effects. I employ different fixed effects to essentially create pseudo-panel data at the $j \times t$ level. I use Development Region $\times$ Ecological belt which results in 15 groups, district fixed effects which results in 74 groups and also use synthetic clusters of 97 clusters. I allow standard errors to be correlated across observations within the same group (j) and across survey periods.

As these surveys were cross-sections, the probability that the same PSU is observed more than once is quite low. However, several PSUs that are close to each other are observed across different periods. I therefore create a pseudo-panel at a level lower than the administrative districts by creating synthetic clusters of PSUs that are close to each other. A group of three (or more) PSUs within 10km of each other are in the same synthetic cluster. Any PSU within 10km of at least two of the PSUs in a cluster also belongs to the same cluster. In cases where this algorithm maps one PSU to more than one cluster, I assign it to the cluster with fewer PSUs. This method gives me a total of 97 synthetic clusters and covers 70 percent of the PSUs in the dataset. I dropped the unassigned PSUs from this specification. Since the 70 percent of the PSUs which are mapped to synthetic clusters are different from those that were not-mapped, this specification would produce biased estimates of β. As a simple check, I test whether income measures differ by whether a PSU is included in the synthetic cluster sample or not. I find that farm income per-capita is not different (p-value of 0.31) whereas consumption per-capita is different (p-value of 0.04) by their inclusion status in the synthetic cluster sample. When I assign higher level clusters to unassigned PSUs, I get qualitatively similar results as in other specifications with fixed effects (and clustering) at higher levels.

The measure of rainfall is identical to the measure used in the rest of the text adapted to different survey years. Conflict measures are set to 0 for NLSS-I and NLSS-III (years 1995/96 and 2010) whereas it measures conflict related deaths in a given district between 1996 and 2002 normalized by district population in 1991 for NLSS-II (year 2003/04). Since the conflict variable is measured at the district level, I only use specification with fixed effects at the district or a higher aggregation. All of my consumption and income measures are converted to 2010 prices.

Table B.1 shows the result of the estimation restricted to households that do not receive any remittance income. I use column (3) as my preferred specification for the income equivalent of rainfall shock and column (5) as my preferred specification for the income equivalent of conflict shock.

The theoretical framework postulates that the wealthy suffer more from conflict. However, Table B.1 only looks at the average effect of conflict on consumption. I use quantile regressions to investigate whether conflict affects consumption differently in different parts of the consumption distribution. Figure B.1 shows the estimates of the same equation at different consumption

quantiles. Indeed, conflict does not affect the consumption of poorer households but reduces consumption of the richer households. At the topmost decile, the effect is larger than Rs 5,000, almost five times the effect at the median.

Tables and figures

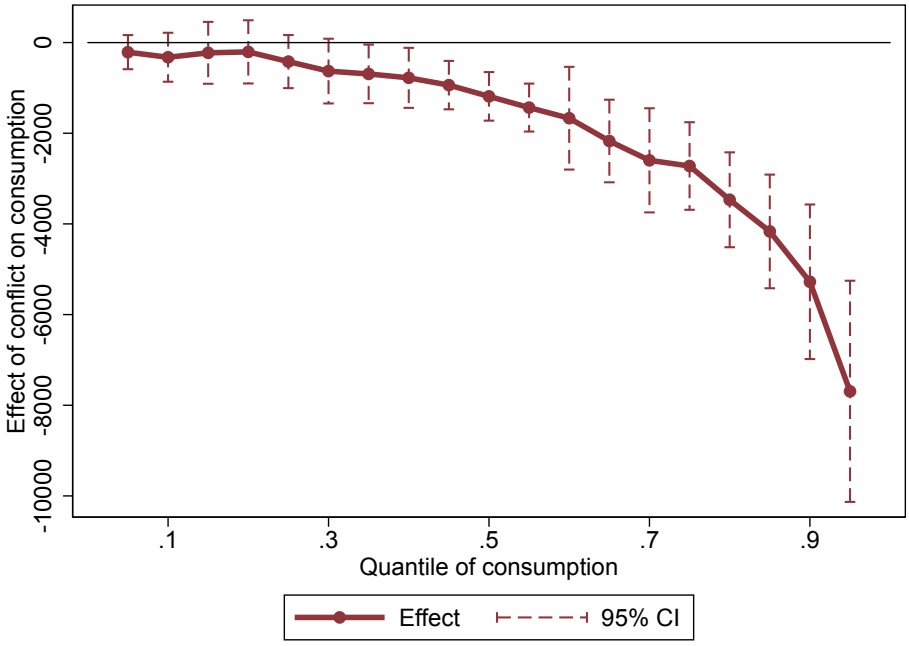
Table B.1: Income effects of conflict and rainfall

	Farm income per-capita			Consumption per-capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Normalized daily monsoon 1 yr ago	2051**	1921	2444**	2133	2323	484
	(880)	(1481)	(1034)	(1297)	(1955)	(858)
Observations	8081	8081	5207	8081	8081	5207
Adj R-squared	0.110	0.133	0.101	0.063	0.140	0.149
Conflict related deaths per 1000				-4719	-3488**	
				(2839)	(1477)	
Observations				8081	8081	
Adj R-squared				0.065	0.141	
Year FE	Y	Y	Y	Y	Y	Y
Region x Belt FE	Y			Y		
District FE		Y			Y	
Synthetic cluster FE			Y			Y

$^{*}: p < 0.1;^{**}: p < 0.05;^{***}: p < 0.01$. Standard errors reported in parenthesis clustered at the level of the group fixed effects. Regression run in pooled Nepal Living Standards Survey of 1995/96, 2003/04 and 2010 and are weighted by their respective sampling weights. Sample further restricted to households that do not receive any remittance income. Conflict variable set to 0 for 1995/1996 and 2010 and counts the deaths from 1996-2002 for year 2003/2004. All consumption and income deflated to 2010 prices. All regressions have survey year fixed effects.

Columns (1) and (4) have Development region × Ecological belt fixed effects (15 groups). Columns (2) and (5) have district fixed effects (74 districts). Columns (3) and (6) have synthetic cluster fixed effects (97 clusters). Synthetic clusters group PSUs into one cluster if they are within 10km of each other.

Figure B.1: Effect of conflict on different quantiles of consumption



Note: Bootstrap standard errors used to estimate the confidence interval. Regression estimates are unweighted.