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The Impact of Remittance on Poverty and Inequality: A Micro-Simulation Study for Nepal

By

Chakra P. Acharya
Roberto Leon-Gonzalez

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National Graduate Institute for Policy Studies
7-22-1 Roppongi, Minato-ku,
Tokyo, Japan 106-8677

The Impact of Remittance on Poverty and Inequality: A Micro-Simulation Study for Nepal[§]

Chakra P. Acharya[a,*] and Roberto Leon-Gonzalez[a]

[a] National Graduate Institute for Policy Studies (GRIPS)

ABSTRACT

We estimate a household consumption function using two rounds of the nationally representative panel of living standard measurement survey (LSMS) of Nepal and simulate the impacts of remittance on poverty and inequality. We study how these impacts vary with the regional 'incidence' and maturity of the migration process and with the country-source of remittance. We find that remittance has conditional impacts on both poverty and inequality, which largely depends on the 'incidence' and maturity of the migration process and, more importantly, on how lower quintiles of the society participate in this process. The national-level simulations indicate that remittance decreases the head count poverty by 2.3% and 3.3% in the first round of the survey, and between 4.6% and 7.6% in the second round. It reduces even further the depth (at least 3.4% and at most 10.5%) and severity (at least 4.3% and at most 12.5%) of poverty. Although overall remittance increases inequality, this is less so in the second round of the survey. Furthermore, remittance payment from India, which is on average much lower than from other countries, decreases inequality and has the largest impact on poverty reduction. This is due to the larger participation of the poor in the Nepal-India migration process. The region-wise simulations show that remittance has larger impacts on poverty reduction in the regions that have higher levels of migration.

Keywords: Migration, remittance, poverty, inequality, Microsimulation, Nepal

JEL Classification: F22, F24, I32, D63

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[*] Corresponding author. E-mail: acpani2003@gmail.com

I. INTRODUCTION

The inflow of international remittance in developing countries (DCs) has increased dramatically since 1990s, increasing from US$30 billion in 1990 to US$325 billion in 2010, and has emerged as a most important source of private capital flows for dozens of these countries (World Bank, 2011). Nepal has also experienced a similar trend, which is far larger in magnitude and growth than in other DCs. For instance, the annual work-related emigration to countries other than India has increased by 30 times from about 10 thousand in early 1990s to about 300 thousand in 2010 (Department of Foreign Employment, [DOFE], 2011). The number would be much larger if we include migrants who are working in India, with whom there is a reciprocal agreement to enter without visa. As a result, the contribution of remittance relative to GDP increased sharply from 2% in early 1990s to 23% in 2009. Currently, as a share of GDP, Nepal is among the top five largest remittance recipient countries in the world (World Bank, 2011). Remittance is the largest foreign exchange earner and it exceeds the sum of tourism, foreign aid and exports earnings in recent years (Shrestha, 2008). Furthermore, due to shortages in the domestic labor market (with at least 30% of the workforce being 'under-utilized') [1], foreign migration is one of the main employment opportunities for Nepalese people.

On the one hand, the poverty declined remarkably from 42% to 31% during late 1990s and early 2000s, despite the modest economic growth and political turbulence (CBS, 2006, p. i-iii). On the other hand, the inequality (measured by Gini coefficient) also increased sharply (from 0.34 to 0.41) during this period (CBS, 2006, p. iii). The Asian Development Bank (2007) reports an even higher level of inequality (Gini coefficient equal to 0.47) and it concludes that Nepal is the most unequal country in Asia among the 22 member countries it studied. Given these developments, this research addresses the question: Is the increase in migration and remittance the main driving force behind the reduction in poverty and the increase in inequality in Nepal?

The previous studies have used two general approaches: (i) remittance as 'exogenous transfer' (see Stark, 1991; Stark, Taylor & Yitzhaki, 1986, 1988) and (ii) remittance as 'potential substitute' for other household earnings (see Barham & Boucher, 1998; Zhu & Luo, 2010 among others), to assess the impact of remittance on poverty and income distribution. The advantage of the latter approach is that it allows correlation between remittance income and household activities. Furthermore, the statistical techniques used to generate counterfactual consumption

[1] Central Bureau of Statistics [CBS], (2009).

(income) also affect the results, leading to mixed findings on the magnitude of poverty reduction and whether remittance would be income equalizer or un-equalizer (Brown & Jimenez, 2008). In addition, heterogeneity in the maturity of the migration-remittance process across countries and regions and in the sources of remittances (e.g. domestic versus foreign, or intra- versus inter-continental), might further widen the variation in results (Taylor, Mora, Adams & Lopez-Feldman, 2005). To the best of our knowledge, there are no studies that disaggregate the impacts over time according to prevalence of migration among regions and source of remittances applying the approach (ii) mentioned above.

As for the econometric method, previous literature has used instrumental variables (IV) and Heckman Selection methods to control for the endogeneity of remittance income. In contrast, we use a fixed effect model that allows for correlation between remittance and unobserved time-invariant factors (e.g. ability), and did not find further evidence of endogeneity after controlling for fixed effects and a large number of control variables. We then carried out simulations at national and regional levels to examine the impact of remittance income on poverty and inequality. We find that all aspects of poverty (i.e. incidence, depth and severity) would worsen in the absence of remittance income, the largest impact being on the severity of poverty. There is regional variation in the impact of remittance on poverty: the regions that have higher prevalence of migration/remittance experience larger poverty reduction. Among the remittance sources, the Indian remittance has the largest impact when compared to domestic and other country remittance sources. The overall impact on equality is negative but the negative effect decreases over time. In contrast with remittance from other parts of Nepal and third countries, Indian remittance works as an income equalizer. These results are consistent with the findings of Stark, et al. (1986), Taylor et al. (2005) and the cumulative theory of migration (for detail, see Massey, Goldring and Durand, 1994).

The remainder of the paper is structured as follows: Section II reviews the literature related to migration, remittance and income distribution in developing countries. The description of data and variables is presented in Section III. Section IV discusses the empirical methodology on model estimation and simulation. Section V presents the results and Section VI concludes with some policy implications.

II. MIGRATION, REMITTANCE, POVERTY AND INEQUALITY

The impact of remittance on poverty and income distribution in developing countries has been extensively investigated since 1980s (see Adams, 1991; Stark, et al. 1986, 1988) with mixed findings. In general, it is agreed that migration and remittance reduce poverty. However, the magnitude of poverty reduction varies among origin communities, remittance sources, and whether remittance is treated as 'potential substitute' or 'exogenous transfer'. Using household data from 11 Latin American countries, Acosta, Fajnzylber, and Lopez (2007) found that the impact was modest and varied across countries. Considering remittance as 'potential substitute', Brown and Jimenez (2008) exemplified that Tonga, having longer migration history and higher incidence of remittance than Fiji, experienced larger impact on poverty. However, the impact was smaller when they considered remittance as an 'exogenous transfer.' Considering remittance as an 'exogenous transfer', Wouterse (2010) found that remittance from African countries had larger impacts on poverty reduction than that from other continents in the case of Burkina Faso.

The impact on income inequality varies among studies, depending on the migration history, setting of migration, and endowment of human capital (Stark, et al. 1986). Some studies find that migration and remittance do reduce income disparities (e.g. Zhu & Luo (2010) for Hubei province of China and Pfau & Long (2011) for Vietnam). However, some other studies show that migration and remittance increase inequality (e.g. Adams, Cuecuecha & Page (2008) for Ghana and Adams (1991) for rural Egypt). Meanwhile, a few other studies show that the direction of impacts depends on the methodology used (Barham & Boucher, 1998), choice of destinations (Wouterse, 2010), setting of migrant communities (Taylor et al., 2005), and maturity of migration process (Brown & Jimenez, 2008).

In the study of Nicaragua, Barham and Boucher (1998) found that remittance would work as an income equalizer when they treated it as an 'exogenous transfer' but it would work as a un-equalizer when they treated it as a 'potential substitute' of household earnings. Taylor et al. (2005), considering remittance as an 'exogenous transfer' in the study of rural Mexico, found that the impact depends on the incidence of migration in each region; the regions having higher level of foreign migration have lower inequality and poverty.

There are few studies on migration and remittance for Nepal. Existing studies have generally focused on the evolution process of migration (for example, Thieme & Wyss, 2005; Yamanaka, 2000) or determinants of migration (see Fafchamps & Shilpi, 2008; WFP, 2008).

Although these studies have discussed the increased importance of migration and remittance, there are limited studies that relate the migration-remittance process to welfare. Milligan (2009) investigated the impacts on child welfare and household consumption and found that the elasticity of consumption from remittance income is far lower than that of non-remittance income for all consumption categories considered.

In addition, Lokshin, Bontch-Osmolovskim, and Glinskaya (2007, 2010) used cross-section data and a Full Information Maximum Likelihood (FIML) method with instrumental variables (i.e. proportion of migrants at ward/district level). They found that increased migration for work contributed about one-fifth of poverty reduction in Nepal during 1995-2004 but it had positive and insignificant impacts on inequality.

We relax the assumptions in previous studies by controlling for household fixed effects while at the same time study the regional variation of the impact of remittances and the importance of the remittance source.

III. DATA

We use two rounds of the Nepal Living Standards Survey (NLSS) conducted by Central Bureau of Statistics (CBS) of Nepal. The first round (NLSS I) was conducted in 1995/96 (hereafter 1996) while the second round (NLSS II) was carried out in 2003/04 (hereafter 2004). The survey had followed the Living Standard Measurement Survey (LSMS) methodology developed by the World Bank for both rounds. It adopted a two-stage stratified sampling method[2]. In this study we use a balanced panel of 962 households, out of the 1,232 households that were enumerated in 2004 (CBS, 1996, 2004).

The survey used similar household and community questionnaires in both rounds. The household questionnaire collects information on household demographic composition, housing, access to facilities, expenditure, land, asset holdings, education, health, employment, farming and livestock, credit and savings, remittance, transfers, etc. The community questionnaire collected information on community, infrastructure, facilities, market and prices both for rural and urban wards. It also collected data on agriculture, migration, school, health facility, etc. for rural wards (CBS, 1996, 2004).

[2] For further details on the sampling procedure see CBS (2004).

We constructed the consumption aggregate following Deaton and Zaidi (2002), with the exception that we included health expenditure as consumption expenditure[3]. Household per capita consumption or per capita expenditure equivalence (PCE), the dependent variable, is calculated by dividing household consumption by household size where the household size includes all the members who were either at home for at least 6 months or were born during the survey year.

Due to data limitations, we cannot separate the effect of migration (through having an absent member) from that of received remittance. From the data we cannot know whether the remittance sender is an absent member of the household, a relative from another household or just a friend. So, we cannot disentangle the effect of having an absent member from the effect of receiving remittance income. Instead, we are merely focusing on the combined effect of migration and remittance.

The pre-migration household size and its composition exclude the absent members of the household who were out of home for more than 6 months at the time of the survey. The household head is considered as having a migration history if he or she had come from another village, municipality or foreign country except for seasonal migration. A person is 'employed' if he or she worked at least an hour during the last seven days or was on temporary leave; and 'unemployed' if he or she did not work during that period but was looking for work, was waiting to hear from a perspective employer to start a new job, could not find work or did not know how to look for work. The major occupation of the household head is the first occupation reported in the questionnaire (CBS, 2004). The remaining explanatory variables are explained in the next section IV.A.

IV. EMPIRICAL METHODOLOGY

A. Econometric Approach

As migration involves risks and uncertainties that are difficult to evaluate (Williams & Balaž, 2011), the credit and insurance market rarely finances for it. Instead, the migration-remittance process becomes a self-enforcing and cooperative contract between migrants and their families that provides coinsurance against risks and uncertainty (Stark, 1985, 1991). The

[3] Other components of the consumption aggregate are expenditure on food, non-food items, housing and flow of services from durables. Weighted food price indices are computed as the proxy for all prices, except rent prices, for six statistical regions based on the 'share of food' and other components available in the survey. These price indices are used to compute regional Laspeyres price indices and household aggregate consumption is deflated using these price indices to adjust for the differences in cost of living across regions. Finally, consumption for NLSS II (2004) is deflated at the constant price of 1996 using the national consumer price index.

household plays the role of both investor and insurer during migration while the migrant altruistically sends remittance which in turn provides insurance for household production, consumption and inheritance (Stark, 1985, 1991; Stark & Lucas, 1988). Therefore, migration is a household level decision that maximizes welfare (for a theoretical review, see Bhattacharya 1985 and Stark, 1991), and hence it is important to allow for correlation between remittance/migration decisions and household activities. Indeed, the literature on migration and remittance argues that the characteristics of migrant households and non-migrant households might be different and thus unobserved factors might determine both migration\remittance decisions and consumption patterns (Barham & Boucher, 1998; Borjas, 1987). Since the pooled OLS estimates might be inconsistent, we use the following unobserved effect model (Wooldridge, 2002, Section 10.2):

$$\ln(PCE_{it}) = \alpha + \beta R_{it} + \gamma X_{it} + \delta G_i + \eta E_i + d_t + f_i + \varepsilon_{it} \quad (1)$$

where, ln(PCE) is the natural logarithm of per capita consumption (PCE)[4] of a household i, d_t is a time dummy, f_i captures time invariant factors for each household and ε_{it} are idiosyncratic errors that change across t as well as i. (X_{it}, G_i, E_i, R_{it}) are observed regressors. R_{it} is a remittance related regressor that represents either a dummy for whether a household received remittance or the actual log remittance income received (log of 1 plus remittance income, so as to include the households who do not receive remittance). The parameter of our interest, β, captures the gain in household welfare, measured by log of per capita consumption, due to the migration-remittance decision. X_{it} is a set of household and community characteristics. The household characteristics include household size and its composition, characteristics of household head, per capita pension income, dummies for the service flow of durables purchased at least one year prior to the survey and dummies for agricultural land holding. We also use binary indicators ('Upper caste' (Brahmin/Chhetri), 'Lower Caste' (Dalit), 'Newar', 'Migrating Janajati', and 'Other caste/ethnic group')[5] to control for caste and ethnicity characteristics. We use six regional dummies (G_i) to control for spatial premiums on consumption, and migration costs associated with socio-physical proximities (Fafchamps & Shilpi, 2008). To capture community level externalities on welfare, we use several ward level characteristics such as mean household consumption, and proportions of population above 15 years who were illiterate or

[4] Alternatively, one could implicitly estimate the adult equivalence per capita consumption by estimating the model with total household consumption as the dependent variable while including natural logarithm of household size and dependency ratio as explanatory variables.

[5] 'Migrating Janajati' includes 'Gurung', 'Magar', 'Rai', 'Limbu' and 'Thakali', which are ethnic groups with a long and remarkable practice of work/business related migration.

passed the high school level national exam (SLC), employed or self employed, and in agriculture or non-agriculture occupation[6].

In model (1), if the unobserved effect (f_i) is uncorrelated with all of the explanatory variables, then one could consistently estimate the parameters using a random effect model (Wooldridge, 2002, Section 10.5.4). However, there could be an arbitrary correlation between f_i and observed explanatory variables. For example, unobserved household characteristics might systematically affect migration and remittance (Barham & Boucher, 1998). So, by allowing arbitrary correlation between the time-invariant f_i and remittance (R_{it}) in a fixed-effect model (Wooldridge, 2002, Section 10.5.5), we can consistently estimate β. However, the endogeneity problem might still remain if *time variant* unobserved factors affect both remittance and consumption. For example, when a government systematically implements welfare improvement policies targeted to the poor in a particular year, the public transfers might have a negative effect on remittance but a positive one on consumption[7]. We cannot control for systematic *time variant* shocks for a particular household unless we use instrumental variables. To test for this possibility, we will rely on migration network instruments[8]. According to the cumulative theory of migration (Massey et al. 1994), the social networks of migrant friends or relatives play an important role on migration decisions by reducing migration costs and risks, creating path dependence, and facilitating the process of sending remittance safely. We believe that these migration networks do not influence consumption directly but only through the effect of remittance income. Following de Braw (2010) and Lokshin et al. (2007, 2010), we use the proportion of adults that were at least 15 years old and living outside their home town for more than six months during the survey year in the community (ward) as one of the instruments. We also use the proportion of remittance receiving households as another instrument to make the model over identified (e.g. Taylor, et al., 2005; Brown & Jimenez, 2008). We test the validity of the instruments (Anderson-Canon test and Hansen test[9]) and then estimate equation (1) using the fixed-effect instrumental variable generalized methods of moment (FE-IV-GMM) estimator (Schaffer, 2010).[10] However, if after controlling for fixed effects remittance was actually exogenous, we would obtain more

[6] For the complete list of controls please see Table 4.
[7] For example, when a household realizes a consumption shock in a particular year, migrant members can make instantaneous decisions on whether to send remittances and how much to send to their relatives and friends.
[8] For excellent reviews of studies on the role of social network in migration and remittance see Massey et al. 1994 and Munshi, 2003; for studies using migration network variables as instruments see McKenzie & Rapport, 2007.
[9] See for example Baum et al, 2003, 2007 for descriptions of these tests.
[10] We use *stata* routine *xtivreg2* written by Schaffer (2010) to estimate FE-IV-GMM model.

efficient estimates using the fixed effect estimator. Thus, we conduct a Sargan test (Baum, et al., 2007) for whether remittance was endogenous.

B. Construction of Counterfactual Consumption

Based on the above models of log consumption, we use our estimates to construct counterfactual consumption patterns under several scenarios for remittance income. At the time of estimating the parameters of equation (1) we did not assume any parametric distribution for ε_{it}. However, for the purpose of simulating mean consumption and poverty/inequality measures, this assumption becomes necessary. We first consider several parametric distributions, in particular normal as well as student t-distribution (with 2 up to 30 degrees of freedom) with zero mean and constant variance (homoskedasticity) or varying variance (heteroskedasticity)[11] for the error term (ε_{it}). We chose a student t-distribution with 30 degrees of freedom and heteroskedasticity because it produced predicted values for consumption, poverty and inequality that are closest to the actual values. Thus, for each household we generate 10,000 values of ln(PCE) using the following equation:

$$\ln(PCE_{it}) = \hat{\alpha} + \hat{\beta}R_{it} + \hat{\gamma}X_{it} + \hat{\delta}G_{it} + \hat{f}_i + \hat{\varepsilon}_{it} \qquad (2)$$

where $\hat{\varepsilon}_{it}$ are random draws from the selected distribution and $(\hat{\alpha},\hat{\beta},\hat{\gamma},\hat{\delta},\hat{f}_i)$ are given by the fixed effects estimator. The predicted values of ln(PCE) for these households are used to compute mean per capita household consumption under different scenarios as well as indices of poverty and inequality. By fixing alternative values for R_{it} we can simulate the impact of remittances on the quantities of interest.

C. Simulation

We do simulations at the national and regional levels[12] (see Tables 5, 6 and Figure 1). We also analyze the impact of the source of remittance (i.e. domestic, foreign, Indian and other countries) in Table 7. We report simulation results for two counterfactual scenarios: (a) *no household receives any remittance* and (b) *1% increase in the proportion of remittance receiving households* separately using the estimates from both the remittance-dummy model and the

[11] In the homoskedastic case, the variance of ε_{it} is estimated as explained in Wooldridge (2002, p. 271, expression 10.56). In the heteroskedastic case, we first regress the squared value of the fixed effect residuals on all explanatory variables. The predicted values of this regression yield an estimate of $E(\varepsilon_{it}^2 \mid R_{it}, X_{it}, G_{it}, E_{it}) = \text{var}(\varepsilon_{it} \mid R_{it}, X_{it}, G_{it}, E_{it})$.

[12] The six statistical regions are Kathmandu valley (KTM), other urban areas (OTHUR), Rural Western Hills/Mountains (RWH), Rural Eastern Hills/Mountains (REH), Rural Western Terai (RWT) and Rural Eastern Terai (RET).

remittance-amount model. In the remittance-dummy model, when we increase the proportion of remittance receiving households by 1%, these households start to receive remittance equal to the average baseline per capita remittance income among remittance receiving households.

Following Foster-Greer-Thorbecke (FGT, 1984), we use three main measures of poverty – head count poverty (P0), poverty gap (P1) and poverty gap squared (P2) – to analyze the implications of remittance on incidence, depth and severity of poverty, respectively. P0 is the number of people below the poverty line while P1 is the aggregate poverty deficit of the poor relative to the poverty line. P2 is sensitive to changes in the income distribution among the poor and gives higher weight for poor households who experience extreme poverty[13]. In our analysis, we use two types of poverty lines – the national poverty line that is based on the cost of the basic need (CBN), and is equivalent to 2,114 Kcal per day for 1996 (NPR 5,089 per year) and 2,144 Kcal per day for 2004 (NPR 5,216 per year at constant price of 1996),[14] and international poverty lines - PPP US$1/day and its double[15].

We use the Gini index, a widely used measure, to explore the impacts of remittance on consumption inequality[16].

D. Limitations

Firstly, it is possible that the effect of remittance on consumption for a particular year does not capture the full impact on household welfare. Remittance income could be invested or saved for future consumption and/or children's education. However, we tested this hypothesis by including interactions of remittance and dummies for the number of children in the household. All these interactions turned out to be insignificant, with negative sign for households with one, two or three children and positive sign for households with four or more children, implying that there is no strong evidence to suggest that remittance is being saved for children's education. Secondly, as mentioned in Section III, it is difficult to separate the impact of migration (through absent members) from that of remittance. Finally, this study captures the direct impacts of

[13] The FGT index satisfies the property of monotonicity and other transfer axioms for poverty measures (Ravallion, 1992).
[14] The difference in the calorie intake between two rounds of survey was due to change in the household composition during 1995-2004 (for detail, see CBS, 2004).
[15] PPP US$1/day at constant price of 1993 is equal to NPR 4,508/year at constant price of 1996.
[16] The Gini coefficient satisfies the desirable properties for an inequality index such as adherence to the Pigou-Dalton transfer principle, symmetry, independence of scale, homogeneity with respect to population, and decomposability (Taylor, et al. 2005).

remittance on consumption of recipient households, but it cannot measure the externalities of massive inflow of remittances or massive emigration on the economy.[17]

V. RESULTS

A. Descriptive Results

Table 1 shows descriptive measures on poverty and consumption in Nepal for each of the two rounds of NLSS. For the sake of comparison, they are calculated using both our panel of 962 households and the full NLSS sample (as reported by CBS, 2006, p. 7-9). Results are similar for National level and rural areas, but vastly different for urban areas. It implies that some top quintile households in urban areas could not be tracked in both rounds. Panel C in Table 1 shows how poverty, consumption and household assets holdings vary across regions. For instance, Kathmandu valley has the lowest incidence of poverty (12% and 3% for 1996 and 2004 respectively) and the highest per capita consumption and durables holding. In contrast, Rural Western Terai has the highest incidence of poverty (58%) in 1996 whereas in 2004 the highest incidence of poverty is found in the group of urban areas that excludes Kathmandu (41%).

[Table 1 about here]

The incidence of poverty among remittance receiving households is lower (37% in 1996 and 28% in 2004, Table 1, Panel D) than the national average (41% and 32%, respectively, Table 1, Panel A). However, there is substantial variability among remittance-receiving households. For example, the poverty is highest (43% and 36% in 1996 and 2004 respectively), even larger than the national average, among the households that receive remittance from India. It is lower for domestic (i.e. within Nepal) migrant households (35% and 27% in 1996 and 2004 respectively) and lowest for other countries migrant households. On the one hand, the lowest poverty level among third country migrant households is not only related to the higher return from migration but also to the higher participation from upper quintiles (Table 2, Panel D). On the other hand, the higher level of poverty among Indian migrant households could be related to the relatively larger participation of lower quintile households in the Nepal-India migration (Table 2, Panel D). The lower levels of durables and land holdings among Indian migrant households (Table 1, Panel D) partially explain that poor households generally send their

[17] For example, reduced unemployment, shortage in labor force supply in a particular village exacerbated by the geographical complexity of the country and most importantly, increased demand/price of goods, and farm and non-farm labors.

members to India due to lack of sufficient collateral for loans required for costly migration to Gulf and East Asian countries (WFP, 2008, p. 47).

[Table 2 about here]

The prevalence of migration (remittance) by destination (sources) varies across rural-urban residency and regions (Table 2, Panel B-C). The level of domestic and Indian migration (remittance) is higher among rural households while the migration to third countries is high among urban residents (Panel B). Among regions, the Rural Western Mountains/Hills region has the highest propensity to receive remittance (34% in 1996 and 47% in 2004) from any country source. This is reinforced by the relatively longer and well developed foreign migration practice in this region. Households of 'Other urban areas' have experienced a sharp increase in third country migration possibly due to sufficient collateral holding for costly migration, and the development of better communications and transportation infrastructure.

B. Econometric Results

This sub-section presents the estimation results for natural logarithm of per capita consumption (PCE) based on the specifications discussed in Section IV.A. First, we report the summary results (Table 3) of the regressions using several econometric methods - pooled ordinary least square (POLS), random effect (RE), fixed effect (FE) and fixed effect instrumental variable GMM (FE-IV-GMM) models. The specifications (E1) through (E4) in Table 3 are for the remittance-dummy model whereas specifications (E5) through (E8) are for the remittance-income model. All estimation methods use standard errors that are robust to heteroskedasticity and intra-individual autocorrelation.

[Table 3 about here]

As discussed above, the pooled regression (specification (E1) and (E5)) estimates are unlikely to be consistent. If we abandon the pooled regression, we have a choice of either fixed or random effects model. The Hausman test suggests that the fixed effect model (specifications (E3) and (E7)) estimates are to be preferred over those of the random effect model (specifications (E2) and (E6)). As we argued in the methodology section, the fixed effects model allows correlation between remittance and the fixed effect (f_i), and thus solves the issues of endogeneity caused by *time invariant* factors. To investigate whether there is any endogeneity left caused by *time variant* factors, we estimate the equation using the FE-IV-GMM estimator (specification (E4) and (E8)) using the proportion of adult population that is absent for more than

6 months during survey year and the proportion of remittance receiving households as instruments. Both the Hansen J statistic and the KPLM statistics indicate that the instruments are valid and relevant. Moreover, the Sargan test indicates that remittance is exogenous. Alternatively, we have to note that the confidence intervals of FE and FE-IV-GMM specifications substantially overlap and that the coefficient of the remittance dummy or remittance-income for the FE specification falls within the confidence interval for the FE-IV-GMM specification. The larger robust standard errors and wider confidence intervals for the FE-IV-GMM estimation reveal that FE-IV-GMM estimates are obviously less efficient than the FE counterparts, in line with standard econometric results (e.g., see Wooldridge, 2002). In contrast, if we reduced the set of controls to just household size and time dummy, the tests (not shown in tables) suggest that the instruments are relevant, but the exclusion restrictions are not valid. So, with a reduced set of controls the estimates would be inconsistent in both the FE model and the FE-IV-GMM.

Table 4 presents the fixed effect estimates for all included regressors for both the remittance-dummy and the remittance-income models. Most of the regressors have the expected sign although many are insignificant. The coefficient of remittance dummy is significantly positive (at 10% significance level): the per capita consumption of remittance receiving households is 6.54% (100(exp ($\hat{\beta}$)–V ($\hat{\beta}$)/2) - 1), Kennedy 1981) higher than that of non-recipient households, other things being constant. The remittance elasticity of consumption is 0.015 and it is significant at 1% level. The small elasticity value (similar to that of Milligan, 2009) suggests that our estimation might not capture the full welfare effect of remittance.

[Table 4 about here]

Both the household size and its composition have significant impact on consumption. The PCE decreases with household size, a result that agrees with literature at the theoretical (Deaton & Paxson, 1998) and empirical (Lokshin, et al. 2010) level. Similar to previous studies, the shares of children (8-15 years old), elderly (more than 64) and most importantly the working age men and women (16-64) have positive and significant impacts on consumption. Importantly, the impact of working age members is much higher than that of dependents. This shows that if a family has a lower dependency ratio, then it experiences higher earnings and higher consumption per capita.

In contrast with some previous cross-section studies in Nepal (e.g. CBS, 2004; Lokshin, et al. 2007), none of the characteristics of the household head (i.e. age and its square, and dummies for education, sex, migration history, employment status and occupation) turned out to have a significant effect on consumption. However, these characteristics turned out to be significant in the pooled OLS and random effects estimations. The households with higher level of assets have significantly higher level of consumption. The agriculture land holding has positive but insignificant effects. Similarly, ward level characteristics such as employment, education and occupation have insignificant effects. Only the ward level average household consumption has a significant and large effect on consumption, implying that in communities with higher level of development and living standards, households also experience higher consumption (Table 4).

C. Simulation Results

Table 5 and 6 present the simulation results for the remittance-dummy and the remittance-income models, respectively. The baseline simulation uses the actual value of all regressors to predict consumption and thereby poverty and inequality measures. We can see that the baseline simulation produces values that are close to the actual ones.

[Table 5 and 6 about here]

Using the remittance-dummy model, scenario (a) (i.e. no household receives any remittance) would make mean consumption decrease by 1.4% in 1996 and 2.1% in 2004 with respect to baseline simulation values (Table 5, Panel A). On the other hand, scenario *(b), 1% increase in proportion of remittance receiving households*, makes average consumption increase by 0.06% in both years (with respect to baseline simulation). The reason for the larger effect in 2004 under scenario (a) is that there is a larger proportion of remittance receiving households in that year. The simulation results for the remittance-income model are similar, but the magnitudes are about 50% larger in both scenarios (Table 6, Panel A).

C.1. Impacts of Migration and Remittance on Poverty

First, we simulate the impacts on poverty in two counterfactual scenarios at national level (Table 5 and 6, Panel B). Based on the national level poverty line and the remittance-dummy model, scenario (a) implies that in 1996 and 2004 the incidence of poverty (P0) would increase by 2.3% and 4.6% (respectively), the depth of poverty (P1) would increase by 3.4% and 6.4%

(respectively), and the severity of poverty (P2) by 4.3% and 7.5% (Table 5, Panel B). If we used the remittance-income model instead, the figures would be larger: 3.3% and 7.6% increase for P0, 5% and 10.5% increase for P1, and 6.4% and 12.5% increase for P2 in 1996 and 2004, respectively (Table 6, Panel B). The effects on all three FGT measures are about two-third larger in the later year because of the sharp increase in migration and the increase in the proportion of poor households in the migration process. The relative impacts on FGT measures under *scenario* (b): the highest impact observed on severity and the lowest on the incidence of poverty, with larger effects when using the remittance-amount model.

As we can see, remittance has a larger impact on the depth and severity of poverty (P1, P2) than on the incidence of poverty (P0). This might be related to the uneven distribution of poor households among migration destinations. Firstly, ultra-poor households migrate to cope with food and employment scarcity to places that are less costly. For instance, small transfers from India contribute to household earnings and food security. Even if these transfers do not bring the poorest households above the poverty line (and so do not affect P0) at least these can help to bring the household nearer to it (improving P1 and P2). Indeed, as shown in Table 1 (Panel D), there is a higher level of poverty among Indian migrant households compared with the national average. Secondly, less poor households can afford to send a member to relatively more costly and risky places. In this case, remittance helps to eradicate poverty (i.e. improve P0) rather than just bringing the poor households near the poverty line.

The above findings are robust when we use an international poverty line i.e. US$1/day in both scenario (a) and (b), and for all FGT measures (Table 5 and 6, Panel C) or when we double it (Table 5 and 6, Panel D). The estimated impacts on poverty for US$1/day poverty line are slightly larger than those for the national poverty line while that for US$ 2/day are about 50% smaller than those for the national poverty line.

Next, we calculate the impacts of remittance from different sources by constructing the counterfactual scenario under which no household receives remittances from a particular source country (Table 7). We first distinguish only between domestic versus foreign (India or third countries). The simulations using both the remittance-dummy and remittance-income models show that the effect of foreign remittance on FGT measures is mostly larger than that of domestic remittance in both years. The results are mostly similar with the international poverty lines. When we use US$2/day poverty line, domestic remittance has larger effects on incidence,

depth and severity of poverty than international remittance while the later one has larger effect when we use the US$1/day poverty line. This is possibly due to the larger participation of the lower quintiles in Indian migration.

[Tables 7 about here]

So, we further disaggregate foreign remittance into India and other countries. Although average per capita remittance earning of Indian migrants is far lower than that of third country migrants, Table 7 shows that Indian remittance contributes at least 80% (90% in 1996) of the impact of overall foreign remittance on poverty reduction. The impact of Indian remittances increases sharply when we use US$1/day poverty line but it decreases for US$2/day poverty line in both years while remittance from third countries has nearly the same impact for all three poverty lines. The reason for the larger impact of Indian remittance[18] on poverty reduction is that the ultra-poor mostly migrate to India, whereas most of the third country migrants come from less poor (or richer) households. This is consistent with the descriptive statistics (Table 1, Panel D and Table 2, Panel D).

Finally, Figure 1 shows the impact of remittance on poverty across six regions for scenario (a) using the national poverty line. It shows that the regions that have higher levels of migration (e.g. Rural Western Hills/Mountains (RWH) and Rural Eastern Terai (RET)) would experience a larger poverty reduction than the regions which have lower migration. This result is stronger in 2004 (Part B and D) than in 1996 (Part A and C). Our results are similar to Taylor, et al. (2005), who also found a correlation between the magnitude of poverty reduction and the level of migration.

[Figure 1 about here]

C.2. Impacts of Migration and Remittance on Inequality

Table 5 and 6 (Panel E) show the effects of remittance on income inequality at the national level. Using the remittance-dummy model under *scenario (a)*, the inequality decreases marginally in 1996 and decreases by even a smaller amount in 2004 (Table 5, Panel E) with respect to the baseline simulation. Furthermore, if we use the remittance-income model (Table 6, Panel E) the inequality decreases unequivocally in both years, but again decreases less in 2004. Similar results hold also for *scenario (b).* Hence, results indicate that remittance increases

[18] The domestic and Indian remittances have almost equal share (23%) of total remittance receipts among all households of Nepal and remaining 53% remittance is received from rest of the other countries (CBS, 2004).

inequality, but less so in the second round of the survey. Although this finding does not agree with the study from Nepal (Lokshin, et al. 2007), it is consistent with the migration process in Nepal becoming more mature, which may have reduced the costs and risks involved in migration, as well as facilitated the participation of the bottom quintile. This is consistent with the results of Stark et al. (1986) in the case of Mexico.

However, remittances from different sources have diverse impact on inequality. In the absence of domestic remittance (*scenario (a)*), the inequality would decrease in 1996 but not in 2004. In the absence of foreign (i.e. Indian and others) remittance inequality would increase in both years. But when we split foreign remittance into Indian and other countries, the Indian remittance is found to be income equalizer in both years, while the opposite is true for other country remittances.

VI. CONCLUSION

In this paper, we consistently and efficiently estimate the determinants of consumption using a fixed effect model and including sufficient household and community level controls to address the endogeneity of remittances. Econometric results show that the consumption is higher for remittance receiving households and it increases with remittance income, other things being the same.

The simulation results show that if none of the households received remittances, the incidence of poverty (P0), measured by the national poverty line, would have increased by at least 2.3% and at most 3.3% in 1996 and at least 4.6% and at most 7.6% in 2004 (the lower bounds correspond to the remittance-dummy model while the upper bounds to the remittance-amount model). Impacts on the depth (P1) and severity of poverty (P2) are even larger. The regional simulations show a strong correlation between the incidence of remittance and the magnitude of poverty reduction, implying variation of impacts among regions. The destination is another important factor determining the impact of remittance on poverty. Although the remittance from third country migration is more than seven times higher than that from India, Indian migration is a necessity for the poorest households that experience severe credit limitations (WFP, 2008). So, it has a far larger impact on poverty reduction in comparison with domestic and other countries' remittance. In this way, although remittance from India acts as an income equalizer, remittance from other countries has the adverse effect. The overall effect of

remittances on income equality is negative but this adverse effect has decreased over time. These stylized facts are consistent with Stark, et al. (1986) and Taylor et al. (2005).

Nepal would witness a sharp fall in poverty and income inequality if the government implemented policies that enabled poor households to send their migrants to developed countries instead of India. Policies that could facilitate this switch of destinations might include providing more credit opportunities and also education to acquire the skills required for third country migration. Although policy makers face the challenge of designing effective skill development programs for less educated people, these programs might have a high return because skilled (even low-skilled) migrant workers might have a better opportunity of obtaining a safe and high-earning job in third countries. The other measures for the bottom quintile might include programs to disseminate information related to migration/remittance and strengthening the legal status of contracts among potential migrants, manpower companies and foreign employers. These would also be appropriate anti-poverty strategies on their own right.

Future research might look at the role of migration and remittance on reducing the vulnerability to rural production shocks in a general equilibrium environment. Moreover, we would like to understand how migration and remittances affect physical/human capital investments, local labor productivity and the intergenerational transmission of poverty and inequality.

TABLE 1
POVERTY, CONSUMPTION AND ASSET HOLDING BY SECTOR, REGIONS AND REMITTANCE SOURCES

	Headcount Poverty (%)		Per Capita Consumption (NPR)		Durables (NPR)		Agricultural Land (Ha)	
	1996	2004	1996	2004	1996	2004	1996	2004
All Nepal								
Nepal	41	32	7,297	9,590	427	741	0.82	0.77
Nepal*	42	31	7,235	10,318	-	-	-	-
By sector:								
Rural	41	32	6,813	9,011	274	517	0.84	0.80
Urban	32	30	16,155	17,474	3,152	4,094	0.36	0.42
Rural*	43	35	6,694	8,499	-	-	-	-
Urban*	22	10	14,536	20,633	-	-	-	-
By region:								
KTM	12	3	23,185	30,216	4,151	7,035	0.09	0.05
OTHR	45	41	11,500	11,823	2,373	2,353	0.57	0.64
RWH	54	27	5,995	8,484	107	352	0.55	0.77
REH	28	37	7,457	8,430	355	278	0.62	0.73
RWT	58	36	6,908	8,441	257	646	1.43	1.05
RET	35	30	6,888	10,046	356	784	1.00	0.76
By remittance-sources:								
ALL	37	28	7,440	9,389	436	510	0.71	0.74
DOM	35	27	7,631	9,494	553	538	0.86	0.70
FOR	42	29	7,247	9,161	375	530	0.54	0.77
IND	43	36	6,350	7,431	193	282	0.56	0.73
OTHR	29	10	21,166	13,567	3,110	1,246	0.35	0.94

Source. Authors' calculation using NLSS I and II data.
Note. Sample size is 962 for both 1996 and 2004. Per capita consumption and durables are in terms of 1996 NPR. * Measures are for cross-section sample. KTM, OTHR, RWH, REH, RWT, and RET are Kathmandu Valley, Other urban areas, Rural Western Hills, Rural Eastern Hills, Rural Western Terai, and Rural Eastern Terai respectively. All, DOM, FOR, IND, and OTHR are remittance received from all sources, within Nepal, India and other countries (except India) respectively.

TABLE 2
PROPORTION OF REMITTANCE RECEIVING HOUSEHOLDS BY SECTORS AND REGIONS, AND DISTRIBUTION OF REMITTANCE AMONG QUINTILES

	1996					2004				
	All	DOM	FOR	IND	OTHR	All	DOM	FOR	IND	OTHR
All Nepal	23.3	12.4	12.1	11.4	0.7	36.9	20.2	18.3	13.9	4.7
By sector:										
Rural	23.8	12.5	12.5	11.8	0.7	37.5	21	18.2	14.3	4.3
Urban	15.2	10.1	5.6	4.1	1.5	28.3	8.8	19.5	8.8	10.8
By regions:										
KTM	12.1	11.0	1.1	0.0	1.1	10.1	3.1	7.0	0.0	7.0
OTHR	17.7	9.3	9.3	7.3	1.9	39.1	12.2	26.9	13.9	13.0
RWH	34.4	13.3	22.5	20.7	1.8	47.4	20.8	28.8	25.2	4.6
REH	12.8	10.9	2.5	2.3	0.2	29.6	20.9	8.7	3.6	5.0
RWT	17.7	12.4	6.2	6.2	0.0	28.0	17.5	12.6	7.6	5.0
RET	26.1	13.3	14.6	14.1	0.4	39.3	22.6	19.3	16.1	3.2
Distribution of remittance-source among quintile:										
Poorest 20%	17.9	13.0	22.5	24.4	0.0	14.9	15.5	13.6	17.0	2.7
Next 20%	15.4	19.0	14.7	14.5	18.0	14.3	12.4	16.6	17.7	12.6
Next 20%	20.3	11.4	27.9	29.7	0.0	18.0	18.9	19.6	23.2	10.6
Next 20%	21.6	28.1	13.0	12.8	15.1	26.1	24.0	28.7	28.8	29.6
Wealthiest 20%	24.8	28.5	21.6	18.6	66.9	25.7	29.2	21.5	13.3	44.5
Total	100	100	100	100	100	100	100	100	100	100

Source. Authors' calculation using NLSS I and II panel data.
Note. Sample size is 962 for both 1996 and 2004. KTM, OTHR, RWH, REH, RWT, and RET are Kathmandu Valley, Other urban areas, Rural Western Hills, Rural Eastern Hills, Rural Western Terai, and Rural Eastern Terai respectively. All, DOM, FOR, IND, and OTHR are remittance received from all sources, within Nepal, India and other countries (except India) respectively.

TABLE 3
REGRESSIONS FOR THE EFFECTS OF REMITTANCE ON NATURAL LOGARITHM OF PER CAPITA CONSUMPTION

	A: Remittance-Dummy Model				B: Remittance-Income Model			
	POLS	RE	FE	FE-IV-GMM	POLS	RE	FE	FE-IV-GMM
	(E1)	(E2)	(E3)	(E4)	(E5)	(E6)	(E7)	(E8)
Remittance	0.098***	0.097***	0.064*	0.179*	0.019***	0.020***	0.015***	0.027*
	(0.026)	(0.026)	(0.036)	(0.10)	(0.004)	(0.004)	(0.005)	(0.015)
	{0.047 - 0.150}	{0.046 - 0.147}	{0.007 - 0.136}	{0.016 - 0.374}	{0.012 - 0.027}	{0.012 - 0.027}	{0.005 - 0.025}	{0.002 - 0.055}
Observations / Groups	1,924	1,924 / 962	1,924 / 962	1,924 / 962	1,924	1,924 / 962	1,924 / 962	1,924/962
R- Squared	0.577		0.42	0.413	0.581		0.424	0.421
Hausman Test		97.05 [0]				98.25[0]		
Hansen J statistics				0.25 [0.62]				0.211 [0.65]
KPLM statistics				67.89 [0]				65.70 [0]
Cragg-Donald statistics				67.88				55.25
				41.96				39.21
Sargan test for endogeneity (Chi-2)				1.49 [0.22]				0.68 [0.41]

Source. Own calculation using NLSS I and II panel data.
Note. POLS= pooled ordinary least square; RE=random effects; FE=fixed effects; FE-IV-GMM=fixed effects instrumental variable generalized methods of moments. Figures in (), {} and [] are Robust standard errors, confidence intervals and p-values respectively. The migrated population above 15 years (%) and proportion of remittance receiving households in ward are used as instruments for specification (E4) and (E8). In Remittance-dummy model (specifications E1- E4), remittance means whether a household receives remittance while in Remittance-income model it means natural logarithm of one plus per capita remittance income (specifications E5-E8). Control variables include household characteristics, household head characteristics, durable asset and agricultural land holding, regional dummies, ethnicity dummies, ward level characteristics and time dummy (for details see table 4).
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level.

TABLE 4
FIXED EFFECT ESTIMATION OF NATURAL LOGARITHM OF PER CAPITA CONSUMPTION

	Remittance Dummy Model		Remittance Income Model	
	Coefficient	Robust Standard Errors	Coefficient	Robust Standard Errors
Remittance	0.064*	0.036	0.015***	0.005
Household Characteristics:				
Household composition:				
Log of Household size	-0.251***	0.063	-0.256***	0.063
Share of children 0-3: Reference cat.				
Share of children 4-7	0.199	0.208	0.225	0.207
Share of children 8-15	0.360**	0.152	0.385**	0.152
Share of men 16-64	1.082***	0.182	1.087***	0.181
Share of women 16-64	0.846***	0.204	0.850***	0.202
Share or elderly 64+	0.616***	0.204	0.630***	0.203
Married members #	-0.029	0.023	-0.027	0.023
Household Head Characteristics:				
Education (Ref: illiterate):				
Informal Education	-0.146	0.148	-0.163	0.143
Primary education	0.067	0.053	0.064	0.052
Secondary education	0.038	0.067	0.036	0.067
Higher education	0.018	0.126	0.034	0.124
Male	0.068	0.063	0.086	0.063
Age	0.012	0.007	0.012*	0.007
Age squared	-0.009	0.007	-0.01	0.007
Ever migrated	-0.006	0.07	-0.001	0.069
Employment dummies (Ref: inactive):				
Wage in agriculture	-0.139**	0.059	-0.131**	0.059
Wage in non agriculture	-0.048	0.062	-0.04	0.062
Self employment in agriculture	-0.037	0.044	-0.035	0.043
Self employment in non agriculture	-0.016	0.069	-0.006	0.068
Unemployed	0.069	0.065	0.074	0.065
Durables (Ref: Asset poor)				
Asset rich	0.173***	0.064	0.169***	0.063
Agriculture land holding (Ref: No agricultural land):				
<.5 ha	-0.068	0.061	-0.068	0.061
0.5-1 Ha	0.011	0.069	0.013	0.068
1-2 Ha	0.092	0.071	0.092	0.071
>2 Ha	0.066	0.092	0.065	0.091
Log per capita pension	0.019	0.013	0.021	0.013
Regional Dummies: (KTM, RWH, REH, RWT, RET dropped)				
Other urban region	0.013	0.147	0.013	0.142
Ethnicity dummies (Dropped):				

	Remittance Dummy Model		Remittance Income Model	
	Coefficient	Robust Standard Errors	Coefficient	Robust Standard Errors
Ward level characteristics:				
Log mean ward consumption	0.642***	0.053	0.640***	0.053
Illiterate population >15 years	0.001	0.003	0.001	0.003
SLC passed population >15 years	-0.005	0.003	-0.005	0.003
Wage in agriculture %	0.001	0.002	0.001	0.002
Wage in non agriculture %	0.005	0.004	0.005	0.004
Self employment in agriculture %	-0.001	0.001	-0.001	0.001
Self employment in non agriculture %	-0.007	0.004	-0.006	0.004
Unemployed %	0.001	0.003	0.001	0.003
Time dummy	0.073	0.045	0.067	0.044
Constant	1.427**	0.689	1.408**	0.686
Observations [Groups]	1,924 [962]		1,924 [962]	
R-squared	0.42		0.424	

Source. Authors' calculation using NLSS I and II panel data.
Note. In remittance-dummy model (specifications E1- E4), remittance means whether a household receives remittance while, in remittance-income model (specifications E5-E8), it means natural logarithm of one plus per capita remittance income.
* Significant at 10% level.
** Significant at 5% level.
*** Significant at 1% level

TABLE 5
IMPACTS OF REMITTANCE ON CONSUMPTION, POVERTY AND INEQUALITY
(SIMULATION BASED ON REMITTANCE-DUMMY MODEL)

Measures	1996					2004				
	Actual	Baseline	SCEN A		SCEN B	Actual	Baseline	SCEN A		SCEN B
			C/F	% Δ	% Δ			C/F	% Δ	% Δ
Consumption:										
Consumption Per Capita	7,297	7,400	7,295	-1.41	0.06	9,590	9,452	9,258	-2.06	0.09
Poverty (National poverty line):										
Head Count (P0)	41.04	42.54	43.52	2.29	-0.04	31.83	29.94	31.32	4.61	-0.17
Poverty Gap (P1)	11.32	12.07	12.49	3.42	-0.08	7.07	7.36	7.83	6.36	-0.23
Poverty Gap Squared (P2)	4.44	4.69	4.89	4.26	-0.13	2.35	2.61	2.80	7.49	-0.24
Poverty ($1/day poverty line):										
Head Count (P0)	33.41	35.01	35.96	2.71	-0.02	20.47	21.65	22.88	5.68	-0.20
Poverty Gap (P1)	8.49	9.11	9.46	3.86	-0.09	4.35	4.80	5.15	7.30	-0.26
Poverty Gap Squared (P2)	3.17	3.31	3.47	4.74	-0.16	1.37	1.58	1.71	8.30	-0.24
Poverty ($2/day poverty line):										
Head Count (P0)	76.11	74.77	75.54	1.02	-0.07	63.53	63.13	64.55	2.26	-0.10
Poverty Gap (P1)	31.32	31.70	32.31	1.92	-0.05	23.6	23.11	23.97	3.70	-0.14
Poverty Gap Squared (P2)	15.93	16.42	16.84	2.56	-0.06	10.91	10.81	11.32	4.75	-0.17
Inequality:										
Gini Coefficient	0.349	0.333	0.333	-0.03	0.00	0.399	0.354	0.355	0.17	0.00

Source. Authors' calculation using NLSS I and II panel data.
Note. SCEN A: Scenario of no households receives remittance. SCEN B: Scenario of 1% increase in the proportion of remittance receiving households. The column labeled C/F contains the simulated value under the counterfactual scenario. % Δ indicates the percentage change with respect to the baseline. Consumption per capita is in NPR (constant price 1996).

TABLE 6
IMPACTS OF REMITTANCE ON CONSUMPTION, POVERTY AND INEQUALITY
(SIMULATION BASED ON REMITTANCE-INCOME MODEL)

Measures	1996					2004				
	Actual	Baseline	SCEN A		SCEN B	Actual	Baseline	SCEN A		SCEN B
			C/F	% Δ	% Δ			C/F	% Δ	% Δ
Consumption:										
Consumption Per Capita	7,297	7,396	7,227	-2.28	0.11	9,590	9,451	9,108	-3.62	0.17
Poverty (National poverty line):										
Head Count (P0)	41.04	42.57	43.97	3.30	-0.25	31.83	30.00	32.28	7.60	-0.45
Poverty Gap (P1)	11.32	12.06	12.66	5.02	-0.34	7.07	7.37	8.14	10.54	-0.45
Poverty Gap Squared (P2)	4.44	4.68	4.98	6.40	-0.42	2.35	2.61	2.93	12.51	-0.45
Poverty ($1/day poverty line):										
Head Count (P0)	33.41	35.01	36.37	3.87	-0.25	20.47	21.68	23.71	9.34	-0.48
Poverty Gap (P1)	8.49	9.09	9.61	5.71	-0.38	4.35	4.81	5.39	12.15	-0.44
Poverty Gap Squared (P2)	3.17	3.30	3.54	7.21	-0.47	1.37	1.58	1.80	13.97	-0.45
Poverty ($2/day poverty line):										
Head Count (P0)	76.11	74.81	76.04	1.65	-0.08	63.53	63.13	65.52	3.78	-0.13
Poverty Gap (P1)	31.32	31.71	32.62	2.88	-0.17	23.6	23.13	24.56	6.16	-0.28
Poverty Gap Squared (P2)	15.93	16.42	17.04	3.79	-0.24	10.91	10.82	11.67	7.90	-0.36
Inequality:										
Gini Coefficient	0.349	0.333	0.332	-0.39	-0.03	0.399	0.354	0.354	-0.14	0.03

Source. Authors' calculation using NLSS I and II panel data.
Note. SCEN A: Scenario of no households receives remittance. SCEN B: Scenario of proportion of remittance receiving households increases by 1% and these households start to receive remittance equal to the average baseline remittance. Other labels are as in Table 5.

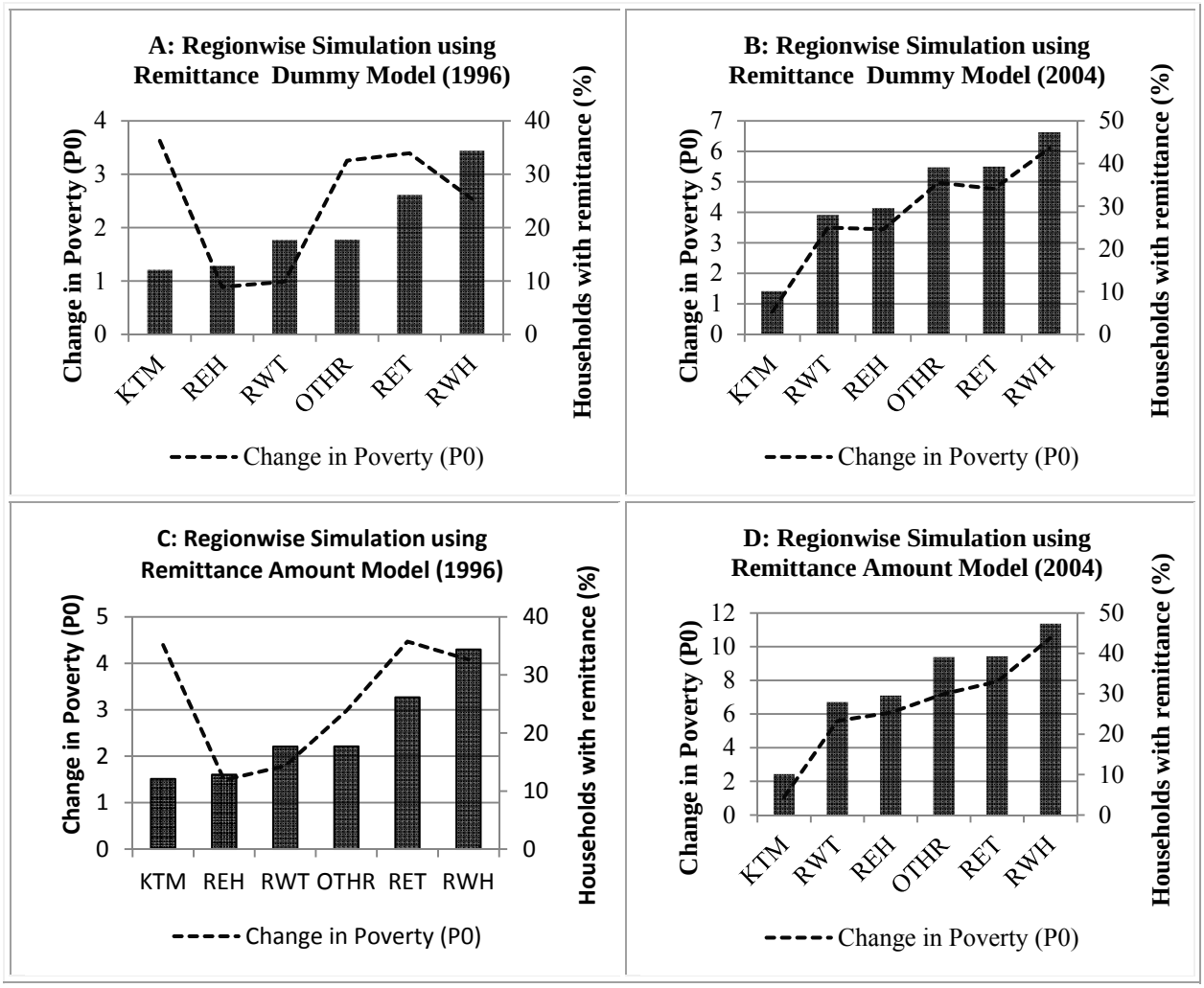
TABLE 7
IMPACTS OF REMITTANCE ON CONSUMPTION, POVERTY AND INEQUALITY BY SOURCE OF REMITTANCE

Measures	Baseline	No DOM REM		No FOR REM		No IND REM		No OTHR REM	
		C/F	% Δ	C/F	% Δ	C/F	% Δ	C/F	% Δ
Remittance – Dummy Model (in 1996):									
Consumption Per Capita	7,400	7,341	-0.80	7,354	-0.62	7,360	-0.54	7,394	-0.07
Head Count (P0)	42.54	43.05	1.19	43.05	1.19	43.06	1.20	42.57	0.06
Poverty Gap (P1)	12.07	12.27	1.63	12.31	1.93	12.3	1.91	12.08	0.06
Poverty Gap Squared (P2)	4.69	4.78	1.93	4.81	2.48	4.81	2.45	4.69	0.04
Gini Coefficient	0.333	0.333	-0.15	0.334	0.18	0.334	0.30	0.333	-0.09
Remittance - Income Model (in 1996):									
Consumption Per Capita	7,396	7,298	-1.34	7,323	-0.99	7,335	-0.83	7,384	-0.16
Head Count (P0)	42.57	43.32	1.77	43.30	1.71	43.27	1.64	42.59	0.05
Poverty Gap (P1)	12.06	12.34	2.34	12.41	2.89	12.4	2.81	12.07	0.06
Poverty Gap Squared (P2)	4.68	4.81	2.79	4.86	3.86	4.86	3.79	4.68	0.06
Gini Coefficient	0.333	0.332	-0.42	0.334	0.15	0.334	0.39	0.332	-0.21
Remittance - Dummy Model (in 2004):									
Consumption Per Capita	9,452	9,352	-1.06	9,348	-1.10	9,389	-0.67	9,408	-0.47
Head Count (P0)	29.94	30.6	2.21	30.73	2.64	30.6	2.21	30.08	0.49
Poverty Gap (P1)	7.36	7.58	3.02	7.64	3.77	7.60	3.34	7.39	0.43
Poverty Gap Squared (P2)	2.61	2.70	3.61	2.72	4.40	2.71	3.97	2.62	0.40
Gini Coefficient	0.354	0.354	0.00	0.355	0.23	0.356	0.54	0.353	-0.28
Remittance - Income Model (in 2004):									
Consumption Per Capita	9,451	9,286	-1.75	9,260	-2.02	9,346	-1.11	9,359	-0.97
Head Count (P0)	30.00	31.04	3.49	31.34	4.46	31.06	3.56	30.32	1.06
Poverty Gap (P1)	7.37	7.72	4.82	7.83	6.28	7.77	5.43	7.44	1.00
Poverty Gap Squared (P2)	2.61	2.76	5.72	2.80	7.43	2.78	6.65	2.63	0.96
Gini Coefficient	0.354	0.354	-0.14	0.355	0.11	0.357	0.82	0.352	-0.62

Source. Authors' calculation using NLSS I and II panel data.
Note. DOM, FOR, IND, and OTHR are remittance from within Nepal, foreign countries, India and other countries (except India), respectively. C/F is the scenario under which no household receives remittance from a particular destination: DOM, FOR, IND or OTHR. National poverty line is used. Other labels are as in Table 5.

FIGURE 1

SIMULATION FOR CHANGE IN HEAD COUNT POVERTY (P0) ACROSS REGIONS IN COUNTERFACTUAL SCENARIO OF NO HOUSEHOLDS RECEIVED REMITTANCE



Source. Authors' calculation using NLSS I and II panel data.
Note. The regions: KTM, OTHR, RWH, REH, RWT, and RET are Kathmandu Valley, Other Urban areas, Rural Western Hills, Rural Eastern Hills, Rural Western Terai, and Rural Eastern Terai respectively. Data labels are for change in head count poverty (P0).

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