Essays on Emigration, Health and Education

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Abstract

This dissertation three chapters related to development economics encompassing education, health and emigration.

The first Chapter, "Is Gender-gap Disappearing? Evidence from Household Educational Expenditures in Nepal" explores investment decision of parents on education of children in Nepal. In a firm patriarchal society like Nepal, parents are more willing to invest on boys than on girls as investing on former is perceived as a future insurance since the boys remain with the families and take care of them.

This study examines the household allocation of resource on education in Nepal. Using an OLS approach on individual-level data from 1995 and 2010 from Nepal, the study finds a weakly significant evidence pro-male gender-gap over expenditure on children's education in 1995. The same approach does not yield any significant gender bias across households in 2010. Further, the results across ethnic-groups shows that Brahmin/Chhetri, the upper echelon on traditional caste system, spend more on children's education than other ethnic groups in both years. The paper finds no evidence for systematic difference on spending pattern between rural and urban households.

Second Chapter "Estimating the causal effect of Mother Education on Child and Infant Mortality in Cameroon: Evidence from the Demographic and Health Surveys Data", coauthored with Simba Mutsvangwa, studies impact of waiving school fees for primary education, which provides a natural experiment to examine the causal effect of mother education on child mortality in a developing country. Our empirical analysis relies on data from two rounds of Demographic

and Health Survey (DHS) conducted in 2004 and 2011 for Cameroon. The DHS are nationally representative surveys of reproductive-aged women and their children, among other information. We exploit the age-specific exposure to tuition free primary education policy of 2000 as our exogenous variation in education of woman in analyzing the causal effect of education on child mortality in Cameroon. In this paper, the tuition fee waive policy due to adoption of Universal Primary Education, is used as a natural experiment for years of schooling. The findings show that additional years of maternal education are significantly associated with reductions in neo-natal, infant mortality and neo-natal mortality in Cameroon. Our results show that neo-natal mortality rate is reduced by maternal education. Infant and Neo-natal mortalities are reduced by about 1.3% and 6.3% respectively.

Third Chapter "Effect of Emigration on Wage Earning in Nepal" examines the effect of emigration on wages of stayers in Nepal. Despite the fact that a number of researches have been dedicated on the effects of immigration on native countries, a very few researches have been done on the effects emigration on the labor markets of sending countries. A simple labor demand and supply theory predicts wage growth when emigration occurs via decrease in labor supply. The study follows an instrumental variable method (past emigration rates as an IV) finds an overall positive wage growth for the stayers (non-emigrants) in Nepal. Sector wise, non-agricultural sector saw a significant rise in wage as a result of mass emigration. The OLS estimate shows that 1 percentage point increase in emigration increases hourly wage by 59 percentage points, while the IV estimate predicts 116 percentage points rise in real wage for every percentage point increase in emigration.

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Introduction

This dissertation titled "Essays on Emigration, Health and Education" consists of three separate essays on gender gap on education spending in Nepal, causal effect of mother's education on child mortality rates in Cameroon and the effect of international migration on the wage of non-migrants in Nepal. Although these are important topics in development economics, the essays are not related to each other.

The first chapter of this dissertation ***"****Is Gender-gap Disappearing? Evidence from Household Educational Expenditures in Nepal"* investigates the trend on gender-gap on educational spending in Nepal in two separate years 1995 and 2010. As Nepal has a relatively short history of formal education (Shrestha, 1988), women lag far behind men in terms of in educational attainment. Education has been one of the top priorities of the Government of Nepal for the last five decades. Education policies have primarily focused on increasing enrolment by creating culture of schooling such as community mobilization, door to door program, increasing scholarships for girls and backward caste groups, adult literacy programs, etc. (Garner, 1998).

Apart from the main objective of investigating gender-gap on education spending this paper also examines spending patterns across different ethnic-groups. The paper finds that gender-gap on education spending which used to be significantly pro-males in 1995 narrows down in 2010. Across ethnic groups, Dalits, the most backward class in Nepali society and other backward ethnic-groups spend significantly less on education of their children as compared to Brahmin/Chhetri group. Further, higher rate of increment in returns to education for females than males between the two years (1995-2010) is potentially linked to the narrowing down the gender-gap over education spending

Second Chapter *"Estimating the causal effect of Mother Education on Child and Infant Mortality in Cameroon: Evidence from the Demographic and Health Surveys Data",* is a joint work with Simba Mutsvangwa. The study examines the impact of waiving school fees for primary education, which provides a natural experiment to examine the causal effect of mother education on child mortality in Cameroon, a developing country.

A large number of studies have examined the potential relationship between maternal education and child health outcomes. One of the frequently cited mechanisms through which maternal education affects child health is through greater access to economic resources brought about by a higher education and the increased knowledge associated with it (Adler & Newman, 2002; Glewwe, 1999; Grossman, 2006; Lindeboom et al., 2009). From previous research, it is highly probable that educated women are more likely to be of higher socioeconomic status.

The findings show that additional years of maternal education are significantly associated with reductions in neo-natal, infant mortality and neo-natal mortality in Cameroon. Our results show that neo-natal mortality rate is reduced by maternal education. Infant and Neo-natal mortalities are reduced by about 1.3% and 6.3% respectively.

Third Chapter *"Effect of Emigration on Wage Earning in Nepal"* I examine the effect of emigration on wages of stayers in Nepal. Nepal has experienced a large outflow of labor force in the last two decades. The poverty level in Nepal has declined to 31% in 2004 from 42% in 1996 of which more than half of the decline has been linked to contribution of remittances by migrants (Adhikari, 2011). Despite the fact that a number of researches have been dedicated on the effects of immigration on native countries, a very few researches have been done on the effects emigration on the labor markets of sending countries like Nepal.

Using migration network as an Instrumental Variable (IV), the research finds an overall positive wage growth for the stayers (non-emigrants) in Nepal. Sector wise, non-agricultural

sector saw a significant rise in wage as a result of mass emigration. The OLS estimate shows that 1 percentage point increase in emigration increases hourly wage by 59 percentage, while the IV estimate predicts 116 percentage points rise in real wage for every percentage point increase in emigration.

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Chapter 1: Is Gender-gap Disappearing? Evidence from Household Educational Expenditures in Nepal

1.1 Introduction

The widespread prevalence of gender-gap on educational attainment in many developing countries has often been pointed out to the weak bargaining power of females within the households. One of the key reasons for backwardness of women and girls in many developing countries lies in the fact that households invest more on education of boys than on girls (Stash, 2001). Households have tendency to invest more on children who are more economically productive [Schultz, 1982] [Pitt, 1990]. Despite firmly established existence of gender wage gap in US (Kahn, 2016) or China (Zhang, 2008) there are no strong evidences for low returns to education for females. Similar are the findings in Southeast Asian countries. (Kenayathulla, 2013) finds that the average return to education in Malaysia for secondary school for females surpasses their male counter parts (by 15.4 percent and 12.1 respectively). Even with low overall wage rate for females, Deolalikar (1995) show that secondary schooling contributes 50% higher returns than males in Indonesia.

Researchers have pointed out that parental preference too, plays crucial role for determining on which child to spend more. Parents may rely more on children of one gender depending on cultural contexts such as marriage or inheritance norms. They have more incentives to invest on the gender of the child; usually the sons, who take care of them in their old age. The difficulty of estimating a direct opportunity cost of children's time implies that parents decide to enroll their children based on the expected future returns to them and thus favoring higher investments for boys. Using household data for India, Kingdon (2013) finds bias occurs due to enrollment decisions by parents i.e. depending upon parents' decision on

whether to enroll a particular child to school and their choice on type of school; private or public. The bias is more pronounced in rural households where parents' enrolment decision favor boys more. Likewise, pro-male bias occurs as parents send boys to fee-charging private schools and girls to fee-tuition government public schools.

Even though basic public schooling is usually free of cost in most countries in a sense the tuitions are free, costs on uniforms, stationaries and transports are a burden for parents. Due to low-income, households cannot send all children to schools. Lincove (2009) finds income elasticities of education for girls is higher in Nigeria. In such a situation there arise a gender disparity where boys are prioritized. Additionally, researches for Pakistan (Alderman et al., 2001), Malaysia and Philippines (King, 1987), and Peru (Gertler, 1992) found distance to school (private or public) put girls on a relative disadvantage.

Evidences suggest that order of birth and number of siblings in a household too plays an important role. Verheyden (2010) shows in Sub-Saharan Africa, children who are born early have lower education level than children who are born later in poor households whereas it is the opposite in richer households. Su (2006) argues that first born sons who are also the inheritor of parental properties in Taiwanese societies fare better in competition of resources with other children. Yet, first born daughters do not enjoy the same privilege.

Further, Kambhampati (2001) suggests from his research rural West Bengal (India), while father's education has significant effect on children's primary school outcome, mother's literacy has greater impact on daughters' education than sons', similar effect is observed in Brazil (Thomas, 1996).

1.2 Education and Gender-gap in context of Nepal

Nepal, being a firm patriarchal society is a good example for the backwardness of women in educational attainment. With a mere 57.4% of literacy rate, women lag far behind men who have literacy rate of 75.1% (CBS[1] 2011). The patterns of literacy rate and education attainment amongst various caste and ethnic groups differ significantly for both males and females. Girls from socio-ethnically backward class have poor record of access to education. Acute poverty, social exclusion of women and caste system have been a challenge for an access to equitable education in Nepal.

The history of education in Nepal itself is very young. In 1951, the year Nepal got its democracy, there were only 321 primary schools attended by about 8,500 students (Shrestha, 1988). In terms of literacy rate, the 1952/54 census puts it to 5.3% of which the rate for men was 9.5 % and 0.7% for female; resulting in gender ratio of 1:14 (Population Monograph, 1987). Education was given considerable priorities after1950s by implementation of various National Education Plans. Primary education became free of cost in the mid-70s. To address the huge gender-gap on enrolment and literacy rates that persisted, government adopted a policy to increase girls' enrolment by awarding schools with high girl enrolment, awarding scholarships and programs for encouraging parents to send their daughters to schools (Garner, 1998).

After the reinstatement of democracy in 1991, Government of Nepal has been keen to achieve equitable education by drawing up plans with donors. In recent decades around a quarter of education budget has been burdened by donor countries and INGOs[2]. Education policies have primarily focused on increasing enrolment by creating culture of schooling such as community mobilization, door to door program, increasing scholarships for girls and backward caste groups, adult literacy programs, etc. (Garner, 1998). With over 50 years of

[1] CBS is Central Bureau of Statistics, Nepal.
[2] Nepal Education in Figures 2015, Ministry of Education Nepal

planned educational development, Nepal has seen a steady improvement in literacy rates. As a result, there is no gap in primary and secondary school enrolment rates between female and male while it still persists in tertiary education enrolment rates with female to male ratio of 0.64:1[3].

Although, systematic empirical studies regarding how intra-household resources on education are allocated reports are hard to find in the context of Nepal, various reports [DFID, 2006] & [Min, 2004], etc. suggest a wide gender-gap on educational attainment. To the best of my knowledge there is no prior studies on intra-household expenditure on education at national level on Nepal. This study examines attempts to analyze the patterns of gender-gap on education expenditure in 1995 and 2010. The study finds that while there is a weakly significant gender-bias over girls on expenditure in 1995, the results do not predict any significant bias in 2010.

The rest of the paper proceeds as follow: section 2 reviews recent literature in the field of gender-gap on household educational expenditures; section 3 describes empirical method, data and descriptive statistics. Results and conclusion are presented in sections 4 and 5 respectively.

1.3 Recent Studies on gender-gap on Educational expenditure

Recent researches on intra-household allocation of expenditures apply two approaches, the Engel curve estimation and Hurdle model. In absence of individual level data, direct comparison of expenditures on males and females are difficult to make. The best approach in this scenario is the use of Engel curve estimation techniques. The researchers can look at how the expenditure behavior of a household responds to the change in its gender composition.

[3] World Economic Forum, 2014

Deaton (1997) questions the reliability of this methodology since it fails to show strong gender effects when measures of outcomes show differences between boys and girls.

Kingdon (2005) gives two reasons for the failure of Engel curve technique to detect gender bias. Firstly, because it incorporates all children of school going age and does not differentiate between those children who are out of school and those who are enrolled to school. In such case the aforementioned approach according to the author, fails to account the gender-gap that arise from enrolment decision, i.e. conditional on enrolment there may or may not be a significant difference on educational spending on boys and girls. Secondly, the specification of Engel curve itself allows for aggregation is allows for the aggregation of the data such as food expenditures that cannot be accurately assigned to individuals.

To overcome limitation of Engel curve, Kingdon (2005) further proposes the use of Hurdle model. Indian household survey data (1994) shows the existence of gender bias in rural households when estimated by Engel curve. But once enrolled to school i.e. conditional on decision to enroll, the hurdle model does not show any bias.

Aslam (2008) finds pro-male bias for 10-14 and 15-19 age groups in Pakistan when estimated with Engel curve and Hurdle model. For 5-9 age group the lack of evidence for gender bias is rejected by Hurdle model as it predicts a weak pro-Female bias. The result implies that decisions to enroll and how much to spend once enrolled to schools potentially work in the same direction for older children while for the 5-9 age-groups decision to enroll favors boys but among the enrolled children, girls enjoy a slightly more share of the investment. Following the same approaches, Himaz (2010) for Sri Lanka, Materson (2012) for Paraguay and Kenayathulla (2005) for Malaysia find mixed results for different age-groups and regions.

2. Model and Empirical Strategy

I begin analysis by estimating share of educational expenditure of an individual to the total household expenditure and the individual characteristics. A simple OLS regression with following specification is used for two different data sets; 1995 and 2010. $W_i =$

$$\beta_0 + \beta_1 female_i + \beta_2 X_i + \mu_i \qquad (1)$$

Where,

W_i is the ratio of educational expenditure for an individual i to the total household expenditure;

$female_i$ is a dummy variable indicating gender;

Xi is a vector of other individual such as ethnicity, age-group

μ_i is an error term

Here, β_1 is the parameter of primary interest to be estimated. Thus, the significance of coefficient β_1 would be paramount to conclude the presence of gender bias on educational expenditure. Equation (1) can be also be used to examine gender-gap on educational expenditure for ethnic group, regional and age-group sub-subsamples. β_1 captures both intra-household and inter-household gender gaps on education spending.

One potential problem with the above model is that if the data contains a considerable proportion of school going-age children with zero educational expenditure and result in censoring of dependent variable which would not give clear evidence if the bias comes from enrolment decision or from the differential expenditure conditional on expenditure. OLS is not suitable as its application to censored data could lead estimates to be biased downward.

In order to explore for the possible biases arising from enrolment decision, (Kingdon, 2005) proposes a Hurdle model. This model basically contains two independent equations (Cameron, 2010) first part is a probit model that models the probability of any positive

expenditure for a particular child (basically an enrollment decision) whereas the second part is an OLS which models on how much is spent on a particular child conditional on he/she is enrolled.

$$P(w = 0|x) = 1 - \Phi(x\Upsilon) \quad (2)$$

$$w|(x, w > 0) \sim Normal(x\beta,\ \sigma^2) \quad (3)$$

Where,

w is the ratio of educational expenditure for an individual i to the total household expenditure;

x is the vector of other individual characteristics;

Φ and Υ are the parameters to be estimated

σ is the standard deviation of w

Φ(.) is the cumulative distribution function

The MLE of Υ is the probit estimator at w=0 vs w>1 and that of β is OLS estimator at w>0.

The empirical analysis is based on the estimation of the above three equations.

i. OLS (Unconditional) equation of (1) of educational expenditure on individual child
ii. Probit estimation to (2) to investigate the possibilities of whether expenditure is positive for an individual child
iii. Conditional OLS equation on any positive expenditure incurred on an individual child through enrollment

3. Data and Descriptive Statistics

National Living Standard Survey (NLSS) is a nationally represented household level (cross-section) survey conducted by the Central Bureau of Statistics, Government of Nepal. It is also one of the most comprehensive survey that include data from sample households all

over the country. This paper uses data from NLSS 1 and NLSS 3 which were collected in the years 1995-1996 and 2010-2011 respectively. This study refers the former survey period as year 1995 and the latter as 2010. NLSS 1 survey is based on 3,388 households across 73 out of 75 and NLSS 3 includes 7,020 households across 75 districts in the country.

A major advantage of these data sets is that each sets contain detail information on education expenditure (tuition, uniforms, transport, books and stationary) on each child besides other household expenditure on food, clothes, health, etc.

Secondary schooling in Nepal is up to 10th grade. After passing out School Leaving Certificates (SLC) exams at the end of 10th grade, usually at 16 years of age, many students leave home to pursue their education at bigger towns and cities. Some of them even support their studies by doing part time works. As a result of this phenomenon accuracy of educational expenditure on individual children after the age of 16 can be questioned upon. Therefore, the analysis is limited to the individuals from 6 to 16 years old. Children are divided into three age-groups, 6 t0 9, 10-13 and 14-16.

The survey reports more than 100 different caste/ethnic groups. The paper broadly divides them into 5 different caste/ethnic groups, namely, Brahmin/ Chhetri, Newar, Indigenous, Dalits and Terai/Madesh groups by closely following (World Bank and DFID, 2006) report titled Unequal Citizens: Gender, Caste and Ethnic Exclusion in Nepal. Among the caste/ethnic groups, Brahmin/Chhetri group is considered to be privileged group in Nepalese society. Dalits are the most backward people while Newars are concentrated in urban areas and are economically better off.

Table 1 shows an average education expenditure on individual child for 1995 and 2010 by gender, ethnic groups and regions in Nepalese Rupees (NRS) for the overall sample. In average girls received lower educational spending than boys in both years. Children in urban areas and also children from Newar household are spent more on education.

Table 1: Average Educational Expenditure for an individual child

Variables	2010 Avg. Expenditure(NRS)	2010 Avg. Expenditure(NRS)
Male	2,515	5926
Female	2,602	5672
Urban	1,179	14110
Rural	4,038	6084
Eastern	1,130	2632
Central	1,621	3280
Western	1,119	5526
MidWest	822	3144
FarWest	547	1601
Brahmin/Chhetri	1,653	6791
Indigenous	1,350	2093
Newar	248	15780
Terai/Madesh	661	2416
Dalits	798	1524

Source: Author's Calculation

Summary statistics of the variables used in the regressions, their definition and means are presented in Table 2. The dependent variable is ratio of education expenditure of an individual to the total education expenditure of a household and the sample size is 4,573 in 1995 and 5014 in 2010. Proportion of girls slightly increased for the year 1995. The ratio of education expenditure of an individual to total education expenditure of a household increased from 1.5%in 1995 to 3.2% in 2010.

Table 2: Summary of regression variables and their definition

Variable	Definition	Mean 1995	Mean 2010
EducExp_to Exp	Ratio of educational expenditure for an individual to total household expenditure	0.015	0.0322
Female	Dummy (1 if Female; 0 otherwise	0.490	0.5189
Lhsize	Log of per capita household expenditure	1.896	9.4863
Urban	Dummy (1 if Urban; 0 otherwise	0.183	0.2196

Brahmin/Chhetri	Household head's ethnicity (1 if Brahmin_Ch~i)	0.172	0.3213
Indigenous	Household head's ethnicity (1 if Indigenous)	0.189	0.2613
Newar	Household head's ethnicity (1 if Brahmin_Ch~i)	0.095	0.0471
Dalits	Household head's ethnicity (1 if Dalits)	0.094	0.1542
Terai/Madesh	Household head's ethnicity (1 if Terai/Madesh)	0.176	0.1217
Moteduc_5	Mother's Education (1 if primary level)	0.283	0.0044
Moteduc_10	Mother's Education (0 if secondary level)	0.175	0.0114
Moteduc_0	Mother's Education (1 if no formal education)	0.551	0.0080
For_remit	Household Receiving Foreign remittances (1 if received)	0.009	0.2156
Eastern	Regional Dummy (1 if Eastern)	0.181	0.3024
Central	Regional Dummy(3 if Central)	0.332	0.2166
Western	Regional Dummy (2 if Western)	0.207	0.2158
MidWest	Regional Dummy(1 if Mid-West)	0.132	0.1619
FarWest	Regional Dummy (1 if Far West)	0.148	0.1075
No of Observations (N)		4,573	5,014

4. 1 Results of Regression

Table 3 presents the results of OLS estimation for 1995. The variable female captures the gender difference on educational spending. For the full sample in 1995, expenditure on females were less than males, albeit the coefficient is weakly significant at 1% level. The gender-gap for the age-groups 5 to 9 and 10-13 also follow similar pattern except for age-group 14 to16 which is not significant. Urban households spend significantly higher amount for all age-groups than rural households. Across ethnic/caste groups, compared to Brahmin/ Chhetri, which is the base group here, only Newar children are spent more. The coefficients on log of expenditure per capita is negative for conditional and unconditional OLS like the education budget the expenditure per capita usually does not increase by same percentage the total per

capita expenditure increases. Mother's education up to primary level has positive and significant effects for 1995 sample.

Table 3: OLS Estimation on Education Expenditure by Age –Group 1995

Variables	(1) Full Sample	(2) Age-Groups5-9	(3) Age-Groups 10-13	(4) Age-Groups 14-16
Female	-0.00514***	-0.00430*	-0.00633**	-0.00490
	(0.00167)	(0.00243)	(0.00296)	(0.00347)
Lhsize	-0.0352***	-0.0290***	-0.0360***	-0.0414***
	(0.00216)	(0.00313)	(0.00395)	(0.00433)
Urban	0.0183***	0.0220***	0.0197***	0.0116**
	(0.00246)	(0.00366)	(0.00425)	(0.00514)
Indigenous	-0.00959***	-0.00438	-0.00595	-0.0214***
	(0.00240)	(0.00346)	(0.00432)	(0.00489)
Newar	0.00534*	0.00504	0.00494	0.00450
	(0.00320)	(0.00491)	(0.00568)	(0.00620)
Dalits	-0.0191***	-0.0197***	-0.0151***	-0.0219***
	(0.00305)	(0.00434)	(0.00530)	(0.00670)
Terai/Madesh	-0.0194***	-0.0159***	-0.0176***	-0.0280***
	(0.00246)	(0.00347)	(0.00442)	(0.00526)
Moteduc_5	0.0319**	0.0612***	0.0111	0.0189
	(0.0151)	(0.0210)	(0.0226)	(0.0592)
Moteduc_10	0.0119	0.000219	0.0215	0.00193
	(0.0157)	(0.0235)	(0.0244)	(0.0420)
For_remit	0.00121	0.0234*	-0.00330	-0.0181
	(0.00872)	(0.0142)	(0.0146)	(0.0173)
Central	-0.000725	0.00360	-0.00755*	0.00216
	(0.00254)	(0.00372)	(0.00450)	(0.00522)
Western	0.00325	0.000842	0.00461	0.00542
	(0.00270)	(0.00389)	(0.00473)	(0.00576)
MidWest	-0.0136***	-0.0101**	-0.0154***	-0.0168***
	(0.00309)	(0.00454)	(0.00535)	(0.00649)
FarWest	-0.0153***	-0.0121***	-0.0171***	-0.0175***
	(0.00305)	(0.00436)	(0.00537)	(0.00653)
Constant	0.155***	0.138***	0.163***	0.168***
	(0.00643)	(0.00911)	(0.0116)	(0.0136)
Observations	4,573	1,758	1,633	1,182
R-squared	0.128	0.136	0.114	0.160

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The results of Hurdle regression for 1995 presented in Table 4 allows us to inspect if the gender-gap is due to enrolment bias or down to the difference in expenditure after enrollment. Column (2) and Column (3) in Table 4 present the regression results for education expenditure conditional on enrolment and Marginal Effects (Probit) regression on enrolment.

Fourth column represents coefficients of unconditional OLS. The results show that once enrolled, the coefficient on female becomes non-significant providing small evidence that gender-gap on spending is due to enrolment decision. Column (2) in Table 4 indicates that females are about 25% less likely to enrolled to school

Table 4: Regression Results for 1995

Variables	(1) Conditional OLS	(2) Marginal Effects (Probit)	(3) OLS (Unconditional)
Female	-0.00542	-0.254***	-0.00514***
	(0.0112)	(0.0542)	(0.00167)
Lhsize	-0.375***	1.189***	-0.0352***
	(0.0353)	(0.0772)	(0.00216)
Urban	0.0338**	0.291***	0.0183***
	(0.0143)	(0.0911)	(0.00246)
Indigenous	-0.0124	-0.229***	-0.00959***
	(0.0155)	(0.0806)	(0.00240)
Newar	0.00926	0.178	0.00534*
	(0.0174)	(0.136)	(0.00320)
Dalits	-0.0364	-0.694***	-0.0191***
	(0.0226)	(0.0881)	(0.00305)
Terai/Madesh	-0.0612***	-0.690***	-0.0194***
	(0.0216)	(0.0728)	(0.00246)
Moteduc_5	0.0771	-0.0261	0.0319**
	(0.0645)	(0.590)	(0.0151)
Moteduc_10	-0.0159	4.529	0.0119
	(0.0837)	(238.5)	(0.0157)
For_remit	-0.0244	0.268	0.00121
	(0.0514)	(0.370)	(0.00872)
Central	0.0237	-0.382***	-0.000725
	(0.0167)	(0.0864)	(0.00254)
Western	0.0108	-0.0460	0.00325
	(0.0175)	(0.0975)	(0.00270)
Mid-West	-0.0449*	-0.520***	-0.0136***
	(0.0241)	(0.0981)	(0.00309)
Far West	-0.0430*	-0.623***	-0.0153***
	(0.0238)	(0.0974)	(0.00305)
Constant	0.481***	-1.144***	0.155***
	(0.0379)	(0.163)	(0.00643)
N	4,573	4,573	4,573

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Moving on to 2010, gender-gap on education expenditure as displayed on Table 5, is not significant unlike for 1995. Females are likely to receive 1.3% less expenditure than males but the result is statistically not significant. By region, the negative and significant coefficients

in 1995 have improved for Mid-West and Far-West in 2010. Overall, for age-group 5-9, there exists a weak bias against girls. There is a strong evidence girl-child in the households receiving foreign remittances are better off than the boy-child with about 3% more on education expenditure ; Table 5, Columns 1,2 &3. Dalits, Indigenous and Terai/Madhes communities still invest significantly less amount then Brahmin/Chhetris.

Table 5: OLS Regression for 2010

Variables	(1) OLS 2010 Full Sample	(2) OLS 2010 Age 5-9	(3) OLS 2010 Age 10-13	(4) OLS 2010 Age 14-16
Female	-0.0130	-0.0339*	0.0148	-0.0254
	(0.0102)	(0.0173)	(0.0167)	(0.0196)
Lhsize	-0.402***		-0.0474	-0.502***
	(0.140)		(0.285)	(0.168)
Urban	0.0941***	0.120***	0.0904***	0.0800***
	(0.0126)	(0.0223)	(0.0209)	(0.0233)
Indigenous	-0.0492***	-0.0174	-0.0485**	-0.0723***
	(0.0130)	(0.0222)	(0.0217)	(0.0240)
Newar	0.0111	0.0935**	-0.0726*	0.00599
	(0.0258)	(0.0409)	(0.0438)	(0.0515)
Dalits	-0.0970***	-0.108***	-0.104***	-0.0793***
	(0.0152)	(0.0262)	(0.0246)	(0.0295)
Terai/Madesh	-0.0342*	-0.0514*	-0.0136	-0.0317
	(0.0175)	(0.0289)	(0.0290)	(0.0345)
Moteduc_5	-0.0271	-0.0194	0.0348	-0.122
	(0.0771)	(0.111)	(0.131)	(0.186)
Moteduc_10	0.0588	0.0755	0.0324	0.0837
	(0.0484)	(0.0785)	(0.0705)	(0.127)
For_remit	0.0341***	0.0688***	0.0427**	-0.0198
	(0.0125)	(0.0215)	(0.0198)	(0.0245)
Central	-0.0310**	-0.0413*	-0.0273	-0.0177
	(0.0151)	(0.0251)	(0.0253)	(0.0288)
Western	-0.0187	-0.0360	-0.000464	-0.0219
	(0.0157)	(0.0271)	(0.0256)	(0.0302)
Mid-West	-0.0136	-0.0323	0.00502	-0.00869
	(0.0168)	(0.0285)	(0.0284)	(0.0308)
Far West	-0.0256	-0.0165	-0.0221	-0.0336
	(0.0192)	(0.0344)	(0.0314)	(0.0348)
Constant	4.132***	0.303***	0.762	5.107***
	(1.332)	(0.0238)	(2.701)	(1.598)
N	5,014	1,637	1,943	1,434
R-squared	0.026	0.045	0.024	0.032

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Estimation of Hurdle Model for household education expenditure for the year 2010 as presented on Table 6 does not produce statistically significant difference between genders. However the negative coefficients on the variable female hints to a bias against girl children both in terms of enrolment and receiving education spending after enrolment.

Table 6: Regression Results for 2010

Variables	(1) Conditional OLS 2010	(2) Marginal Effects (Probit) 2010	(3) OLS (Unconditional) 2010
Female	-0.0130	-0.0130	-0.0116
	(0.0102)	(0.0102)	(0.00983)
Lhsize	-0.402***	-0.402***	-0.400***
	(0.140)	(0.140)	(0.135)
Urban	0.0941***	0.0941***	0.0451***
	(0.0126)	(0.0126)	(0.0124)
Indigenous	-0.0492***	-0.0492***	-0.0282**
	(0.0130)	(0.0130)	(0.0125)
Newar	0.0111	0.0111	0.000381
	(0.0258)	(0.0258)	(0.0249)
Dalits	-0.0970***	-0.0970***	-0.0607***
	(0.0152)	(0.0152)	(0.0148)
Terai/Madesh	-0.0342*	-0.0342*	-0.0177
	(0.0175)	(0.0175)	(0.0169)
Moteduc_5	-0.0271	-0.0271	-0.0381
	(0.0771)	(0.0771)	(0.0743)
Moteduc_10	0.0588	0.0588	0.0237
	(0.0484)	(0.0484)	(0.0466)
For_remit	0.0341***	0.0341***	0.0198*
	(0.0125)	(0.0125)	(0.0120)
Central	-0.0310**	-0.0310**	-0.0365**
	(0.0151)	(0.0151)	(0.0145)
Western	-0.0187	-0.0187	-0.0337**
	(0.0157)	(0.0157)	(0.0152)
Mid-West	-0.0136	-0.0136	0.00624
	(0.0168)	(0.0168)	(0.0162)
Far West	-0.0256	-0.0256	-0.0166
	(0.0192)	(0.0192)	(0.0185)
Constant	4.132***	4.132***	3.648***
	(1.332)	(1.332)	(1.283)
R-squared			0.096
N	5,014	5,014	5,014

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

4.2 Discussions

Owing to different factor gender gap on education expenditure could attenuate over time. At least, this seems to be the case for Nepal. As discussed above, foreign remittance has significantly favored expenditure on girls. Besides remittance, to explore the possible channel by which gender gap on education expenditure showed improvement, Table 7 compares the returns to education for males and females in Nepal between the years 1995 and 2010.

Table 7: Returns to Education for Males and Females in the years 1995 & 2010

	(1)	(2)	(3)	(4)
Variables	Male 1995	Female 1995	Male 2010	Female 2010
Education Years	0.0369***	0.0319***	0.0460***	0.0450***
	(-0.0057)	(-0.0055)	(-0.0082)	(-0.0082)
Experience	0.00991	0.00477	0.0285***	0.0176*
	(-0.0062	(-0.0059)	(-0.0104	(-0.0098)
Experience Sq	-0.0002	-0.0001	-0.000394**	-0.000310*
	(-0.0001	(-0.0001)	(-0.0002)	(-0.0002)
Constant	2.701***	2.823***	3.332***	3.391***
	(-0.0802	(-0.0777)	(-0.135)	(-0.126)
Observations	1,876	1,790	1,225	1,566
R-squared	0.023	0.024	0.028	0.02

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

An additional year of schooling for males increased wage by roughly 0.9 percentage ponts; from 3.7 % in 1995 to 4.6% in 2010. In the same span of time wage for female increased by about 1.3 percentage points i.e. from 3.2% to 4.5%. The results suggests that labor market outcomes increase demand for education which in turn influences households to invest more

on education of girl child. he results corroborate with other existing evidences with no significant gender gap on education expenditure. For instance, for Indonesia (Deolalikar, 1995) secondary schooling for females contributes 50% higher returns than males and for Malaysia, (Kenayathulla, 2013) average return to education in Malaysia for secondary school for females surpasses their male counter parts (by 15.4 percent and 12.1 respectively).

5. Conclusion

The study examined gender differential on household education expenditure in Nepal for two different years in the gap of 15 years (1995 and 2010) using individual level data. The descriptive statistics suggested some bias on educational spending for over boys and girls and across ethnic/caste groups. A weakly significant gender bias was found for the year 1995 but no significant bias is observed for 2010. There remains disparity among educational across ethnic/caste groups but coefficients on these variables are in line of our expectations. Since Dalits and Terai/Madesh and Indigenous groups generally poor communities, share of education expenditure on children for this group is lower than the relatively economically well off Brahmin/Chhetri groups.

The paper employed Hurdle Model, besides OLS to detect the presence of any bias that could arise from enrolment decision. Unlike, Kingdon (2005) for India, where Hurdle Model predicts a strong gender-bias conditional on enrolment at individual level, this study finds that OLS and Hurdle Model led to same direction implying that households do not spend differently on boy-child and girl-child conditional on enrolment decision. Further, the paper does not make any distinction whether the gender gaps are within-households or across-household phenomena. More understanding on household dynamics, such as who makes the decisions, asset holdings,

etc., would perhaps be more useful to further enhance the issues of educational expenditure on gender.

Appendix

Table A1: OLS Estimation by Development Regions 1995

Variable	(1) OLS 1995 Eastern	(2) OLS 1995 Central	(3) OLS 1995 Western	(4) OLS 1995 Mid-West	(5) OLS 1995 Far West
Female	-0.00515	-0.00281	-0.00575	-0.00514	-0.00999***
	(0.00400)	(0.00307)	(0.00380)	(0.00402)	(0.00351)
Lhsize	-0.0506***	-0.0389***	-0.0483***	-0.0138***	-0.0199***
	(0.00572)	(0.00444)	(0.00452)	(0.00508)	(0.00423)
Urban	-0.00169	0.0172***	0.0252***	0.000317	0.0103
	(0.00818)	(0.00381)	(0.00570)	(0.00770)	(0.00654)
Indigenous	-0.00815*	-0.0203***	-0.00640	-0.00444	0.0223
	(0.00465)	(0.00457)	(0.00482)	(0.00676)	(0.0204)
Newar	-0.0150	-0.000173	0.0196**		-6.01e-05
	(0.00909)	(0.00428)	(0.00812)		(0.0235)
Dalits	-0.0224**	-0.0247***	-0.0229***	-0.0110**	-0.0146**
	(0.0101)	(0.00681)	(0.00626)	(0.00549)	(0.00608)
Terai/Madesh	-0.0204***	-0.0329***	-0.0171***	-0.0113**	-0.00853*
	(0.00599)	(0.00491)	(0.00593)	(0.00557)	(0.00478)
Moteduc_5	-0.0362	0.00232	0.0234	0.144***	
	(0.0573)	(0.0244)	(0.0262)	(0.0350)	
Moteduc_10	-0.0210	0.00574	0.0187	0.0461	
	(0.0407)	(0.0201)	(0.0596)	(0.0492)	
For_remit	-0.00495	-0.0386***	0.0356***		
	(0.0334)	(0.0135)	(0.0137)		
Constant	0.229***	0.146***	0.217***	0.0891***	0.0986***
	(0.0164)	(0.0123)	(0.0147)	(0.0135)	(0.0115)
Observations	827	1,519	945	605	677
R-squared	0.133	0.141	0.178	0.070	0.075

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2: OLS Estimation by Development Regions 2010

Variable	(1) OLS 2011 Eastern	(2) OLS 2011 Central	(3) OLS 2011 Western	(4) OLS 2011 Mid-West	(5) OLS 2011 Far West

Female	-0.0112	-0.0178	-0.0249	-0.0105	-0.0108
	(0.0222)	(0.0192)	(0.0215)	(0.0251)	(0.0307)
Lhsize	-0.0233				-0.525***
	(0.283)				(0.191)
Urban	0.0404	0.143***	0.0775***	0.101***	0.0411
	(0.0276)	(0.0218)	(0.0290)	(0.0380)	(0.0381)
Indigenous	-0.0233	-0.0394	-0.0566**	-0.0634**	-0.113**
	(0.0272)	(0.0261)	(0.0275)	(0.0293)	(0.0448)
Newar	0.0589	-0.00480	0.0313	0.217	
	(0.103)	(0.0329)	(0.0692)	(0.145)	
Dalits	-0.109***	-0.121***	-0.0883***	-0.0928***	-0.0531
	(0.0330)	(0.0384)	(0.0297)	(0.0337)	(0.0399)
Terai/Madesh	0.00651	-0.00789	-0.0802**	-0.0708	-0.290
	(0.0355)	(0.0272)	(0.0331)	(0.0777)	(0.346)
Moteduc_5	-0.0659	0.107	-0.0639	0.453	-0.225
	(0.151)	(0.218)	(0.125)	(0.352)	(0.201)
Moteduc_10	-0.00502	0.0234	0.0930	0.215	0.00606
	(0.102)	(0.101)	(0.0832)	(0.176)	(0.174)
For_remit	0.00602	0.0674***	0.0114	0.0296	0.0532
	(0.0298)	(0.0248)	(0.0239)	(0.0291)	(0.0358)
Constant	0.538	0.265***	0.322***	0.306***	5.278***
	(2.685)	(0.0236)	(0.0231)	(0.0235)	(1.810)
Observations	1,086	1,516	1,082	812	539
R-squared	0.015	0.047	0.024	0.030	0.037

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Regression Results for Urban and Rural Sample 1995

Variable	(1) Urban 1995	(2) Rural 1995
Female	-0.000774	-0.00199
	(0.00364)	(0.00167)

Lhsize	-0.0251***	-0.00501***
	(0.00456)	(0.00188)
Indigenous	-0.0262***	-0.0110***
	(0.00418)	(0.00390)
Newar	-0.0292***	-0.0215***
	(0.00985)	(0.00271)
Dalits	-0.0474***	-0.0260***
	(0.00941)	(0.00235)
Terai/Madesh	-0.0242	0.00277
	(0.0179)	(0.0153)
Moteduc_5	0.0139	0.0193
Moteduc_10	(0.0171)	(0.0152)
For_remit		0.0135
		(0.00996)
Central	0.0125	-0.00238
	(0.0101)	(0.00248)
Western	0.000241	0.00334
	(0.0124)	(0.00280)
Mid-West	0.0198	-0.00756**
	(0.0132)	(0.00306)
Far West	0.00293	-0.0140***
	(0.0129)	(0.00311)
Constant	0.105***	0.0617***
	(0.0119)	(0.00402)
Observation	960	4,304
R-squared	0.100	0.056

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4: Regression Results for Urban and Rural Sample 1995 2010 Rural Urban OLS

Variable	(1) OLS 2011 By Urban	(2) OLS 2011 Rural
Female	-0.0158	-0.0111
	(0.0250)	(0.0111)
Lhsize	-	-0.410***
		(0.135)
Indigenous	-0.0573*	-0.0456***
	(0.0341)	(0.0139)
Newar	-0.0308	0.0303
	(0.0435)	(0.0341)
Dalits	-0.170***	-0.0771***
	(0.0397)	(0.0164)
Terai_madhesi	-0.0142	-0.0303
	(0.0406)	(0.0196)
Moteduc_5	0.0129	-0.0247
	(0.185)	(0.0847)
Moteduc_10	0.177**	-0.0370
	(0.0788)	(0.0653)
For_remit	0.0801**	0.0242*

	(0.0329)	(0.0133)
Central	0.0363	-0.0529***
	(0.0345)	(0.0169)
West	0.00794	-0.0259
	(0.0412)	(0.0168)
Mid-West	0.0196	-0.0224
	(0.0486)	(0.0176)
Far West	-0.00776	-0.0228
	(0.0485)	(0.0208)
Constant	0.379***	4.217***
	(0.0319)	(1.281)
Observations	1,101	3,913
R-squared	0.031	0.014

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter 2: Estimating the causal effect of Mother Education on Child Mortality in Cameroon: Evidence from the Demographic and Health Surveys Data

1.1 Introduction

More educated people have longer life spans, are healthier and tend to have fewer but healthier children (Grossman, 2006). Most demographic research shows that there is a significant relationship between maternal education and infant mortality (Bicego and Boerma, 1991; Hobcraft et al., 1984; Mensch et al., 1985; Cleland & Van Ginneken, 1988; Akter et al., 2015; Bicego and Ties Boerma, 1993; Mahy, 2003; Smith-Greenaway, 2013). Some early works of Caldwell (1979; 1994) concluded the existence of causal relationship between maternal education and child health and mortality.

However, the question of whether a causal relationship exists between maternal education and child health is still a matter of debate in empirical research, particularly in developing countries (Basu, 1994; Desai & Alva, 1998; Grépin & Bharadwaj, 2015; Hobcraft, 1993; Lochner, 2011; Makate and Makate, 2016). In Africa and other developing countries, there is still continued debate on the causal relationship between maternal education and child survival. In Cameroon, however, there is still scant literature on this area.

Mother's education level may influence child's health and mortality through different ways. According to Grossman (2006), education can either directly affect an individual's health through allocative or productive efficiency mechanisms or other channels such as higher income (Grossman, 1972). In general, mothers who have higher education also have higher incomes or have husbands with higher incomes (Palloni, 1981). Parental education might directly influence child health by enhancing a parent's ability to acquire and process information resulting in better health and parenting choices (Lindeboom et al., 2009). Also, education might indirectly influence child health through its effect on labor market opportunities for parents (Aslam and Kingdon, 2012; Grépin & Bharadwaj, 2015, Makate and Makate, 2016).

Tackling the mentioned causality issues requires using some exogenous variation in education that is not related to child health outcomes which act as instrumental variables for education. Previous studies have relied on compulsory schooling laws (Lindeboom et al., 2009; Lundborg et al., 2014), primary school expansions (Osili & Long, 2008) and college openings (Currie & Moretti, 2003) to identify the exogenous changes in education that potentially might impact child health outcomes. This paper focuses on Cameroon case, and try to explore channels through which maternal education might influence child survival using Cameroon

Demographic and Health Survey (DHS) data. The rest of the paper is as follows: Section 2, brief literature review, Section 3, explains User Fee Policy for Cameroon, Section 4, is Method, Section 5 is Results and followed by the conclusion.

1.2 Literature review

The relationship between education and health outcomes has received lots of attention from numerous researchers especially in economics (Grossman, 2006). While there seems to be an agreement among researchers on the positive correlation between education and health, empirical evidence on the causal connection is far from conclusive (de Walque, 2007; Lleras-Muney, 2005). Moreover, numerous studies have primarily focused on developed country contexts with very few focusing on developing countries (Lochner, 2011). This paper analyzes the causal effect of maternal education on child mortality (neo-natal, infant and under 5 child mortality) in Cameroon, which is one of the developing countries in Sub-Saharan Africa. Maternal education is of importance as far as child health is concerned, since researches have established that children born to highly educated mothers have better chances of acquiring more education themselves and have better labor market outcomes compared to their counterparts born to non-educated mothers (Currie, 2009).

Various studies have examined the potential relationship between maternal education and child health outcomes. One of the frequently cited mechanisms through which maternal education affects child health is through greater access to economic resources brought about by a higher education and the increased knowledge associated with it (Adler & Newman, 2002; Glewwe, 1999; Grossman, 2006; Lindeboom et al., 2009). From previous research, it is highly probable that educated women are more likely to be of higher socioeconomic status. This higher socioeconomic status is possibly through improvements in their entrepreneurial capacity (Jiménez et al., 2015) which impacts their fertility behavior and consequently reducing the risks of infant and child mortality (Al-Meshari et al., 1996; Hobcraft, 1993). Maternal education is most likely to be associated with better child health through its positive influence on parental cognitive skills (literacy and numeracy), health knowledge, and household income (Glewwe, 1999). At the community level, aggregate levels of maternal education can help improve sanitation and medical services and consequently child nutrition (Alderman et al., 2003; Desai & Alva, 1998).

Taiwan`s compulsory schooling laws have been associated with higher infant survival rates (Chou et al., 2010; Grytten et al., 2014) and higher birth weight in the case of Norway (Grytten et al., 2014). While the majority of the studies as mentioned agree on the effects of

maternal education on child health, other studies have found small and negligible effects. Lindeboom et al. (2009) using the 1947 education reform in the United Kingdom that extended the minimum school leaving age from 14 to 15 years as an instrument for parental education found very negligible effects of parental education on a broad range of child health and nutrition indicators. In a recent study, Gathmann et al. (2015) used data from 18 European countries that implemented compulsory schooling reforms in the twentieth century. They found that increased education levels yield minuscule reductions in adult mortality, especially for adult males while adult females seem not to benefit from the education reforms (Makate and Makate, 2016).

For developing countries, literature on the the causal effects of maternal education on child health outcomes is still limited. In Nigeria, UPE has been linked to delayed fertility outcomes among vulnerable mothers (Osili & Long, 2008). Recently, Grépin and Bharadwaj (2015) examined the impact of maternal education on child mortality and fertility preferences for Zimbabwe. Using the education reform that expanded primary and secondary school enrollment in Zimbabwe, they find that children born to educated mothers were 21% less likely to die compared to their counterparts born to uneducated mothers. Also, Makate and Makate

(2016) examine infant and child mortality and maternal education using nationally representative Malawi DHS survey data.

1.3 School Fee Policy in Cameroon

Cameroon is a Central African Country with a population of about 23 million (World Bank 2013). In 2000, the government of Cameroon abolished school fees for primary education (Kattan, 2006). Before this policy was implemented, the country experienced more than a decade of economic crisis, increased corruption in the education administration and declining school enrollments. In 2000, the government implemented an action plan, the Stratégie du Secteur de 1'Education, 2000, to improve the education sector at all levels (World Bank, 2005e). The government also distributed free textbooks to priority areas (World Bank, 2005e).

Abolishment of tuition fee in primary schools led to an increase in the primary level enrollment. The Primary Gross Enrollment Rate (GER) increased from 87.7% in year 2000 to 105.5% in year 2002. Primary per student government expenditure rose from CFAF 21,000 in year 1995 to CFAF 45,000 in year 2001 (World Bank, 2005e)

2.1 Method and Data source

Our empirical analysis relies on data from two rounds of Demographic and Health Survey (DHS) conducted in 2004 and 2011. DHS are nationally representative surveys of reproductive-aged women (aged 15-49) and their children, among other information. The Cameroon Demographic and Health Surveys are conducted by the Institut National de la Statistique (INS) in collaboration with the Ministère de la Santé Publique, Yaoundé, with technical assistance from ICF International. The first stage involves a random sampling of clusters or enumeration areas followed by second stage of a random sampling of listed households within the randomly selected clusters. We collect information on child mortality from the DHS' birth histories section (BR recode file of DHS), with data collected on full history of all reproductive-aged women. The birth records have all information on every birth a woman had, the date of birth and death of a woman's child.

2.2 Measures of child mortality

Using mortality information from the Cameroon DHS birth file, we create three binary indicators to measure mortality in children as our dependent variables. We created a binary indicator taking 1 if the child died before reaching 28 days (neonatal mortality) and 0 otherwise. Also, we generated a binary indicator taking 1 if the child died before reaching one year (infant

mortality) and 0 otherwise. Our third binary indicator takes 1 if the child died before reaching the age of five years (under-five mortality) and 0 otherwise.

We use maternal years of completed schooling observed at the survey date. Our model include other variables that might influence child mortality. We left out education of the father due to its endogeneity and high correlation with maternal education (Chou et al., 2010). We controlled for the region of residence at the time of the survey, urban residence, woman's previous birth experiences, birth type (single or multiple births), and survey fixed effects.

2.3 Econometric Model

We estimated equation (1) to analyze the relationship between maternal education and child mortality outcomes, which is specified as follows:

$$Y_i = \alpha_0 + \beta_1 S_i + \beta_2 V_i + \varepsilon_i \qquad (1)$$

Where Y_i indicates the outcome of interest of the i^{th} woman; S_i is the woman's years of completed schooling; Vi is a vector of maternal, child health characteristics and others for instance age in 2000, survey fixed effects, regional fixed effects, among others α_0 is an intercept term and ε_i is an idiosyncratic error term. The coefficient we are mainly focusing on

is β_1 which captures the effect of education on child mortality outcomes. Using to estimate equation (1) might produce biased regression results in our parameter of interest β_1 due to influence of some potentially unobserved maternal characteristics affecting our outcome. To reduce the chances of omitted variable bias, the same equation is estimated using a two-stage least square (2SLS) regression approach.

Following the novel works of (Baum et al., 2003, 2007) and many other reform-related studies in various countries (Agüero & Ramachandran, 2010; Aguero & Bharadwaj, 2014; Behrman, 2015a, b; Fenske, 2015; Grépin & Bharadwaj, 2015; Tsai & Venkataramani, 2015, Makate and Makate, 2016) the 2SLS model we estimate is specified below. We estimate the first stage using the following regression model specification:

$$S_i = \delta_0 + \delta_1 Z_i + \delta_4 V_i + \epsilon_i \qquad (2)$$

Where S_i measures maternal education; Z_i is the instrument variable that takes value 1 if the woman's age in 2000 was less than or equal to 13 and 0 otherwise; Age_{2000} is the age of the woman in 2000; Vt s the vector of control variables including survey fixed effects, region fixed effects, dummy indicator equals 1 for urban residence and 0 otherwise; $\delta 0$ is an intercept term;

other δs are regression coefficients and, ϵ_i is an error term. The predicted values for maternal education $\widehat{S_i}$ from equation (2) are then used in the second stage regression model that takes the following form:

$$Y_i = \beta_0 + \beta_1 \hat{S}_i + \beta_4 V_i + \varepsilon_i \qquad (3)$$

Estimating equation (3) via 2SLS gives the coefficient estimate of β_1 which is the causal impact of maternal education on child mortality outcomes. We assume that Z_i is uncorrelated with both ϵ_i and ε_i.

As suggested in van der Klaauw (2002), we use the binary indicator for the age threshold as an excluded instrument in the 2SLS regression model that accounts for the endogeneity of maternal education (van der Klaauw, 2002). Since exposure to the free primary tuition policy depended on the mother's year of birth, we compare the outcomes for women who were between the ages 5-13 years in 2000 (treatment group) as the official primary schooling age in Cameroon is from 6 -13 years.

The rationale for employing the 2SLS approach rests on two broad assumptions. First, conditional on other observables, the instrumental variable should only influence the outcome variables through exposure to the free primary tuition fee policy (Wooldridge, 2002).

Second, the instrumental variable should be highly correlated with maternal schooling. In other words, the free primary tuition fee policy should increase the years of maternal schooling in Cameroon.

3. Descriptive statistics

The descriptive statistics are presented in Table 8, 9 and 1000 below. The average of years of schooling for the women in our sample is 4.15 years. Most of the women in our sample gave birth to their first child around the age of 18 years. Total birth is on average around 2 per each woman.

Table 8: Summary Statistics: Neo-Natal Mortality

Variable	Obs	Mean	Std. Dev.	Min	Max
Neonatal Mortality	28502	.0332257	.1792287	0	1
Education years	28502	4.158796	2.431037	0	17
Wealth Index	28502	3.209599	1.275797	1	5
Total Birth	28502	5.75921	2.588394	1	15
Age at 1st Birth	28502	18.27781	3.189182	11	40
Age marriage	28502	18.0714	4.436428	8	46
Vaccination	28502	.253105	.4347982	0	1
Child gender	28502	1.492772	.4999565	1	2

Table 9: Summary Statistics: Neo-Natal Mortality

Variable	Obs	Mean	Std. Dev.	Min	Max
Infant Mortality	28502	.0418216	.2001849	0	1
Education years	28502	4.158796	2.431037	0	17
Wealth Index	28502	3.209599	1.275797	1	5
Total Births	28502	5.75921	2.588394	1	15
Age at 1st Birth	28502	18.27781	3.189182	11	40
Age marriage	28502	18.0714	4.436428	8	46
Vaccination	28502	.253105	.4347982	0	1
Child gender	28502	1.492772	.4999565	1	2

Table 10: Summary Statistics: Child Mortality

Variable	Obs	Mean	Std. Dev.	Min	Max
Child Mortality	28502	.0451898	.2077239	0	1
Education years	28502	4.158796	2.431037	0	17
Wealth Index	28502	3.209599	1.275797	1	5
Total Births	28502	5.75921	2.588394	1	15
Age at 1st Birth	28502	18.27781	3.189182	11	40
Age marriage	28502	18.0714	4.436428	8	46
Vaccination (at least 3 vaccines)	28502	.253105	.4347982	0	1
Child gender	28502	1.492772	.4999565	1	2

4. Results

We explored the potential mechanisms through which maternal education might impact child's mortality. The IV estimates are presented in Table 11, Table 12 and Table 13 for child mortality, infant mortality and neo-natal mortality. They show the impact of the 2000 policy on the number of years spent in school for all the women in our sample. We also reported OLS and First Stage results in the same tables. The potential variables we considered include

an indicator husband's years of education, mother's literacy, prenatal care use, child immunizations, among others.

Table 11: Maternal Education on Child Mortality

Variable	(1) OLS Estimates	(2) First Stage	(3) 2SLS Estimates
Education Years	-0.000804		0.0690*
	-0.000506		-0.0375
Wealth Index	-0.00739***	0.0477***	-0.0123***
	-0.00106	-0.0124	-0.00202
Total Births	0.000862*	0.0115**	0.000783
	-0.000495	-0.0058	-0.000622
Age at 1st Birth	-0.00149***	-0.005	-0.00144***
	-0.000439	-0.00514	-0.00043
Age Marriage	0.000302	0.0100***	-0.00057
	-0.000315	-0.00368	-0.000487
Vaccination (at least 3 vaccines)	0.0000739	-0.265***	0.0224**
	-0.00285	-0.0334	-0.0103
Child Gender (male=1)	-0.00132	0.0648**	-0.00545*
	-0.00246	-0.0288	-0.0033
Rural(=1)	0.0011	0.03	-0.00425
	-0.00284	-0.0332	-0.00268
Policy (=1 affected by policy)		0.0599**	
		-0.0291	
Constant	0.0907***	3.785***	-0.162
	-0.0103	-0.119	-0.143
Observations	28,502	28,502	41,731
R-squared	0.003	0.004	0.005

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 12: Maternal Education on Infant Mortality

Variable	(1) OLS Estimates	(2) First Stage	(3) IV Estimates
Education Years	0.00139***		-0.134***
	-0.000488		-0.0351
Wealth Index	0.00560***	0.0439***	-0.000562
	-0.00096	-0.0117	-0.00176
Total Births	0.000965**	0.0115**	0.00292***
	-0.000477	-0.0058	-0.00058
Age at 1st Birth	0.00161***	-0.0051	-0.00222***
	-0.000423	-0.00514	-0.000403
Age Marriage	0.000308	0.0100***	0.00120***
	-0.000303	-0.00368	-0.000455
Vaccination (at least 3 vaccines)	0.00352	-0.264***	-0.0352***
	-0.00274	-0.0333	-0.0096
Child Gender (male=1)	-0.00358	0.0647**	0.00509*
	-0.00237	-0.0288	-0.00308
Policy (dummy)		0.0598**	
		-0.0291	
Constant	0.0884***	3.808***	0.607***
	-0.00972	-0.116	-0.134
Observations	28,502	28,502	41,731
R-squared	0.003	0.004	0.004

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Our findings corroborate previous studies in developing countries (Bbaale & Buyinza, 2012; Desai & Alva, 1998; Gathmann et al., 2015; Grépin & Bharadwaj, 2015; Omariba et al., 2007; Quamruzzaman et al., 2014; Van De Poel et al., 2009, Makate and Makate, 2006). For Zimbabwe, as an example Grépin and Bharadwaj (2015) found that a one-year increase in maternal education lowered the risk of infant mortality by approximately 1.2 percentage points and our result for Cameroon shows that an additional year of maternal

schooling reduces the risk of infant mortality by about 1.3 percentage points. Contrary to (Makate and Makate, 2016), our results shows that neo-natal mortality rate is reduced by maternal education. Child, Infant and Neo-natal mortality are reduced by about 6.9%, 1.3% and 6.3% respectively.

Table 13: Maternal Education on Neo-natal mortality

	(1)	(2)	(3)
Variable	OLS Estimates	First Stage	IV Estimates
Education Years	-0.000629		-0.0636**
	-0.000437		-0.0318
Wealth Index	-0.00271***	0.0439***	-0.000936
	-0.00086	-0.0117	-0.00159
Total Births	0.00108**	0.0115**	0.00306***
	-0.000427	-0.0058	-0.000526
Age at 1st Birth	-0.00111***	-0.0051	-0.000929**
	-0.000379	-0.00514	-0.000365
Age Marriage	0.00119***	0.0100***	0.00104**
	-0.000272	-0.00368	-0.000412
Vaccination (at least 3 vaccines)	-0.00669***	-0.264***	-0.0227***
	-0.00246	-0.0333	-0.0087
Child Gender (male=1)	-0.00771***	0.0647**	-0.00482*
	-0.00212	-0.0288	-0.00279
Policy (=1 if affected by Policy)		0.0598**	
		-0.0291	
Constant	0.0502***	3.808***	0.297**
	-0.00871	-0.116	-0.122
Observations	28,502	28,502	41,731
R-squared	0.002	0.004	0.003

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

In this paper, we investigated the effect of mothers' education on the health outcome of children (neonatal, infant and child mortality rates) in Cameroon using Universal Primary

Education (UPE) as a natural experiment. We observe that policy (Universal Primary Education) significantly increased maternal education level. The findings show that additional years of maternal education are significantly associated with reductions in neo-natal, infant mortality. Infant and Neo-natal mortality rates are reduced by about 6.9%, 1.3% and 6.3% respectively even though IV estimates and OLS estimates for and under-five mortality show contradictory results.

Chapter 3: Effect of Emigration on Wage Earnings in Nepal

1.1 Introduction

Despite the fact that a number of researches have been dedicated on the effects of immigration on native countries, a very few researches have been done on the effects emigration on the labor markets of sending countries. One of the possible reason for the handful of research on this field could be the scarcity of data on emigrants and their characteristics. Nevertheless, it is getting quite good attention from the researchers in recent years.

Hanson (2005) examines regions of high external and internal migration in Mexico and finds that earnings for males increased in high migration regions. Earnings increased by 6-9% in high-migration regions as compared with low migration region. Mishra (2007) ingeniously matches Mexican immigrants in both US and Mexican censuses and applies education-skill group approach proposed by Borjas (2003) to estimate the effect of emigration on the wage of stayers. She finds that 10% increase in emigration for an education- skill group increases wages by an average of 3.2 percent for similar groups in Mexico. Benjamin (2013) reinforces the findings for positive wage impact of emigration by analyzing data on the stayers in Lithuania. Chiquiar (2005 shows that Mexican states with larger trade and migration links benefit from increased faster wage growths and labor returns.

Dutsmann (2015) investigate the impact of emigration on Polish wages for 10 years (1998-2007) and conclude that emigration increased wages of high and medium-skill but they suspect negative effects for those at the lower skill group.

There are two dominant theoretical foundations for labor migration; macro and micro models. The macro model migration theories explain that the labor migration is a part of economic development. Due to differences in geography that results differences in supply and demand of labor migration occurs. This difference is mostly observed between rural the agricultural sector and the urban non-agricultural sector. One of the basic models (Lewis, 1954) assumes that a perfect labor market with a surplus labor in the traditional agricultural sector. The urban sector absorbs the surplus labor from the rural sector. The rural sector workers are attracted by the urban sector because of a positive wage differential.

Another strong macro model for the labor migration is dual market theory (Priore, 1979). The dual market theory explains that labor migration occurs from structural demand from developed countries, as the wage rates in the labor market in developed countries are high. The primary sectors provide jobs that are well paid. The secondary sector also attracts unskilled workers with higher wages than the labor markets in the countries of origin. Thus, emigration of labor to the developed countries takes place until the wage rates become the same in the two countries.

The micro models of migration emphasize the human capital approach where an individual is assumed to act independently in making decisions whether to migrate or to stay.

The motivation for the decision comes from maximizing the personal utility. The traditional approach to micro models regard migration as an investment in human capital, an idea developed by Sjaastad (1962). According to him, migration decision is made not only because the income differences but also due to differences in returns to skills. The model predicts the migration patterns of less educated people from those regions with high income-inequality to the regions with low-income inequality. On the other hand, as migration improves their relative returns, well-educated from low income-inequality regions would migrate to high income inequality-regions. This could be a possible explanation for Nepalese migrant workers.

The self-selection phenomenon among migrants is a widely accepted to be positive in many studies on migration (Pieck, 2011). However, there are also some previous studies, which found negative self-selection of migrants. The question of negative self-selection is solved to some extent by Chiquiar (2005) with an alternative model that predicts that negative self-selection does not occur if the origin of the migration has high inequality. The same is true even if the migration costs decrease with skills.

Regarding positive self-selection among migrants, there have been concerns about the potentially bigger impacts on countries sending migrants. As outflows of positively selected immigrants can result in brain drain for the sending country, positive self-selection of migrants leads to decreasing the human capital and ability of the country to build and sustain effective institutions (Akee, 2007). Brain drain is a subject of concern for countries sending labors overseas.

1.2 Labor Migration from Nepal

The present wave of migration began The Labor Act of 1985 that paved the way for present migration trend of Nepali workers to foreign countries. The government of Nepal has recognized overseas employment opportunities as a means to reduce poverty and unemployment in the country. Promotion of foreign employment has been emphasized in the Ninth five-year-plan (1997-2002) and Tenth Five-year plan (2002-2007). These plans sought not only to reduce unemployment but also to reduce income, gender and ethnic disparities through foreign employment (Gurung, Ganesh, 2004) .

Due to high demand for labor, the rapidly growing Gulf countries and Malaysia are the main destination for Nepalese migrant workers. Out of 384,665 people that left Nepal for employment in 22 different countries in 2012, Qatar and Malaysia attracted 105,681 and 98,367 respectively. An estimated 11.8 percentage of the populations live in foreign countries and 32.1% of the households have at least one member who migrated to foreign countries (CBS, 2012)

Poverty and unemployment can be attributed as the chief reasons for the migration of Nepalese workforce to foreign countries. Nepal is one of the poorest countries with $619.5 nominal GDP per capita (World Bank, 2012) as of 2012. A quarter of the population is bound to live below the poverty line with the unemployment rate at 46% in 2012 (CIA World

Factbook, 2012). An estimated 11.8 percentage of the populations live in foreign countries and 32.1% of the households have at least one member who migrated to foreign countries (CBS, 2012)

Labor migration has clearly brought benefits to the Nepalese society. The poverty level has declined to 31% in 2004 from 42% in 1996 of which more than half of the decline has been linked to contribution of remittances by migrants (Adhikari, 2011). A further declined from 34% to 21% between 2004 and 2010 would have been impossible without remittance. It would have just declined to 27% in absence of remittance (Adhikari, 2011). However, the impact of emigration on the wage earnings of stayers remains unaccounted. Prior literature on this topic are mostly focused on wage effects on the source countries such as Mexico and some other EU nations but almost no research exists for countries outside North America and Europe.

A simple labour demand/labour supply theory predicts wage growth when emigration occurs via decrease in labour supply. The paper is based on this simple hypothesis. The rest of the paper proceeds as follows. Section 2 describes empirical strategy; section 3 describes data and descriptive statistics. Results of analysis and conclusion are presented in sections 4 and 5.

2.1 Empirical Strategy

A simple labor demand-supply model in a competitive market can easily explain the effect of emigration on wages of a source country. Increased emigration results in reduction on labor supply thereby increasing the wages of the non-migrants. As shown in Figure 1,

equilibrium wage, W0 increases to W1 when labor supply shifts from S0 to S1 due to emigration.

Figure 1: Effect of Emigration on the wages of a source country

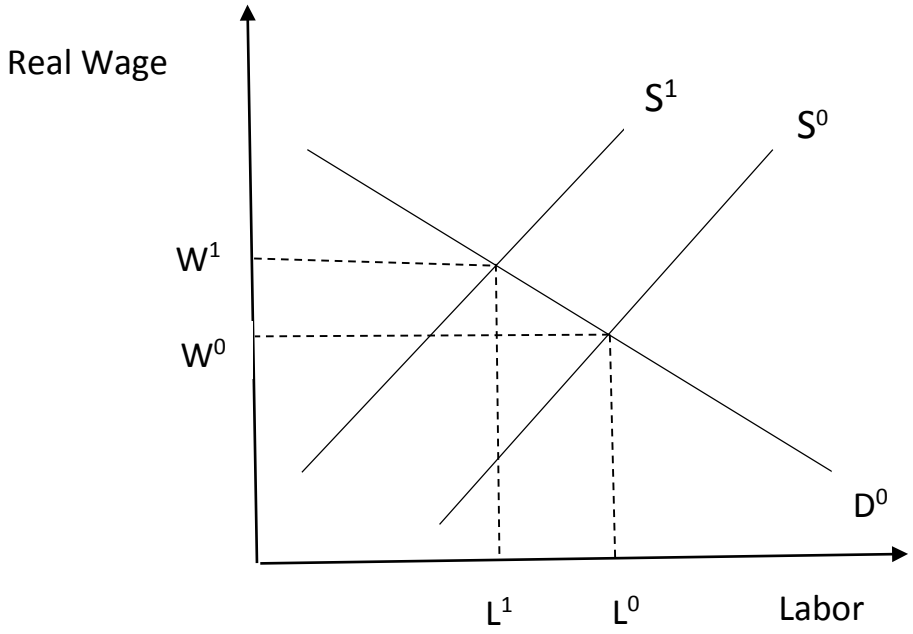
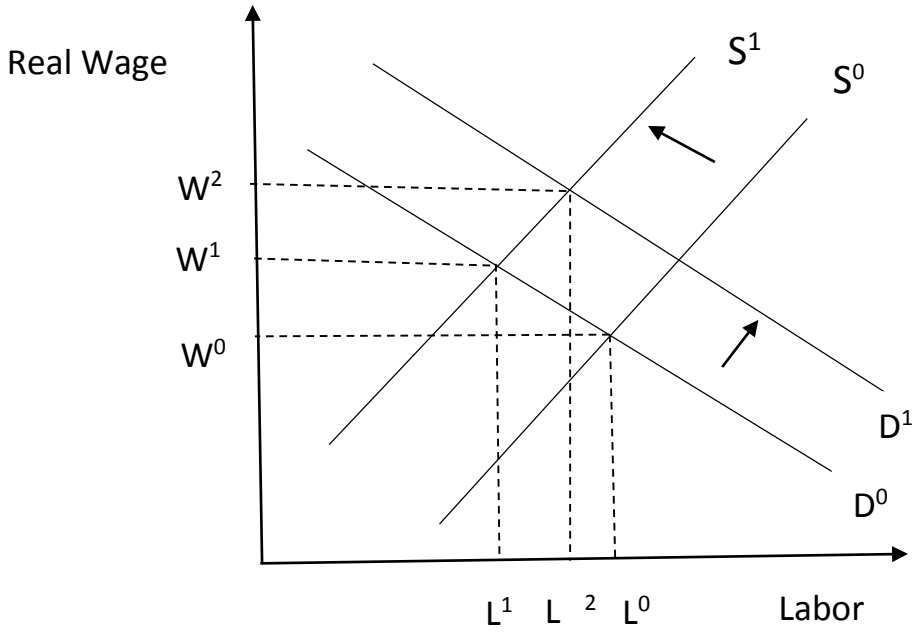
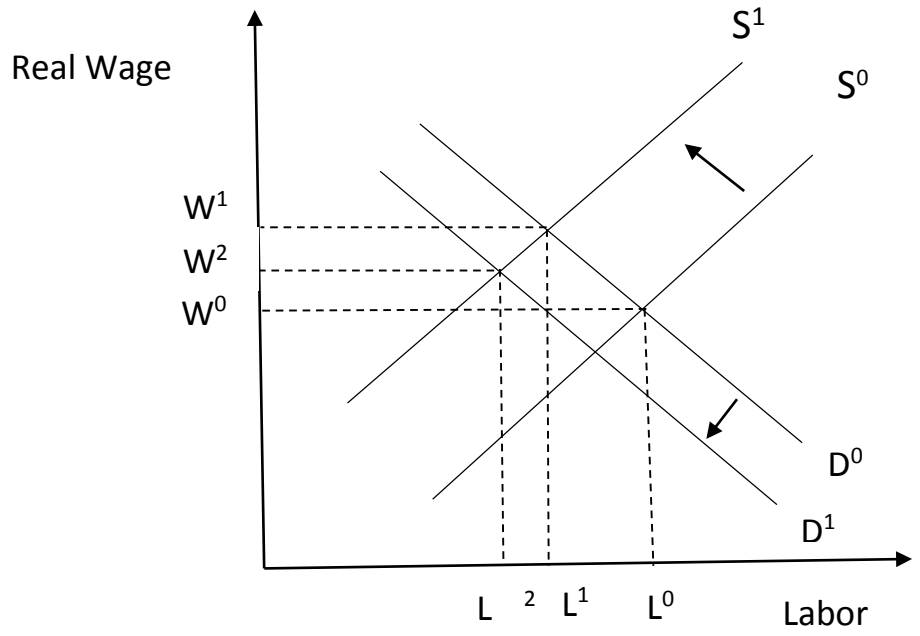


Figure 2: Effect of Emigration on the wages of a source country when labor demand is increasing



Similar effect could be predicted when the labor demand in a source country is increasing.

Figure 3: Effect of Emigration on the wages of a source country when the labor demand is falling



Labor demand in a source country could fall owing to various structural changes. Figure 3, shows one example on how emigration affects wages when labor demand falls in a source country. The equilibrium wage is determined depending upon the demand magnitudes of the emigration and reduction on demand. To capture the effect of emigration on wage of stayers, a simple starting point could be the estimation of the following model.

$$lwage_{ij} = \beta_0 + \beta_1 Emi_j 2011 + \beta 2 X_{1j} + \mu_{ij} \qquad (1)$$

Where, $lwage_{ij}$ is the log of real wage for an individual *i* (stayer) in a place *j*;

Emi_j2011 is the ratio of emigrants (15-65 years of age) to the labour force (15-56 years of age) in the region $_j$ in the year 2011; X_{ij} is the vector of individual characteristics; education, experience, gender, etc. for a stayer *i* in region *j*, and μ_{ij} is an error term.

β_1, the coefficient of primary interest, cannot have causal interpretation as emigration (Emij2011) is potentially confounded with unobserved factors that indirectly affect wage via emigration. Numerous literatures (Zimmermann, 1997) (Rapoport, 2010) (Genicot, 210) (Espinosa, 1997) argue that migration network (a form of social capital) is an important driving force for migration. Migrants provide useful information, financial assistance, sense of security, etc. to other potential migrants in the country of their origin. Based on the idea that emigration triggers further emigration (migration network), this paper uses past emigration rate (Emigration rate in 2001) as an Instrumental Variable (IV) to estimate the effect on the present emigration rate (Emigration rate in 2011) so as to overcome the issue of endogeneity. The first and second stages of the two-stage least squares (2SLS) can therefore, be specified by equations (2) and (3) respectively as below:

$$\widehat{Emi}_{j2011}=\delta_0+\delta_1 Emi_{j2001}+\delta_2 X_{ij}+\varepsilon_{ij} \qquad (2)$$

$$lwage_{ij}=\alpha_0+\alpha_1 \widehat{Emi}_{j2011+}\ \alpha_2 X_{ij}+\eta_{ij} \qquad (3)$$

Where Emi_{j2001} is the emigration rate in 2001, X_{ij} is same as defined before and ε_{ij} and η_{ij} are the error terms.

Equation (2) is estimated using an ordinary least squares (OLS) technique to generate the predicted value $\widehat{Emi}$j2011. Finally, equation (3) involves estimating wage as a function of predicted level of emigrants, i.e. $\widehat{Emi}_{j2011}$ and other individual-level characteristics.

3. Data and Descriptive Statistics

The National Living Standard Survey (NLSS) is a nationally represented household level survey conducted by the Central Bureau of Statistics, Government of Nepal. It is also one of the most comprehensive surveys that include the data from sample households all over the country. The survey based on 7,020 households across the country covers more than 16,000 individuals. Detailed questions about family living conditions, education, income, etc. were asked. This paper uses a cross-section data from NLSS III conducted in 2010/2011. The survey covers all 75 districts in Nepal.

Further, I use Nepal Census 2011 data to compile number of emigrants and workforce for district level and calculate the ratio of emigrants to the total working population for the year 2011. Similarly, ratio of emigrant to work force for 2001 is calculated from Nepal Census 2001 data for each district level. The ratio of emigrant to work force for 2001 is used as an instrumental variable. The variable 'experience' is defined as age in 2011- No. of years of Schooling -6. Individuals working in their own enterprises are excluded from the sample. Wages are converted into hourly wage.

Figure 4 shows the trend of emigration in the year 2001 and 2011 corresponding to each district. Broadly, it can be said that the pattern of emigration is similar for both the years albeit with different magnitudes reinforcing the theory of Migration Network. Mean and standard deviation of the variables used are presented in Table1.

Figure 4: Labor Emigration rates in the year 2001 and 2011

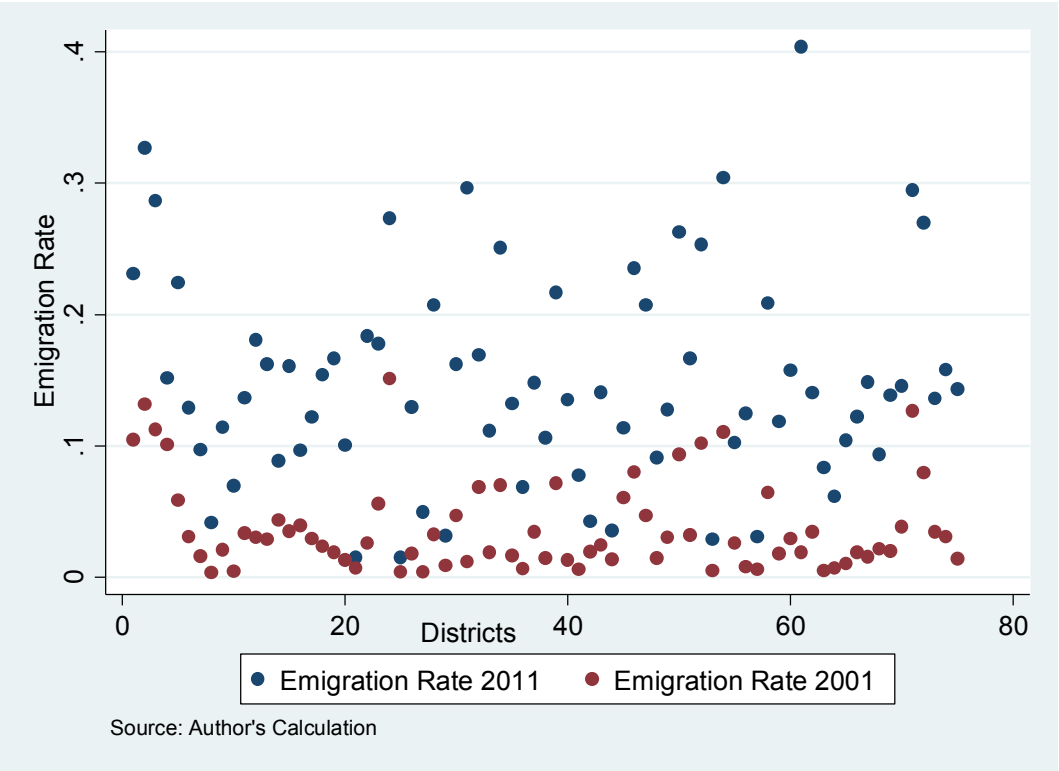


Table 14: Descriptive Statistics

Variables	Mean	Std. Dev.
Log Wage	3.698301	1.072783
Emigration 2011	0.146702	0.068313
Female	1.836778	3.613283
Education Years	25.25422	13.29018
Experience	814.3623	731.3068
Experience Square	0.566881	0.495566
Mountain (base Rural Terai)	0.118318	0.323023
Urban Hills	0.085293	0.279351
Rural Hills	0.181278	0.385294
Urban Terai	0.301497	0.458962
No. of Observation=2,715		

4. Results of Regression

The results of regression on for the full sample is presented in the Table 15. The results of OLS first stage and second-stage of 2SLS are significant at 1% level. The OLS estimate shows that 1 percentage point increase in emigration increases hourly wage by 59 percentage. While the IV estimate predicts 116 percentage points rise in real wage for every percentage point increase in emigration.

Compared to OLS estimates, the IV estimates show a larger effect on wages. It can be seen from columns (1) and (3) in Table 15 that the difference in OLS and IV estimates is 57 percentage points. The reason for the difference could be that OLS estimation could be downward-biased towards zero if unobservable factors reduce the probability of emigration. Suppose that if the economic growth or FDI inflow is high, the negative correlation between better employment opportunities at home country and emigration will bias the OLS results downward. As expected number of years of education, affects wage positively. As for the regions, wages in the Urban Hills saw the largest increment compared to Rural Terai.

Table 15: Results of Regression for the full sample

Dependent Variables	(1) OLS Estimate	(2) Firs Stage (Emigration 2011)	(3) IV Estimate
Emigration 2011	0.593**		1.162***
	(0.242)		(0.354)
Education Years	0.0337***	0.000400**	0.0334***
	(0.00562)	(0.000167)	(0.00561)
Experience	0.0128**	0.000327	0.0132**
	(0.00555)	(0.000218)	(0.00555)
Experience Sq.	-0.000184*	-4.50e-06	-0.000193**
	(9.69e-05)	(4.05e-06)	(9.70e-05)
Female	-0.116***	-0.00141	-0.117***
	(0.0323)	(0.00149)	(0.0323)
Wage Agri (=1)	-0.555***	-0.00500***	-0.550***
	(0.0364)	(0.00191)	(0.0365)
Mountains(base Rural Terai)	0.0351	-0.00195	0.0385
	(0.0612)	(0.00356)	(0.0610)
Urban Hills	0.292***	0.00238	0.288***
	(0.0519)	(0.00145)	(0.0518)
Rural Hills	0.207***	0.000789	0.187***
	(0.0378)	(0.00211)	(0.0382)
Urban Terai	0.0864	0.00202	0.0851
	(0.0640)	(0.00198)	(0.0641)
Emigration 2001		1.723***	
		(0.0291)	
Constant	3.380***	0.0864***	3.301***
	(0.0817)	(0.00292)	(0.0900)
Observations	4,209	4,209	4,209
R-squared	0.071	0.538	0.072

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Tables 16 and Table 17 display the results of wage regressions for individuals working in agricultural and non-agricultural sectors. In agricultural sector, the coefficients of emigration are small and negative but non-significant in both OLS and IV estimates Table 16 columns (1) and (3). However, in non-agricultural sector (Table 17) the both the estimates (column 1 & 3)

are positively significant at 1% level. The IV estimates show two times larger effect (70 percentage points) than the OLS estimates.

Table 16: Results of Regression for agricultural wage

Dependent Variables	(1) OLS Estimates	(2) First Stage (Emigration 2011)	(3) IV Estimates
Emigration 2011	-0.430		-0.740
	(0.481)		(0.545)
Education Years	0.0216	0.00100	0.0224
	(0.0155)	(0.000671)	(0.0155)
Experience	0.00870	0.000105	0.00833
	(0.00961)	(0.000507)	(0.00958)
Experience Sq.	-0.000142	-5.79e-07	-0.000134
	(0.000171)	(9.03e-06)	(0.000170)
Female	-0.169***	0.00134	-0.167***
	(0.0643)	(0.00352)	(0.0644)
Mountains(base Rural Terai)	0.00189	-0.00378	-0.000535
	(0.135)	(0.00705)	(0.136)
Urban Hills	0.633***	0.0107	0.643***
	(0.196)	(0.00778)	(0.198)
Rural Hills	0.268***	-0.00624*	0.276***
	(0.0662)	(0.00378)	(0.0662)
Urban Terai	0.107	-0.00720	0.106
	(0.148)	(0.00819)	(0.148)
Emigration 2001		1.965***	
		(0.0959)	
Constant	3.046***	0.0766***	3.087***
	(0.146)	(0.00725)	(0.147)
Observations	498	498	498
R-squared	0.074	0.663	0.075

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17: Results of Regression for non- agricultural wage

Dependent Variables	(1) OLS Estimate	(2) First Stage (Emigration 2011)	(3) IV Estimate
Emigration 2011	0.705***		1.402***
	(0.264)		(0.393)
Education Years	0.0347***	0.000373**	0.0343***
	(0.00585)	(0.000172)	(0.00584)
Experience	0.0134**	0.000362	0.0139**
	(0.00613)	(0.000236)	(0.00613)
Experience Sq.	-0.000192*	-5.16e-06	-0.000201*
	(0.000107)	(4.40e-06)	(0.000107)
Female	-0.109***	-0.00175	-0.110***
	(0.0355)	(0.00162)	(0.0355)
Mountains(base Rural Terai)	0.0381	-0.00170	0.0420
	(0.0669)	(0.00391)	(0.0667)
Urban Hills	0.276***	0.00222	0.271***
	(0.0543)	(0.00150)	(0.0542)
Rural Hills	0.197***	0.00184	0.171***
	(0.0428)	(0.00237)	(0.0433)
Urban Terai	0.0808	0.00270	0.0789
	(0.0684)	(0.00204)	(0.0684)
Emigration 2001		1.694***	
		(0.0310)	
Constant	3.355***	0.0869***	3.259***
	(0.0895)	(0.00314)	(0.0992)
Observations	3,711	3,711	3,711
R-squared	0.033	0.524	0.035

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

The research investigated the causal effects of emigration on wage on the stayers in Nepal using an instrumental variable approach. The paper finds evidence that emigration helped increase the wage of non-emigrants in Nepal. Data limitations on movement of capital and foreign direct investments (FDI) in district level means the paper is not free of some limitations. Overall, both OLS and IV estimates yielded significant positive results. Sector wise,

wages in agriculture related jobs was not affected at least at any acceptable level of significance level but non-agriculture sector saw significant rise in wage. This could be because emigration rate is higher for skilled workers as non-agricultural sector generally employs more skilled workers than agricultural-sector or it could be due to a larger unemployment rate among non-skilled workers who are likely to work in agriculture sector.. To investigate which effect is greater and whether these effects are sustained in a long run or not remains open for future research.

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