# Is emigration of workers contributing to better schooling outcomes in Nepal?

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Abstract

This paper presents evidence on the effects of emigration for work on schooling outcomes for primary and secondary school-age children in Nepal. The identified effects however critically depend on how schooling outcomes are measured. While conventional measures of school attendance indicate no impact, our new set of schooling status and schooling gap measures reveals significant impacts. Schooling status measures reveal favourable impacts for girls, and for emigration to India. Schooling gap measures reveal favourable and significant effects of all emigration on schooling outcomes for girls and of emigration to other countries for boys.

Keyword: migration, schooling, Nepal

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# 1 Introduction

The growth of international migrants worldwide has been accelerating, from an annual rate of 1.2% between 1990 and 2000 to 2.3% since 2000. In 2017, more than 258 million individuals (representing 3.4% of the world population) left their home country to live or work in another region (United Nations, 2017). More often than not, migrants send money back to their family members in their country of origin. The amount of remittances sent back home is astounding. With USD 450 billion sent in 2017 (World Bank, 2017), remittances are by far higher than official development assistance (ODA) which reached USD 143 billion in 2016 (OECD, 2017). Given the scale of migration and the magnitude of dollars sent home, there has been a persistent interest in analysing the impact that such a large scale phenomenon can have in migrant-sending economies. While most of the literature has found positive effects of migration on poverty reduction and growth in sending areas (Adams and Page, 2005; World Bank, 2006; Acosta, Fajnzylber, and Lopez, 2007; Giuliano and Ruiz-Arranz, 2009; Cooray, 2012; Ziesemer, 2012) recent analyses and surveys highlight that impacts on human capital investment, and educational investment in particular, are not necessarily positive (Antman, 2013; Démurger, 2015). In the large literature focussing on schooling outcomes, while some studies have found no (or in some cases negative) impact, others find significant positive effects, but there is considerable heterogeneity across subgroups of households, migrants and children.[1]

In part, the heterogeneity reflects the different channels through which migration influences schooling outcomes. The literature identifies four key channels: higher remittances, altered

[1] See, for instance, Acosta, Fajnzylber and Lopez (2007), Yang (2008), Bansak and Chezum (2009), Calero, Bedi, and Sparrow (2009), Acosta (2011), McKenzie and Rapoport (2011), Antman (2012), Alcaraz, Chiquiar, and Salcedo (2012), Acharya and Leon-Gonzalez (2014), Zhou, Murphy, and Ran (2014), Bouoiyour, Miftah, and Mouhoud (2016), Yabiku and Agadjanian (2017).

expected returns to schooling, altered decision-making within the household, and changes in time allocation among household members. Remittances relax the budget constraint and can have positive income effects on schooling outcomes of children (Calero, Bedi, and Sparrow, 2009; Amuedo-Dorantes and Pozo, 2010). The prospects of higher earnings through migration can change the expected returns to schooling positively or negatively depending upon how far the migration opportunity rewards higher or lower skills (Mountford, 1997; Beine, Docquier and Rapoport, 2001; 2008; Katz and Rapoport, 2005; de Brauw and Giles, 2017). Migration alters the axes of decision-making within the household, often giving women a greater role when it is mostly the men who migrate (Cortes, 2015; Bouoiyour, Miftah, and Mouhoud, 2016). Finally, the absence of an able adult household member can alter time allocation within the household, including children's time in educational pursuits (Meyerhoefer and Chen, 2011, Coon, 2016). The overall effect of emigration on children's education is thus both theoretically indeterminate and empirically diverse depending upon the relative strengths of the different forces at play. However, given the scale of migration, the question of whether and how education is affected by emigration is of tremendous importance.

A particular feature of the empirical literature on this topic is that a large share of studies have focused on relatively simple measures of schooling such as school attendance or enrollment.[2] However, simple enrolment-based measures of schooling can be quite limited in various ways. In some environments, school enrolment rates are already quite high and it may be difficult to pick up additional effects of migration on enrolments. So, it may be important to focus on how children are progressing through school. More generally, school attendance is a poor measure of

[2] We use the terms attendance and enrolment interchangeably throughout the paper. Like most other studies, we do not have data on daily attendance through the school year.

educational achievement. School enrollment can hide different dynamics occurring among both current attendees and non-attendees; for instance, while the numbers of children out of school could decline, those in school could be progressing poorly as a result of inadequate learning.[3] In such contexts, enrollment can be quite misleading in assessing the overall impact of migration on schooling performance.

In this paper, we examine whether emigration is contributing to better schooling outcomes of 6-14 year old children in Nepal using a wider range of schooling outcome variables. In addition to school attendance, we investigate effects on four mutually exclusive measures of schooling status and three schooling deprivation indices for boys and girls. Using two waves of nationally representative household survey data, we estimate the effects of emigration to India and the rest of the world in a district fixed-effects instrumental variable framework. Our instrumental variable exploits the historical distribution of overseas migrant networks and country-specific variations in emigrants over time to identify the effects of emigration to India and the rest of the world. The four mutually exclusive schooling status measures relate to prevalence rates for children who have never attended school, those who have dropped out, those straggling (lagging behind age-appropriate grade), and those progressing normally. For our three schooling deprivation indices, we use the schooling gap measures proposed by Datt and Wang (2017) that build in the size and distribution of schooling deficits across children.

A key message of the paper is that the measurement of schooling outcomes can be as crucial as the empirical strategy for identifying impact. In particular, we highlight the importance of going beyond school attendance to measures that better capture other dimensions of educational

[3] There is growing emphasis on the low levels of learning in developing countries; see, for instance, Pritchett (2013), UNESCO (2014) and World Bank (2018).

achievement. Measuring schooling outcomes with attendance, we find no impact of emigration for either boys or girls, regardless of the migration destination. But, significant effects emerge when impact is evaluated in terms of the four schooling status measures. In particular, emigration significantly increases the normal-progression rate and reduces the straggling rate amongst girls aged 6-14 years, while no similar effect is observed for boys. We also find that for these results, the destination matters: larger and more significant positive effects on girls' schooling are found for emigration to India in contrast to that to other countries. However, the paper further argues that these schooling status measures while more informative than attendance are still in the nature of partial indices. A more complete picture of schooling impacts of emigration is offered by the schooling deprivation indices that are sensitive to the distribution of schooling deficits across children. The use of these measures reveals that both emigration to India and to other countries have favourable and significant effects on schooling outcomes, and the effects, though larger for girls, are not confined to girls.

While the main contribution of the paper is its use of a novel and wider set of schooling outcome measures that can be readily constructed from typically available survey data, we also discuss the likely roles of the aforementioned four channels – remittances, expected returns, household decision-making and time allocation – for the effects that our schooling outcome measures reveal. Though our data do not allow us to quantify the contribution of individual channels, we draw upon the heterogeneity of our estimated effects as well as reduced-form estimates of how emigration influences remittances, female headship and work participation of children to explore the likely interplay of these different channels in the Nepalese context.

The paper is organized in seven sections. Section 2 presents key characteristics of external migrant workers based on survey data drawing out some important implications for our empirical strategy.

Section 3 introduces our new set of schooling outcome measures and offers a brief descriptive account of these outcomes for Nepalese children aged 6 to 14 years. Section 4 discusses our estimation methodology. Section 5 presents our results, while section 6 discusses the potential mechanisms at play. The last section offers some concluding observations.

## 2 Emigrating workers of Nepal

### 2.1 Data and the Nepalese context

This paper draws upon data from the Nepal Living Standards Survey III (NLSS3) for 2010 and the Nepal Labor Force Survey 2008 II (NLFS2). Both data sets are from nationally representative surveys. There are two main reasons underlying our choice of these data sets. First, both surveys have comparable modules with information on basic characteristics of migrant workers and remittances, as well as on schooling variables for children. In particular, the schooling and migration questions allows us to construct these variables in identical fashion. Second, the sample design of NLSS3 was closely related to that of NLFS2. Specifically, NLSS3's cross-sectional stratified random sample of 499 primary sampling units (PSUs) in 2010 was randomly drawn from the 799 PSUs included in NLFS2 for 2008 with the same level of stratification. These two data sets thus offer a two-period panel of 499 PSUs allowing us to define comparable schooling and migration variables at the PSU level.[4]

Migrant workers are identified from the modules on absentee members in NLFS2 and NLSS3. Absentee members are defined as individuals who are not current household members but have been household members in the past and for whom there is an expectation that they will come back

[4] The schooling outcomes are defined later in section 3. For further details on the data including data dissemination policy, see CBS (2009, 2011).

to the household at some point in the future. In our analysis, migrants are defined as absentee members of a household. This also corresponds to the definition used in the Nepal Migration Survey 2009 conducted by the World Bank (World Bank, 2011) and also the definition used by the Central Bureau of Statistics in their Report on the Nepal Labour Force Survey (CBS, 2009). A migrant worker is then defined as an absentee member (i) whose primary activity is not either of the following – household work, student, not working, not reported or don't know, or (ii) if the primary activity is "don't know" but the absentee member nonetheless sends remittance to household members.[5]

Emigration of workers and the related inflow of remittances have emerged as one of the most salient features of the Nepalese economy over the last two decades. The number of external migrant workers and the value of remittances received are large. Based on NLSS3 data for 2010, the total number of migrant workers abroad is estimated at around 2.2 million, or about 13% of the national labor force aged 10 and above – a very high proportion by international standards. For 2010, total remittance inflows are estimated at around US$ 3.5 billion – a near four-fold increase since 2004. Remittances represent about one-fifth of the country's GDP, making Nepal the top 6$^{th}$ country in the world ranked by remittance inflows as a proportion of GDP in 2010.[6] Yet these are likely to be underestimates as they do not fully account for inflows from India as well as other remittances flowing through informal channels. To many observers, the rapid growth in emigration of Nepalese workers reflects the weakness of the domestic economy in creating adequate

[5] Use of condition (ii) allows us to cover 480 cases where the primary activity of the absentee member is reported as "don't know" while the type of work is reported as wage job (471 cases) or self-employed (9 cases). Since the primary activity question asks for the 3-digit NSCO occupation code, these are presumably cases where the household knows that the absentee members is wage or self-employed, but they do not know the particular occupational category they are employed in.

[6] The countries with higher remittance–GDP ratios are Kyrgyz Republic (21%), Samoa (23%), Moldova (23%), Lesotho (29%), and Tajikistan (31%); estimates by Data Prospects Group, World Bank. Yet, these are relatively small countries; their *combined* population (for 2010) is only about 60% of Nepal's population.

employment opportunities for its rapidly growing workforce. Migration outside the country for work has clearly been an important source of additional income for Nepali households. The scale and significance of worker migration in Nepal makes it a good candidate for studying its impact.

## 2.2 Characteristics of emigrant workers from Nepal

Several characteristics of emigrant workers from Nepal are pertinent to our empirical approach. First, external migration for work is very widespread: about 30% of households have one or more absentee member working outside the country.[7] In contrast, the size of those migrating within the country for work is only one third the size of external migrant workers. In the vast majority of cases, households only have a single emigrant worker (80% of all households with external migrant workers). Remittances from migrant workers represent about a fifth of the per capita consumption of all households, and nearly two-thirds of the per capita consumption of households with an external migrant worker (see Table A2 in the Appendix).

Second, emigration for work is widespread throughout the country; the shares of rural and urban areas, regions and ecological belts in the total number of emigrating workers is broadly in line with their shares in total population (see Table A3 in the Appendix).

Third, 99% of emigrant workers are 15 years old or older: children below the age of 15 as a rule do not migrate outside the country for work, even though they are a non-trivial proportion (11%) of the total emigrant population (absentee members living outside the country). Similarly, only 2% of the emigrating workers are 55 years or older. The vast majority – about four-fifths – are in the

[7] Table A1 in the Appendix shows the distribution of households by the number of migrant workers.

prime age range of 20-44 years. Even if we look at the age at the time of migrating[8] rather than the current age of migrants, we find that 95% of emigrating workers were 15 years or older, and less than 3% were 50 or above when they migrated.

Fourth, emigration for work is almost entirely a male phenomenon: 94% of the emigrant workers in 2010 were male (95% in 2008). Nearly 70% of them are married. Not surprisingly, the absence of the migrating members from the household necessitates a rearrangement of roles and responsibilities within the household. For instance, for more than 40% of married male emigrant workers, their absence led their wives to assume headship of the household. And such female-headed households account for nearly 40% of all female-headed households in Nepal.[9] Change in headship is an important, but by no means the only, instance of a rearrangement of roles and responsibilities due to emigration. Out-migration of key members can significantly alter the organization and day-to-day running of many households, and this can plausibly be expected to influence several household outcomes.

[Table 1]

Finally, there is also a qualitative difference between emigration of workers to India and that to other countries (especially, the Gulf and Malaysia). For 2010, among the migrant workers abroad, 42% worked in India, 32% in the Gulf countries, and 12% in Malaysia. There are several notable facets of this variation in destination. India has an open, porous border with Nepal. Citizens of either country do not need a visa to travel across the border. There are also shared ties of language

[8] Age at the time of migrating is obtained as the current age of the migrant worker minus the number of years since the migrant left. There is some ambiguity as to how the latter is reported for those migrant workers who may have had multiple spells of migration, though in most cases this is likely to refer to the beginning of the most recent spell.
[9] Nepal has an uncharacteristically high proportion of female-headed households. For 2010, 26.6% of households are female-headed in 2010, and 10.4% of households are female-headed because the erstwhile male head has migrated abroad for work.

and culture especially across the neighbouring parts of India. In contrast, common destinations other than India are more distant, typically necessitate air travel and compliance with destination country's visa requirements, and are more dissimilar in terms of language and culture. There are also notable differences in the emigrant profile (Table 1). Relative to India, emigration to other countries tends to have a larger proportion of workers in the prime age group 20-44 years (90% relative to 68% for India); emigrating workers to other countries tend to have a better level of education (median years of schooling higher by 3 years); and median (mean) remittances per worker from other countries are five (three) times higher than those from India. The latter suggests that at least the gross returns from emigration to other countries are much higher than from emigration to India.[10] In light of these differences, our estimation methodology below will distinguish between these two types of emigration to allow for potentially differential effects.

## 3 Measuring schooling outcomes

This section introduces the eight outcome measures that we use to investigate the impact of emigration on schooling outcomes of children from the sending households. There are three sets of measures. All measures are constructed at the PSU level.

The first set is the singleton for school attendance which is the conventional and perhaps most widely-used schooling outcome measure. School attendance simply reflects the fact that a child is going to school. At the PSU level, thus, our first outcome is just the school attendance rate for

[10] To look into whether the net returns are higher or not will require controlling for differences in the age and education level of workers as well as the costs of migration.

the 6-14 year old children in the PSU. This measure does not take into account the grade the children may be attending.

The second set of measures exploit the notion of schooling status of a child in terms of their actual grade and the grade appropriate for their age. This relevance and significance of this notion could be illustrated by referring to the Nepalese schooling context. As per the Ministry of Education guidelines, a Nepalese child should be in grade 1 by age 5, should finish the primary cycles up to grade 5 by age 9, should progress to lower secondary grades 6 to 8 through age 10 to 12 years, and to secondary grades 9 and 10 at age 13 and 14 respectively (MOE, 2012).[11] Thus, the simple fact of a 14-year old attending grade 10 presumes many things have gone right: starting school at the correct age of 5, uninterrupted schooling since then, and successful progression to the next grade every year. In an ideal world, nearly all of the 14-year olds would be attending grade 10. In reality, many things often do not go right. Late starts, grade repetition, and interruption or termination of schooling for instance have implied that in 2010 only 8% of the 14-year olds in Nepal were enrolled in grade 10 (or above). About 14% of the 14-year olds were not enrolled at all, 16% were enrolled in grade 9, and 63% were enrolled in lower grades from 2 to 8.[12]

As the above discussion illustrates, children of any given age between 6 to 14 years, must belong to one of the following four mutually-exclusive schooling groups:

a) those who have never attended school (the never-attended group)

b) those who have currently dropped out but attended school in the past (the drop-outs)

[11] Age is measured in completed years.

[12] Appendix Table A4 shows the stipulated grade structure by age for the schooling system in Nepal. Figure A1 in the Appendix shows the actual distribution of 14-year olds by their current grade for 2010.

c) those who are currently attending school but below their age-appropriate grade (the stragglers or the left-behind group)

d) those currently attending school at the age-appropriate grade (the normal progression group).

The shares of these four schooling status groups in the relevant school-age population give us our second set of schooling outcome measures. Denoting these shares as $s_{jt}^{NA}$, $s_{jt}^{DO}$, $s_{jt}^{ST}$ and $s_{jt}^{NP}$ for PSU $j$ at date $t$, several points relevant to their measurement can be made. First, note that by definition these shares add up to one.

$$s_{jt}^{NA} + s_{jt}^{DO} + s_{jt}^{ST} + s_{jt}^{NP} = 1$$

Second, from an education policy perspective, the normal-progression (NP) and the never-attended (NA) groups represent opposite ends of the spectrum from the best to the worst outcome, with the stragglers (ST) and the drop-outs (DO) in between representing two different types of underperformance.

Third, the share of the normal-progression group, $s_{jt}^{NP}$, is similar to the net enrolment rate (NER), though with the important difference that $s_{jt}^{NP}$ is measured as the mean of a binary variable *for every child*, with the variable taking the value 1 if the child is attending the age-appropriate grade and 0 otherwise. On the other hand, the net enrolment rate is typically measured *over an age-band* and it will thus still include many children who are mismatched with their age-appropriate grade.[13] Thus, $s_{jt}^{NP}$ is a more stringent measure of age-specific schooling outcomes and will be strictly

[13] For instance, in the Nepalese context, the secondary net enrolment rate (NER) would be measured as the proportion of 10-14 year olds who are currently attending grades 6-10. Thus measured, secondary NER would, for example, still include many 14-year olds who are in grades 6-9 (or 13-year olds who are in grades 6-8), while $s_{jt}^{NP}$ measured for 10-14 year olds will exclude them.

below conventionally measured NERs so long as there are any stragglers within the NER age-band. Due to its complete exclusion of stragglers, $s_{jt}^{NP}$ may arguably be also considered a more accurate measure of schooling performance than the net enrolment rate.

Fourth, also note that the current attendance rate, our conventional first measure, is just the sum $s_{jt}^{ST} + s_{jt}^{NP}$. As attendance rates improve, this amounts to a shift out of the never-attended and drop-out groups into stragglers and the normal-progression group. Thus, an improvement in attendance rates can coexist with an unchanging or even declining share of the normal-progression group, $s_{jt}^{NP}$. Similarly, stagnation in attendance rates can coexist with both improvements in schooling outcomes or worsening schooling outcomes. For example, attendance can remain unchanged while the rate of the normal-progression group is increasing and the rate of the stragglers is decreasing. In this case, we would miss out on improvements of educational outcomes. Of course, the reverse is possible too: the normal-progression group could be decreasing with an increasing rates of stragglers. In that case, a negative impact on schooling outcomes would fail to be captured by attendance. These dynamics occur for the attendees but a similar point can be made for those currently not attending school with compensating variations occurring between the dropout rates and the rate of the never attending groups. Thus, distinguishing between the different schooling status groups offers a richer and more accurate description of schooling performance.

It is nonetheless arguable that measures based on schooling status groups, while an improvement over simple school attendance-type measures, are still in the nature of partial indices, as they do not build in the extent of schooling deficits across children. For instance, the proportion of stragglers gives us the fraction of attending children who are lagging behind their age-appropriate grade, but it does not tell us how far they are lagging behind. Thus, we can supplement the

schooling status measures with schooling deprivation indices (as in Datt and Wang, 2017) that explicitly build in the distribution of schooling deficits, defined as the lag between the desired or age-appropriate grade for a child and her/his actual grade. Note that the age-appropriate grade is determined as the age of the child minus the recommended starting age at grade 1.[14] The actual grade is taken to be the highest completed grade for a currently attending child, the last grade completed if the child has currently dropped out, and zero if the child has never attended school.

Thus, following Datt and Wang (2017), if $g_{kj}^{*}$ denotes the highest grade child $k$ in PSU $j$ should have completed given her/his age, and $g_{kj}$ denotes the actual highest grade she/has completed, then schooling deprivation indices for PSU $j$ with $n_j$ total number of children in the relevant age-group (6-14 years in our case) can be defined as:

$$D_j^{\alpha} = \frac{1}{n_j}\sum_{k=1}^{n_j}\left(\frac{g_{kj}^{*} - g_{kj}}{g_{kj}^{*}}\right)^{\alpha} I(g_{kj} < g_{kj}^{*}) \text{ for } \alpha \geq 0$$

where $I(g_{kj} < g_{kj}^{*}) = 1$ if $g_{kj} < g_{kj}^{*}$ and $I(g_{kj} < g_{kj}^{*}) = 0$ otherwise.

The three indices for $\alpha = 0, 1, 2$ constitute our third set of schooling outcome measures. These measures are similar to the Foster-Greer-Thorbecke (1984) class of poverty measures and have a similar interpretation. In particular, for $\alpha = 0$, the measure is analogous to the headcount index in the poverty literature, and measures the proportion of children with a (positive) schooling gap (with highest completed grades below the grades they should have completed given their age). The values of $\alpha = 1, 2$ similarly define the schooling gap and the squared schooling gap indices respectively. The schooling gap index for $\alpha = 1$ is the average proportionate schooling gap for all

[14] Thus, for instance, if the recommended starting age for grade 1 is 5 years, then a child of age 6 should have completed grade 1.

children in the relevant age group, where the schooling gap is counted as zero for those whose highest grade completed equals or in some cases even exceeds the age-appropriate benchmark. The squared schooling gap index for $\alpha = 2$ makes the $D^{\alpha}$ index convex, by according greater weights to those with higher schooling gaps, thus making the measure sensitive to the distribution of schooling gaps, not just their average value.[15]

[Table 2]

Table 2 presents the eight schooling outcome measures for 2008 and 2010 for Nepal for 6-14 year old girls and boys. As can be seen from the Table, attendance rates are quite high for both years and both girls and boys. Though boys have a slightly higher attendance rate than girls in 2008, by 2010 their attendance rates are very similar at 92 and 94 percent for girls and boys respectively. Thus, out of school children, though not altogether unimportant, does not appear to be the major issue for educational policy in Nepal. Looking at the schooling groups, the never-attended group is relatively small, accounting for about 5% in 2010 (7% in 2008) of all 6-14 year olds. Current drop-outs are an even smaller group, representing less than 2% of the 6-14 year olds in both 2008 and 2010. The major issue has to do with a very low share of the normal progression group (11% in 2010) and a very high share of stragglers (82% in 2010). Thus, the greater challenge for schooling outcomes in Nepal is not that children are not attending school, but that they are falling behind with only a small proportion progressing to grades consistent with their age. There is also heterogeneity in the extent to which children lag behind their age-appropriate grade. While some lag behind by just a year, others straggle by many more. Table A5 in the Appendix shows the distribution of schooling deficits (number of years children lag behind their age-appropriate grade)

[15] These schooling deprivation indices and their properties are discussed in greater detail in Datt and Wang (2017).

by age. For instance, among 10-year olds, 17% lag behind by one year, 24% by 2 years, 21% by three years and 29% by four or more years.

Table 2 also presents the schooling deprivation indices for Nepal for 2008 and 2010. Focusing first on the headcount measure for $\alpha = 0$, the estimates show that 89% of 6-14 year olds in Nepal in 2010 had a positive schooling gap (of one year or more) if one were to go by the Ministry of Education guidelines for age-appropriate grade completion. There is no significant change in this proportion between 2008 and 2010; nor are there any significant gender differences. However, some deterioration in schooling performance is indicated by the increases in the schooling gap and the squared schooling gap indices between 2008 and 2010. The relatively greater increase in the squared schooling gap index suggests that the deterioration is greater for those with larger schooling gaps. This pattern also seems more evident for boys than girls. Interestingly, girls seem to converge towards boys over time, though with a decreasing never-attendance rate but an increasing straggler rate.

## 4 Estimation methodology

We estimate the following fixed effects model for each of the eight schooling outcomes:

$$y_{ijt} = \alpha_j + \beta_I M_{ijt}^{India} + \beta_R M_{ijt}^{Rest} + \gamma X_{ijt} + \delta_{2010} + \varepsilon_{ijt}$$

The dependent variable $y_{ijt}$ measures a schooling outcome for 6-14 year old children living in primary sampling unit (PSU) *i* in district *j* at time *t*. As mentioned above, the model is estimated at the PSU level (exploiting the panel of PSUs across 2008 and 2010) and for girls and boys

separately.[16] The key explanatory variables of interest are the two variables relating to emigration of workers from the PSU. The variable $M_{ijt}^{India}$ represents the number of migrant workers to India from PSU *i* in district *j* at time *t*, normalized by the working age population of PSU *i* in district *j* at time *t*.[17]

The variable $M_{ijt}^{Rest}$ analogously represents migrant workers to the rest of the world (mostly, the Gulf countries and Malaysia). Note that the working age population of PSU *i* is defined to include individuals aged 15-60 years currently residing in PSU *i* as well as migrant workers from PSU *i* currently working abroad. The coefficients $\beta_I$ and $\beta_R$ capture the impacts of out-migration to India and to the rest of the world respectively on the dependent variable of interest. Distinguishing between the two destinations will allow us to test whether different destinations affect child schooling outcomes differently.

The term $\delta_{2010}$ is a dummy variable equal to one if the year is 2010. The term $\alpha_j$ is the fixed effect for district *j*. The model also includes some additional control variables ($X_{ijt}$) to capture time-varying influences on educational outcomes that may be correlated with out-migration rate. First, motivated by the oft-noted consideration that parents' education levels influence those of their children, we include the share of those with college or higher education amongst all persons aged 31 and above. We also introduce a set of age-controls for children motivated by another stylized fact about schooling outcomes, viz., they tend to worsen with the age of children; for instance, dropout rates tend to be higher for older children, secondary NERs tend to be lower than primary NERs. We thus include as additional controls the shares of single-year age-groups (6 to 13)

[16] Appendix Tables A6-A8 also report gender-pooled estimates for reference, but the discussion in the main paper focuses on separate estimates for girls and boys.
[17] A migrant worker is defined as an absentee household member who is working; for details, see section 2.1 above.

amongst 6-14 year olds for each gender.[18] The term $\delta_{2010}$ captures any national level time effect on schooling outcomes. The error term $\varepsilon_{ijt}$ captures all other unobserved time-varying factors.

For comparison purposes, we also report ordinary least squares (OLS) estimates omitting district fixed effects. The OLS estimates however are likely to suffer from selection bias; for instance, poorer areas may have both higher outmigration rates and worse schooling outcomes. The use of district fixed effects can partially address this form of selection bias by controlling for time-invariant observed and unobserved determinants of schooling outcomes for each district.

The inclusion of district fixed effects however may not be sufficient to identify the causal effects of out-migration on children's schooling outcomes. Specifically, because individuals may choose to go abroad in search of employment when the local economy or labor market conditions in the district are poor, the variation in out-migration rate within the district will likely be correlated with unobserved time varying factors that also affect children's schooling outcomes. For example, when the local economy in district *j* is depressed, more individuals may choose to go abroad for employment and children's schooling outcomes may deteriorate due to financial difficulties. If this is the case, the negative effect of poor local economy on student outcomes may countervail the effect of remittances, biasing the positive effect of out-migration downward. To address this form of endogeneity problem, we adopt an instrumental variable strategy that is often used in studies of the impacts of immigration.

**Instrumental variable**

We construct instrumental variables for the fractions of emigrants to India and the rest of the world in the working age population following an approach used in earlier work by Altonji and Card

[18] Thus, the variables included are the sex-specific shares of 6-year olds, 7-year olds etc. amongst 6-14 year olds.

(1991), Card and DiNardo (2000), Card (2001), and Cortes (2008). The instrumental variable exploits the tendency of migrants to move to foreign destinations relying on pre-established networks of migration from specific source to destination areas. The literature has often relied on the relevance of preexisting migration network (Fajnzylber and Lopez, 2007; Amuedo-Dorantes and Pozo, 2010; Acosta, 2011; Mansour, Chaaban, and Litchfield, 2011; Bouoiyour, Miftah, and, Mouhoud, 2016) to explain current international migration. Following this general approach, our instrument is constructed as:

$$Z_{ijt}^{d} = \left(\frac{1}{(Working\ age\ population)_{ijt}}\right)\phi_{ij,pre}^{d} \cdot M_{t}^{d} \quad \text{where}$$

$$\phi_{ij,pre}^{d} = \frac{M_{ij,pre}^{d}}{M_{pre}^{d}}$$

Note that $M_t^d$ is the total national number of migrants from Nepal to destination *d* at time *t*, and $\phi_{ij,pre}^{d}$ is the fraction of national migrant workers to destination *d* in 2007 or earlier that originated from PSU $i$. The values of $\phi_{ij,pre}^{d}$ are computed from NLFS2 2008 using information on those foreign migrant workers who had been away for longer than 12 months. Thus, our instrument can be interpreted as destination-specific predicted number of migrant workers from PSU $i$ normalized by the working-age population of the PSU $i$ in district *j* at time *t*. Effectively, we allocate the total number of migrants from Nepal in a given year to the two foreign destinations, namely India and rest of the world, to different PSUs according to their historical distribution across the same PSUs to form a predicted number of migrants by PSU to the two destinations for that year.

This type of instrument is often referred to as the Bartik type or shift-share instrument.[19] We would expect $Z_{ijt}^{d}$ to be a strong instrument if migrant workers tend to work in foreign destinations in a manner similar to their predecessors from the same area, i.e., if pre-existing local migration networks are strong. Some direct evidence on the strength of such networks is available from NLSS3. For instance, roughly half of all migrant workers found their current overseas job through relatives, friends or neighbors, and almost 31% found their current jobs through employment agencies who heavily rely on local brokers. Both suggest that a concentration of early migrants from the same source areas to particular destinations will likely influence new migrants' choice of foreign destinations.

As we use the same historical migration networks to construct the instrumental variable in each PSU for both years (thanks to the panel dimension of the data) and since we also include a set of district fixed effects in our regression specification, we effectively isolate differences in historical migration networks across PSUs and rely on exogenous variations in them for identification. Although there may be some concern with the exclusion restriction for these instruments if there are persistent general equilibrium effects of past migration networks, the use of district fixed effect should alleviate this concern. Our preferred results are thus those based on instrumental variables with fixed-effects.

## 5 Results

### 5.1 Effects on attendance and the four schooling status groups

[19] See Freeman (1980), Bartik (1991) and Blanchard and Katz (1992) for an early use of Bartik instruments. Goldsmith-Pinkham, Sorkin, and Swift (2018) provide a complete review and analysis of the instruments.

Tables 4 and 5 report our results on the effects of migration on attendance rate and the fractions of different schooling status groups. The Tables report OLS, fixed effects (FE) and fixed-effect instrumental variable (FE-IV) estimates. Before discussing these results, it is useful to refer to the first-stage estimates for our instrumental variables. Table 3 shows the first-stage regressions of migration to India and to other countries for boys in columns (1) and (2) and for girls in columns (3) and (4). Unsurprisingly, the predictions are very similar for both boys and girls.[20] As seen in Table 3, with p-values below 1%, the first-stage estimates indicate that prior networks of migrant workers from a particular PSU to India and other countries predict well the current flow of migrants to India and to the rest of the world. The F-statistics for both migration variables are large and highly significant to allay potential concerns regarding weak instruments.

[Table 3]

The OLS estimates in Table 4 show that neither out-migration to India nor out-migration to other countries predict changes in the school attendance rate of children of any gender. However, the OLS estimates may suffer from selection bias as previously discussed. The district fixed effects regression, which partially addresses this sort of selection bias, shows a mildly significant increase in boys' attendance with increases of emigration to countries other than India, but not for other destinations. Our preferred FE-IV estimates which further address the endogeneity of out-migration fail to detect any significant effects on attendance rates regardless of destination. These

[20] The only reasons why the two differ are (i) the difference in the PSU samples for boys and girls on account of the exclusion of one PSU that did not have any school-age boys, and (ii) the difference in the controls for age which are gender-specific.

results thus offer no evidence that out-migration to India or to other countries has any impact on schooling as measured by the school attendance rate.

[Table 4]

Table 5 reports the effects of out-migration on the shares of the different schooling status groups for girls and boys. Panels A and B presents the effects for shares of the never-attended and drop-out groups. Focusing on the preferred FE-IV estimates, our results reveal no significant effects for either of these schooling status groups for either destination, for either boys or girls. These results are consistent with the lack of any significant effects on attendance rates noted above. They complement those results by further indicating that neither of the two components of those not attending – the never-attended and dropout groups – is significantly influenced by worker migration.

[Table 5]

By contrast, Panels C and D for the stragglers and those progressing normally reveal an interesting pattern of significant schooling effects of out-migration. Focusing again on the preferred FE-IV estimates, the results show that emigration to India significantly reduces the share of stragglers and significantly increases the share of those progressing normally amongst 6-14 year old girls. For every one percentage point increase in out-migration to India, girls' straggling rate falls by 0.8 percentage points while their normal progression rate increases by 0.7 percentage points. The effects for out-migration to other countries or for boys are not significant.

It is also notable that the significant effects on straggler and normal progression rates for girls are almost equal and opposite in sign, indicating that out-migration improves schooling outcomes for

girls through a shift out of the straggling group to those progressing normally. The results thus highlight the value of disaggregation by different schooling status groups. Since straggler and normal progression rates together add up to the school attendance rate, this important aspect of improvement in schooling outcomes would have been completely bypassed by assessments that relied only on the attendance rate.

### 5.2 Effects on schooling deprivation indices

As noted earlier, the shares of the NA, DO, ST and NP groups, while more informative than school attendance, still offer a somewhat limited perspective insofar as they ignore the magnitude and distribution of schooling gaps. The schooling gap indices, $D_j^{\alpha}$, introduced in section 3 offer a way of building these in. Note that the schooling gap measure for $\alpha = 0$ shows the prevalence rate of any schooling deficits amongst school-age children, and by construction, $D_j^0 = 1 - s_j^{NP}$. Hence, the estimates for $\alpha = 0$ will by construction be mirror images of the estimates for normal progression rate in Panel D of Table 4. Thus, Table 6 only reports the estimates for on schooling gap indices for $\alpha = 1$ and 2, which extend the results thus far and offer additional insights. The size of the estimated parameters for the schooling deprivation gap and squared gap measures are somewhat difficult to interpret. What matters is whether they are both significant or if only one or neither is significant. For example, if the estimate for the schooling gap measure is not significant, but that for the squared schooling gap is, this indicates that migration reduces schooling deprivation not by reducing the average schooling gap, but by reducing the inequality of schooling gaps.

[Table 6]

Table 6 shows that when a weight is placed on not just the occurrence but also the size ($\alpha = 1$) and inequality ($\alpha = 2$) of schooling deficits of children, more pronounced impacts of migration to countries other than India as well as impacts on boys' schooling outcomes are uncovered. For the schooling gap and the squared schooling gap indices ($\alpha = 1$ and 2 respectively), the effect of emigration to India in reducing girls' schooling deprivation remains strong (Panels A and B, Table 5), while its effect for boys remains insignificant. But additionally now, the effect of migration to other countries also emerges as statistically significant (at the 10% level or better) not only for girls but also for boys. Moreover, in contrast to the earlier rejection of similar impacts of emigration to India and other countries for schooling gap prevalence, for schooling gap and squared schooling indices the hypothesis of similar impacts of migration to alternative destinations can no longer be rejected for either girls or boys. In general, the effects for girls still tend to be stronger and larger than for boys.

Again, these results underscore the importance of how schooling outcomes are measured for assessing the educational effects of migration. The impacts of migration to other destinations and the impacts for boys would have remained uncovered by assessments relying on measures that ignored the size and distribution of schooling deficits. The significant impacts of migration to other countries for measures with $\alpha = 1, 2$ and the absence of significant effects on prevalence measures for $\alpha = 0$, in particular, indicate that emigration to other countries tends to confer benefits to children with relatively larger schooling deficits; it helps reduce their schooling deficits, even as it has no discernible impact on their graduation to normal progression.

### 5.3 Robustness

We conduct three checks of the robustness of our results. First, instead of a common time effect, we introduce district-specific time effects to allow for possible time-varying factors at the district level. As seen from Table 7, our results are robust to this augmented specification with district-year fixed effects.

[Table 7]

Second, we utilize data on schooling outcomes for individual children to re-estimate our model with individual child-level outcome variables, while retaining the same migration variables at the PSU-level on the right hand side. This allows for individual-level variation in outcomes and considerably enhances the number of observation to 8,901 for boys and 8,619 for girls. The results are presented in Table 8. They confirm that our earlier results presented above in Tables 4-6 are robust to estimation with individual child-level schooling outcomes.

[Table 8]

Finally, we examine robustness with respect to a potential concern with our method of constructing our instrumental variable. Recall that we use the information on migrants who had been away for more than 12 months in 2008 to approximate historical or pre-existing migration patterns. Specifically, we use this information to determine the pre-existing proportion of the national total of migrants to a particular destination, say India, who came from a particular locality (PSU). Let's say this is x%. We then work out the expected number of migrants from that locality to India in a given year, say 2008 (or 2010) as x% of the national total of migrants to India in 2008 (or 2010). The idea is that while the actual number of migrants from that locality to India in 2008 (or 2010) will of course be different from the expected number, the latter is potentially a good predictor of

the former. However, since we are using a fraction of the total migrants in 2008 (those who migrated in 2007 or earlier) to predict the whole, there is an "overlap" between total current migrants and the fraction used to compute the expected migrants, though this overlap is limited only to 2008. In order to check if this matters, we redefine current migrants in both years limiting them only to those who have been away for less than 12 months. Table 9 presents the results upon re-estimating our model with this redefinition of the migration variables (which avoids the "overlap" for 2008). As seen from a comparison of Table 9 with Tables 4-6, our earlier results are robust to this redefinition.

[Table 9]

## 6 Potential channels for the schooling effects of migration

As noted in the Introduction, the literature identifies four key channels through which migration may affect schooling outcomes of children in the sending areas. These relate to the potential roles of: (i) remittances, (ii) expected returns to schooling, (iii) changes in headship of households, and (iv) changes in time allocation as it relates to children. To explore the potential involvement of these channels, in part we draw upon what can be learnt from the heterogeneity of our estimated schooling effects across gender, destinations and outcomes. Moreover, we also utilize additional data available from the same surveys on remittances, work participation of children and female headship of households that are relevant to three of the above four channels. Note that for lack of additional instruments, we do not have the option of augmenting our model with additional explanatory variables in relation to these channels. Thus, we are unable to quantify the contribution of these individual channels. However, by looking into how migration affects them, we can shed some light on which of these channels are likely to be in play. We acknowledge that while some

of the potential channels may take a longer period to manifest, we are limited by our data which only covers two close years.

Table 10 reports our FE-IV estimates of how migration influences remittances, work participation of boys and girls, and female headship of households. Effectively, we estimate specifications similar to those for schooling outcomes, but replacing the outcome variable respectively with: remittances per working-age adult in the PSU, work participation rate of 6-14 year old boys in the PSU and similarly for girls, and the proportion of female-headed households in the PSU. We summarize our observations on each of the channels below.

[Table 10]

*Remittances*: Remittances sent back home by migrant workers is perhaps the most obvious channel through which migration can influence schooling outcomes in sending areas. We find that migration increases remittances.[21] The positive effect is significant for migration to countries other than India. For India, the effect is positive too and is in fact larger than for other countries though it is more noisy (Table 10). Note that these are gross remittance effects. However, the costs of migration to India with an open porous border with Nepal are only a fraction of the migration costs to other countries which require air travel, visa costs and payments to migration agents. In light of this, we interpret the evidence to indicate that remittances net of migration costs increase with migration to both India and other countries. Higher remittances are likely to promote better schooling outcomes, though the empirical evidence on this is mixed (Nepal, 2016; Bansak and Chezum, 2015; Bansak, Chezum, and Giri, 2015; Acharya and Leon-Gonzalez, 2014).

[21] Note that these are remittances received from external migrant workers only.

*Work participation of boys and girls*: We define work participation rate for boys (girls) as the proportion of 6-14 year old boys (girls) engaged in economic activity for at least 7 hours per week (or an hour per day), where economic activity itself is defined as hours spent in wage or self-employment in agricultural or non-agricultural activities. We find that while migration to other countries has no significant effect on, migration to India significantly increases participation of both boys and girls in economic activities (Table 10). The magnitude of the effect is similar for boys and girls. While many children in Nepal combine work with schooling, the migration-induced extra work participation may have adverse implications for schooling outcomes.[22]

*Female headship*: The estimates in Table 10 show that migration induces a significant change in headship of the household. Migration to both India and other countries significantly increases the proportion of female-headed households. The resulting changes in household decision-making is likely to be more favorable to girls (Duflo, 2003; Bouoiyour, Miftah and Mouhoud, 2016). On the flip side, the absence of fathers may be more detrimental to boys (Bansak and Chezum, 2009). The change in headship is thus likely to promote better schooling outcomes for girls relative to boys.

*Expected returns to schooling*: We do not have a direct measure of expected returns to schooling for boys or girls. However, the heterogeneity in the schooling impacts of migration offers some clues to their potential role, which seems to be different for boys and girls. For girls, our estimated schooling impacts do not seem to be consistent with higher expected returns to schooling due to migration opportunity. This is because while migration significantly improves schooling outcomes for girls, women hardly migrate for work; as noted above 94-95% of the migrants are men. However, for boys, our estimated schooling impacts seem more consistent with a role of expected

[22] For related discussion of the pattern of child labor in Nepal based on the NLSS3 survey and how it responds to schooling scholarships, see Datt and Uhe (2019).

returns. Recall our finding that while migration to other countries improves their schooling outcomes (lower their schooling gap and squared schooling gap measures), migration to India has no such effect. This is consistent with the fact the migration opportunity in India is mainly for low-wage mostly-unskilled labor, while that for other countries is for higher-wage and a bit more skilled work. This is evident from the other-country migrants' higher median years of schooling and higher remittance per worker (Table 1).

Thus, to summarize, while we cannot conclusively identify the relative roles of different channels, the above discussion suggests a complex interplay of different forces at work. For both boys and girls, higher remittances are likely to have been instrumental in improving schooling outcomes, though their effect is counteracted by the migration-induced increase in work participation. For boys, higher expected returns from migration to countries other than India is likely to have contributed to better schooling outcomes. For girls, migration-induced change in household headship is likely to have been a positive force.

## 7 Conclusion

Migration being an important source of remittances, its effects on current income and consumption of sending households are generally well-known. Less well understood are its potential longer-term welfare effects. This paper sought to investigate one avenue for such effects operating through human capital investments by way of better schooling outcomes for primary and secondary school age children in Nepal. However, the identified effects of migration depend crucially on how schooling outcomes are measured.

Evaluated in terms of the widely-used school attendance rate, the paper fails to identify any significant effect of migration for either boys or girls. The attendance rate is however a fairly crude

measure of schooling outcomes. The vast majority of children in Nepal attend school but straggle as they attend grades well below what would be appropriate for their age, and the very large share of stragglers, rather than school attendance per se, constitutes the primary challenge of school education in the country. Using a wider set of schooling status measures, the paper does find significant migration impacts indicating improvement in outcomes through a shift from stragglers to those progressing normally, though the effect is limited to girls and migration to India only.

The paper further suggests that even these schooling status measures offer a limited perspective on schooling outcomes. To supplement these measures, the paper uses a set of schooling gap indices that build in the size and inequality of schooling deficits where these deficits are measured as shortfalls of children's actual grades from their age-appropriate grades. These schooling gap indices reveal a more complete and informative picture of emigration effects. Using such measures, the paper finds that emigration both to India and to other countries have favourable and statistically significant effects on schooling outcomes, and the effects though larger for girls are not confined to girls.

The channels through which such gains from worker emigration are realized remains an important question. While we are unable to quantify the relative contribution of different channels with our data, our exploration of the potential roles of four main channels – relating to remittances, expected returns to schooling, female headship of households, and work participation of children – paints a picture of complex interplay of different forces at work. Our investigation suggests all four channels are likely to have been involved though in different ways. Remittances appear to have helped improve schooling outcomes, while migration-induced greater participation of children in economic activities is likely to have hindered them. Higher expected returns from more lucrative migration opportunities to countries other than India is likely to have favoured boys' schooling

outcomes, while more women assuming headship of households is likely to have helped improve schooling outcomes for girls. Further careful investigation of the contribution of these potential channels remains an important topic for future research.

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**Table 1: Emigrant work characteristics, by destination, 2010**

| | Workers emigrating to: | | |
|---|---|---|---|
| | India | Rest of the World | All |
| | % of emigrant workers | | |
| No schooling | 21.1 | 11.2 | 15.3 |
| Less than primary | 39.1 | 20.7 | 28.3 |
| Less than secondary | 81.5 | 57.7 | 67.5 |
| Less than intermediate | 96.8 | 86.0 | 90.5 |
| Share of 20-44 year olds amongst emigrant workers (%) | 68.4 | 90.4 | 81.0 |
| Mean years of schooling | 5.4 | 7.6 | 6.7 |
| Median years of schooling | 5 | 8 | 7 |
| Mean remittances per worker (NPR/year) | 39,035 | 120,972 | 87,248 |
| Median remittances per worker (NPR/year) | 14,000 | 70,000 | 40,000 |
| Mean remittances per worker (USD/year) | 520 | 1,613 | 1,163 |
| Median remittances per worker (USD/year) | 187 | 933 | 533 |

Source: NLSS3 data for 2010.

**Table 2: Schooling outcomes for 6-14 year olds by gender, 2008 and 2010**

| | | | | | | | Difference (p-value) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | | | 2010 | | | Boys - Girls | | 2010 - 2008 | | Total |
| **Schooling outcomes** | **Boys** | **Girls** | **Total** | **Boys** | **Girls** | **Total** | **2008** | **2010** | **Boys** | **Girls** | **2010 - 2008** |
| **Attendance** | 93.1 | 89 | 91.2 | 93.8 | 92.2 | 93 | 4.10 | 1.60 | 0.70 | 3.20 | 1.80 |
| | | | | | | | (0.00) | (0.09) | (0.56) | (0.00) | (0.00) |
| **Schooling groups** | | | | | | | | | | | |
| Never attended (NA) | 5.1 | 9.1 | 7 | 4.6 | 6 | 5.3 | -4.00 | -1.40 | -0.50 | -3.10 | -1.70 |
| | | | | | | | (0.00) | (0.09) | (0.57) | (0.00) | (0.00) |
| Drop-outs (DO) | 1.7 | 2 | 1.8 | 1.6 | 1.8 | 1.7 | -0.30 | -0.20 | -0.10 | -0.20 | -0.10 |
| | | | | | | | (0.55) | (0.65) | (0.85) | (0.84) | (0.79) |
| Stragglers (ST) | 80 | 76 | 78.1 | 83.6 | 80.1 | 81.8 | 4.00 | 3.50 | 3.60 | 4.10 | 3.70 |
| | | | | | | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Normal progression (NP) | 13.1 | 13 | 13.1 | 10.2 | 12.1 | 11.2 | 0.10 | -1.90 | -2.90 | -0.90 | -1.90 |
| | | | | | | | (0.60) | (0.03) | (0.00) | (0.05) | (0.00) |
| *Total* | *100* | *100* | *100* | *100* | *100* | *100* | | | | | |
| **Schooling gap indices** | | | | | | | | | | | |
| Schooling gap prevalence (α=0) | 0.868 | 0.869 | 0.869 | 0.898 | 0.879 | 0.888 | 0.00 | 0.02 | 0.03 | 0.01 | 0.02 |
| | | | | | | | (0.54) | (0.03) | (0.00) | (0.04) | (0.00) |
| Schooling gap index (α=1) | 0.489 | 0.513 | 0.501 | 0.537 | 0.527 | 0.532 | -0.02 | 0.01 | 0.05 | 0.01 | 0.03 |
| | | | | | | | (0.01) | (0.11) | (0.00) | (0.08) | (0.00) |
| Squared schooling gap index (α=2) | 0.348 | 0.377 | 0.362 | 0.406 | 0.397 | 0.401 | -0.03 | 0.01 | 0.06 | 0.02 | 0.04 |
| | | | | | | | (0.00) | (0.15) | (0.00) | (0.03) | (0.00) |
| Number of observations | 5,652 | 5,298 | 10,950 | 3,249 | 3,321 | 6,570 | | | | | |

Source: NLFS2 and NLSS3 data. See text for the definition of the schooling groups and schooling gap indices.

**Table 3: First stage estimations of emigration to India and to other countries**

| | ----- Boys ----- | | ------ Girls -------- | |
|---|---|---|---|---|
| | (1) India | (2) Other | (3) India | (4) Other |
| IV Emigration to India | 0.324*** | -0.019 | 0.327*** | 0.002 |
| | (0.031) | (0.018) | (0.033) | (0.021) |
| IV Emigration to other countries | -0.117** | 0.435*** | -0.085** | 0.435*** |
| | (0.035) | (0.037) | (0.031) | (0.032) |
| Share college educated | -0.052 | -0.033 | -0.039 | -0.035 |
| | (0.029) | (0.020) | (0.030) | (0.023) |
| Year 2010 indicator | 0.005 | 0.008** | 0.005 | 0.007* |
| | (0.003) | (0.003) | (0.003) | (0.003) |
| First-Stage IV Estimates | | | | |
| IV's partial F: Emigration to India (p-value) | 60.7 (0.000) | | 62.6 (0.000) | |
| IV's partial F: Emigration to elsewhere(p-value) | 76.2 (0.000) | | 90.3 (0.000) | |
| District Fixed Effects | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Observations | 990 | 990 | 992 | 992 |
| Number of Districts | 71 | 71 | 71 | 71 |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. We also report pooled-gender results in Table A6 in the Appendix. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 4: The effect of emigration on school attendance amongst 6-14 year old boys and girls**

| | Boys | | | Girls | | |
|---|---|---|---|---|---|---|
| | (1) OLS | (2) FE | (3) FE-IV | (4) OLS | (5) FE | (6) FE-IV |
| Emigration to India | 0.124 | -0.039 | -0.088 | -0.011 | -0.138 | -0.158 |
| | (0.076) | (0.087) | (0.208) | (0.126) | (0.155) | (0.278) |
| Emigration to other countries | 0.162 | 0.161* | 0.241 | 0.116 | 0.113 | 0.095 |
| | (0.119) | (0.094) | (0.218) | (0.154) | (0.130) | (0.242) |
| District Fixed Effects | No | Yes | Yes | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 990 | 990 | 990 | 992 | 992 | 992 |
| Number of Districts | 71 | 71 | 71 | 71 | 71 | 71 |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. We also report pooled-gender results in Table A7 in the Appendix. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 5: The effect of emigration on the shares of the four schooling status groups amongst 6-14 year old boys and girls**

| | Boys | | | Girls | | |
|---|---|---|---|---|---|---|
| | (1) OLS | (2) FE | (3) FE-IV | (4) OLS | (5) FE | (6) FE-IV |
| *Panel A: Never Attended (NA)* | | | | | | |
| Emigration to India | -0.051 | 0.069 | 0.104 | 0.045 | 0.185 | 0.093 |
| | (0.069) | (0.077) | (0.178) | (0.124) | (0.144) | (0.268) |
| Emigration to other countries | -0.145 | -0.151** | -0.187 | -0.088 | -0.054 | -0.062 |
| | (0.102) | (0.073) | (0.182) | (0.150) | (0.112) | (0.178) |
| Test of equal parameters: $\beta^I = \beta^R$ | | | | | | |
| (p-value) | | | (0.192) | | | (0.588) |
| *Panel B : Dropout (DO)* | | | | | | |
| Emigration to India | -0.073*** | -0.030 | -0.015 | -0.034 | -0.047* | 0.064 |
| | (0.022) | (0.029) | (0.078) | (0.023) | (0.027) | (0.056) |
| Emigration to other countries | -0.017 | -0.010 | -0.054 | -0.028 | -0.059 | -0.033 |
| | (0.039) | (0.039) | (0.099) | (0.039) | (0.051) | (0.104) |
| Test of equal parameters: $\beta^I = \beta^R$ | | | | | | |
| (p-value) | | | (0.602) | | | (0.391) |
| R-squared | 0.020 | 0.134 | 0.013 | 0.016 | 0.125 | 0.011 |
| *Panel C : Straggler (ST)* | | | | | | |
| Emigration to India | 0.079 | -0.140 | -0.335 | -0.015 | -0.235 | -0.845*** |
| | (0.103) | (0.124) | (0.305) | (0.128) | (0.157) | (0.278) |
| Emigration to other countries | 0.132 | 0.259** | 0.146 | 0.088 | 0.308** | 0.050 |
| | (0.128) | (0.116) | (0.257) | (0.148) | (0.134) | (0.317) |
| Test of equal parameters: $\beta^I = \beta^R$ | | | | | | |
| (p-value) | | | (0.724) | | | (0.015)** |
| *Panel D : Normal Progression (NP)* | | | | | | |
| Emigration to India | 0.045 | 0.101 | 0.246 | 0.004 | 0.097 | 0.687*** |
| | (0.092) | (0.112) | (0.275) | (0.090) | (0.105) | (0.240) |
| Emigration to other countries | 0.030 | -0.097 | 0.095 | 0.028 | -0.195* | 0.046 |
| | (0.103) | (0.115) | (0.244) | (0.093) | (0.103) | (0.271) |
| Test of equal parameters: $\beta^I = \beta^R$ | | | | | | |
| (p-value) | | | (0.514) | | | (0.077)* |
| District Fixed Effects | No | Yes | Yes | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 990 | 990 | 990 | 992 | 992 | 992 |
| Number of Districts | 71 | 71 | 71 | 71 | 71 | 71 |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. We also report pooled-gender results in Table A8 in the Appendix. Robust standard errors clustered at the district level reported in parentheses. The first stage statistics are reported in Table 3. *** p<0.01, ** p<0.05, * p<0.1

**Table 6: The effect of emigration on the school deprivation indices amongst 6-14 year old boys and girls**

| | ---------- Boys ---------- | | | ---------- Girls ---------- | | |
|---|---|---|---|---|---|---|
| | (1) OLS | (2) FE | (3) FE-IV | (4) OLS | (5) FE | (6) FE-IV |
| *Panel A: Schooling gap index (α=1)* | | | | | | |
| Emigration to India | -0.030 | 0.002 | -0.320 | -0.004 | -0.024 | -0.850** |
| | (0.098) | (0.103) | (0.299) | (0.152) | (0.159) | (0.364) |
| Emigration to other countries | -0.187 | -0.055 | -0.425* | -0.233 | -0.044 | -0.525* |
| | (0.158) | (0.152) | (0.243) | (0.177) | (0.129) | (0.310) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.709) | | | (0.482) |
| *Panel B: Squared schooling gap index (α=2)* | | | | | | |
| Emigration to India | -0.027 | 0.031 | -0.332 | -0.030 | -0.011 | -0.842** |
| | (0.101) | (0.107) | (0.312) | (0.171) | (0.183) | (0.410) |
| Emigration to other countries | -0.207 | -0.094 | -0.531** | -0.269 | -0.098 | -0.608* |
| | (0.171) | (0.160) | (0.248) | (0.205) | (0.140) | (0.312) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.515) | | | (0.616) |
| District Fixed Effects | No | Yes | Yes | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 990 | 990 | 990 | 992 | 992 | 992 |
| Number of Districts | 71 | 71 | 71 | 71 | 71 | 71 |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. Robust standard errors clustered at the district level reported in parentheses. The test of equal parameters is the Wald test. The first stage statistics are reported in Table 3. *** p<0.01, ** p<0.05, * p<0.1

**Table 7: FE-IV effects of emigration on all schooling outcomes amongst 6-14 year old boys and girls with district trends**

| | Boys | | Girls | |
|---|---|---|---|---|
| | Emigration to India | Emigration to other countries | Emigration to India | Emigration to other countries |
| School attendance | -0.119 | 0.273 | -0.161 | 0.120 |
| | (0.202) | (0.201) | (0.280) | (0.242) |
| Never Attended (NA) | 0.117 | -0.192 | 0.081 | -0.066 |
| | (0.179) | (0.179) | (0.273) | (0.175) |
| Dropout (DO) | 0.002 | -0.081 | 0.080 | -0.054 |
| | (0.070) | (0.085) | (0.057) | (0.105) |
| Straggler (ST) | -0.342 | 0.181 | -0.853*** | 0.076 |
| | (0.306) | (0.261) | (0.279) | (0.314) |
| Normal Progression (NP) | 0.223 | 0.092 | 0.692*** | 0.044 |
| | (0.279) | (0.254) | (0.227) | (0.258) |
| Schooling Gap index (α=1) | -0.279 | -0.386 | -0.849** | -0.532* |
| | (0.302) | (0.253) | (0.360) | (0.304) |
| Squared schooling gap index (α=2) | -0.281 | -0.471* | -0.844** | -0.619** |
| | (0.315) | (0.259) | (0.409) | (0.310) |
| District Fixed Effects | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | |
| Observations | 984 | | 986 | |
| Number of Districts | 68 | | 68 | |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 8: FE-IV effects of emigration on all schooling outcomes amongst 6-14 year old boys and girls with outcomes defined at the individual level**

| | Boys | | Girls | |
|---|---|---|---|---|
| | Emigration to India | Emigration to other countries | Emigration to India | Emigration to other countries |
| School attendance | -0.053 | 0.250 | -0.202 | 0.142 |
| | (0.202) | (0.216) | (0.285) | (0.253) |
| Never Attended (NA) | 0.077 | -0.192 | 0.134 | -0.105 |
| | (0.172) | (0.182) | (0.274) | (0.190) |
| Dropout (DO) | -0.024 | -0.058 | 0.067 | -0.037 |
| | (0.074) | (0.097) | (0.058) | (0.106) |
| Straggler (ST) | -0.269 | 0.144 | -0.877*** | 0.087 |
| | (0.287) | (0.269) | (0.275) | (0.320) |
| Normal Progression (NP) | 0.216 | 0.106 | 0.676*** | 0.056 |
| | (0.264) | (0.247) | (0.241) | (0.273) |
| Schooling Gap index (α=1) | -0.289 | -0.428* | -0.785** | -0.574* |
| | (0.294) | (0.245) | (0.371) | (0.322) |
| Squared schooling gap index (α=2) | -0.309 | -0.525** | -0.766* | -0.666** |
| | (0.309) | (0.250) | (0.421) | (0.327) |
| District Fixed Effects | | Yes | | Yes |
| Year Fixed Effects | | Yes | | Yes |
| Observations | | 8,901 | | 8,619 |
| Number of Districts | | 71 | | 71 |

Notes: Additional controls include dummy variables for the child's age (separate variables for each age ranging from 6 to 13) as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. Regressions are weighted by PSU-level sample weights. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 9: FE-IV effects of emigration on all schooling outcomes amongst 6-14 year old boys and girls with migrants redefined as those away for less than 12 months**

| | Boys | | Girls | |
|---|---|---|---|---|
| | Emigration to India | Emigration to other countries | Emigration to India | Emigration to other countries |
| School attendance | -0.124 | 0.211 | -0.164 | 0.027 |
| | (0.290) | (0.328) | (0.374) | (0.304) |
| Never Attended (NA) | 0.132 | -0.231 | 0.100 | 0.009 |
| | (0.250) | (0.278) | (0.356) | (0.228) |
| Dropout (DO) | -0.008 | 0.020 | 0.064 | -0.036 |
| | (0.109) | (0.142) | (0.085) | (0.127) |
| Straggler (ST) | -0.462 | 0.148 | -1.227*** | -0.183 |
| | (0.463) | (0.385) | (0.440) | (0.460) |
| Normal Progression (NP) | 0.338 | 0.063 | 1.063*** | 0.210 |
| | (0.406) | (0.338) | (0.399) | (0.372) |
| Schooling Gap index (α=1) | -0.583 | -0.637* | -1.379** | -0.861** |
| | (0.447) | (0.347) | (0.545) | (0.404) |
| Squared schooling gap index (α=2) | -0.648 | -0.836** | -1.379** | -0.949** |
| | (0.466) | (0.361) | (0.605) | (0.421) |
| District Fixed Effects | Yes | | Yes | |
| Year Fixed Effects | Yes | | Yes | |
| Observations | 990 | | 992 | |
| Number of Districts | 71 | | 71 | |

Notes: Additional controls include the shares of children (either boys or girls according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations differs for girls and boys as PSUs which do not have any 6-14 years old boys or girls in one of the sample years are excluded from estimation for both years. Regressions are weighted by the number of 6-14 year boys/girls in the PSU. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

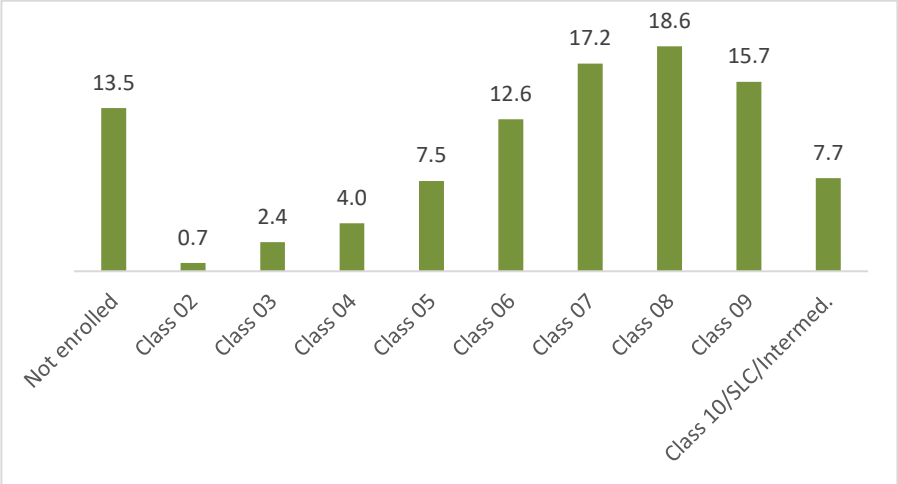
**Table 10: FE-IV effects of emigration on candidate mechanisms amongst 6-14 year old boys and girls**

| | Emigration to India | Emigration to other countries |
|---|---|---|
| Remittances | 285.03 | 186.18*** |
| | (261.56) | (58.22) |
| Female headship | 1.117*** | 1.522*** |
| | (0.218) | (0.261) |
| Boys' work participation | 0.520* | -0.059 |
| | (0.278) | (0.242) |
| Girls' work participation | 0.565** | 0.186 |
| | (0.252) | (0.260) |
| District Fixed Effects | | Yes |
| Year Fixed Effects | | Yes |

Notes: Each row corresponds to a different regression. Additional controls include the shares of children (either boys, girls or both according to the specification) aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. The number of observations is 992 except for boys' work participation which has 990 observations. Regressions are weighted by the number of 6-14 year olds in the PSU (either boys, girls or both according to the specification). Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Appendix

**Figure A1: Distribution of 14-year olds by current class, 2010 (%)**




Source: NLSS3 data.

**Table A1: Distribution of households by the number of external migrant workers, 2010**

| No. of external migrant workers in the household | % of households | % of households with an external migrant worker |
|---|---|---|
| 0 | 70.1 | |
| 1 | 23.9 | 79.9 |
| 2 | 4.8 | 16.1 |
| 3 or more | 1.2 | 4.1 |
| Total | 100 | 100 |

Source: NLSS3 data.

**Table A2: Share of remittances from migrant workers abroad in total household consumption, 2010**

| | Share in total consumption (%) | | |
|---|---|---|---|
| | **Remittance inflows** | **Remittance outflows** | **Remittances net** |
| For all households | 19.3 | 1.5 | 17.9 |
| For households with emigrant worker(s) | 69.5 | 5.4 | 64.1 |
| *By quintiles of real per capita consumption:* | | | |
| Bottom | 15.6 | 0.2 | 15.5 |
| 2nd | 16.9 | 0.6 | 16.2 |
| 3rd | 19.5 | 1.9 | 17.7 |
| 4th | 19.2 | 1.0 | 18.2 |
| Top | 20.7 | 2.1 | 18.6 |

Note: These are remittances from or to migrant workers abroad as a proportion of total household consumption expenditure. Real per capita expenditure allows for spatial variation in cost of living as estimated by the spatial poverty lines estimated for 10 sub-national domains in Nepal.
Source: NLSS3 data.

**Table A3: Origin and destination of external migrant workers, 2010 and 2008**

| | % of external migrant workers | | % of population (resident) | Relative migration rates |
|---|---|---|---|---|
| | 2008 | 2010 | 2010 | |
| **Origin** | | | | |
| Urban | 13.4 | 15 | 19 | 78.9 |
| Rural | 86.7 | 85 | 81 | 104.9 |
| Eastern | 22.6 | 22.7 | 23.3 | 97.4 |
| Central | 26.3 | 25.6 | 35.7 | 71.7 |
| Western | 26.8 | 28.3 | 19.2 | 147.4 |
| Mid-western | 12.6 | 12.7 | 13 | 97.7 |
| Far-western | 11.7 | 10.7 | 8.8 | 121.6 |
| Mountain | 5.3 | 5.3 | 7 | 75.7 |
| Hill | 44.1 | 44.8 | 44.2 | 101.4 |
| Terai | 50.7 | 50 | 48.7 | 102.7 |
| **Destination** | | | | |
| India | 48.4 | 42.3 | | |
| Gulf countries | 29.7 | 32.1 | | |
| Qatar | 14.0 | 16.1 | | |
| Saudi Arabia | 11.4 | 11.6 | | |
| United Arab Emirates | 4.3 | 4.5 | | |
| Malaysia | 13.2 | 12.4 | | |
| Other | 8.7 | 13.2 | | |

Source: NLSS3 data for 2010 and NLFS2 data for 2008 (for 499 PSUs common to both surveys).

**Table A4: The schooling system in Nepal**

| Level of education | Grade | Age |
|---|---|---|
| Higher secondary education (Grades 11-12) | 12 | 16 |
| | 11 | 15 |
| Secondary education (Grades 9-10) | **10** | **14** |
| | **9** | **13** |
| Lower secondary education (Grades 6-8) | **8** | **12** |
| | **7** | **11** |
| | **6** | **10** |
| Primary education (Grades 1-5) | **5** | **9** |
| | **4** | **8** |
| | **3** | **7** |
| | **2** | **6** |
| | 1 | 5 |
| Pre-primary education / Early childhood development | | 4 |
| | | 3 |

Source: World Bank (2009).

**Table A5: Distribution of grade deficit by age of children, 2010-14-year old stragglers, drop-outs and the never-attended groups, by, 2010**

| | Age (in years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grade deficit (years) | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Total |
| 0 | 20.6 | 16.9 | 10.6 | 12.2 | 9.7 | 8.3 | 7.6 | 7.3 | 7.7 | 11.2 |
| 1 | 79.4 | 33.2 | 24.5 | 20.3 | 16.7 | 21.5 | 11.9 | 18.0 | 15.7 | 26.7 |
| 2 | 0 | 49.9 | 27.8 | 26.9 | 23.7 | 24.4 | 23.3 | 19.4 | 19.0 | 23.6 |
| 3 | 0 | 0 | 37.1 | 20.6 | 20.9 | 20.4 | 20.2 | 17.8 | 17.9 | 17.3 |
| 4 | 0 | 0 | 0 | 20.1 | 14.4 | 10.2 | 15.0 | 16.2 | 13.6 | 9.9 |
| 5 | 0 | 0 | 0 | 0 | 14.6 | 7.9 | 8.7 | 8.5 | 9.7 | 5.7 |
| 6 | 0 | 0 | 0 | 0 | 0 | 7.4 | 5.8 | 3.7 | 5.2 | 2.4 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7.6 | 2.5 | 3.5 | 1.6 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.6 | 0.9 | 0.8 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.8 | 0.8 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: NLSS3 data. Grade deficit refers to the number of years by which children of a given age lag behind their age-appropriate grade.

**Table A6: The effect of emigration on school attendance amongst 6-14 year olds**

| | -------- Gender Pooled -------- | | |
|---|---|---|---|
| | (1) OLS | (2) FE | (4) FE-IV |
| Emigration to India | 0.059 | -0.085 | -0.057 |
| | (0.086) | (0.099) | (0.214) |
| Emigration to other countries | 0.126 | 0.134 | 0.180 |
| | (0.122) | (0.082) | (0.172) |
| <u>First-Stage IV Estimates</u> | | | |
| IV's partial F: Emigration to India | | | 63.9 |
| (p-value) | | | (0.000) |
| IV's partial F: Emigration to elsewhere | | | 87.0 |
| (p-value) | | | (0.000) |
| District Fixed Effects | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| Observations | 998 | 998 | 998 |
| Number of Districts | 71 | 71 | 71 |

Notes: Additional controls include the shares of children aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. Regressions are weighted by the number of 6-14 year olds in the PSU. Robust standard errors clustered at the district level reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table A7: The effect of emigration on shares of the four schooling status groups amongst 6-14 year olds**

| | ---------- Gender Pooled ---------- | | |
|---|---|---|---|
| | (1) OLS | (2) FE | (3) FE-IV |
| *Panel A : Never Attended (NA)* | | | |
| Emigration to India | -0.005 | 0.125 | 0.050 |
| | (0.084) | (0.090) | (0.202) |
| Emigration to other countries | -0.108 | -0.098 | -0.133 |
| | (0.112) | (0.066) | (0.128) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.348) |
| *Panel B : Dropout (DO)* | | | |
| Emigration to India | -0.054*** | -0.040** | 0.007 |
| | (0.016) | (0.019) | (0.051) |
| Emigration to other countries | -0.018 | -0.036 | -0.047 |
| | (0.028) | (0.029) | (0.078) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.508) |
| *Panel C : Straggler (ST)* | | | |
| Emigration to India | 0.033 | -0.183 | -0.523** |
| | (0.094) | (0.110) | (0.225) |
| Emigration to other countries | 0.098 | 0.268*** | 0.087 |
| | (0.109) | (0.070) | (0.185) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.013)* |
| *Panel D : Normal Progression (NP)* | | | |
| Emigration to India | 0.026 | 0.097 | 0.466** |
| | (0.070) | (0.088) | (0.218) |
| Emigration to other countries | 0.028 | -0.134 | 0.094 |
| | (0.068) | (0.081) | (0.205) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.179) |
| District Fixed Effects | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| Observations | 998 | 998 | 998 |
| Number of Districts | 71 | 71 | 71 |

Notes: Additional controls include the shares of children aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. Regressions are weighted by the number of 6-14 year olds in the PSU. Robust standard errors clustered at the district level reported in parentheses. The first stage statistics are reported in Table A6. *** p<0.01, ** p<0.05, * p<0.1

**Table A8: The effect of emigration on schooling deprivation indices amongst 6-14 year olds**

| | -------- Gender Pooled -------- | | |
|---|---|---|---|
| | (1) OLS | (2) FE | (3) FE-IV |
| *Panel A: Schooling Deprivation Prevalence (α=0)* | | | |
| Emigration to India | -0.026 | -0.097 | -0.466** |
| | (0.070) | (0.088) | (0.218) |
| Emigration to other countries | -0.028 | 0.134 | -0.094 |
| | (0.068) | (0.081) | (0.205) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.179) |
| *Panel B: Schooling gap index (α=1)* | | | |
| Emigration to India | -0.017 | -0.006 | -0.603** |
| | (0.104) | (0.114) | (0.306) |
| Emigration to other countries | -0.192 | -0.044 | -0.480** |
| | (0.145) | (0.121) | (0.241) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.719) |
| *Panel C: Squared schooling gap index (α=2)* | | | |
| Emigration to India | -0.026 | 0.017 | -0.602* |
| | (0.114) | (0.127) | (0.341) |
| Emigration to other countries | -0.217 | -0.086 | -0.569** |
| | (0.166) | (0.131) | (0.246) |
| Test of equal parameters: $\beta^I = \beta^R$ (p-value) | | | (0.926) |
| District Fixed Effects | No | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| Observations | 998 | 998 | 998 |
| Number of Districts | 71 | 71 | 71 |

Notes: Additional controls include the shares of children aged 6, 7, 8, 9, 10, 11, 12, and 13 amongst the 6-14 year olds as well as the share of those with college or higher education amongst all persons aged 31 and above. Parameter estimates for the intercept, district fixed effects, and the controls are not reported. Regressions are weighted by the number of 6-14 year olds in the PSU. Robust standard errors clustered at the district level reported in parentheses. The Test of equal parameters is the Wald test. The first stage statistics are reported in Table A6. *** p<0.01, ** p<0.05, * p<0.1