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Does the Absence of Men from the Household Increase Girls' Shares in Education Expenditures? Evidence from Rural Pakistan

Sundus Saleemi

ABSTRACT

This article investigates the impact of men's migration on expenditure by left-behind households on children's education, focusing on the gendered distribution of this expenditure. Using longitudinal survey data of rural households in Pakistan, the effect of men's migration on the share of households' education expenditure spent on girls is estimated using the fixed-effects model (FEM). Results suggest that in households from which men migrate for periods longer than six months, the share of education expenditures spent on girls is up to 31 percent higher than that of the average household in the sample. There is no evidence of a significant impact on households' total education expenditure due to this migration. Overall, in households where men are absent, the distribution of education expenditure tilts in favor of girls. A possible mechanism behind the increase in girls' shares is the greater participation of women in household decisions in the absence of men.

KEYWORDS

Education, intrahousehold allocation, household decision making, gender equality, migration, Pakistan

JEL Codes: D13, J16, I24

HIGHLIGHTS

- In Pakistan, rural households from which men have migrated have higher expenditure on girls' schooling.
- Men's outmigration plausibly expands women's participation in household decisions.
- Women's role in expenditure decisions may improve and increase investments in girls' education.
- Higher participation of women in household decisions potentially reduces gender inequality.

INTRODUCTION

Migration of individual members of the household, as opposed to *en masse* household migration, affects aspects of migrants' lives as well as those of the left-behind members including children (Chang, Dong, and MacPhail 2011; Jingzhong and Lu 2011; Mendola 2012; Cortes 2013).[1] One aspect is households' expenditure on children's education, which may be affected through the household's receipt of remittances (Edwards and Ureta 2003; Hanson and Woodruff 2003; Calero, Bedi, and Sparrow 2009; Acosta 2011; Alcaraz, Carlo, and Salcedo 2012; Vogel and Korinek 2012).

However, the migration of household members may affect expenditures even in the absence of remittances. Migration may change the decision makers responsible for the allocation of budget for children's schooling in the left-behind households (Antman 2011, 2015). A change in decision makers may affect expenditures if the preferences of new decision makers differ from those who made these decisions before migration. Migration of members may also lead to a transfer of norms, for example those relating to children's education, from destination areas to migrant-sending areas (Fargues 2006; Giannelli and Mangiavacchi 2010). Exposure to different norms may change a household's expenditure on children's education by changing their attitude toward children's schooling. Migration may also have an incentive effect; if migration positively selects skilled individuals, migration may encourage education in migrant-sending areas (Beine, Docquier, and Oden-Defoort 2011; Di Maria and Lazarova 2012; Brown and Jimenez-Soto 2015); however, if skilled individuals are not positively selected into migration, higher education may be discouraged (Boucher, Stark, and Edward Taylor 2009).

These effects may also differ for boys versus girls in left-behind households (Mansuri 2006). If migration positively selects on levels of education and the level of education of boys is higher than that of girls, boys will be expected to migrate. A higher probability of migration of boys will incentivize households to invest in the education of boys, exacerbating the educational disparity between boys and girls. On the other hand, migration from areas of educational disparity between girls and boys to areas with low disparity can also lead to a diffusion of norms of the host areas into the sending areas (Fargues 2006, 2011). This can lead households to spend on girls' education. The overall effect could be a reduction of disparities between the education of boys and girls or an exacerbation of this disparity. In contexts with a high disparity of education between boys and girls, the gendered effects assume salience.

This article empirically investigates the effects of migration on household expenditure on children's education. Specifically, I investigate the effect of the migration of men from rural households on the share of left-behind households' education expenditures spent on girls' education in rural areas

of Pakistan. The share of household education expenditure spent on girls reflects the gendered distribution of household education expenditures. The effect of migration on this gendered distribution of household expenditures is the highlight of this article. This aspect has hitherto not been analyzed in empirical work, particularly in the context of rural Pakistan.

Migration and thereby the absence of men from households may leave women in the left-behind households with decision-making power regarding allocation of expenditures for children's education. Women's participation in these decisions may increase the household's expenditures on children's health and education. In rural Pakistan, migration for employment is almost exclusively undertaken by men. An assessment of the effect of men's migration on the gendered distribution of these expenditures can shed light on the efficacy of women's participation in household decisions in reducing gender inequality in the allocation of household expenditures on children's schooling.

The study explores various channels through which household expenditure and its distribution can be affected: (1) remittances, (2) transfer of norms, and (3) change in household decision makers. This is done by disaggregating households based on the types of migration undertaken by their members: permanent migration and temporary migration. It is expected that longer absences of migrants from the household leave household decisions to the left-behind members, and this type of migration may affect household expenditures through this channel. On the other hand, both permanent and temporary migration may expose migrants and their households to different norms. If changes in household expenditure occur via this channel, then both permanent and temporary migration may have a significant effect. Changes in households' incentives to educate their children and the effects of the absence of members on children's work have not been explored.

Estimating the effects of migration is complicated by the endogeneity of migration. Migration is endogenous due to (1) self-selection of migrants and (2) simultaneity of the migration decision with other household decisions. Self-selection means that migrants/migrant households differ from nonmigrants/nonmigrant households in terms of observed and unobserved characteristics; that is, there is heterogeneity of cross-sectional units. Comparing outcomes, such as expenditure on children's schooling, for migrant and nonmigrant households will lead to biased estimates as these comparisons are likely to capture the differences between these two types of households. The simultaneity of the decision to migrate with households' other decisions implies that households may decide to send a member away at the same time as taking another decision, for example increasing expenditures on children's schooling. Hence, any observed change in the outcome of interest cannot be considered

to have resulted from migration. Empirical studies are wary of cross-sectional comparisons of migrant and nonmigrant households and rely on instrumental variables (IVs) or propensity score matching (PSM) to identify the effects of migration. This article uses longitudinal survey data that allows the estimation of a fixed effects model to tackle time-invariant heterogeneity of cross-sectional units by comparing the same households before and after migration.

The prime contribution of this article is the estimation of changes in the gendered distribution of household expenditures due to migration. In rural Pakistan, wide disparities exist between the education of girls and that of boys, rendering this analysis significant. Furthermore, the focus on changes in household decision makers as conduits of these changes sheds light on women's role in the reduction of gender inequality in highly gender-unequal contexts. I analyze household expenditures rather than education outcomes, as expenditures reflect households' attitudes toward children's education while educational outcomes are affected by a host of other factors. Furthermore, changes in expenditures can be observed in the immediate period after migration while schooling outcomes may take a longer time to change.

LITERATURE REVIEW

The theoretical links between migration and children's education outlined in the introduction find mixed empirical support (Nguyen, Yeoh, and Toyota 2006; Adams 2011; Ye et al. 2013; Antman 2018). Remittances received by left-behind households may allow households to increase expenditure by increasing household income. In Ecuador, remittances have been found to increase school enrollment among children ages 10–17, with a larger positive effect on the enrollment of girls (Calero, Bedi, and Sparrow 2009). In El Salvador, remittances have not been found to significantly affect children's schooling (Acosta 2011). In Mexico, a reduction in remittances received by households has been found to decrease school attendance, and an increase in remittances has been found to reduce child illiteracy and increase schooling for 5-year-olds. However, remittances have been noted to negatively affect the enrollment of 7- to 14-year-olds (López-Córdova 2005; Alcaraz, Carlo, and Salcedo 2012). Other studies (Edwards and Ureta 2003; Hanson and Woodruff 2003; Brown et al. 2006; Vogel and Korinek 2012; Pickbourn 2015) have estimated the effect of remittances on children's education but have not tackled endogeneity of remittance receipt (Adams 2011; Brown and Jimenez-Soto 2015).

Cross-country analyses have shown that tertiary enrollment and private school enrollment are positively affected by remittances. In response to receipt of remittances, girls' enrollment and completion rates are affected more than those of boys, pointing to the potential of remittances to reduce

the inequality of education between boys and girls. It may be that girls receive a larger proportion of households' expenditures on education by receiving remittances (Azizi 2018).[2]

People's attitudes toward education may change due to migration; migration exposes migrants to norms different from their own and thus may change their attitudes toward education (Fargues 2006; Giannelli and Mangiavacchi 2010). Migration experiences of household members may also affect children's education aspirations (Kandel and Kao 2000). Randall Kuhn (2006) and Yao Lu (2012) find a positive association between the migration of a family member (father or brother) on children's schooling in Bangladesh and rural China, respectively. A negative or no effect of migration on children's education has been noted in China and Mexico (McKenzie and Rapoport 2011; Meyerhoefer and Chen 2011; Zhou, Murphy, and Tao 2014; Zhou, Murphy, and Tao 2014).

Children's education may also be affected by changes in household decision makers (Antman 2011, 2015). Gianna Claudia Giannelli and Lucia Mangiavacchi (2010), for households in Albania, find that the migration of fathers negatively affects left-behind children's schooling, and this effect is more pronounced for girls. They suggest that the migration of a father leaves household decisions to be taken by an older male family member who is likely to have conservative attitudes toward girls' education, manifesting a strong negative effect on girls. It has also been shown that the absence of a male head of the household due to migration tilts household expenditures on clothing in favor of girls. A reverse pattern is observed in the event of the return migration of the male members. It is hypothesized that the absence of men leaves household decisions to women in left-behind households who spend more on girls (Antman 2011). This effect can also be expected for household education expenditures.

Incentive effects of migration on education have also been empirically tested. If migration improves socioeconomic status, and higher skills are positively associated with the likelihood of migration, households are encouraged to invest in children's education. On the other hand, if higher skills are not associated with the likelihood of migration, then households' incentives to educate children are not changed (Boucher, Stark, and Edward Taylor 2009). Stephen R. Boucher, Oded Stark, and J. Edward Taylor (2009) find evidence that villages in Mexico with higher migration prospects have an overall higher level of education among the population.

DATA AND METHODOLOGY

The article uses four rounds of the Pakistan Rural Household Panel Survey (PRHPS; IFPRI and IDS 2012, 2017). The fourth round of the panel was conducted in a subsample of the PRHPS by the author in the year 2017 (henceforth called round 4).[3] The PRHPS is a longitudinal dataset of

2,090 rural households from the provinces of Punjab, Sindh, and Khyber Pakhtunkhwa in Pakistan.[4] The survey sample is nationally representative of the rural areas of these three provinces.[5] Round 4 was limited to households in the PRHPS in Khyber Pakhtunkhwa province and from one district of the province of Punjab and consisted of 300 households.[6] From the three provinces surveyed in the PRHPS, Khyber Pakhtunkhwa was chosen for a revisit because of its higher rates of migration of men. Secondly, since overall gender inequality in the rural areas of Khyber Pakhtunkhwa is more pronounced than in the province of Punjab,[7] it is suitable as a case for assessing the gendered effects of men's migration.[8] Appendix Table A1 provides a brief overview of social and economic indicators of the four provinces of the country. It can be seen that rural populations in the three provinces Punjab, Sindh, and Khyber Pakhtunkhwa account for almost 88 percent of the rural population of Pakistan. Differences in household size and incomes as well as the differences in the rates of education of men and women can also be gleaned from Appendix Table A1. The table also provides an overview of the rural populations of Baluchistan, the province excluded from the sampling universe of the PRHPS, to give a sense of the differences from and similarities to the other provinces. Baluchistan has the smallest proportion of the country's overall population. The average monthly household income in the province is between that of other provinces, higher than that in Sindh and lower than in Punjab and Khyber Pakhtunkhwa. The household size, however, is the largest. The rate of women's education in Baluchistan is among the lowest in the country, with only 26.8 percent literate women and 0.51 percent having tertiary education.[9]

For the PRHPS, from each household, a men's and a women's questionnaire were filled out during all rounds. Information on all members of the household regarding age, marital status, employment, education, migration status, and so on was collected.

The explanatory variables are migration of one or more male member(s) from the household and receipt of remittances. To differentiate the channels that may affect household expenditures, migration is categorized into two groups: (1) permanent migration of a member (also referred to as a left-behind household) and (2) temporary migration of a member. The criteria for identifying permanent migrants in the data is that a person is a male member above the age of 11, left the household during the year preceding the survey, left for employment, was in an urban area outside their own district, and had been away for over six months; or a male member who had left the household for employment – that is, he was no longer listed in the household roster as a member. The criteria for a temporary migrant were the following: male member, left for employment, was in an urban area outside the district, left sometime during the year preceding the survey, had been away one to five months but had returned to

the household at the time of the survey. A positive effect of temporary and permanent migration on the dependent variable is expected through the transfer of urban norms to the rural areas. A positive effect of permanent migration is expected through changes in household decision makers. Changes in household expenditures in the year when the migration of a member takes place can be considered an outcome of migration. As a robustness check, I also assess the impact of having a long-term migrant from the household by considering households from which a man had migrated for work at some time in the past and had not returned to the household. The criteria to define different types of migrants are detailed in Appendix Table A2; the table shows the differences in these various types.

A log of remittances received by the household during the survey year captures the impact of remittance receipts. Households with migrants do not perfectly overlap with those that report receiving remittances. There are two main reasons for this. The definitions of permanent and temporary migrants used here consider migration of household members occurring during the survey year, and these migrants may not yet have started sending households any remittances. Moreover, there are households with migrants who migrated years earlier and send remittances.

The summary statistics for households in these categories are shown in Table 1. It can be seen that the annual expenditure per child of permanent migrant households is larger than that of nonmigrant households. The annual education expenditures per boy in both types of migrant households are significantly larger but the annual education expenditure per girl in these households is not. Girls' share is slightly higher for permanent migrant households, but this difference is not statistically significant. This share, however, is significantly higher for households that received remittances.

The dependent variable of interest is the share of the household's education expenditure spent on girls. To calculate girls' share, annual expenditure per girl is calculated by adding up the expenditure on the schooling of all school-age girls in the household and dividing by the number of school-age girls. Education expenditures include (1) school fees, (2) expenditures on schoolbooks and stationery, and (3) expenditure on school uniforms. Total annual education expenditure is calculated by adding expenditures in the above-mentioned categories for all school-age children in the household. Financial aid received by children for education is subtracted from expenditure incurred by the household. All children ages 5–17 are considered school age. School-age children not attending school at the time of the survey are considered to have zero expenditures when calculating girls' and boys' shares.[12] The annual education expenditure per child is calculated by dividing the total expenditure by the number of school-age children in the household. The expenditure per girl is divided by the expenditure per child to arrive at

Table 1 Summary statistics by migrant and nonmigrant status

Variable	(1) Migrant (*P*)	(2) Migrant (T)	(3) Remittance	(4) Nonmigrant
Number of observations[10] (percentage in parentheses)	434 (7)	62 (1)	587 (9.3)	5,393 (86)
Household size	7.1***	7.4**	6.4	6.4
Number of men in household	1.9	2.1**	1.7	1.7
Number of women in household	2.1***	1.9	1.8**	1.7
Number of children in household	3.0	3.3	2.8*	3.0
Number of school-age girls	1.1	1.1	1.0	1.0
Number of school-age boys	1.0**	1.6*	1.0	1.1
Household annual income per person	36,808	28,838	64,432***	36,334
Household annual education expenditure per child[1]	4,572***	3,348	3,778*	3,098
Household annual education expenditure per girl	3,456*	2,782	3,362	2,924
Household annual education expenditure per boy	5,498***	4,253	4,650*	3,714
Share of boys in education expenditure	1.24	1.12	1.17	1.26
Share of girls in education expenditure	0.76	0.81	0.84*	0.75

Notes: Comparison of mean values for the category using t-test compared to nonmigrant, nonremittance-receiving households in column (4). *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. All expenditures are in Pakistan Rupee (PKR). Migrant (P) are households with a permanent migrant; migrant (T) are households with temporary migrant; remittance are households that received remittances; and nonmigrant are households without permanent or temporary migrants who also did not receive any remittances.
Source: Pooled data from the four rounds of the survey.

Table 2 Households' annual average expenditure per child, per girl, and per boy, and girls' and boy's shares (number of observations in parantheses)

	Migrant (*P*)	Migrant (T)	Remittance[11]	Nonmigrant
Average education expenditures per child	3,332*	3,387	3,402*	2,522
	(81)	(22)	(127)	(1,774)
Average expenditure per girl	3,257	2,905	3,367	2,734
	(61)	(16)	(98)	(1,261)
Average expenditure per boy	4,842**	4,441	4,417*	3,421
	(76)	(20)	(119)	(1,639)
	Share in education expenditures			
Girls' share	0.70	0.81	0.79	0.70
	(81)	(21)	(127)	(1,728)
Boys' share	1.32	1.16	1.24	1.35
	(81)	(21)	(127)	(1,728)

Notes: Comparison of mean values for the category using t-test compared to nonmigrant, nonremittance-receiving households in column (4). *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively.
Source: Pooled data from the four rounds of the survey.

the share of education that households spend on girls (girls' share). In this way, girls' share is adjusted for the number of boys and girls in the household. Girls' share and households' education expenditures per child, in households with permanent migrants or with temporary migrants, and those receiving remittances, are shown in Table 2. The comparisons are restricted to households with both school-age girls and school-age boys present in the household.

The first row of Table 2 shows the average education expenditures per child of households. Households with a permanent migrant and households that reported receiving remittances have significantly higher average annual per child education expenditures than households without migrants. There appear to be no statistically significant differences in the average annual per child expenditure of households with temporary migrants. Table 2 also shows the average annual per girl and per boy expenditure. It can be seen that girls receive lower expenditures on their education than boys in all types of households. However, the average annual per girl expenditure in migrant households (both types) and households that received remittances is higher than the average annual per girl expenditures of nonmigrant households (statistically nonsignificant). The average annual per boy expenditure in households with a permanent migrant and those who received remittances is significantly higher than the average annual per boy expenditure of nonmigrant households.

Table 2 also suggests that girls' shares are smaller than boys' shares in all types of households. As these shares are calculated by dividing education expenditure per girl (boy) by the per child expenditure, in a situation of equality, girls' and boys' shares should be 1. That is, a household's expenditure per girl should be equal to the household's expenditure per child. That would mean that the girl child receives what the average child receives. However, the average share for girls is less than 1 and the average share for boys is greater than 1. This shows that on average, households spend less on their girls' education as compared to their boys'. This girls' share is higher for households with temporary migrants, and for households that received remittances, but these differences are not statistically significant.

Here I provide a brief note on the number of observations in different rows in Table 2. Households with both school-age girls and boys are compared; there are 2,703 such observations. Of these, 636 have missing data on school expenditures because either all children were out of school, or there were zero expenditures on children's schooling, leaving 2,067 observations.[13] The average expenditure is calculated by keeping observations on children who were out of school as missing. So, the number of observations of 1,436 (sum of four columns of the second row) corresponds to households that had girl children who were attending school and had positive educational expenditures incurred by the household. The number of observations is different from 1,854 (sum of four columns of the third row) because out of the 2,703 observations corresponding to a positive number of girls and boys of school age, a larger number (1,436 for girls, 1,854 for boys) have positive expenditures on the schooling of boys than on girls.

To calculate the shares, expenditure on children out of school is considered zero, hence shares are compared for all households that had both boys and girls of school age and at least some children were attending school. So, a household with girls of school-going age not attending school but boys of school-going age attending school is said to have 0 shares for the education of girls. These comparisons are limited to 2,703 observations on households that had both boys and girls age 5–17 in the household. This leaves us with 2,020 data points to compare the shares of girls' and boys' education expenditures in the total education expenditures of the household.[14]

There are a number of school-age children in the surveyed households not attending school (see Appendix Table A3). Table 3 shows the percentage of households who had children out of school. Row one of Table 3 shows the percentage of households in each of these categories that had children of both sexes of school-going age but one or more of those children were not attending school. That means that in 2,478 households without migrants (from pooled data of four

Table 3 Percentage of migrant and nonmigrant households with children out of school

Households with children out of school	Migrant (*P*)	Migrant (T)	Remittance	Nonmigrant
Girls[a]	52***	54	49***	64
	(162)	(37)	(220)	(2,541)
Boys[b]	35**	35	33***	47
	(162)	(37)	(220)	(2,541)

Notes: [a]Households have school-age children of both sexes, and no boy is out of school, but one or more girls do not attend school. [b]Households have school-age children of both sexes, and no girl is out of school, but one or more boys do not attend school.

rounds), 64 percent had one or more school-age girl who was not attending school, compared to 52 percent of households with a permanent migrant.

Households with children out of school are different from households who send children to school. In estimating the effect of migration on households' expenditures on children's schooling and shares of households' expenditures on girls, it is assumed that changes in expenditures occur either because households start investing more in children's education or start spending on children's education if they previously did not (that is, they start sending their children to school if they previously did not). The assumption is that processes that lead households to start spending on children's schooling and those that lead households to increase spending on children's schooling are similar. However, it may be that these two decisions are driven by different factors. To assess this, a Heckman selection model is estimated at the individual level. In the selection model, the effects of explanatory variables on the log of a household's annual expenditure on a girl child are estimated after accounting for selection of girls into schooling.

In this analysis, the dependent variable is the log of households' expenditure on each girl child. For girls of school age not attending school, this household expenditure is missing. The selection variable is the household's distance to girls' primary (Grade 1–5) and secondary (Grade 6–10) school. Households have reported the distance to the school that their children attend; for households that have not reported this distance, the average distance to schools in their village is used. As most schools in rural areas are sex-segregated, households' distance to girls' primary and secondary schools has been used. Distance to school affects households' decision to enroll their children into school but is not expected to directly affect the expenditures on the above-mentioned categories of expenditures.[15]

ESTIMATION AND IDENTIFICATION STRATEGY

To estimate the effect on girls' share, a fixed-effects model (FEM) with household and year fixed effects is used. The effect is estimated using the following equation:[16]

$$GirlsShare_{i,t} = \beta_1 PMigrant_{i,t} + \beta_2 TMigrant_{i,t} + \beta_3 Rem_{i,t} + \beta_4 X_{i,t} + \omega_i + \Phi_t + \epsilon_{i,t} \quad (1)$$

where $GirlsShare_{i,t}$ is the share of household i's expenditure on schooling of girls. $PMigrant_{i,t}$ is a binary variable that takes a value of 1 if household i, at period t, had a permanent migrant in period t. $TMigrant_{i,t}$ is a binary variable that takes a value of 1 if household i, at period t, had a temporary migrant in period t. $Rem_{i,t}$ is the natural log of remittances received by household i in period t. $X_{i,t}$ is a vector of household i's characteristics in period t, including household size, household income per person,[17] the ratio of girls of school age to boys of school age (5–17), household income quartile in the sample, and the share of women's income in the total income of the household. ω_i are the household's fixed effects and Φ_t are the year fixed effects. $\epsilon_{i,t}$ is the error term.

To estimate the effect of migration on a household's annual expenditure on girls' education after accounting for selection of households into sending their girl children to school, a Heckman selection model at the individual level is estimated.

The dependent variable, $LnExp*_i$, is the log of households' annual expenditure on girl child i. The variables $PMigrant_i$, $TMigrant_i$, and Rem_i are constructed as for Equation (1). X_i is a vector of controls including village dummies and time dummies.

The outcome equation of the Heckman selection equation takes the following form:

$$LnExp*_i = \gamma_0 + \gamma_1 PMigrant_i + \gamma_2 TMigrant_i + \gamma_3 Rem_i + \gamma_4 X_i + + \epsilon_i \quad (2)$$

$$LnExp_i = LnExp*_i \ if \ GirlSchool_i = 1$$

$$LnExp_i \ Not \ observed \ if \ GirlSchool_i = 0$$

The latent selection equation is:

$$GirlSchool_i = \rho_1 X_i + \rho_2 SchoolDistance_i + \rho_3 PMigrant_i + \rho_4 TMigrant_i + \rho_5 Rem_i + \varepsilon_i \quad (3)$$

$$GirlSchool_i = \begin{cases} GirlSchool_i = 1, & if\ \rho_1 X_i + \rho_2 SchoolDistance_i + \rho_3 PMigrant_i \\ & \quad +\rho_4 TMigrant_i + \rho_5 Rem_i > 0 \\ GirlSchool_i = 0, & if\ \rho_1 X_i + \rho_2 SchoolDistance_i + \rho_3 PMigrant_i \\ & \quad +\rho_4 TMigrant_i + \rho_5 Rem_i \leq 0 \end{cases}$$

where $GirlSchool_i$ is 0 if the girl child does not attend school. In this case, the log of expenditure on a child's education is missing. $GirlSchool_i$ takes a value of 1 if the girl child attends school. The Heckman selection model is estimated for all girls ages 5–17 in the pooled sample of all four rounds. The model is estimated separately for girls of primary school age (5–10) and girls of secondary school age (11–17).

RESULTS

Share of household expenditure on girls' education

Table 4 shows the results of the estimation of Equation (1). Estimates have been controlled for household and year fixed effects. Column (1) shows the effects of three explanatory variables of interest on the dependent variable, and column (2) shows the estimates after including household characteristics that are expected to affect girls' shares in education expenditures, as control variables. In column (3) the log of remittances is removed, and in column (4) the dummy variables indicating whether the household has a permanent or temporary migrant are removed. A full set of control variables is included in estimations reported in columns (2), (3), and (4). Sampling weights are incorporated in the estimation and robust standard errors are estimated. The sample is restricted to households with both girls and boys of school age (5–17) present in the household at the time of the survey. The sample, therefore, is of households that had children of both sexes present in the household at the time of the survey and households had positive expenditures on children's education, even if some of the children had zero expenditures either because they were out of school or because the household made zero out-of-pocket expenditures on their education.

The results shown in Table 4 suggest that households with a permanent migrant – that is, left-behind households – have significantly higher shares of their education expenditures spent on the education of girls. The coefficient of the binary variable indicating whether a household has a permanent migrant is positive and statistically significant. The estimated coefficient is 0.20–0.22; that is, households with a permanent migrant have a girls' share 0.20–0.22 percentage points higher than the average share of nonmigrant households. The average girls' share in nonmigrant households' is 0.70 (Table 2). That means that households with a permanent migrant have a share around 28–31 percent higher spent on girls than the average nonmigrant household. The coefficient of log remittances and that of temporary migrants is not statistically significant.

The results reported in Table 4 are based on the full panel. Appendix Table A4 reports the result of the estimation of Equation (2) based on a panel of the households included in the subsample surveyed in round

Table 4 Dependent variable: Girls' share in household total education expenditure (full panel)

Variables	(1)	(2)	(3)	(4)
Household has permanent member (left behind)	0.200**	0.215**	0.224**	
	(0.0969)	(0.0954)	(0.0923)	
Household has a temporary migrant	0.107	0.113	0.121	
	(0.126)	(0.123)	(0.121)	
Log remittance	0.00491	0.00433		0.00860
	(0.0121)	(0.0119)		(0.0117)
Number of observations	2,035	2,035	2,035	2,035
R-squared	0.024	0.034	0.034	0.026
Number of hid	889	889	889	889
Year and household FE	Yes	Yes	Yes	Yes
Household controls	No	Yes	Yes	Yes

Notes: Robust standard errors are given in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Household controls: Income per person, women's share in household income, ratio of girls to boys, number of children in household, and ratio of adult women to men.

4. The results corroborate the results presented earlier. The number of observations is low as the sample is restricted to households with both girls and boys of school age (5–17) present in the household. The estimated coefficient of the variable indicating whether the household is a left-behind household is positive and significant. The average girls' share in this smaller sample is 0.75, and the estimated coefficient of the variable indicating a left-behind household is 0.24–0.25, meaning that for left-behind households, the girls' share is 24–33 percent higher than that of nonmigrant households.

To assess whether households with permanent migrants have overall higher expenditures spent on children's education, I estimate Equation (1) with the log of the household's total annual education expenditure and the log of expenditure per child as dependent variables. These results are shown in Appendix Table A5 (full panel) and Appendix Table A6 (balanced panel). The analysis does not find evidence that households with permanent migrants have significantly different education expenditures spent on children's education. That these households have significantly higher shares of their education expenditures spent on girls may be because, in the absence of men from the household, left-behind women who take charge of household expenditures spend more on girls. This observation is in line with the work of Francisca M. Antman (2011) who observed that the share of household clothing expenditures spent on girls increased in the absence of the male head of the household. Our estimated

Table 5 Girls' share in household total education expenditure (sample restricted to households with children attending school)

Variables	(1)	(2)	(3)	(4)
Household has permanent member (left behind)	0.111*	0.114*	0.124**	
	(0.063)	(0.064)	(0.062)	
Household has a temporary migrant	0.0548	0.0688	0.0743	
	(0.054)	(0.054)	(0.055)	
Log remittance	0.00310	0.00348		0.00606
	(0.0076)	(0.0078)		(0.0076)
Number of observations	1,479	1,479	1,479	1,479
R-squared	0.039	0.057	0.056	0.047
Number of hid	678	678	678	678
Year FE and household FE	Yes	Yes	Yes	Yes
Household controls	No	Yes	Yes	Yes

Notes: Robust standard errors are given in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Household controls: Log of household income per person, household size, ratio of girls to boys of school-going age, share of women's income in household income, and dummy variable indicating whether the household has only girl children in the school-going age group.

coefficient is controlled for the ratio of girls and boys in the household, so the observed tilt in the share cannot be attributed to change in this ratio.

In the analysis so far, children not attending school have been assumed to have zero expenditures incurred for their education by the household. The underlying assumption is that the decision to enroll children in school and the decision to increase expenditure on children's schooling are driven by similar underlying processes. A change in expenditure on children's education because children previously not enrolled in school are now enrolled is treated the same as a change in children's education expenditures because children are provided more books or stationery or enrolled in better quality schools. If, however, changes in household shares of expenditures are gauged only for households that already sent their children to school, the following estimates are obtained (Table 5). We limit the sample to households with both boys and girls of school age present in the household and households that had positive expenditures on the education of both boys and girls.[18] The results echo the findings provided earlier: left-behind households from which a male member had migrated and was away from the household have significantly higher shares of their education expenditures spent on the education of girl children. The estimated coefficient is 0.11–0.12, meaning that girls' shares in households from which men migrate are 0.11–0.12 percentage points higher on average.

Table 6 Dependent variable: Girls' share in household total education expenditure (permanent migrants disaggregated into internal and international migrants)

Variables	(1)	(2)	(3)	(4)
Internal migrant	0.292**	0.291**	0.278**	0.283**
	(0.124)	(0.123)	(0.122)	(0.122)
Household migrant outside Pakistan	0.0830	0.0821	0.0499	0.0485
	(0.0963)	(0.0939)	(0.117)	(0.116)
Household has a male return migrant			− 0.180	− 0.183
			(0.139)	(0.138)
Log remittance				0.00773
				(0.0128)
Household has a temporary migrant				0.131
				(0.122)
Number of observations	2,035	2,035	2,035	2,035
R-squared	0.036	0.038	0.039	0.040
Number of hid	889	889	889	889
Year FE	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes
Income quintile	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Control variables: Log of household income per person, household size, ratio of girls to boys of school-going age, share of women's income in household income, and dummy variable indicating whether the household has only girl children in the school-going age group.

Mechanism check

To delineate the mechanism through which girls' share increases, I separate permanent migrants into two categories based on migrant destination: households from which men migrate to countries outside Pakistan (international migrants) and households from which men migrate to destinations inside Pakistan (internal migrants). Data limitations do not allow such disaggregation of temporary migrants into international and internal migrants. The transfer of norms mechanism is expected to come into play via international migration as international migrants may be more exposed to gender-egalitarian ways of living. However, for international migrants from Pakistan, the destination of the majority is the countries of the Gulf, where gender norms remain conservative. Hence, the effect of international migration on gender equality in the left-behind households in rural Pakistan may be positive if gender-egalitarian norms are transferred, or the effects could be negative if gender-conservative norms are transferred. The results are shown in columns (1) and (2) of Table 6.

Results suggest that left-behind households with internal migrants have a significantly higher girls' share; the category of permanent migrants appears to have been driven by these households and not by left-behind households of international migrants. The effect of having an international migrant is nonnsignificant but negative, suggesting perhaps that the transfer of norms mechanism, if present, may be weak. However, if changes in the role of women in left-behind households are the mechanism at play, why do left-behind households of international migrants not increase these shares? It may be that in left-behind households of international migrants the decision-making role of women is lower than the role of women in left-behind households of internal migrants. This is expected because international migrants emigrate farther and are less able to come back easily in a time of need; therefore, they are more likely to leave women and children under the supervision of another male relative who then becomes responsible for household decision making.

It can also be argued that if the observed changes in girls' shares are due to the increased role of women in household decisions in the absence of migrants, it may be that these roles are reversed upon migrants' return. We may then observe a decrease in girls' shares. To assess whether the permanent return of migrants affects the girls' shares, a category of male return migrants is included in the estimation of Equation (1). The category identified includes male migrants who had emigrated from the village before the start of the survey and hence were not counted as household members. However, at some point between the four rounds of the survey, these men had returned to their households. This differentiates them from permanent and temporary migrants identified earlier; permanent migrants had left the households and were away at the time of the survey, while temporary migrants, although they had returned to the household, had only been away for one to five months during the survey. These temporary migrants may migrate again for work.

The results of the estimation of Equation (1) with an added category of return male migrants included are presented in column (3) of Table 6. The estimated coefficient of the binary variable that takes a value of 1 if the household has a male return migrant is negative, although it is statistically nonsignificant. The negative sign may be indicative that returning male members reverse the decision-making roles of men and women in the households, but the effect is not strong. The negative sign also indicates that a transfer of norms mechanism is not at play.

To further delineate these mechanisms, the category of male return migrants is disaggregated into international returnees and returnees from within Pakistan. However, for the sample of households for which Equation (1) has been estimated, there are only three households with international return migrants. Equation (1) is still estimated with these categories. The results are provided in Table 7. The binary variable

Table 7 Girls' share in household total education expenditure (permanent and return migrants disaggregated into internal and international migrants)

Variables	(1)	(2)	(3)	(4)	(5)
Internal migrant	0.292**	0.291**	0.291**	0.278**	0.283**
	(0.124)	(0.124)	(0.124)	(0.122)	(0.122)
Household migrant outside Pakistan	0.0830	0.0909	0.0925	0.0605	0.0591
	(0.0963)	(0.0908)	(0.0933)	(0.116)	(0.115)
Household has a male return migrant			− 0.194	− 0.200	− 0.203
			(0.144)	(0.146)	(0.146)
Return migrant outside Pakistan			0.0347	0.0419	0.0380
			(0.211)	(0.267)	(0.262)
Log remittance					0.00780
					(0.0128)
Household has a temporary migrant					0.131
					(0.122)
Number of observations	2,035	2,035	2,035	2,035	2,035
R-squared	0.036	0.038	0.038	0.039	0.040
Number of hid	889	889	889	889	889
Year FE	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes
Income quintile	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Control variables: Log of household income per person, household size, ratio of girls to boys of school-going age, share of women's income in household income, and dummy variable indicating whether the household has only girl children in the school-going age group.

indicating whether the household is a left-behind household of an internal migrant is significant, positive, and robust to the inclusion of the additional variables. The coefficient of the variable that indicates whether the household had an international returnee is positive (though nonsignificant), suggesting that there may be some transfer of norms effect that is not strong. Looking at all these results together, we may infer that in left-behind households from which a male member migrates for employment, the share of households' education expenditures spent on girls increases due to the increased role of women in household decisions, including decisions regarding expenditures.

Long-term migrants

In the foregoing analysis, the categories of migrants that were defined – temporary and permanent migrants – attempt to capture scenarios where

women's decision participation can be expected to change. If men who migrated for work were away from the household for six months or more in a year, it is more likely that the left-behind members, including left-behind women, make household decisions (our category of "permanent migrants"). If the migrant men are away for less time than that, then they may actively participate in decisions such as expenditures on children's schooling (our category of "temporary migrants"). The analysis, however, does not consider households with long-term migrants. Long-term migrants are those migrants who are away from the household for longer than one year. It can be argued that in households where migrants are away for periods longer than a year, women assume decision-making roles. Data limitations do not allow for an analysis of households with long-term migrants. In the first three rounds of the PRHPS, only the migration of members in the survey year was recorded. Furthermore, an impact on the dependent variable cannot be gauged using fixed effects if a household is a long-term migrant household throughout the various rounds of the survey.

We still attempt to use the available data. In all rounds of the survey, data are collected on members of the household who had "left the household" for employment in the year preceding the survey and had not returned to the household. We define these households as households with "long-term" migrants in that round and *all subsequent rounds*. These households are identified by a binary variable taking a value of 1.[19] We use the information on return migrants to introduce variation in the binary variable. If the household reports a male "return" migrant in the subsequent round, the binary variable indicating whether the household is a long-term migrant household takes a value of 0. Equation (1) is estimated with girls' share as the dependent variable and the category of "long-term" migrants as an explanatory variable. The results are shown in Appendix Table A7. Households that have long-term migrants have significantly higher shares of their education expenditures spent on girls' education. The model does not capture the significant impact of remittances on these shares, nor are households' overall education expenditures affected by the household having a long-term migrant. We report these results cautiously given that our category of long-term migrants is defined in an *ad hoc* manner. However, the results lend support to the hypothesis that women taking over household decisions in the absence of men increases the shares of the household expenditures spent on girls.

School enrollment and expenditure on girls' schooling

Tables 8 and 9 report the results of the estimation of Equations (2) and (3). The model is estimated for all girls of school age (5–17) in the pooled data from the four rounds. The model is estimated separately for girls of primary school age (5–10) and girls of secondary school age (11–17), considering

Table 8 Dependent variable: Log of annual expenditure on girl child's education (ages 5–10, primary school)

Variables	(1)	(2)	(3)	(4)
Household has migrant member	0.0735	0.125		0.0338
	(0.3263)	(0.3061)		(0.4218)
Household has temporary migrant	− 0.548	− 0.521		− 0.543
	(0.8800)	(0.8821)		(0.8839)
Log remittance	0.0186		0.0194	0.0146
	(0.0178)		(0.0153)	(0.0207)
*Out migrant * Log remittance*				0.0146
				(0.0444)
Selection equation				
Distance to girls' primary school	− 0.0445***	− 0.0437***	− 0.0444***	− 0.0453***
	(0.0115)	(0.0115)	(0.0115)	(0.0116)
Household has migrant member	0.302**	0.382***		0.405***
	(0.1314)	(0.1232)		(0.1547)
Household has temporary migrant	− 0.225	− 0.205		− 0.242
	(0.2506)	(0.2554)		(0.2505)
Log remittance	0.0274**		0.0343***	0.0369***
	(0.0116)		(0.0110)	(0.0139)
Out migrant Log remittance*				− 0.0379
				(0.0255)
/artho	0.1618***	0.1628***	0.16323***	0.1637***
	(0.1330)	(0.0336)	(0.0326)	(0.0337)
/lnsigma	0.4701***	0.4803***	0.4805***	0.4800***
	(0.0522)	(0.0522)	(0.0522)	(0.0522)
Number of observations	3,278	3,278	3,278	3,278
Selected	1,801	1,801	1,801	1,801
Nonselected	1,477	1,477	1,477	1,477

Notes: Robust standard errors are given in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Control variables: Household size, ratio of girls to boys, share of women's income in household income, log of income per capita, and child age.

differences in households' preferences regarding the schooling of girls of different age groups.

Control variables included in both equations are the log of the household's annual income per person, the ratio of school-age girls to school-age boys in the household, household size, the ratio of adult women to adult men in the household, the share of income earned by women in the household's total income, the child's age, dummy variables to capture year fixed effects for each round, and dummy variables to capture village fixed effects. The selection equation further includes households' distance

Table 9 Dependent variable: Log of expenditure on girl child's education (ages 11–17, secondary school)

Variables	(1)	(2)	(3)	(4)
Household has migrant member	0.555***	0.466**	-	0.730***
	(0.201)	(0.191)		(0.203)
Household has temporary migrant	− 0.527	− 0.540	-	− 0.536
	(0.895)	(0.888)		(0.894)
Log remittance	− 0.0192	-	− 0.00442	− 0.00713
	(0.0174)		(0.0163)	(0.0221)
Household has migrant member * Ln remittance	-	-		− 0.0417
				(0.0310)
Average distance in village to girls' secondary school	− 0.0251***	− 0.0262***	− 0.0250***	− 0.0250***
	(0.00783)	(0.00781)	(0.00784)	(0.00784)
Average distance in village to girls' primary school	− 0.139***	− 0.138***	− 0.138***	− 0.138***
	(0.0231)	(0.0231)	(0.0231)	(0.0231)
Household has migrant member	0.0703	0.235**		− 0.00979
	(0.105)	(0.0996)		(0.124)
Household has temporary migrant	− 0.0770	− 0.0358		− 0.0553
	(0.218)	(0.216)		(0.219)
Log remittance	0.0448***		0.0467***	0.0367***
	(0.00993)		(0.00936)	(0.0122)
Household has migrant member Ln remittance*				0.0258
				(0.0210)
/artho	0.0668***	0.05411***	0.0648***	0.0668***
	(0.0213)	(0.0206)	(0.0207)	(0.0218)
/lnsigma	0.4844***	0.4846***	0.4877***	0.4838***
	(0.0542)	(0.0541)	(0.0540)	(0.0542)
Number of observations	3,261	3,261	3,261	3,261
Selected	1,184	1,184	1,184	1,184
Nonselected	2,077	2,077	2,077	2,077

Notes: Robust standard errors are given in parentheses. *, **, and *** denote significance at the 1, 5, and 10 percent levels, respectively. Control variables: Household size, ratio of girls to boys, share of women's income in household income, log of income per capita, child age, year dummies, and village dummies.

to girls' primary and secondary schools. The selection equation includes all control variables except the dummy variables for village fixed effects and year fixed effects. Table 8 shows the results of the estimation of the Heckman selection model for girls of primary school age (5–10) in the households across the pooled sample of four rounds. In column (1) of Table 8, all explanatory variables of interest, whether the household has permanent migrant, whether the household has temporary migrant, and the log of remittances are included along with all control variables. Overall, the estimated selection equation suggests a strong, positive association of households with permanent migrants with girls' selection into school. The coefficient of the binary variable indicating a household has a permanent migrant is 0.302–0.405, suggesting that girls of primary school age in households with a permanent migrant are significantly more likely to be selected into school than are those in households without migrants. The coefficient of log remittances is also positive and significant; the magnitude of the coefficient is between 0.027 and 0.036, suggesting that primary school-age girls in households that receive remittances are also more likely to be enrolled in school.

It can be argued that the two variables capture the impact of the same underlying process; therefore, in columns (2) and (3) of Table 8, the log remittance variable and a binary variable indicating whether the household has a permanent migrant are, respectively, removed. Moreover, to assess the joint effect of having a permanent migrant and receipt of remittance an interaction term of the two is included; results for this are shown in column (4). These results suggest an independent association of both variables with girls' enrollment in school. However, controlling for selection, the explanatory variables do not appear to have a significant association with the expenditure on the child's education, as indicated by the nonsignificant coefficients in the upper panel of the table.

Table 9 shows the results of the estimation of the Heckman selection model for girls of secondary school age in the pooled sample of four rounds. All control variables are included in the estimation; the selection equation is further controlled for the average distance in the village to the girls' secondary school and the average distance in the village to the girls' primary school. Estimates from the selection equation suggest nonrandom selection of girls into school, with the distance to both primary and secondary school significantly negatively associated with enrollment. The results are in line with literature in Pakistan's context that greater distance to school reduces the likelihood that girls are sent to school (Lodhi 2012).

Girls in households with a permanent migrant have significantly higher education expenditure on their education. The estimated coefficient of the binary variable indicating whether a household has a permanent migrant is between 0.46 and 0.73, suggesting that households with a permanent

migrant have up to 73 percent higher expenditure on the education of secondary school-age girls. In contrast to the results for primary school children (Table 8), except for log remittance, the explanatory variables do not show a consistently significant association with the likelihood of girls being sent to school. There is a consistently significant association of remittances with the likelihood that girls are enrolled in school.

The results shown in Tables 8 and 9 leave room for further research; taken together, it appears that primary school-age girls in households with permanent migrants are more likely to be enrolled in school but do not receive significantly different expenditures on their education. On the other hand, living in a household with permanent migrants is not significantly associated with the likelihood of being selected into schooling for secondary school-age girls. However, for this age group girls in migrant households have higher education expenditures. The reasons for the apparent differences in the effects for different age groups could be myriad; it can be conjectured that since primary school education is relatively inexpensive, the differences in the outcomes for girls in households where women are the decision makers – that is, in households with permanent migrants – use their decision role to send girls to school. Due to the overall low cost of primary school education, significant differences are not observed in terms of expenditures. On the other hand, girls of secondary school age face more conservative attitudes that even women in households where they decide are unable to counter. Perhaps this is the reason for the lack of a significant association between living in a household with a permanent migrant and the likelihood of selection into school. Further research can elaborate on the mechanisms behind the patterns observed here.

DISCUSSION

In this article, I have estimated the effect of migration of men from rural households on households' expenditure on children's education, focusing especially on its gendered distribution. To this end, the effect of men's migration on the share of education expenditure spent on girls is estimated. It is considered that migration may affect expenditure on education and its gendered distribution through various channels. Expenditure may be affected by a transfer of norms, by a change in household decision makers or through the receipt of remittances by the left-behind household. To delineate the mechanisms through which the dependent variables are impacted, migration is classified into two groups: temporary and permanent migration of men. Households from which a male member migrated to an urban area for employment during the survey year and was away from the household for over six months are considered households with a permanent migrant. Households from

which a male member migrated to an urban area for employment during the survey year and spent one to five months away from the household but then returned to the household are considered temporary migrant households. In households with permanent migrants, it is expected that decisions regarding household expenditures including expenditure on children's schooling are taken by left-behind members including women. In households with temporary migrants, decisions are not expected to be taken over completely by the left-behind members. However, changes in household attitudes toward children's education may occur due to migrants' exposure to different norms regarding children's education, particularly the education of girls. Furthermore, to differentiate the effect of men's absence due to migration from the effect of receipt of remittances, the effect of remittances is separately analyzed.

This article has exploited a longitudinal dataset from rural households in Pakistan to estimate a fixed-effects model. Moreover, considering the large number of girls who do not attend school, Heckman selection models are applied to pooled data, while the fixed-effects model is used to estimate the effect of the explanatory variable, controlling for cross-sectional heterogeneity and thus reducing the bias in estimates.

Our results from the fixed-effects model, estimated for households with both girls and boys of school age (5–17) present in the household, suggest that households from which a male member had permanently migrated during the year have significantly higher shares of their education expenditure spent on girls. These shares are up to 24–33 percent higher than the average share of nonmigrant households. A likely channel for this change may be an increase in the decision-making participation of women in the left-behind household in the absence of men. It can be argued that when women gain control over household decisions in the absence of men, they spend more on girls' education. Similar results were reported in a few earlier studies on Pakistan. Xiaohui Hou (2016) notes a positive relationship between women's decision making and enrollment of girls in schools. Evidence of women's participation in household decisions potentially closing gender gaps in education has also surfaced in other contexts: Farzana Afridi (2010) reports that women's empowerment reduces gaps in the education of girls versus boys in India, where empowerment of women is proxied by women's decision participation. Luciana Luz and Victor Agadjanian (2015), in the context of rural Mozambique, also report that women express a greater preference for girls' education when they are in charge of decisions. Rania Roushdy (2004) similarly noted that girls are more likely to complete education when women are taking decisions.

The Heckman selection model suggests that girls of primary school age (5–10) are more likely to be enrolled in school if living in households with

a permanent migrant, and that girls of secondary school age (11–17) living in households with a permanent migrant have higher expenditures.

The focus of the article is on the gendered distribution of households' education expenditures. This has been highlighted as previous works point to different effects of migration and remittances on boys and girls. Moreover, in the context of rural Pakistan, wide gaps exist in education outcomes as well as household expenditures on the education of girls and boys. The results of the analysis do not find evidence that households with permanent migrants and those with temporary migrants have significantly different education expenditures.

There are obvious limitations to the study. The fixed-effects model reduces bias in estimated impacts due to cross-sectional heterogeneity but does not tackle the simultaneity of decision making. It may be that households decide to send member(s) for work and to increase girls' share in education expenditures simultaneously. The observed increase in girls' shares, then, may not be the outcome of migration. Moreover, the results of the Heckman selection model are correlations rather than causations.

Sundus Saleemi
Rheinische Friedrich-Wilhelms-Universität Bonn Zentrum fur Entwicklungsforschung – Economic and Technological Change (ZEF-B)
Gensceralle 3 53113, Bonn, NRW 53113
Germany

Pakistan Institute of Development Economics
Quaid-I-Azam University, Campus 44000, Islamabad 44000
Pakistan
email: sundus.saleemi@gmail.com
http://orcid.org/0000-0001-5945-5067

NOTES ON CONTRIBUTOR

Sundus Saleemi is a Senior Researcher at the Center for Development Research (ZEF), University of Bonn. She has previously worked as a Staff Economist at the Pakistan Institute of Development Economics (PIDE).

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NOTES

[1] Jingzhong Ye et al. (2013) note that the term "left behind" has been used to describe: (1) families and households that have a migrant member away from the household, (2) families and households in migrant-sending communities that do not have a migrant away from the household and hence are considered "left behind," and (3) rural communities that have been "left behind" in the development process. In this article, "left behind" refers to nonmigrant members of households from which one or more members migrate leaving the other members in the place of origin.

[2] Given that the analysis of this article is at the household level, previous macro-level studies are not extensively reviewed; only a few latest and methodologically sound studies are mentioned.

[3] However, it makes the panel unbalanced due to the smaller number of households surveyed in round 4. Therefore, sampling weights from the first round of the survey are used in all estimations. Reliability of estimates is checked by restricting the sample to households included in round 4 wherever possible, contingent on the number of useful observations available in the smaller sample.Data in the fourth round were collected by the author in collaboration with the International Food Policy Research Institute (IFPRI). Written consent of the households was obtained. The necessary ethical clearance for the fourth round was also obtained.

[4] The province of Baluchistan and some areas in the province of Khyber Pakhtunkhwa were not surveyed due to adverse security situation. The sampling universe of the dataset also excludes the Federally Administered Tribal Areas (FATAs).

[5] The data collection methodology can be found in Nazli and Haider (2012). The PRHPS sample is representative of the rural areas of the three provinces. See https://www.ifpri.org/publication/pakistan-rural-household-panel-survey-prhps-2012.

[6] The districts are Districts Nowshera and Mansehra in Khyber Pakhtunkhwa province and District Attock in Punjab province.

[7] Gender inequality in terms of children's enrollment rates is one aspect of the overall inequality.

[8] Khyber Pakhtunkhwa province was also more accessible to the author than Sindh province.

[9] The four provinces Punjab, Sindh, Khyber Pakhtunkhwa, and Baluchistan are the second-tier administrative units of the country. In addition to these four units, there exist the province of Gilgit-Baltistan, the Federal Capital Territory, and FATAs. These areas were also excluded from the sampling universe of the PRHPS. The FATAs were merged with Khyber Pakhtunkhwa province in 2018.

[10] This is the total number of observations in the relevant category, including some observations overlapping with other categories; for example, some migrant households may also be receiving remittances. However, households in these overlapping categories are excluded when calculating the summary statistics and for comparison of means. For example, households that had a permanent migrant and also received remittances are not included to calculate the summary statistics in column (1). The summary statistics are based on 230 households with permanent migrants, not receiving any remittances and without temporary migrants; forty-five households with temporary migrants, not receiving any remittances and without permanent migrants; and 382 households that received remittances but did not have any permanent or temporary migrants.

[11] Households that had permanent or temporary migrants are excluded from this category for analysis; that is, only those remittance-receiving households are included in this category for comparison that did not have migrants from the two defined categories.

[12] We also calculate these shares without making this assumption, using actual expenditure and keeping expenditures missing for children not attending school.

[13] Of these 2,703 observations, 670 have zero education expenditures (either all the children are out of school or there were zero out-of-pocket expenditures incurred by the household), and thirteen have missing data. Another nine observations had other missing variables.

[14] The comparisons also excluded overlapping categories, so to calculate the average for households with permanent migrants, permanent migrant households that received remittances are excluded.

[15] The dataset reports expenditures on travel to school incurred for each child attending school in the household. In the calculation of both expenditure shares and per child (per girl, per boy) expenditures, travel costs have not been included.

[16] Equation (1) is also estimated for the log of households' total annual education expenditure and the log of households' annual per child expenditure as dependent variables; these results are provided in the Appendix.

[17] Household income estimates are used to indicate households' economic status instead of household expenditures, as data on the latter (except for that on children's schooling) are not available for round 4 of the survey. Incomes of all members, from all reported sources, of the household are added to arrive at the total household income. The total earned income is divided by the number of household members for per person income of the household. Income sources include primary and secondary employment, income from agriculture (farming and animals), rents, remittances, and social protection programs.

[18] That is, girls' share in households' education expenditures are therefore missing either because no child in the household was attending school or because no girls in the household were attending school.

[19] These migrants are included in the category of "permanent migrants" but only in the round the migration was reported in. Moreover, the category "permanent migrants" also includes these migrants who spent between six and twelve months away from the household.

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed online at https://doi.org/10.1080/13545701.2023.2191615.

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