MIGRATION'S SOCIO-ECONOMIC FOOTPRINT: ANALYSING THE EFFECTS ON LEFT-BEHND HOUSEHOLDS IN INDIA THROUGH IHDS

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ABSTRACT

Migration plays a pivotal role in India, presenting both opportunities and challenges for growth. The study analyses the effects of migration on left-behind households in India using the Indian Human Development Survey (IHDS) dataset for the periods 2004-05 and 2011-12. The empirical approach follows a Differences in Differences fixed effects regression to assess the impact of migration on household expenditure, income, assets, debt, and education level. The findings reveal that migration significantly enhances total household expenditure, reflecting improved living standards due to the inflow of remittances. The category wise analysis showed that migration positively impacts food, non-food, and energy expenditures of the households. However, the impact of migration on education expenditure is negative and health expenditure is insignificant. This suggests that households may prioritize short-term economic needs over long-term investments in human capital. Additionally, the increase in household debt among migrant households' points to the high financial costs associated with migration, which can impose significant economic burdens. It is evident from the analysis that migration positively impacts households' income while its impact on asset accumulation is insignificant. However, the probit regression analysis indicates significant and negative impact of migration on poverty, demonstrating the crucial role of migration in poverty alleviation.

Keywords: Migration, Left-behind households, Household expenditure

1.Introduction

Migration has been a pivotal force throughout human history, profoundly shaping the evolution of civilizations. This movement of people both within and across national borders, acts as a key component of the global socio-economic framework. It has been widely acknowledged as a crucial intervening apparatus in facilitating development and offering a route to mitigating deepening inequalities between different regions (Raghuram, 2009). In India, migration is a significant socio-economic phenomenon, with millions seeking better opportunities both within the country and internationally. As one of the largest sources of international migrants, India has millions of citizens working abroad, especially in the Gulf countries, the United States, and Europe (McAuliffe & Oucho, 2024). Domestically, migration from rural to urban areas is substantial, driven largely by economic factors. The Census of India, 2011 reported that there were 139 million internal migrants, highlighting the scale of movement within the country for improved livelihoods (Census of India, 2011).

The intricate link between migration and development is particularly important in the context of a developing country like India, since it presents both opportunities and challenges for growth. Migrants contribute to destinations by filling labour shortages, boosting innovation, and supporting aging populations (Goldin et al., 2018). Additionally, migration plays a vital role in the development of sending regions. Remittances sent back home by migrants provide an important source of income for families and communities. These funds support household expenditures, improve access to education and healthcare, and stimulate local economies (Ratha et al., 2011). Migration as a livelihood strategy

provides access to better employment, improves standard of living, and provides economic stability. It is evident that in India, migration significantly contributes to poverty reduction and economic development in rural areas (Deshingkar & Akter, 2009).

Recognising the dual impact of migration on both destination and origin, our study focuses on the link between migration and the welfare of left-behind families. Using the Indian Human Development Survey (IHDS), our study aims to analyse the impact of migration on household welfare through various social and economic outcomes. Firstly, the study evaluates the impact of migration on various categories of household expenditure, including food, non-food, health/medical, education, energy, and temptation goods expenditures. Secondly, the study seeks to determine the influence of migration on other socio-economic indicators such as income, assets, outstanding household debt, and education level. Further, it sheds light on the broader implication of migration by assessing its impact on poverty alleviation of left-behind households.

2. Literature Review

Migration—both internal and international—has emerged as a critical livelihood strategy across developing countries. Extensive literature highlights its potential to influence household welfare, especially for those left behind. The net effects of migration on income distribution are explained by Barham and Boucher (1998) in their study on remittances and inequality. Based on a sample of households in Nicaragua, they empirically proved that migration can both reduce and exacerbate income inequality, depending on the utilization of remittances. The direct and indirect income effect of remittances in improving household welfare has also been empirically demonstrated in Turkey by Koc and Onan (2001).

Several studies have examined the allocation of remittance income across expenditure categories. Russell et al. (1990), indicated that migrants often invest remittance money in education, farming, livestock, and small-scale enterprises after fulfilling household subsistence needs. This was echoed by Edwards and Ureta (2003) in El Salvador and Yang (2005) in the Philippines, who highlighted that remittances are primarily directed towards educational expenditures, reinforcing their role in human capital development. Tabuga (2007) further confirmed that remittance-receiving households tend to allocate more resources to education, health, housing, and durable goods.

Evidence from rural China indicates that households distinguish between productive and consumptive investments with poorer households favouring consumptive goods (Van Dalen et al., 2005; De Brauw & Rozelle, 2008). In Ghana, Quartey (2006) reported that remittances help maintain consumption among the poorest households while also supporting community-level and productive investments.

Remittances have also shown positive effects on health. Hildebrandt and McKenzie (2004) observed that international migration improved child health outcomes in Mexico by enhancing nutrition and food

expenditure. Taylor and Mora (2006), using data from Mexico's National Rural Household Survey, found that international migrant households allocated larger shares of their budgets to health, while internal migrant households spent more on health, housing, and education.

Asset accumulation is another key outcome of remittance inflows. In Nigeria, Osili (2005, 2007) found that migrants' income increased the likelihood of investing in housing and significantly improved household asset holdings. Similarly, Adams (1998) showed that international remittances contributed to rural asset accumulation in Pakistan.

Martinez and Yang (2005) examined the relationship between remittances and poverty in migrants' home areas in the Philippines, finding that remittances significantly reduce poverty levels. This evidence highlights the potential of remittances to alleviate poverty. Similarly, Wouterse (2008) found that remittances reduce the poverty headcount ratio among households with international migrants in Burkina Faso. Studies in Bangladesh also corroborate these findings, demonstrating that migration enhances household welfare and reduces poverty (Raihan et al., 2009; Sharma and Zaman, 2009; Wadood and Hossain, 2017). These outcomes are often mediated by increased spending on education and housing, as Adams and Cuecuecha (2010) noted, which contributes to improved living conditions and long-term economic development.

In Vietnam, studies by, Nguyen (2009), and Nguyen et al. (2015), confirm that migration is a primary strategy for poverty alleviation and improving household welfare in rural areas. Nguyen and Mont (2012) used data from the Vietnam Household Living Standard Surveys (VHLSS) 2002 and 2004, finding that international remittances are often used for savings and investments, while internal remittances are typically spent on consumption. Binci and Giannelli (2012) found positive effects on child education outcomes in remittance-receiving households, while Le and Nguyen (2011) noted that households receiving remittances exhibited higher levels of expenditure, especially on human capital and basic needs.

The positive impact of migration on left-behind household members has also been demonstrated through experimental studies. Gibson et al. (2010), using data from a migration lottery program, found significant improvements in household consumption and health outcomes. Their later study (2013) accounted for selection bias and duration-dependent effects, emphasizing the heterogeneous and complex nature of migration's welfare impacts. Similarly, Grigorian and Melkonyan (2011), studying Armenia, found that remittances influence critical household decisions, including consumption, savings, and investment, further highlighting their transformative potential.

Antman (2013) provided a comprehensive overview of the impact of migration on families left behind. Her analysis highlights the multifaceted effects of migration, including changes in labour supply, investment in human capital, and shifts in consumption patterns. Bala and Prada (2014) confirmed that remittances stabilize household consumption and mitigate economic volatility in developing countries.

Their study underscores the interconnectedness of migration, remittances, and household welfare, emphasizing the need for supportive policies to enhance the developmental impact of remittances. Bryan et al. (2014) exploring seasonal migration in Bangladesh found that migration can serve as a catalyst for economic activity by providing the necessary capital to invest in productive technologies. This perspective is crucial for understanding how migration can indirectly influence household welfare by enabling investments that boost overall economic productivity. In the Indian context, Parida et al. (2015) demonstrated that remittances significantly influence household expenditure patterns in rural areas, promoting investments in education and health. Their study underscores the critical role of remittances in enhancing household welfare and supporting long-term economic development.

3. Data and methods

3.1 Data

The analysis is based on two rounds of The Indian Human Development Survey (IHDS)2004-05 and 2011-12. The nationally representative, multi-topic survey of Indian households was conducted by the National Council of Applied Economic Research (NCAER) in collaboration with the University of Maryland. It provides detailed information on various aspects of human development including health, education, employment, income, and consumption. The IHDS is particularly valuable for the study as it includes two waves of data collection (2004-05 and 2011-12), allowing for longitudinal analysis. The first round in 2004-05 covered 41,554 households, out of which 83 percent were reinterviewed in the second round. Suitable substitutes were found for the remaining households leading to a sample of 41,554 in the second round. To measure the effect of migration, the study focuses on the households which were interviewed in both the first and second round resulting in a sample of 40,018.

3.2 Variables

We begin the description of variables by explaining the construction of migrant households, as the data set does not provide direct information on migration. Instead, it records the number of non-resident members of the households, including individuals who moved within the state, to another state, or abroad. Based on this, households have been created as migrant household if there has been any change in their non-resident member status between the two waves. Thus, migrant households have been defined as those households which had zero non-resident members in wave 1 (2004-05) of the survey but had at least one non-resident member in wave 2 (2011-12). This was done to only focus on new migration that occurred between the two waves, excluding households where migration was already present in the baseline (2004-05). This variable captures both internal and international migration, although the proportion of international non-residents was relatively lower in the sample.

To assess the impact of migration on left-behind households, the analysis focuses on a set of key outcome variables, including household expenditure patterns, income levels, asset ownership, household debt, educational attainment, and poverty status.

Expenditure data in the IHDS is reported across a wide range of goods and services—such as rice, wheat, clothing, and other consumables. From this information, different expenditure categories have been created as illustrated in Table 1. The consumption of individual goods has been aggregated into broad categories to facilitate analysis. To ensure uniformity and comparability, expenditures across different categories have been standardised monthly. Additionally, per capita values have been calculated to provide a more precise measure for analysis.

Table 1: Creation of consumption expenditure variable for analysis.

Category	**Variables included**
Food expenditure	Expenditure on consumption of rice, wheat, sugar, cereals, pulses, meat, oil, eggs, milk, vegetables, salt & spices, tea & coffee, fruits & nuts, gur & sweets.
Non-food household expenditure	Expenditure on housing and rent, telephone, toiletries, household items like soap, clothing and bedding, footwear, other personal household items.
Health expenditure	Expenditure on Medical in-patient and medical out-patient care.
Education expenditure	Expenditure on tuition fees and school utilities such as books.
Energy expenditure	Expenditure on fuel & electricity, kerosene, transportation & petrol.
Temptation goods expenditure	Expenditure on eating out, Paan/tobacco & intoxicants, recreation goods and entertainment
Total expenditure	Total expenditure on the above-mentioned categories

Household income in IHDS is reported annually and derived from multiple sources including farm income, agriculture and non-agricultures wage income, business income, salary income and income from government pension. Using the total income variable, a monthly per capita income variable has been created to facilitate the analysis. Income serves as a key indicator to assess the extent to which migration influences economic disparities within and across households.

To capture asset-based economic status IHDS provides an index of household assets by summing 30 dichotomous items measuring household assets and housing quality. The variable includes possessions such as television, grinder, vehicles etc along with housing quality measures such as type of wall and roof in house. The variable has a range from zero to thirty with a higher value indicating greater asset value. This household asset variable attempts to measure the economic status of the household and is the least volatile over the years in comparison to income and expenditure.

Data on outstanding household debt, includes debt from all sources such as formal financial institutions, informal sources, and other liabilities. The ‘log’ of this variable has been created for the purpose of the analysis. Migration may influence borrowing behaviour of households which influences household economic decisions such as savings, investment, and spending.

To incorporate a social dimension of welfare, the analysis includes the highest educational attainment among adult household members. Educational levels are closely linked to employment prospects,

income potential, and resource management capacity. For left-behind households, the education of remaining members may significantly affect their ability to adapt to the changes induced by migration.

Finally, household poverty status is captured by IHDS using a dichotomous variable indicating whether the household falls below the official poverty line, based on monthly per capita consumption and Planning Commission thresholds. Analysing poverty enables assessment of migration's effectiveness as a livelihood strategy and its role in reducing economic vulnerability.

3.3 Analytical Strategy

The study uses the Difference-in-Differences (DiD) methodology to estimate the causal impact of migration on household consumption expenditure. It is one of the most frequently used methods in impact evaluation studies. Based on a combination of before-after and treatment-control group comparisons, the method has an intuitive appeal and has been widely used in economics, public policy, health research, management, and other fields. In this study, the treatment group consists of households that experienced migration between the two survey waves, while the control group comprises households that had no migration in either wave.

This model assumes the parallel trends assumption, meaning that in the absence of migration, the changes in household consumption expenditure for migrant households would have followed the same trend as those of non-migrant households. This assumption is crucial for the identification strategy and the validity of the Difference-in-Differences (DiD) estimator. The model is defined by the following equation:

$$\mathbf{Y_{it} = \alpha_i + \gamma_t + \delta\ (\ Treatment_i\ x\ Post_t\ ) + \ E_{it}}$$

Where,

- Y_{it} is the outcome variable for housheold 'i' at time 't'. For the analysis the dependent variables are per capita total monthly household expenditure, per capita monthly food expenditure, per capita monthly non-food expenditure , per capita montly health expedniture, per capita monthly energy expedniture and per capita temptation good expenditure.
- α_i is the household fixed effect, capturing all time-invariant differences between households.
- γ_t is the time fixed effect, capturing common shocks to all households at a given time.
- $Post_t$ is the binary variable indicating the post treatment period which is defined as 1 for 2011-12 and 0 for 2004-05.
- Treatment is the binary variable indicating migration status which is defined as 1 if the housheold is migrant and 0 for non-migrant household.
- ($Treatment_i$ x $Post_t$) is the interaction term representing the DiD estimator.
- E_{it} is the error term.

Results for the DiD fixed effect regression have been elaborated in Table 4. The choice for fixed effects has been validated by performing the Hausman test. The result of the test strongly rejected the null hypothesis that the difference in coefficients between the fixed-effects and the random-effects models is not systematic (P-values of the tests are smaller than 0.01). This model has been further used to analyse the impact of migration on other variables including assets, income, outstanding household debt and highest adult education in the household.

To better understand the impact of migration on poverty, the analysis continues with a probit regression model. This approach helps in identifying the probability of households falling below the poverty line as influenced by migration patterns, while accounting for certain control variables.

The model is defined by the following equation:

$$\Pr(P=1|X_{it}) = \Phi(\beta_0 + \beta_1 Post_t + \beta_2 DiD_{it} + u_i + \epsilon_{it})$$

Where,

- $\Pr(P=1|X_{it})$ represents the probability that the dependent variable P (indicating poverty) equals 1, given the independent variables X_{it} .
- Φ is the cumulative distribution function of the standard normal distribution.
- β_0 is the intercept term.
- $Post_t$ is a binary variable indicating the post-treatment period (1 for 2011, 0 for 2005).
- DiD_{it} is the differences in differences estimator created above.
- U_i represents unobserved individual-specific effects.
- ϵ_{it} is the idiosyncratic error term.

The findings from this probit regression will provide critical insights into the key determinants of poverty and underscores the significant role of migration in influencing the likelihood of a household falling below the poverty line.

4. Results and discussion

4.1 Descriptive analysis

Table 2 provides a detailed overview of the background characteristics of households over time highlighting significant differences. Over the years, house ownership remains high across all groups with an increase in households with access to electricity from 76.9 percent to 87.5 percent for non-migrant households and 86.4 percent in migrant households from 2004-05 to 2011-12. Access to indoor piped drinking water increased for non-migrant households in 2011 from 27.5 percent to 32.3 percent. However, this trend was opposite for migrant households as this percentage fell to 26 percent. Households with no toilets have reduced in 2011-12 from 58.5 percent to 46.1 percent for non-migrant households and 47.6 percent for migrant households.

Table 2: Description of surveyed data according to selected housing and economic characteristics according to migration status for baseline.

Selected housing and economic characteristics	**2004-05 (%) (Baseline)**	
	Non-migrant households	**Migrant households**
House ownership (Pearson Chi-squared - 30.96***)		
Owned	93.1	94.8
Rented	5.6	4
Others	1.4	1.2
House type* ** (Pearson Chi-squared - 24.45***)		
House with no shared walls	17.9	19.2
House with shared walls	54.2	55.2
Flat	2.5	1.9
Chawl	8.8	7.7
Slum housing	10.3	9.8
Others	6.2	6.1
Indoor piped drinking water * ** (Pearson Chi-squared - 57***)	28.4	23.9
Separate kitchen in household* ** (Pearson Chi-squared - 23.16***)	58.9	62.1
Toilet facility in household* ** (Pearson Chi-squared - 14.79***)		
No toilet	58.2	59.7
Pit latrine	19.9	17.9
Flush toilet	21.9	22.3
Household with electricity * (Pearson Chi-squared - 6.23***)**	77.2	75.8
Cooking stove type* (Pearson Chi-squared - 83.66***)**		
Open fire	23.9	23.7
Traditional stove, without chimney	48.2	52.9
Improved stove, with chimney	4.7	4.9
Kerosene, LPG etc	23.2	18.5
Asset quintile* ** (Pearson Chi-squared - 23.14***)		
Poorest	16.8	18.1
Second quintile	18.2	18.2
Middle quintile	22.6	21.6
Fourth quintile	22.6	20.8
Richest	19.8	21.2
Poverty status^{ns} (Pearson Chi-squared - 0.0015)		
Poor	23.4	23.4
Non poor	76.5	76.5

Note:1. Poverty status is calculated using official planning commission poverty line of both time periods respectively
2. *p<0.10, **p<0.05, ***p<0.01, ns – not significant

The overall impact on poverty status indicates improvement with reduction in households with poor status from 23.4 percent in 2004-05 to 18 percent for non-migrant households and 13.8 percent for migrant households in 2011-12. It is noted that migrant households have greater reduction in poverty in comparison to non-migrant households in 2011-12. However, within asset quintiles it is seen that households coming under the poorest quintile have increased from 17 percent in 2005 to 19.3 percent for non-migrant households and 20.5 percent for migrant households in 2011-12. The high significance of the Pearson Chi-squared test for all variables across different household groups indicates significant differences between the background characteristics and whether they belong to migrant or non-migrant households. This strengthens the need for our analysis to decipher the impact of migration on welfare of households.

4.2 Impact of migration on household expenditure

This section presents the results for the econometrics analysis aimed at understanding the impact of migration on household welfare. Table 3 elaborates the results of the DiD fixed effects regression on various categories of household expenditure. For per capita total expenditure, the variable 'Post' indicating time after migration is significant and positive highlighting an increase in total expenditure with time. Specifically, a unit change in time is associated with a 23.3 percent increase in total expenditure. The interaction term (DiD) capturing the treatment effect of migration also shows a significant and positive impact on total household expenditure. This implies that for the treatment group (migrant households), migration leads to 13.5 percent increase in total consumption expenditure compared to the control group (non-migrant households). This rise in household expenditure and living standards following migration is well-documented across developing countries and is largely attributed to increased remittance income; for instance, in Vietnam, migration has been linked to higher per capita expenditures (De Brauw & Harigaya, 2007).

The results for food expenditure also indicate significant and positive impact over time and for migration. Specifically, there is a 13.1 percent increase in food expenditure among migrant households attributed to migration. For the variable 'Post,' it is noted that there is 18 percent increase in household food expenditure, indicating overall improvement over time. This aligns with findings from Indonesia where having at least one migrant in the family increases the composite index of food consumption and enhances the family's food security (Hasanah et.al., 2017).

Similarly, for the category of non-food expenditure, it is highlighted that over time there is significant difference in consumption with a 22.4 percent increase with a unit change. Additionally, migration shows significant and positive impact on non-food expenditure in migrant households. Specifically, with migration there is a 14.9 percent increase in non-food expenditure in migrant households.

For expenditure on education, it is seen that migration has a significant but negative impact, decreasing per capita expenditure on education by 57.4 percent. This negative effect of migration on education

expenditure in India is important to understand as mostly literature has suggested increase in education expenditure with migration. However, Vietnam presents a similar situation like India, where migration leads to decrease in education expenditure. This can be explained by a co-insurance mechanism by rural households of having migrants as some of these rural household members must stop studying and join the labour force in the place of origin (Nguyen et.al., 2017). Time shows a positive and significant effect with education expenditure to the extent of 45.4 percent.

Table 3: Results for DiD fixed effects regression for impact of migration on different expenditure categories.

Variables	**Per capita monthly total Exp. (ln)**	**Per capita monthly food Exp. (ln)**	**Per capita non-food Exp. (ln)**	**Per capita monthly health Exp. (ln)**	**Per capita monthly education Exp. (ln)**	**Per capita monthly energy Exp. (ln)**	**Per capita monthly temptation good Exp. (ln)**
Post (1=2011-12)	0.233*** (0.014)	0.180*** (0.013)	0.224*** (0.053)	0.555*** (0.149)	0.454*** (0.061)	0.527*** (0.064)	0.074 (0.094)
DiD estimator	0.135*** (0.012)	0.131*** (0.012)	0.149*** (0.036)	0.011 (0.091)	-0.574*** (0.114)	0.198*** (0.031)	-0.072 (0.066)
Constant	6.654*** (0.007)	6.323*** (0.007)	6.575*** (0.027)	1.950*** (0.074)	3.336*** (0.033)	2.185*** (0.033)	2.835*** (0.046)
Observations	68034	68071	69590	69712	69737	69347	69716

Note: 1. *p<0.10, **p<0.05, ***p<0.01
2. Standard errors are in parentheses
3. Household fixed effects are included in all models
4. Exp. = Expenditure

Table 3 presents interesting results for health expenditure where it is noted that migration has no significant impact on this expenditure category. The variable with significant impact on health expenditure is time with 55.5 percent increase in the expenditure. Although there is literature indicating positive impact on health expenditure by migrant households, the impact of internal migration on this expenditure was negligible in rural China. This was explained by households' allocation of remittances on immediate consumption needs such as food, clothing, and daily necessities (Démurger & Wang, 2016). This trend holds true for India as well, where migration significantly impacts food and non-food expenditure, highlighting Indian households' priority of budget allocation to these categories over others. Further, this pattern is reflected in the expenditure on temptation goods such as entertainment, as migration has no significant impact.

However, it is noted that migration has a significant and positive impact on expenditure on energy requirements by 19.8 percent in migrant households. There is also significant and positive relationship with time as a unit change leads to 52.7 percent increase in the expenditure.

Therefore, the results indicate that migration has a significant positive impact on several categories of household expenditure, including total, food, non-food, and energy expenditures. However, migration

has a significant negative impact on education expenditure and no significant impact on health and temptation good expenditures.

4.3 Impact of migration on income, assets, household debt and education

Further, to encapsulate the impact of migration on other socio-economic indicators, the results of the DiD fixed effects regression on these dependant variables has been presented in Table 4. As evident from the table, migration has a significant and positive impact on per capita monthly income of migrant households. Specifically, migration leads to a 21.8 percent increase in monthly income of migrant households in comparison to non-migrant households. Remittances significantly boost household incomes, which is critical for understanding the economic lifeline that remittances provide to households in vulnerable regions (Brown and Leeves, 2007). Additionally, time has a significant and positive impact where a unit change leads to an increase in per capita monthly income by 30.8 percent.

Similarly, time has a significant and positive impact on asset accumulation with a unit change leading to an increase in assets by 2.849 units. However, the DiD estimator shows that migration does not have any significant impact on assets for migrant households in comparison to the non-migrant households. This could be due to prioritised budget allocation towards food and non-food expenditures.

In contrast, migration shows a significant and positive effect on household debt. Migrant households experience a 54.7 percent increase in household debt compared to non-migrant households. This could be attributed to financing the high costs of migration. Time does not show any significant impact on households outstanding debt.

Table 4: Results for DiD fixed effect regression for impact of migration on assets, monthly income, education, and outstanding household debt.

Variables	**Assets**	**Per capita monthly income (ln)**	**Highest adult education in household**	**Outstanding household debt (ln)**
Post (1=2011-12)	2.849***	0.308***	0.790***	-0.243
	(0.161)	(0.034)	(0.058)	(0.238)
DiD estimator	-0.048	0.218***	-0.771***	0.547***
	(0.091)	(0.023)	(0.076)	(0.167)
Constant	11.774***	6.882***	7.405***	5.350***
	(0.075)	(0.017)	(0.030)	(0.124)
Observations	69792	68790	69754	60387

Note: 1. *p<0.10, **p<0.05, ***p<0.01
2. Standard errors are in parentheses.
3. Household fixed effects are included in all model.

Also, it is noted that for highest adult education in household, both time and migration have significant impacts. However, the direction of the impact differs, with time affecting education positively as a unit change leads to a 0.79 unit increase in adult education. Whereas migration impacts education negatively

as a unit change leads to a decline by 0.771 units. This aligns with the negative impact of migration on education expenditure empirically proved in the analysis above. It is important to reiterate that since some members of the household have migrated, there could be reallocation of labour within the remaining members. This shift in responsibility in response to increased labour demands can divert financial resources away from education.

4.4 Impact of migration on poverty

According to the probit regression results in Table 5, the variable 'Post' is significant suggesting that with a unit change in time there is 5.3 percent probability of reduction in poverty. The DiD estimator which encapsulates the effect of migration is also significant indicating that migration is associated with a reduction in the probability of a household being in poverty by 4.7 percentage points holding other factors constant. This significant reduction in poverty with migration works through multifaceted mechanisms. Primarily, the increase in income through remittances provides stability and enables the household to meet their consumption requirements (Adams & Page, 2005; Deshingker & Grimm, 2005; Mohanty et.al., 2016).

Table 5: Results for probit regression for impact of migration on household poverty status.

Variables	**Coefficient**	**Marginal effect (dy/dx)**
Post (1=2011-12)	-0.248***	-0.053***
	(0.080)	(0.019)
DiD estimator	-0.233***	-0.047***
	(0.047)	(0.008)
Constant	-0.942***	
	(0.122)	
Observations	69750	68672

Note: 1. *p<0.10, **p<0.05, ***p<0.01
2. Standard errors are in parentheses.

5. Conclusion

The analysis, utilizing Difference-in-Differences (DiD) fixed effects regression, revealed several key findings. Firstly, migration significantly increases total household expenditure with a 13.5 percent increase attributed to the treatment. This has been attributed primarily to remittance income according to previous literature documenting the positive impact of remittances on household living standards. In terms of specific expenditure categories, migration positively impacted food, non-food, and energy expenditures. Migrant households saw a 13.1 percent increase in food expenditure and a 14.9 percent increase in non-food expenditure, reflecting improved living conditions and increased household welfare. Additionally, migration led to a 19.8 percent increase in energy expenditure, further highlighting the enhanced financial capacity of migrant households to meet their essential needs.

Contrary to expectations, migration had a significant negative impact on education expenditure, decreasing it by 57.4 percent. This finding suggests a potential reallocation of household resources, possibly due to immediate economic pressures or the need for additional labour in the place of origin. This suggests that households may prioritize short-term economic needs over long-term investments in human capital. This is also visible in the insignificant impact of migration on health expenditure of households. The lack of expenditure in these categories indicates a critical area for policy intervention to ensure that migration does not adversely affect human capital development.

The analysis of other socio-economic indicators showed that migration significantly boosts household income by 21.8 percent, providing a stable foundation to households for incurring expenditures. However, migration did not significantly impact asset accumulation, possibly due to prioritized spending on immediate consumption needs. Migration also resulted in a significant increase in household debt by 54.7 percent, likely due to the high costs associated with migration which can impose significant economic burdens on the household. Furthermore, migration had a complex impact on education levels within households. While the overall level of adult education increased over time, migration itself negatively impacted this indicator, possibly due to the diversion of financial resources and labour towards immediate economic needs. Importantly, migration was associated with a significant reduction in household poverty as indicated in the probit regression analysis. The probability of a household being in poverty decreased by 4.7 percentage points due to migration, highlighting the role of remittances through migration in providing economic stability and reducing their vulnerability to economic shocks.

In summary, the study concludes that migration has multifaceted impacts on household welfare in India. While migration enhances overall expenditure, food security, and income, it also presents challenges such as increased household debt and negative effects on education expenditure. These findings underscore the need for targeted policy interventions to maximize the positive impacts of migration while mitigating its adverse effects.

6. Limitations

This study relies on data from the Indian Human Development Survey (IHDS) for the periods 2004–05 and 2011–12, and therefore does not capture more recent migration patterns or economic shifts. In addition, the use of self-reported data on household expenditure and welfare introduces the possibility of reporting bias. Another limitation of the study arises from the construction of migrant households. Households that reported having non-resident members in both Wave 1 (2004–05) and Wave 2 (2011–12) were not classified as migrant households, as the analysis focused exclusively on new migration that occurred between the two survey rounds. As a result, the potential long-term effects of sustained or earlier migration episodes are not captured in this study. Additionally, the analysis does not account for return migration (households having non-residents in Wave 1 but none in Wave 2), which may influence household welfare outcomes.

The study employs the Difference-in-Differences (DiD) fixed effects approach to control for unobserved, time-invariant household characteristics, it does not fully address endogeneity arising from time-varying shocks that jointly affect migration and household outcomes. Therefore, the estimates have been interpreted under the assumption of parallel trends. However, due to the absence of year-wise data, a formal test of this assumption was not conducted. These limitations highlight the need for future research employing more longitudinal data and advanced econometric techniques to strengthen causal inference.

There is need to further investigate the negative impact of migration on education expenditure and outstanding household debt depicted in the analysis with greater scrutiny to highlight the mechanism and implications for effective policy intervention. Also, the analysis was limited in terms of variable inclusion, and incorporating a broader range of economic indicators could enhance the depth of the findings. Variables such as labour market outcomes, entrepreneurial activities, and community-level economic development would provide a more comprehensive understanding of migration's economic impact. Additionally, examining intergenerational effects—such as the educational and occupational outcomes of children in migrant households—would offer valuable insights into the long-term implications of migration for social mobility and economic development.

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