

# **Local Nonfarm Opportunities and Migration Decisions: Evidence from Bangladesh**

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# Motivation...

- Rural nonfarm (RNF) activities in developing countries →
  - Generating employment
  - Reducing poverty

(Hoang et al., 2014; Christiaensen et al., 2013; Haggblade et al., 2010)

- RNF is no longer considered as a residual sector → ‘occupations of the last resort’ to the rural households
- Share of RNF income in total household income → Increasing (Iqbal et al., 2021)
- In developing countries, nonfarm workers are richer than farm workers (World Bank, 2017)
- Nonfarm households earned more than only farm or mixed households (Sen, 2018)
- The higher productivity of RNF employment → structural transformation in rural economy and overall economic growth (McMillan and Rodrik, 2011)

# Motivation...

- Literature misses one important aspect of the impacts of nonfarm activities →

## **Rural-urban migration**

- Some anecdotal evidences → Local nonfarm opportunities slow down rural-urban migration.
  - There is no robust empirical evidence on the relationship between the household nonfarm income and migration decisions.
- Fills up this gap

# Why important....

## 1. Policies influencing domestic migrations

- Domestic migration is seen as a strategy to reduce seasonal hunger and poverty
- Migration subsidy:
  - Bryan et al. (2014) generated experimental evidences that such policies work.
  - A small monetary incentives (\$8.50) to households in rural Bangladesh was able to induce 22 percent of the sample households to send a seasonal migrant.
  - Can we scale up such policies?
    - exhaustion of arbitrage opportunities in urban areas

## 2. Rural development strategies

- Impact on rural labor market → shortage of agricultural labor → high wage/food prices

Akram et al. (2018): migration subsidy induced emigration → male wage rate in the village increased by 4.5-6.6 percent → 2.7 percent increase in food prices

→ shortage of agricultural labor → fallow land (Xu et al. 2019; Caulfield et al. 2019)

## 3. Sustainable urban development

→ Higher rural-urban migration

- adverse impact on the urban labor, land and housing market
- congestion and pressure on public services
- environment of the urban economy

# Link between RNF income and migration

Complex!

- **HH members may not migrate even if local nonfarm opportunities are low**
- Lack of information about the likelihood of securing jobs, wages, etc. can also deter migration (Todaro, 1980; Stark and Levhari, 1982)
- Parental migration → **Unsupervised children left-behind** → loss of parental inputs in human capital development
  - Negative impact on children's test score
  - Negative impact on children's cognitive development
  - Negative impact on health outcomes
  - Psychological impact

(Bai, et al. 2018; Dustmann and Glitz, 2011; McKenzie and Hillel, 2011; Lei, 2018; Hongliang et al, 2014; Mulcahy and Kollamparambil, 2016)

- Long distance relationship → marital relationship of the adult migrants (Mercer et al., 2007; Jetley, 1987).

## **Household members may migrate even if local nonfarm opportunities are high**

- High non-monetary benefits
- Better working condition in urban areas
- More stable jobs (e.g., salaried jobs)
- May create opportunities for full family migration for better living standard
- Chetty, Hendren, and Katz (2016): If a household moves to wealthier areas, this may increase the likelihood of upward mobility and this strategy is cost-effective.

## **Impact of rural nonfarm income on migration decision can go either way!**

→ Empirical question

→ We answer this question in the context of Bangladesh

# Data and summary statistics

## 1. Domestic migration

→ Household Income and Expenditure Survey (HIES 2016)

Information of the migrants – age, years of education, occupations, the name of the destination districts, etc.

Table 1: Patterns of domestic migration

	Full sample		Rural		Municipalities		City corporation	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Share of domestic migrants (%)	<b>0.039</b>	0.194	<b>0.047</b>	0.211	0.025	0.155	0.01	0.099
Within district migration (%)	0.156	0.363	0.143	0.351	0.207	0.406	0.333	0.483
Within division migration (%)	0.385	0.487	0.376	0.485	0.429	0.496	0.429	0.507
Migrated to Dhaka and Chittagong (%)	0.843	0.364	0.852	0.355	0.803	0.399	0.714	0.463
Average years of schooling of the migrants	7.614	4.631	7.213	4.483	9.418	4.787	11.476	5.4
Average age of the migrants	31.719	11.319	31.229	11.207	34.031	11.724	35	9.492
Migrant is engaged in Industrial sector (%)	0.326	0.469	0.348	0.476	0.228	0.42	0.143	0.359
Migrant is engaged in Service sector (%)	0.626	0.484	0.604	0.489	0.728	0.446	0.81	0.402
Migrant is engaged in Agricultural sector (%)	0.036	0.187	0.037	0.188	0.034	0.182	0.048	0.218

# Definition of nonfarm income

- Conservative definition
- Sources of HH income:
  - i. agriculture self employment
  - ii. agriculture wage labor
  - iii. non-agriculture self employment**
  - iv. non-agriculture wage labor**
  - v. other (domestic and foreign remittances, transfers, rental, etc.)

RNF income = non-agriculture self employment + non-agriculture labor

Share of RNF income =  $\text{RNF Income} / [(i) + (ii) + (iii) + (iv)]$

➔ This has implications on identification strategy



# Rural nonfarm opportunities at local (union) level

- **Economic Census 2013**
- Economic Census: nonfarm economic establishments
- 3 Types of establishments
  - Permanent establishments
  - temporary establishments
  - household based economic establishments

8 Divisions → 64 Districts → 495 Sub-districts → 7845 Unions

Total Person Engaged (TPE) includes: Full-time, part-time, casual workers and owners

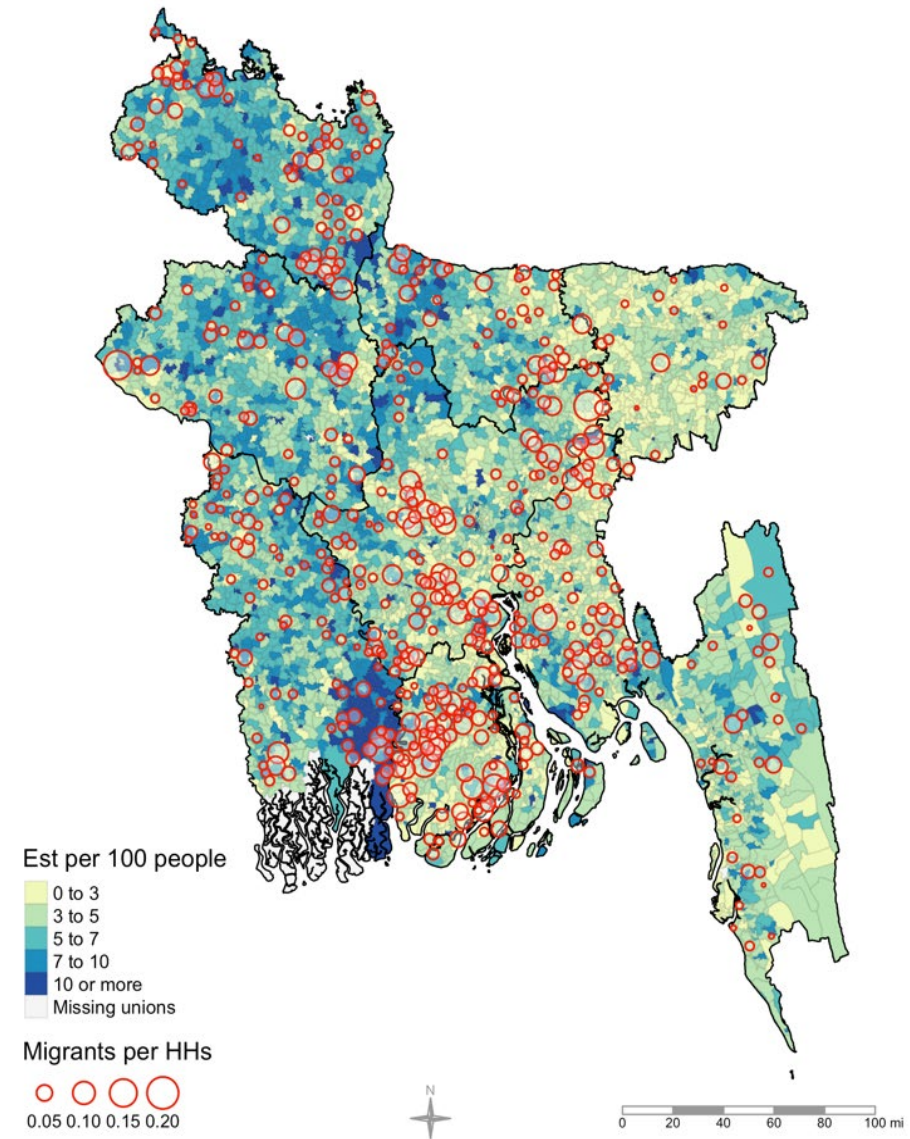
- Two Variables
  - **Number of establishments per 100 person in a union**
  - **Total Person Engaged (TPE) in enterprises per 100 person in a union**

Union level population: Population Census 2010

# Domestic migration and nonfarm prospects (enterprises per 100 people)

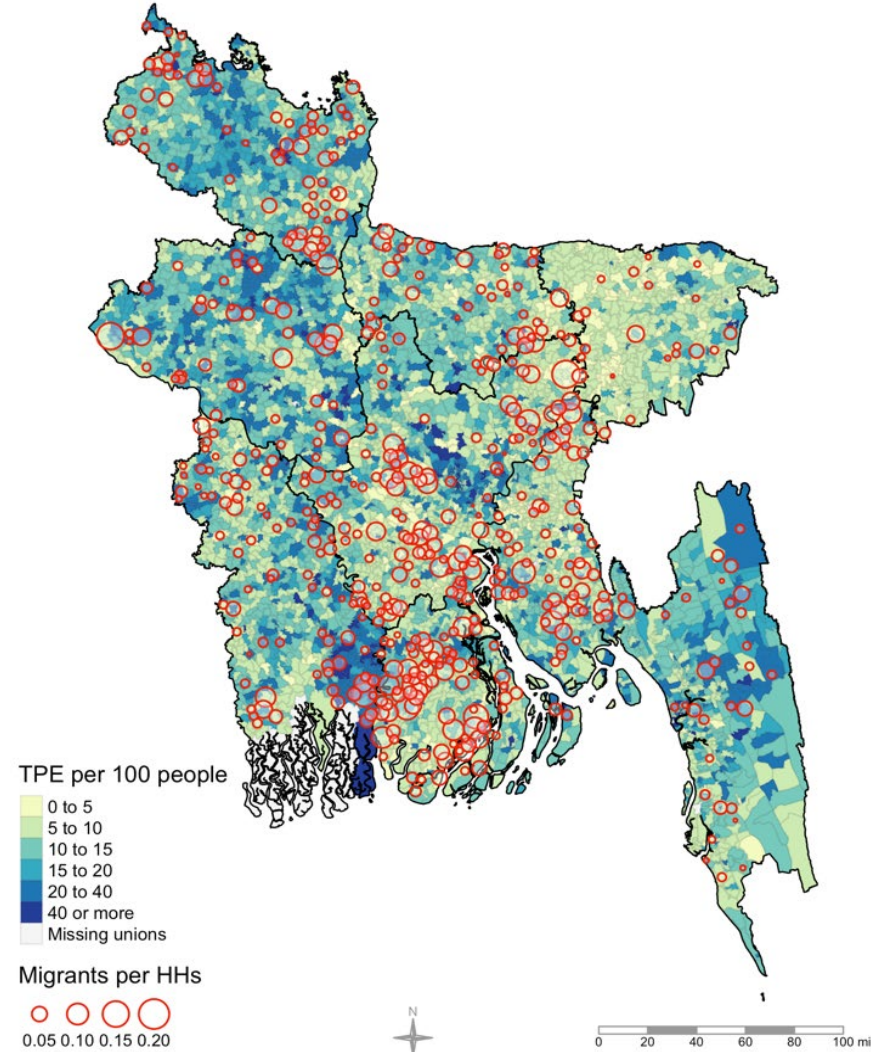
Union-level map of Bangladesh

Number of enterprises per 100 people, with number of HHs with migrants



# Domestic migration and nonfarm prospects: TPEs per 100

Union-level map of Bangladesh  
Number of employees of enterprises per 100 people and HHs with migrants



# Empirical strategy

Share of nonfarm income in total income is endogenous!

**Sources of endogeneity:**

## **i. Simultaneity bias**

Migration → remittances → share of nonfarm income

## **ii. Omitted variable bias**

Some unobserved third factor (e.g. ability, entrepreneurship) may impact the share of nonfarm income and migration decision.

# The instruments

- local nonfarm opportunities at the union level to instrument share of nonfarm income of a household.
  - Number of establishments per 100 person in a union
  - Total Person Engaged (TPE) in enterprises per 100 person in a union

## Validity of instruments

### 1. Exogeneity

- Concentration of nonfarm largely historically determined
    - Higher concentration in Western part of the country
    - Pabna's handloom and hosiery: pre-British period
    - Narayangonj's jamdani: Akbar's era
- ➔ Local nonfarm opportunities are exogenous to the decisions of engaging in nonfarm occupations and migration

## 2. Exclusion restriction

- Local nonfarm opportunities impact household member's decision to migrate only through nonfarm income

→ Local nonfarm opportunities → HH's nonfarm income → migration decision

- Violation:

Nonfarm → better Infrastructure → migration

→ District dummy

### 3. Relevance: First stage regression

- *Share of nonfarm income* $_i = \beta_0 + \beta_1 \text{union level nonfarm opportunities}_j + \beta_2 \text{district dummy} + u_i$
- The proxies for the union level nonfarm opportunities:
  - number of establishments per 100 people in a union
  - number of TPE (Total Person Employed) per 100 people in a union.

# Second stage Regression

- $Migration_i = \beta_0 + \beta_1 \text{instrumented share of nonfarm income}_i + \beta_2 \text{Disaster dummy}_i + \beta_3 \text{HH size}_i + \beta_4 \text{share of male adult}_i + \beta_5 \text{Female HH head dummy}_i + \beta_6 \text{district dummy}_i + e_i$
- Migration: Dummy, if a HH has a migrant
- Disaster dummy: If the HH experienced any natural disaster in the last one year
- HH size: number of HH member
- Share of male adult = number of male adult/total adult



# Regression results: 1<sup>st</sup> stage

Dependent variable: Share of non-farm income = Nonfarm income/(farm + nonfarm income)

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Rural + Municipalities	Municipalities only	Rural only	Rural + Municipalities	Municipalities only	Rural only
Number of establishments per 100 people in a union	0.014*** (0.003)	0.005*** (0.001)	0.010*** (0.003)			
Number of TPEs per 100 people in a union				0.004*** (0.001)	0.001*** (0.000)	0.005*** (0.001)
District dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.870*** (0.040)	0.806*** (0.042)	0.858*** (0.078)	0.288*** (0.070)	0.696*** (0.111)	0.604*** (0.078)
Observations	36,500	9,959	26,541	36,500	9,959	26,541
Adjusted R-squared	0.130	0.107	0.093	0.148	0.126	0.106
F stat	26.64	16.178	19.30	26.80	16.865	20.99

# Regression results: 2<sup>nd</sup> stage

(IV = Number of establishments per 100 people in a union)

- Dependent variable: dummy: domestic migration=1 if the HH has a member who has migrated for work within the country and 0 otherwise

	OLS			Probit		
	1	2	3	4	5	6
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.038*** (0.014)	-0.057** (0.023)	0.090 (0.144)	-0.063*** (0.022)	-0.099* (0.060)	0.092 (0.063)
Natural disaster (dummy)	0.014** (0.006)	-0.018* (0.010)	0.035* (0.019)	0.025** (0.010)	-0.023 (0.020)	0.041** (0.018)
Household size	0.004*** (0.001)	0.002 (0.001)	0.003 (0.002)	0.005*** (0.001)	0.004 (0.004)	0.002 (0.003)
Male adult/Total adult	0.020* (0.012)	-0.010 (0.016)	0.012 (0.027)	0.029** (0.013)	-0.021 (0.019)	0.022 (0.017)
HH head female (Dummy)	0.049*** (0.007)	0.029*** (0.008)	0.052*** (0.013)	0.052*** (0.012)	0.032*** (0.008)	0.061*** (0.012)
District Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.026 (0.022)	0.096** (0.043)	-0.143 (0.103)	-0.546 (0.422)	0.109** (0.051)	-0.307 (0.301)
Observations	36,498	9,958	26,540	36,498	9,958	26,540
R-squared	0.029	0.024	0.005	0.031	0.028	0.007

# Regression results: 2<sup>nd</sup> stage

(IV = TPE per 100 people in a union)

- Dependent variable: dummy: domestic migration=1 if the HH has a member who has migrated for work within the country and 0 otherwise

	OLS			Probit		
	1	2	3	4	5	6
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.040*** (0.011)	-0.065** (0.027)	0.034 (0.056)	-0.067*** (0.019)	-0.104** (0.059)	0.035 (0.037)
Natural disaster (dummy)	0.014** (0.006)	-0.020* (0.010)	0.028*** (0.010)	0.016** (0.007)	-0.031 (0.026)	0.035*** (0.011)
Household size	0.004*** (0.001)	0.002 (0.001)	0.004** (0.002)	0.005*** (0.001)	0.003 (0.002)	0.005** (0.025)
Male adult/Total adult	0.020* (0.012)	-0.010 (0.016)	0.022 (0.018)	0.031* (0.016)	-0.019 (0.018)	0.032 (0.027)
HH head female (Dummy)	0.049*** (0.007)	0.029*** (0.008)	0.055*** (0.010)	0.062*** (0.009)	0.024*** (0.006)	0.063*** (0.014)
District Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.025 (0.021)	0.102** (0.046)	-0.106** (0.045)	-0.094 (0.081)	0.209*** (0.037)	-0.209** (0.102)
Observations	36,498	9,958	26,540	36,498	9,958	26,540
R-squared	0.028	0.020	0.038	0.029	0.022	0.043

# Heterogeneity of impact: Based on income

	OLS			Probit			OLS			Probit		
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Panel A: Above mean of income</b>												
Sample: Above mean of income; Instrument= Number of establishments per 100 people in a union						Sample: Above mean of income; Instrument= Number of TPEs per 100 people in a union						
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.083** (0.038)	-0.194** (0.076)	0.346 (0.388)	-0.157*** (0.057)	-0.407** (0.203)	0.350* (0.209)	-0.210*** (0.059)	-0.494** (0.249)	0.054 (0.099)	-0.210*** (0.059)	-0.494** (0.249)	0.054 (0.099)
<b>Panel B: Below mean of income</b>												
Sample: Below mean of income; Instrument= Number of establishments per 100 people in a union						Sample: Below mean of income; Instrument= Number of TPEs per 100 people in a union						
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.035*** (0.013)	-0.015 (0.021)	-0.039 (0.090)	-0.053** (0.026)	-0.018 (0.060)	-0.034 (0.063)	-0.026** (0.012)	-0.012 (0.033)	0.013 (0.048)	-0.041** (0.021)	-0.045 (0.075)	0.008 (0.038)

# Heterogeneity of impact: Based on land owned

	OLS			Probit			OLS			Probit		
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Panel A: Above mean of land owned</b>												
Sample: Above mean of land owned; Instrument= Number of establishments per 100 people in a union						Sample: Above mean of land owned; Instrument= Number of TPEs per 100 people in a union						
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	0.011 (0.040)	0.042 (0.081)	0.949 (0.876)	0.014 (0.047)	0.097 (0.124)	1.704 (2.369)	-0.001 (0.032)	0.042 (0.073)	0.328* (0.194)	-0.006 (0.042)	0.120 (0.135)	0.402** (0.211)
<b>Panel B: Below mean of land owned</b>												
Sample: Below mean of land owned; Instrument= Number of establishments per 100 people in a union						Sample: Below mean of land owned; Instrument= Number of TPEs per 100 people in a union						
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.043*** (0.015)	-0.076** (0.031)	-0.002 (0.142)	-0.083*** (0.027)	-0.158** (0.083)	-0.002 (0.067)	-0.043*** (0.013)	-0.077** (0.036)	-0.024 (0.059)	-0.077*** (0.023)	-0.144* (0.082)	-0.024 (0.045)

# Heterogeneity of impact: Based on education of the HH head

	OLS			Probit			OLS			Probit		
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Panel A: Above mean of education of the household head</b>												
Sample: Above mean of education of the HH head; Instrument= Number of establishments per 100 people in a union							Sample: Above mean of education of the HH head; Instrument= Number of TPEs per 100 people in a union					
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.064*** (0.015)	-0.151*** (0.045)	-0.056 (0.206)	-0.114*** (0.033)	-0.323*** (0.135)	-0.035 (0.174)	- 0.058*** (0.015)	-0.175*** (0.057)	-0.004 (0.083)	-0.083*** (0.026)	-0.267** (0.115)	-0.013 (0.084)
Observations	15,809	5,583	10,226	15,809	5,583	10,226	15,809	5,583	10,226	15,809	5,583	10,226
<b>Panel B: Below mean of education of the household head</b>												
Sample: Below mean of education of the HH head; Instrument= Number of establishments per 100 people in a union							Sample: Below mean of education of the HH head; Instrument= Number of TPEs per 100 people in a union					
Variables	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural	Rural + Municipalities	Municipalities	Rural
Share of non-farm income	-0.006 (0.027)	0.026 (0.033)	0.167 (0.172)	-0.013 (0.031)	0.099 (0.121)	0.155** (0.076)	-0.023 (0.019)	0.013 (0.039)	0.065 (0.074)	-0.043 (0.032)	0.062 (0.163)	0.073 (0.049)
Observations	20,689	4,375	16,314	20,689	4,375	16,314	20,689	4,375	16,314	20,689	4,375	16,314

# Robustness check: SME Cluster and migration

- SME Foundation: 177 manufacturing clusters
- Large concentration of manufacturing enterprises
- Idea: People tend to migrate less from the union with SME clusters
- Instrument: union dummy: if the union has a SME cluster

## Second stage regressions (Instrument= Cluster union dummy)

Dependent variable: dummy: domestic migration=1 if the HH has a member who has migrated for work within the country and 0 otherwise

Variables	OLS			Probit		
	1	2	3	4	5	6
	Rural + Municipalities	Municipal ities	Rural	Rural + Municipalities	Municipal ities	Rural
Share of non-farm income	-0.054** (0.022)	-0.143* (0.075)	-0.057 (0.144)	-0.059*** (0.020)	-0.106** (0.052)	-0.334 (0.096)
Natural disaster (dummy)	0.011 (0.007)	-0.041* (0.023)	0.016 (0.020)	0.023 (0.017)	-0.071 (0.067)	0.031 (0.040)
Household size	0.005*** (0.001)	0.002* (0.001)	0.006* (0.003)	0.008*** (0.002)	0.004* (0.019)	0.011* (0.050)
Male adult/Total adult	0.022* (0.012)	-0.007 (0.017)	0.037 (0.030)	0.033* (0.016)	-0.012 (0.019)	0.077 (0.101)
HH head female (Dummy)	0.050*** (0.007)	0.029*** (0.008)	0.060*** (0.013)	0.072*** (0.009)	0.054*** (0.012)	0.094*** (0.019)
District Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.020 (0.021)	0.166** (0.071)	-0.044 (0.099)	-0.077 (0.071)	0.202* (0.101)	-0.077 (0.127)
Observations	36,498	9,958	26,540	36,356	7,564	26,226
R-squared	0.021	0.022	0.022	0.022	0.023	0.022



# Regression results: Summary

## → Baseline results

- Nonfarm opportunities at the union level increases the share of nonfarm income of the households and this in turn reduces of the chances of migration of a member the household.
- Strong impact at the municipality level

## → Heterogeneity of impact

- The impact has also been found to be more pronounced for the households with higher income, higher education but lesser land holdings

## → Robustness check

- The likelihood of migration is lower from the union with SME cluster.

# Conclusion

## Headline results

Member of a household is less likely to migrate if the share of nonfarm income is high, particularly in semi-rural areas.

## Policy implications

- Creating nonfarm opportunities at the local level is central to the idea of reducing influx of people to the urban areas. How?
  - ➔ Infrastructure development such as roads, bridges, culverts, etc. and development of local markets and rural bazars.
  - ➔ Public investment in rural and semi-rural areas such as development of small industrial estate, for example.
  - ➔ Development of secondary town closer to villages

**THANK YOU**