Effect of Remittances on Farm Productivity after a large natural disaster.

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December 5, 2024

Paper in a Gist

<u>Aim</u>:

- Exploit exogenous spatial variation in the earthquake's intensity, variation in time and remittances to investigate the impact of remittances on the farm productivity of households during the time of disasters.

- Address the endogeneity of remittances by using the exchange rate as an instrument
  1. What is the impact of remittances on farm productivity during shocks?
  2. What are the potential mechanisms?

<u>Methodology</u>?

1. Triple-Difference Strategy

2. Using exchange rate as an instrument for Remittances to correct for endogeneity issues of remittance

Definition

- <u>Remittances</u>:
  Remittances are the amount of money sent to households by family members who migrated elsewhere for work. It includes both within-country migration and international migration.
- Farm Productivity:
  Farm Productivity is calculated as the total income generated by households through farming activities (incl. livestock) per land used.
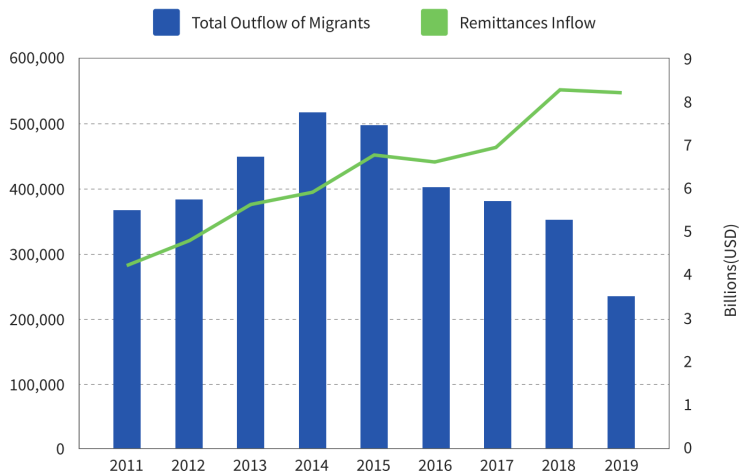
Context: Remittances

World

- Remittances to low- and middle-income countries (LMICs) increased by an estimated 5 percent in 2022 to $626 billion.
- The growth of global remittance flows is expected to be 4.9 percent in 2022.
- Remained resilient during COVID-19 Shock

Nepal

- $ 8 billion (USD) Remittances received in 2020
- 28% Remittance as a share of GDP (Top 10)
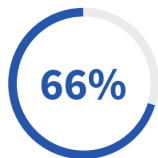- 55.8% of total households receive remittances

(Source: World Bank, 2022)

Context: Remittances

Source: World Bank, 2022 & Foreign Emplyment Information Management System (FEIMS)

Context: Agriculture

66% People Involved in Agriculture

36% Agriculture as a Share of GDP

Source: Government of Nepal, 2020

Context: Remittances in 2021 (mil USD) / Survey Data

(a) Flow of Remittances

Country	Remit Out	Remit In
Saudi Arabia	0	1,691.98
Malaysia	0	1,684.72
India	1,596.07	1,583.4
Qatar	0	1,098.59
United States	0	684.18
Australia	0	466.58
United Kingdom	0	224.54
South Korea	0	136.75
United Arab Emirates	0	105.82
Kuwait	0	89.19

Source: KNOMAD

(b) Remittance Table

(c) Destination (Survey)

Country	Number	Amount
Malaysia	1599	3.5
Qatar	1487	3.4
Saudi Arabia	1194	2.8
India	4001	2.2
Dubai	562	1.3
Japan	211	0.8
South Korea	113	0.7
US	184	0.4
UK	135	0.3
Australia	122	0.2

Source: Survey and Authors calculation

(d) Destination Table

Data

- Nepal Living Standard Survey(NLSS) 2011
  - Nationally Representative Household Survey
  - Comprehensive household-level information about demographic and socio-economic characteristics, labour supply, agricultural and business activities, household income and sources, financial activites, migration, and the receipt of remittances.
- Household Risk and Vulnerability Survey 2016-18
  - Based on NLSS survey for comparability
  - Survey Conducted on the aftermath of earthquake

Specification

- We use the following specification:

$$Y_{hwt} = \beta_0 + \beta_1 \cdot \text{MMI}_w + \beta_2 \cdot \text{Post}_t + \beta_3 \cdot \text{Remit}_{hwt} + \beta_4 \cdot (\text{MMI}_w \times \text{Pos}$$
$$+ \beta_5 \cdot (\text{MMI}_w \times \text{Remit}_{hwt}) + \beta_6 \cdot (\text{Post}_t \times \text{Remit}_{hwt})$$
$$+ \beta_7 \cdot (\text{Post}_t \times \text{Remit}_{hwt} \times \text{MMI}_w) + \gamma_w + \epsilon_{hwt} \qquad (1)$$

- Y stands for farm productivity alongside labour market variables that varies at household level
- β_7 is the triple difference estimator and the coefficient of interest
- γ_w is ward fixed effects.
- Error is clustered at district level to allow arbitrary correlation of errors for district **10.1162/003355304772839588**.

Empirical Strategy: DID

Potential Issues with DID:

- Possible SUTVA violation due to different dosage of impact
- Dividing into treatment and Control might lead to endogenity in treatments

Solution to both: **Continuous Treatment: MMI**
We estimate both TWFE and doubly roust estimators <**empty citation**> and interpret following the procedures of
**callaway2024differenceindifferences** for continuous treatments.

Empirical Strategy: IV

IV Assumptions

- Plausibly Random: One issue would be government manipulating the exchange rate which might affect remittances but is improbable, first because peg on India and second because Gulf countries have a peg on USD with little variation.
- Exclusion restriction plausibly holds: Because probable channel of violation would be if the price of input for agriculture or price for export, which would impact productivity. This is unlikely because more than 90 percent of imports are from India, which has a fixed exchange rate. No import essentially from Gulf Countries and Malaysia.
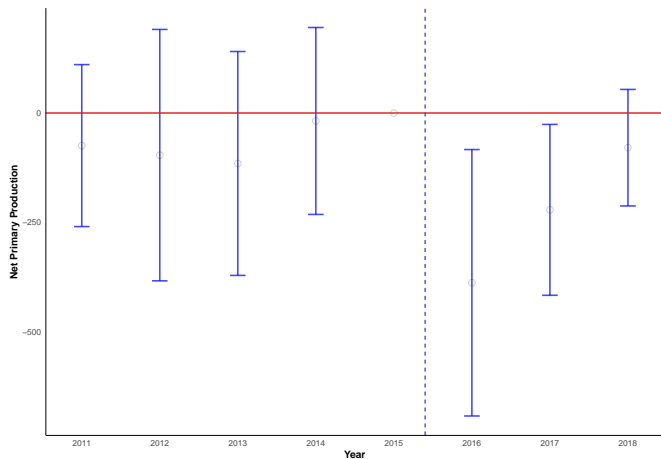
Potential Issue: Lack of Variation

- We use interview date to get average annual exchange rate, so we get inter wave variation in exchange rate.

Preliminary Results: Parallel Trends
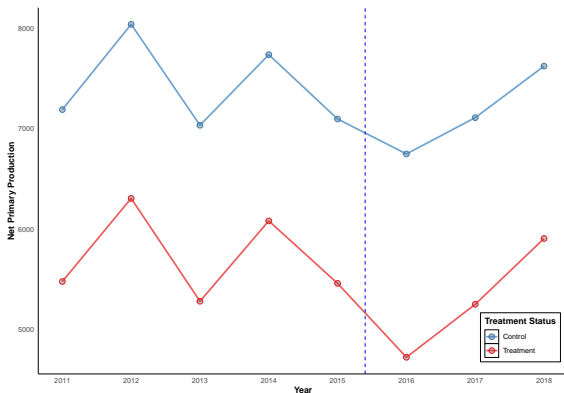
Preliminary Results: Event Study

Preliminary Results: First Stage

Table: First Stage Regression

	log(Remittances)	log(Remittances)	log(Remittances)
Exchange Rate	0.160***	0.162***	0.167***
	(0.022)	(0.022)	(0.022)
Adjusted R^2	0.163	0.171	0.245
Observations	31,859	31,856	31,849
F-statistics	53	23	29
Ward FE	No	No	Yes
HH Controls	No	Yes	Yes

Preliminary Results

Table: Main Regression

	log(Productivity)	log(Productivity)
Panel A: Aggregate		
Remittances × Treated × Post	-0.186**	-0.162**
	(0.079)	(0.077)
Panel B: Yearly Estimates		
2016 × Remittances × Treated	-0.206**	-0.176**
	(0.091)	(0.085)
2017 × Remittances × Treated	-0.226***	-0.194**
	(0.084)	(0.082)
2018 × Remittances × Treated	-0.132	-0.101
	(0.080)	(0.077)

Preliminary Results

Table: Labour Hour per head

	(1)	(2)	(3)	(4)
Remittances $\times$ Treated $\times$ Post	0.152	-0.147	-0.055	-0.147***
	(0.231)	(0.126)	(0.188)	(0.051)
VDC FE	Yes	Yes	Yes	Yes
HH Controls	Yes	Yes	Yes	Yes

Note: SE clustered at District Level,

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

Preliminary Results

Table: Labour Hours Individual

	Total LH (1)	Total Agriculture (2)	Self Agricu (3)
Panel A: Aggregate			
Remittances $\times$ Treated $\times$ Post	0.084 (0.105)	0.010 (0.080)	0.012 (0.082
Panel B: Yearly Estimates			
2016 $\times$ Remittances $\times$ Treated	0.047 (0.102)	-0.014 (0.075)	-0.006 (0.078
2017 $\times$ Remittances $\times$ Treated	0.113 (0.106)	0.015 (0.083)	0.014 (0.083

Conclusion

- We show negative impact of remittances on farm productivity
- We do not find changes in total labor supply which is consistent with evidence from other papers (Mobarak et al., 2023; Akram et al., 2017).
- Therefore could be driven by the shift of labour to Self Non-Agricultural Activities. Current evidence are mixed (Mobarak et al., 2023; Lokshin and Glinskaya, 2009; Phadera, 2016; Kinnan et al., 2018).

Any Questions?

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