Migration and Risk

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Important Research Agendas around Migration and Risk

- Migration is a risk mitigation strategy
  - e.g. Rosenzweig and Stark (JPE 1989)
- Migration is risky
  - e.g. structural transformation (Arthur Lewis, Harris & Todaro, 1950s)
- Risk aversion may prevent profitable migration
  - Bryan, Chowdhury, Mobarak (ECMA 2014), Lagakos (JEP 2020)
- Migration can affect informal risk sharing
  - Morten (JPE 2018), Meghir, Mobarak, Mommaerts, Morten (REStud 2021)
- Informal risk sharing can prevent migration
  - Munshi and Rosenzweig (AER 2016)

The Environment

- Rural, agrarian areas of developing countries
- Weather-dependent and faces large weather risk
- How do you mitigate that risk?
  - Credit, savings (but there are market failures)
  - Informal risk sharing if no formal insurance
  - Diversify income sources (e.g. migrate seasonally)
- How do you generate growth?
  - Technology adoption
  - Migration in search of better wages

Research Agendas we will talk about

- Why is there low technology adoption?
- Is migration a profitable technology?
  - If so, why don't people migrate?
- Is risk aversion a deterrent to technology adoption?
- Does migration change informal risk sharing?

Motivation: Low Technology Adoption

- Examples abound in development of relatively inexpensive welfare-improving technologies that are not adopted by poor households
  - Insecticide treated bed-nets, birth control, vaccines
  - New varieties of seeds and fertilizer
  - Hand-washing, Toilets
  - Weather insurance
  - Migration
- Note that the examples span health, finance, agriculture
- Low demand for apparently beneficial technologies may be a key constraint to development
  - e.g. development implications of insurance, informal sharing norms, savings and investment
- Availability of state-of-the-art rigorous research using large-scale randomized controlled field trials in developing countries

Why Don't People Adopt?

- Some hypotheses:
  - Lack of liquidity
    - …or Credit or Savings…
  - Information failure or learning externalities (inefficiently low experimentation)
  - "Taste" and tradition
  - Habit
  - Risk Aversion
  - Substitute Informal Solutions
  - Ambiguity Aversion
  - Present-Biased Preferences
  - Externalities, Strategic Complementarities, Social Learning and other Inter-linkages
  - Intra-household externality

Why study the different sources of aversion?

- Disentangling different reasons for adoption has important policy implications – do we need to address costs, or risk aversion, or taste, or an information failure?
  - With a limited development budget or marketing budget, it is costly to subsidize a product with low price elasticity, or it may be cheaper to encourage adoption using a different policy instrument
- What are the implications of our results for policy change?
  - Political economy, welfare, general equilibrium consequences

Approach to my research

- Market the product or behavior to several thousand households in a developing country
- Randomly vary different aspects of the marketing strategy to understand what works best, and to identify the key aversions to take-up
- Two key requirements:
  - Randomization
  - Large Sample
- Design experiments at larger scale to understand the implications (political economy, general equilibrium, welfare) of policy change

The marketing challenge

- Products, behaviors and technologies that we want to sell are sometimes "new"
- Costs and benefits of the product to the user are uncertain.

- Risk averse users may choose not to experiment with the product

Risk Aversion vs. Product is bad

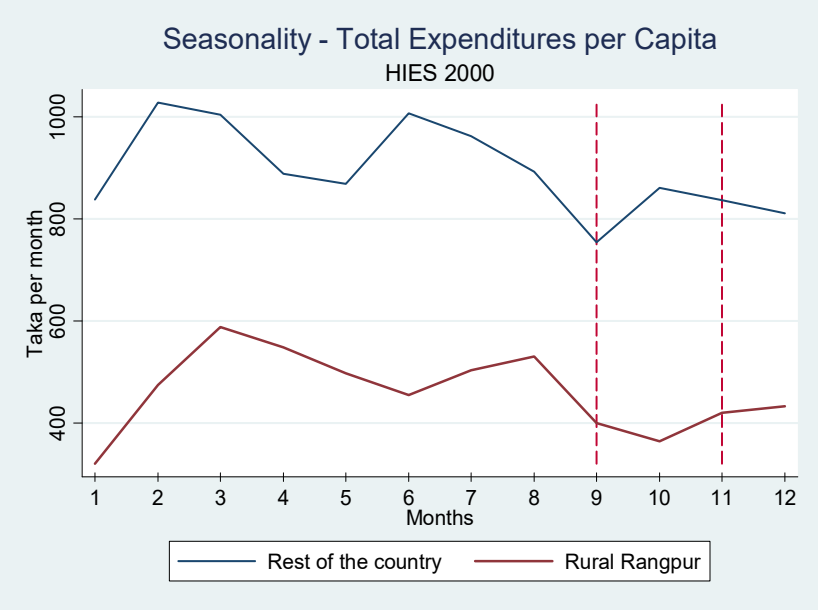
- Distinguish between
  - "expected net benefits are negative" and
  - "the technology carries positive expected net benefits to the user, but she still chooses not to experiment"
- Not:
  - A healthy stove may change the taste of the food
  - A bed-net will be too hot or unpleasant to sleep under
- But, the more interesting question:
  - "I think the stove or bed-net will make me better off overall, but I still prefer not to try it out."

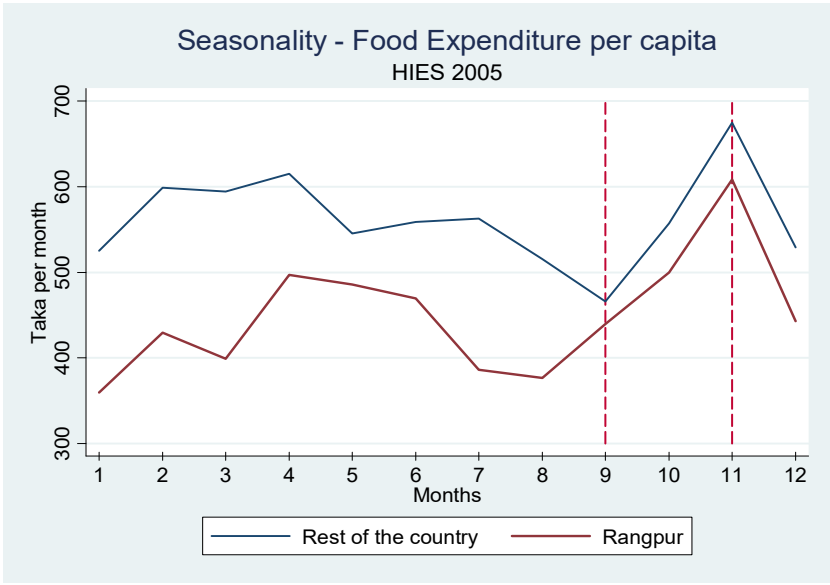
When is risk aversion most likely to be a factor?

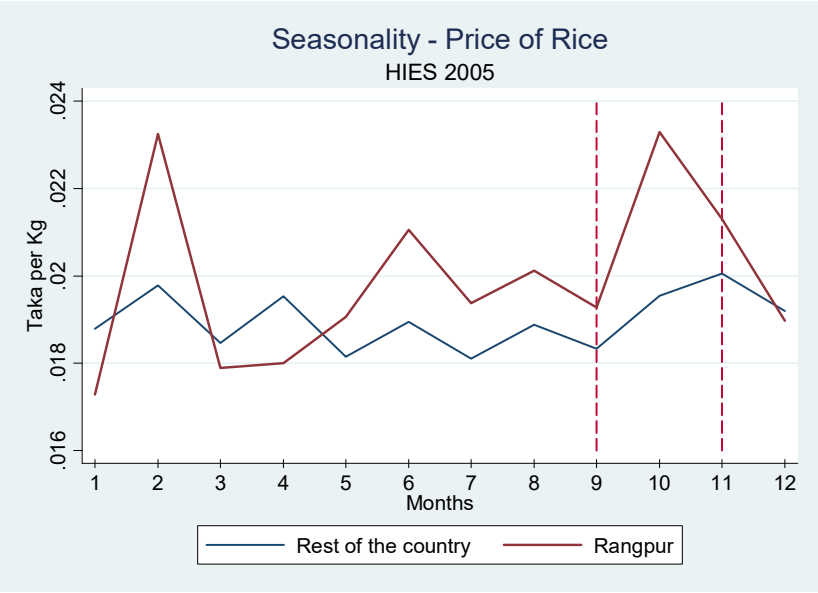
- When the uncertainty is individual-specific
  - Otherwise, the uncertainty can be easily resolved by looking at other's experiences, or through a persuasive information campaign
- When the downside risk is large
  - Individuals are unable to take on the downside risk, even if the expected returns are positive
  - If people are extremely poor, and any downside risk poses large welfare/utility costs
- When insurance markets are incomplete, and there is less informal insurance

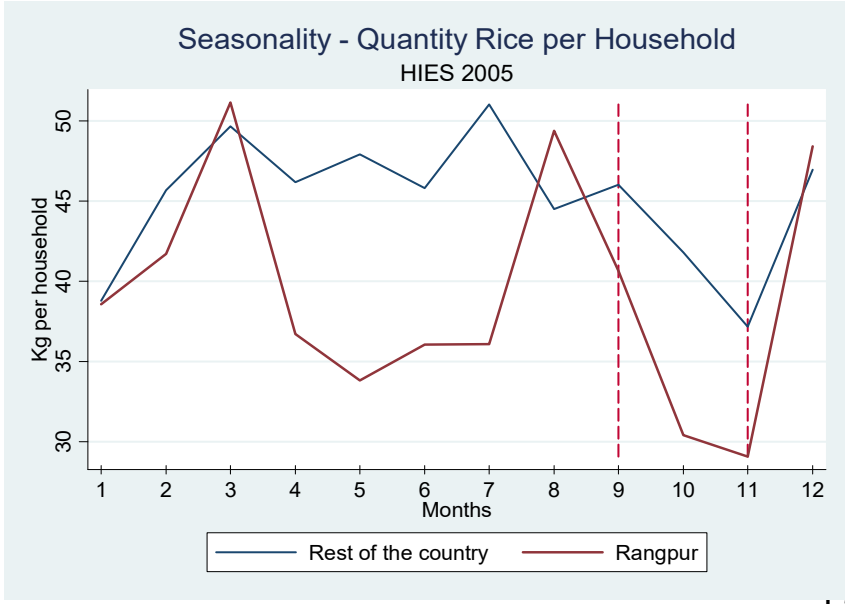
Example – Seasonal Migration

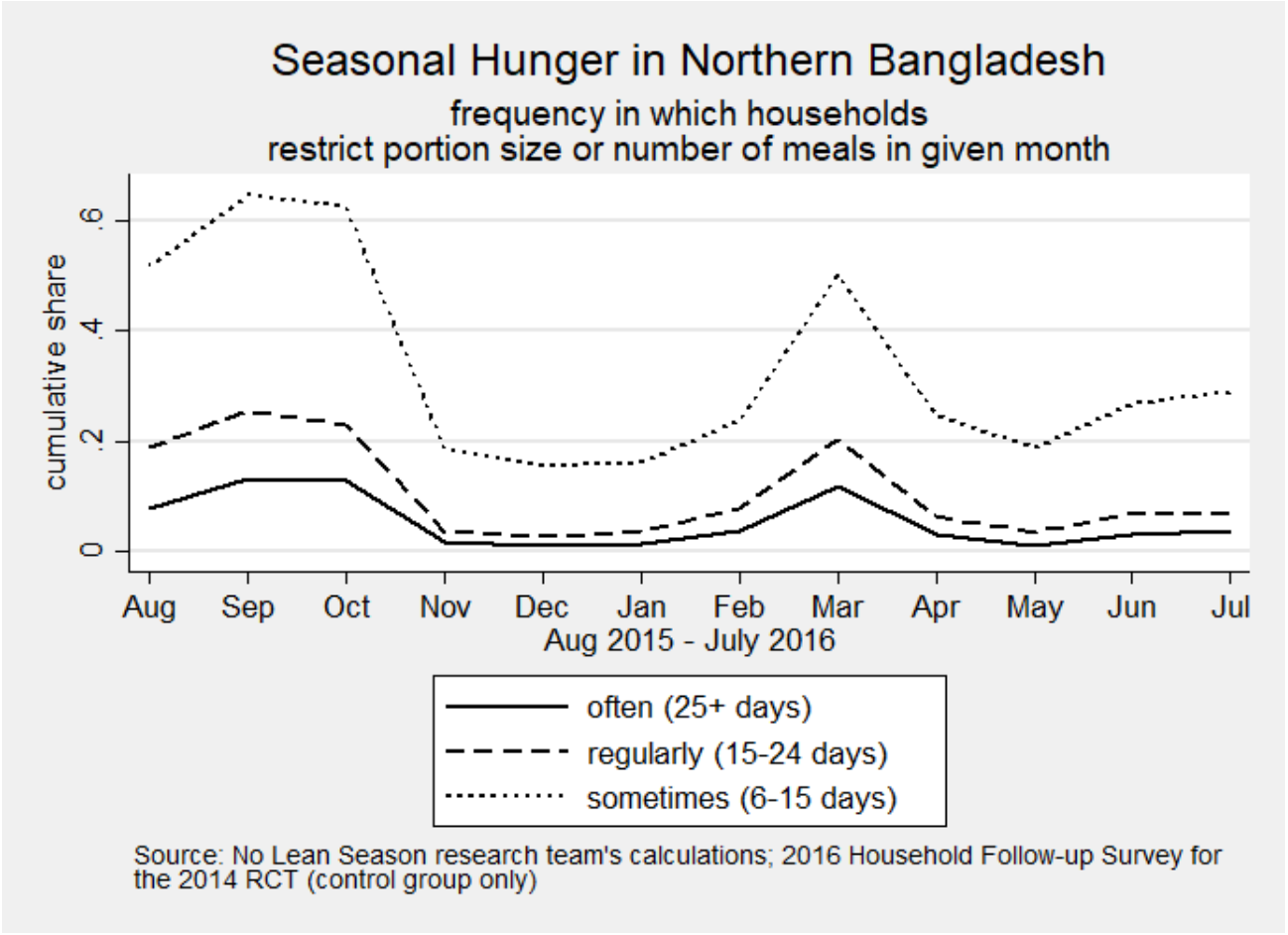
- Pre-harvest lean season (Sept-Nov in Bangladesh),
  - Limited job opportunities, low wages, high prices high.
- "Hungry seasons" affect hundreds of millions around the world (South Asia, Indonesia, Malawi, Madagascar, Ethiopia, Kenya,…)
- Takes the form of a seasonal famine in Rangpur districts in North Bengal
  - Especially poor (incomes ~60% of rest of country)
  - Pronounced seasonality (~40% drop in income)
  - 9.6 million people in region; 5.3 million in poverty


Seasonality - Total Expenditures per Capita
HIES 2000
Taka per month
400
600
800
1000
1 2 3 4 5 6 7 8 9 10 11 12
Months
Rest of the country
Rural Rangpur


Seasonality - Food Expenditure per capita
HIES 2005
Taka per month
300
400
500
600
700
1 2 3 4 5 6 7 8 9 10 11 12
Months
Rest of the country
Rangpur


Seasonality - Price of Rice
HIES 2005
Taka per Kg
.016
.018
.02
.022
.024
1 2 3 4 5 6 7 8 9 10 11 12
Months
Rest of the country
Rangpur


Seasonality - Quantity Rice per Household
HIES 2005
Kg per household
30
35
40
45
50
1 2 3 4 5 6 7 8 9 10 11 12
Months
Rest of the country
Rangpur


Seasonal Hunger in Northern Bangladesh
frequency in which households
restrict portion size or number of meals in given month
cumulative share
0
.2
.4
.6
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug 2015 - July 2016
often (25+ days)
regularly (15-24 days)
sometimes (6-15 days)
Source: No Lean Season research team's calculations; 2016 Household Follow-up Survey for the 2014 RCT (control group only)

But it's not just a recent phenomenon…

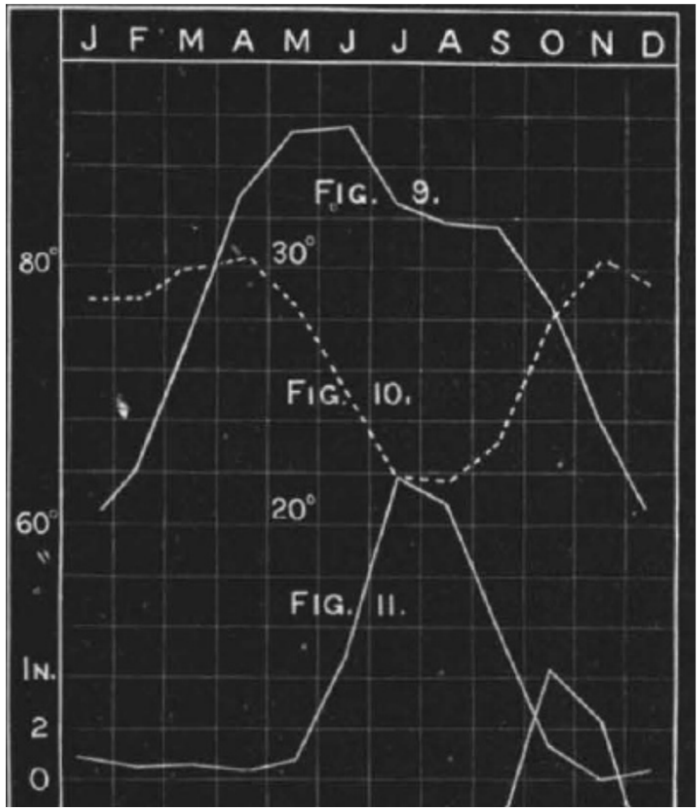


Fig 11: Rainfall
Fig 10: Mortality Rate (Northwest Provinces, Oudh)

Source:

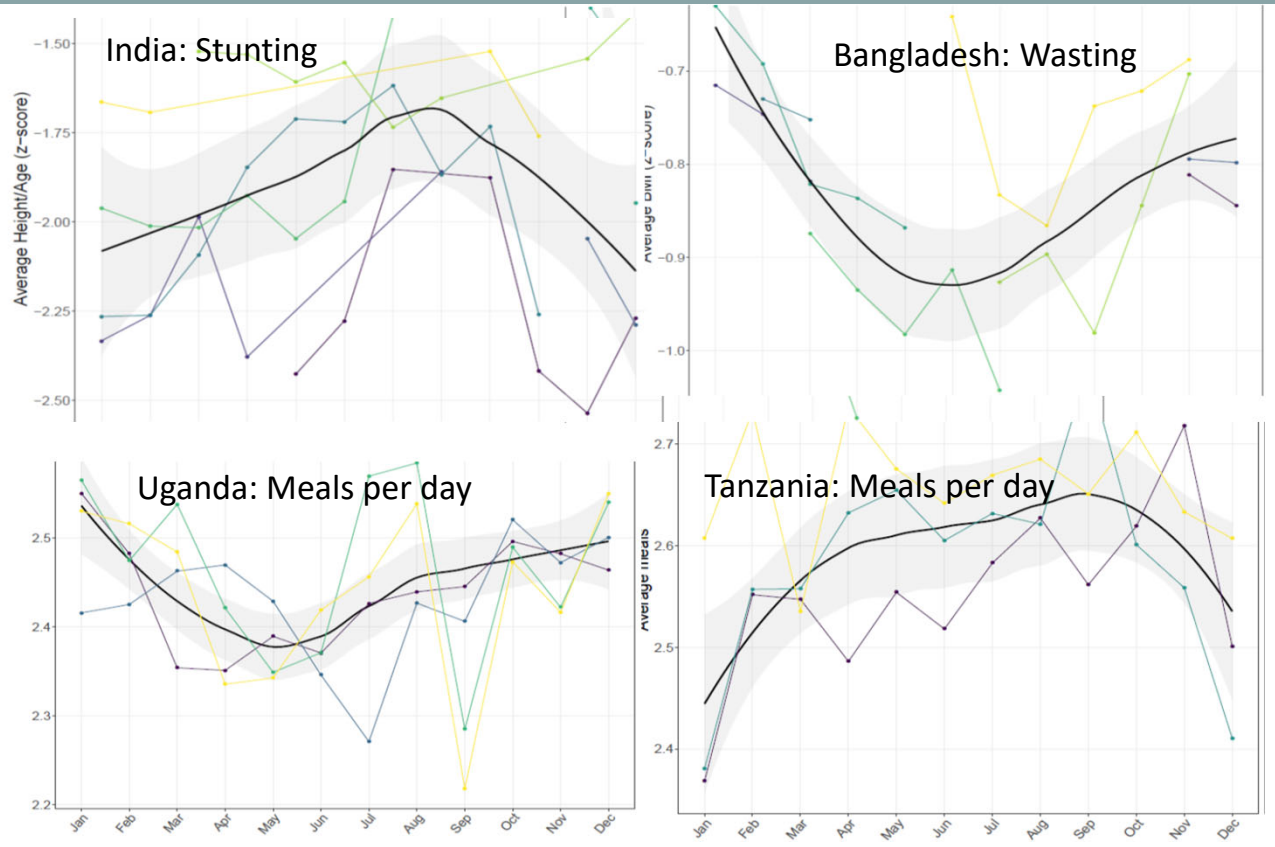
NATURE [*Feb.* 7, 1884

Number of Deaths from all Causes Registered in the North-West Provinces and Oudh during the Five Years 1878–82

Year	Jan.	Feb.	March	April	May	June	July
1878	137,161	140,173	143,760	157,326	136,867	120,767	91,677
1879	75,387	62,837	71,874	87,302	100,040	83,802	73,120
1880	116,366	72,030	69,250	72,534	76,622	78,200	56,502
1881	95,226	91,011	97,829	124,831	115,683	86,083	81,609
1882	114,220	92,472	96,596	107,628	119,714	114,382	122,110
Total	538,360	458,523	479,309	549,621	548,926	483,234	425,018

YALE Y-RISE
RESEARCH INITIATIVE ON INNOVATION & SCALE

Seasonal Poverty Today



YALE Y-RISE
RESEARCH INITIATIVE ON INNOVATION & SCALE

Promising Solutions – Why is it difficult to smooth consumption

- What markets are failing?
  - ✓ Savings are leaky (theft, pests, kin taxes)
  - ✓ Farmers face credit constraints
  - ✓ Labor Markets are not spatially well-integrated due to under-developed infrastructure and institutions
    - Seasonal, Circular Migration, Remittance
- A menu of potential solutions, depending on context
  - Subsidies for migration
  - Seasonally-timed consumption loans
  - Ease of remitting funds
  - Technical fixes for storage or agricultural production
  - Make it easier for people to save

Puzzles

- Less pronounced seasonality in other regions (Khandker 2010)
- Jobs available and wages higher in nearby urban areas (Zug 2008)
- Remittances into the north-west is the lowest in the country
- Government and NGO efforts (food subsidies, targeted microcredit) – are place-based, not people based
  - Has the effect of keeping people there
  - Greater inter-regional variation in income/poverty than inter-seasonal
- Specific Policy Goal for the Impact Evaluation:

  Can seasonal migration mitigate the effects of the seasonal famine
  - Reduce the spatial mismatch between jobs and people if there is structural seasonal unemployment in Rangpur?

Outline

1. Seasonal out-migration has large positive returns
   - High take-up, large consumption effects, and re-migration
2. Why were people not migrating?
   - Model with risk aversion and learning
3. "Qualitative" Tests of the model:
   - Heterogeneity in take-up, heterogeneity in re-migration, learning
   - New round of experiments in 2011 with migration insurance
4. Are the results quantitatively sensible?
   - How risk averse do people have to be, given our data?
   - Simulate a model adding buffer stock savings
   - Discuss extensions that would provide better fit: behavioral biases, incorrect expectations, utility cost, savings constraints

The Experiments

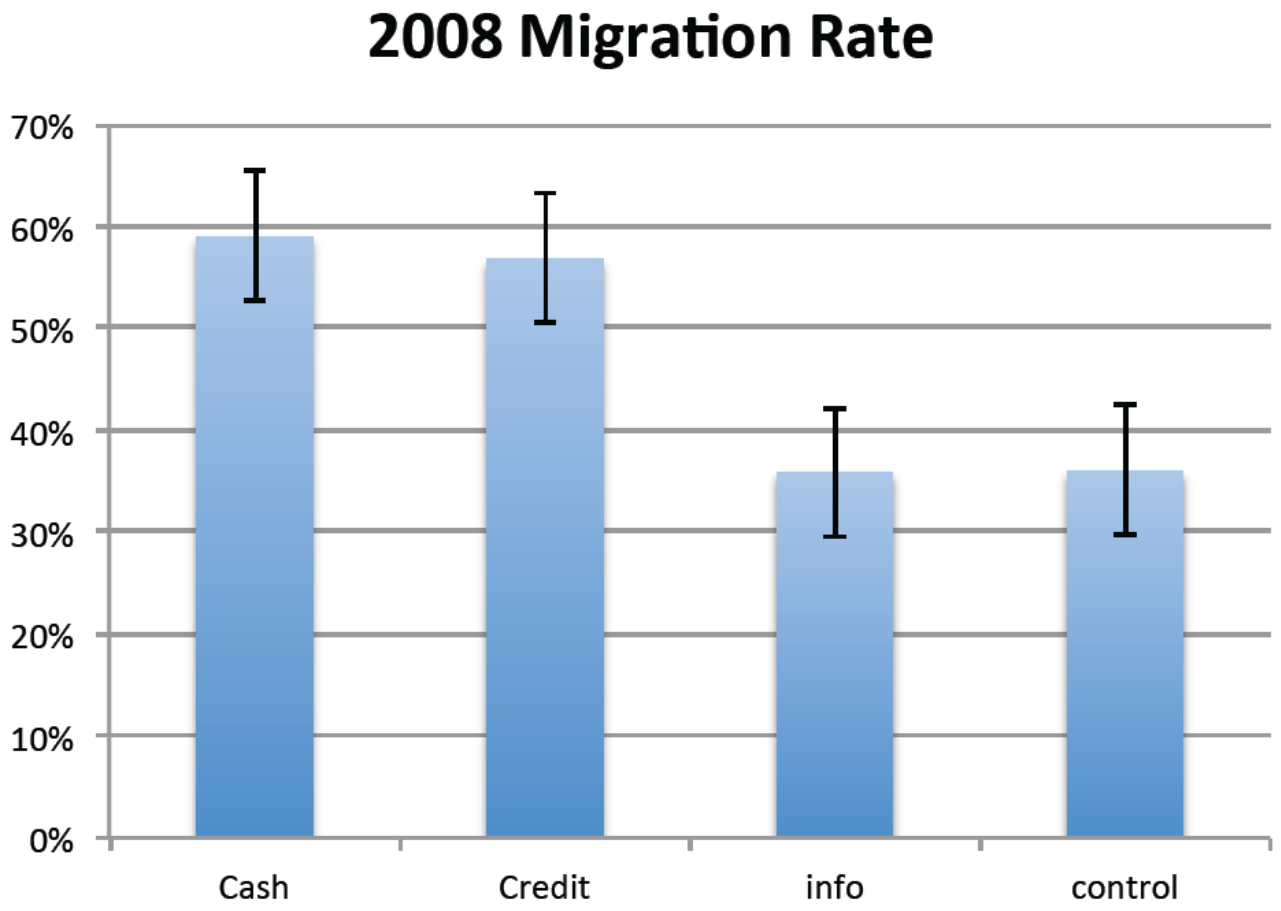
- Randomly assigned incentives to migrate during the 2008 Monga
- 1900 households in 100 monga-affected villages

  - Cash (37 villages): 600 Taka ($8.50)
  - Credit (31 villages): Loan of same amount
  - Information / endorsement (16 villages)
  - Control (16 villages)

- $8.50 = Round-trip bus ticket + couple of days food
- Tracked households in the short run, and in the long-run, after inducements were removed.

Program Evaluation Results

1. 24% of households induced to send a seasonal migrant



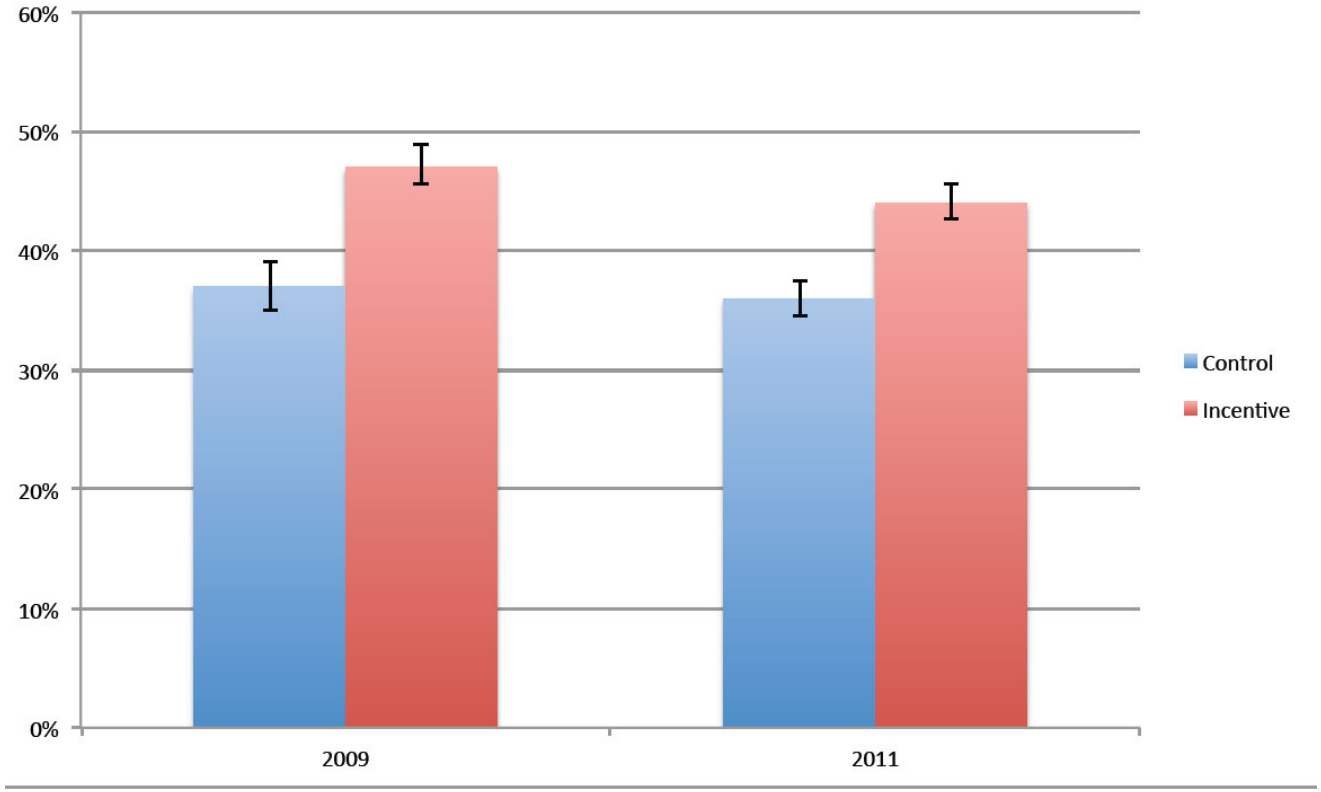
Income, Consumption Effects

2. Seasonal out-migration has large benefits
   - Migrants earn $110 on average at destination (70-90% successful)
   - They save about half of income, and carry it back

   Effects on Induced Migrants:
   - Families of migrants consume 600 calories more per person per day
   - Per-capita Expenditures increase 30%
   - Protein consumption increases 35%
   - Switch to more desirable protein (fish, meat from veggies, lentils)
   - Child education expenditures increase

Ongoing Migration

3. Treatment households continue to re-migrate a year later and 3 years later…absent any further incentives



87% of migrants go back and work for the same employer

Where do we go from here?

Why did we have to run this program?

Why weren't households migrating to begin with?

- Imagine if you were asked to buy this (very attractive) lottery ticket
- Extreme risk aversion close to subsistence

Evidence:

- Our incentive induces those close to subsistence and those not comfortable migrating.
- Strong response to "migration insurance" offers in 2011

A model of risky experimentation

- Guaranteed income at home *y*,
- Uncertain returns from migration: *(y + g)* with prob. *μ(g)*, *(y + b)* with prob. *μ(b)* where *g>b*.

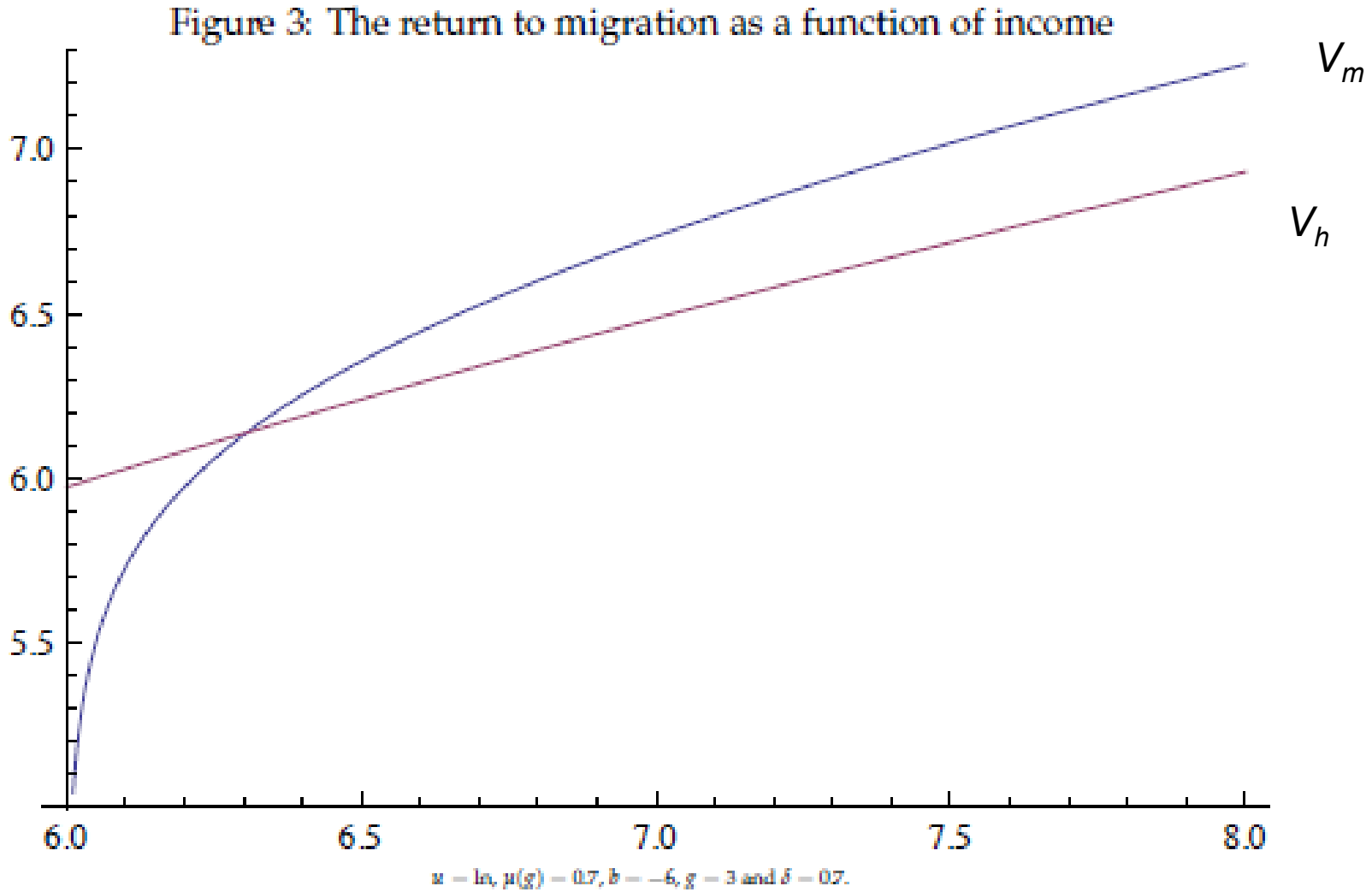
- Household is a discounted expected utility maximizer such that:

  u(y + g) > u(y); and

  u(y + b)< u(y).

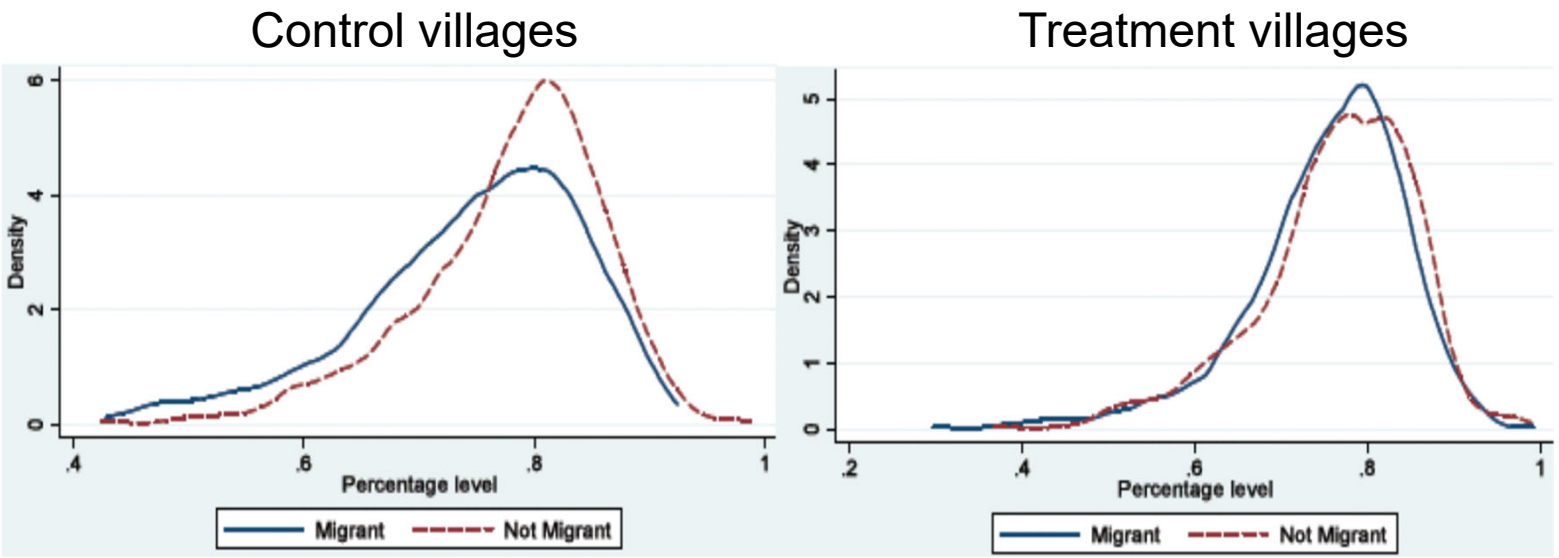
$$V^m = \frac{\mu(g)u(y+g) + \mu(b)((1-\delta)u(y+b) + \delta u(y))}{1-\delta}$$

$$V^h = \frac{u(y)}{1-\delta}.$$



Single crossing conditions in Banerjee (2004). To cross like this, you need outcome *b* to be sufficiently bad, so that u(y+b) is in the steep part of utility function

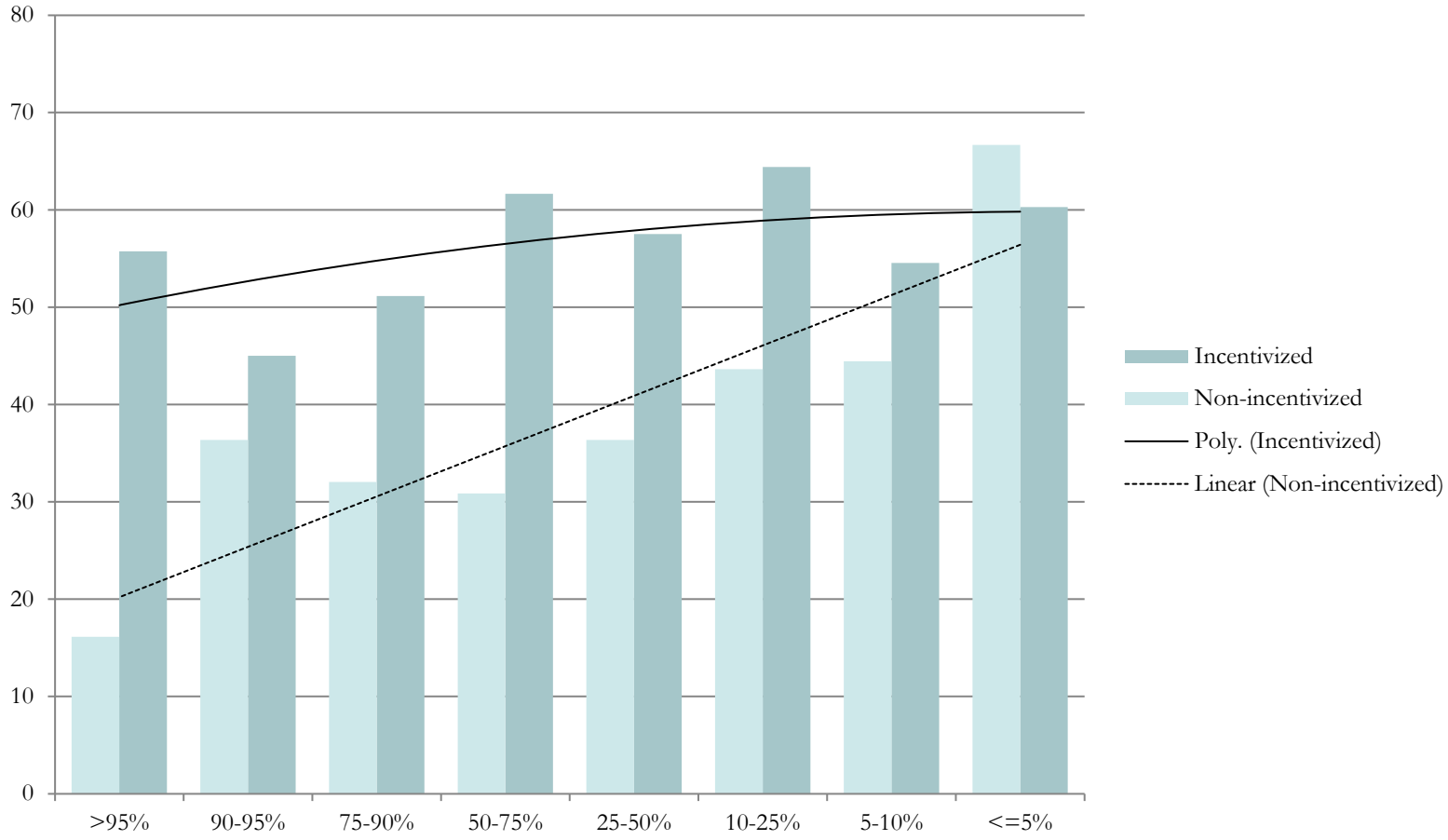
Who Chooses to Migrate?



- In general, people closer to subsistence are less likely to migrate (control villages)
- But those households are more responsive to our incentives (treatment villages)
- Regression coefficients:

Subsistence: -0.870***, Treatment*subsistence: +0.567**

Migration Rates across the Distribution of Food Expenditures/Total Expenditures



Who was induced to migrate by our treatments?

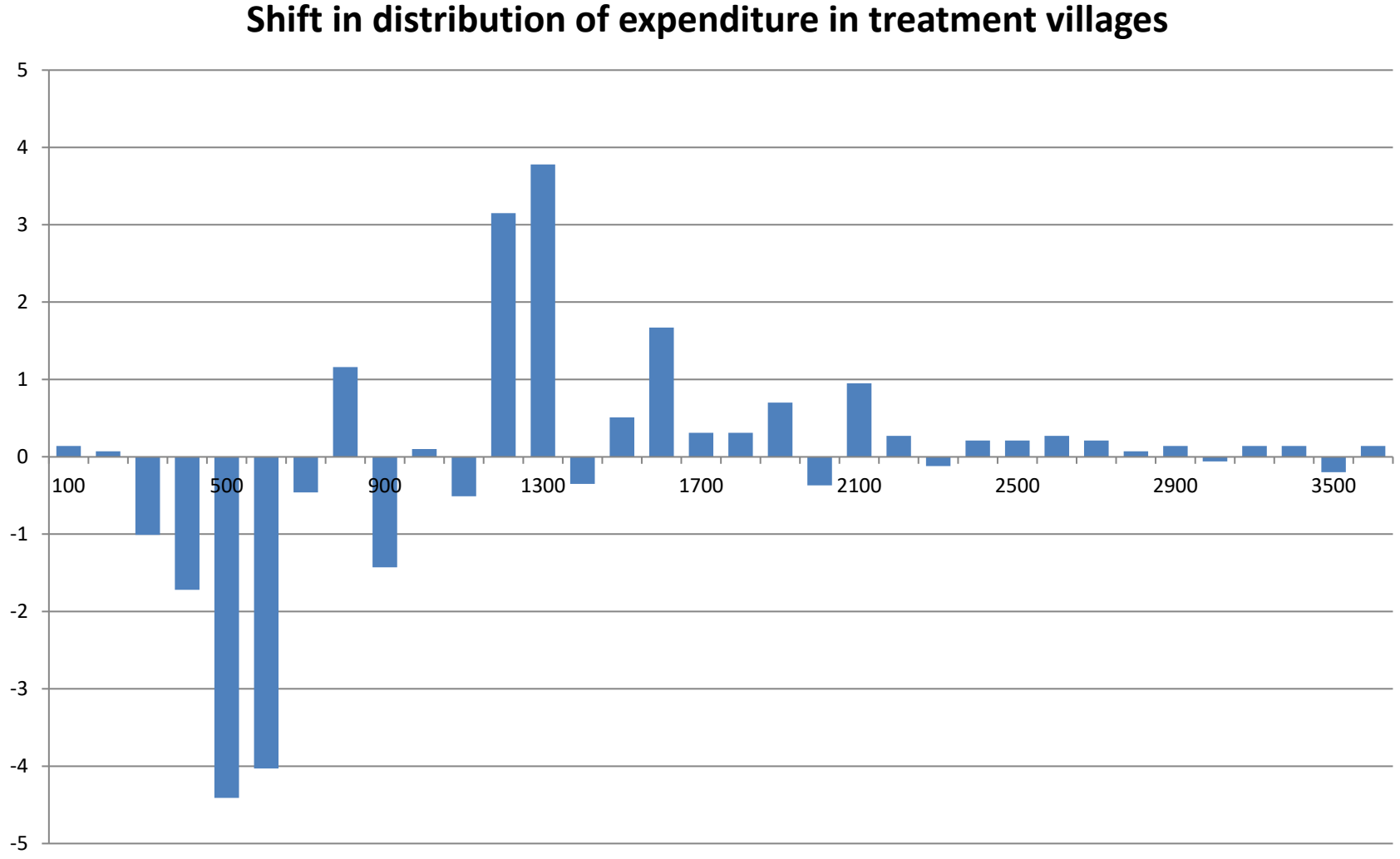
Percentage of Migrants that Know Someone at Destination

	Incentive	Non incentive	Diff	Std Error
First Episode	47%	65%	0.17***	0.04
Second Episode	60%	72%	0.12**	0.06
Third Episode	68%	82%	0.14	0.09
Fourth Episode	86%	88%	0.06	0.11

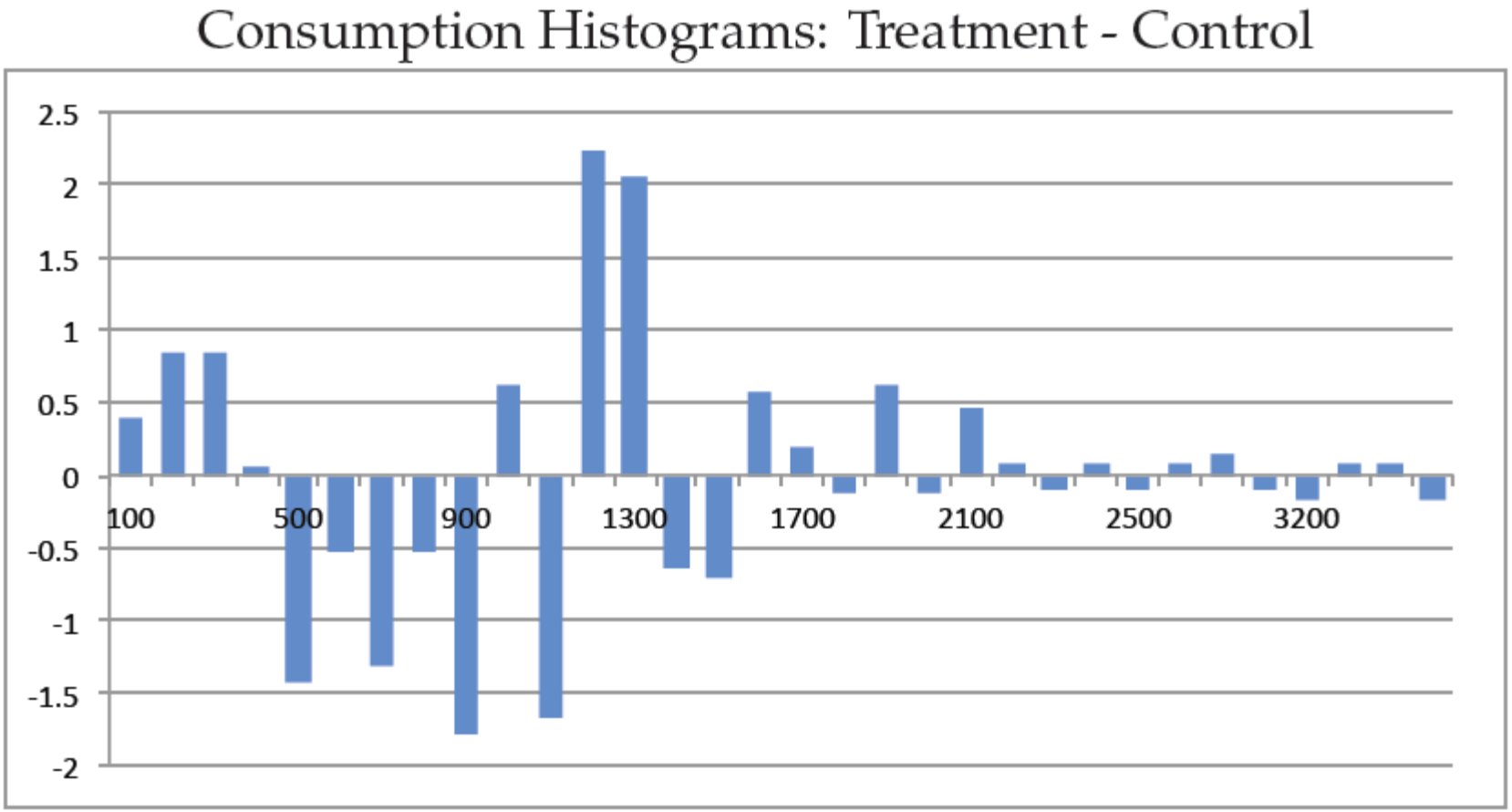
Percentage of Migrants that had a Job Lead at Destination

	Incentive	Non incentive	Diff	Std Error
First Episode	27%	44%	0.17***	0.03
Second Episode	29%	47%	0.18**	0.06
Third Episode	36%	54%	0.18**	0.09
Fourth Episode	53%	59%	0.06	0.15

- Induced migrants less likely to have social networks, job leads at the destination, and to travel alone compared to control group migrants
- We induced people who were *otherwise less comfortable going*


Shift in distribution of expenditure in treatment villages
5
4
3
2
1
0
-1
-2
-3
-4
-5
100
500
900
1300
1700
2100
2500
2900
3500

Migration Risk – if we subtract the incentive payment from those that took the money



Is this story quantitatively plausible?

- Returns to migration are very large. Why weren't people saving up for it?
- Large yearly variation in income. Why don't you escape the poverty trap in a good year?
- Model could add:
  - Income variation and buffering
  - Possibility of saving up
  - Subsistence (sort of already there, but made explicit)
  - Non-monetary welfare losses from migration (Lagakos, Mobarak and Waugh 2020)

Is this story quantitatively plausible?

- How risk averse do people have to be to rationalize all the data?
  - Returns to migration are large but people don't do it
  - A small incentive is enough to induce them to migrate
  - Why didn't they save up to migrate?
- Answer from our model: very *extreme* (implausible) level of risk aversion
  - These guys should not have been getting up from bed
- Adding another constraint to the model (e.g. savings constraints) can help rationalize the data better
  - Puts less pressure on the risk aversion parameter

The Problem: Seasonal Poverty

0.5 - 1 billion

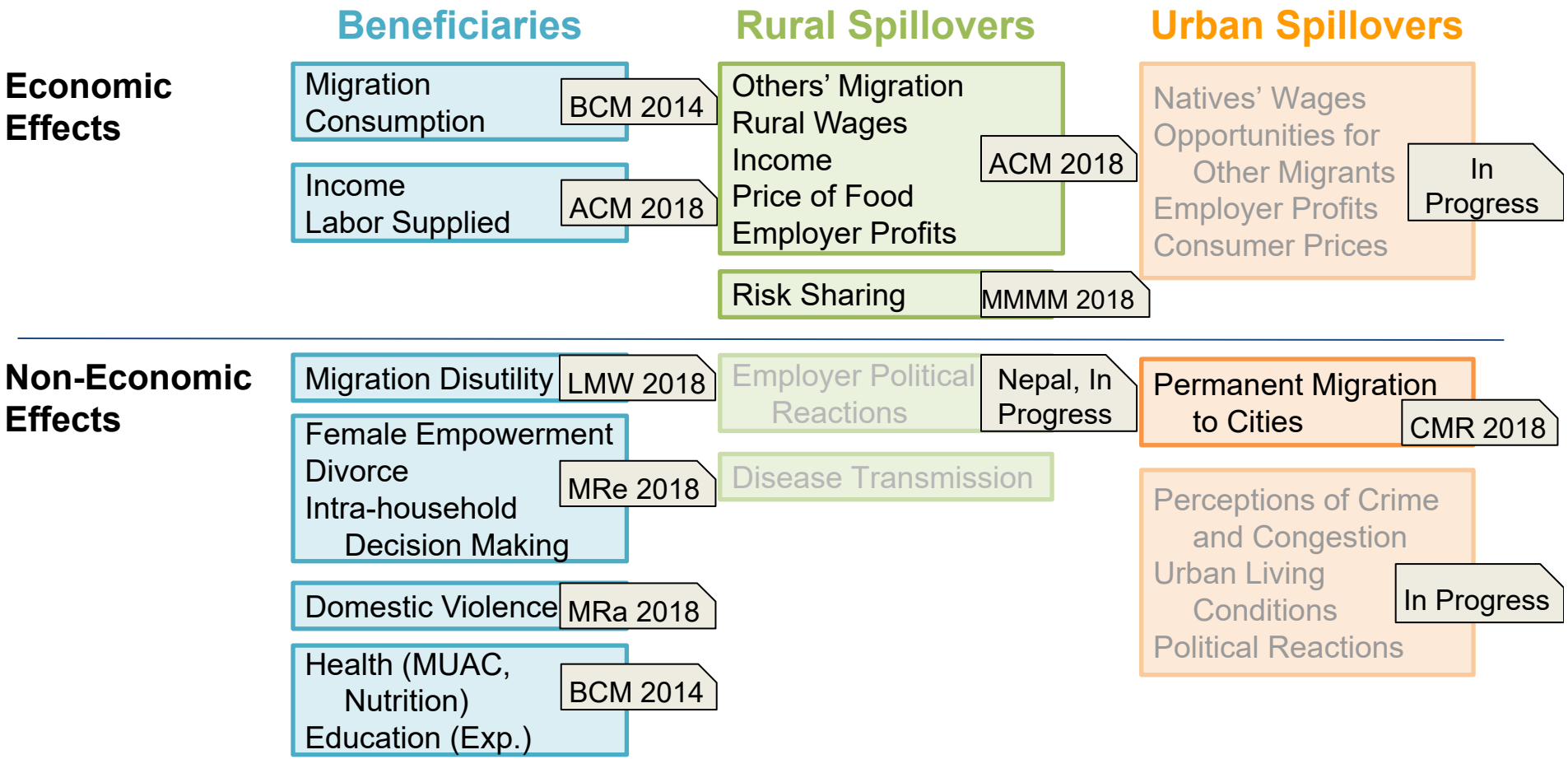
people in the world experience seasonal hunger


A Possible Solution: Migration to Urban Labor Markets
100 million
live near thriving cities with jobs available

Before we scale-up…

- Why were people not migrating to begin with? (*ECMA* 2014)
- What about spillover effects on the origin villages when productive people leave? (Akram, Chowdhury, Mobarak 2017)
- Changes in risk sharing? (Meghir, Mobarak, Mommaerts, Morten 2017)
- What about unintended non-economic (social, health, political) consequences?
- Does this really improve welfare? (Lagakos, Mobarak, Waugh 2017)
- Spillovers on the city? (2017-2018 experiment)

Overview of Seasonal Migration Research



Theoretical Questions

Why is there seasonal deprivation? — BCM 2014

If migration is a good idea, why were people not migrating before? — BCM 2014, LMW 2018

How should we induce people to migrate? Grants, loans, or insurance? — BCM 2014, LMW 2018

Who is induced to migrate? — BCM 2014, LMW 2018, Indonesia

Does migration create unmeasured disutility? — LMW 2018

Would unconditional cash transfers be better? — LMW 2018, Indonesia, *In Progress*

Are there other ways to address seasonality? Rural workfare, savings, credit? — MR 2018

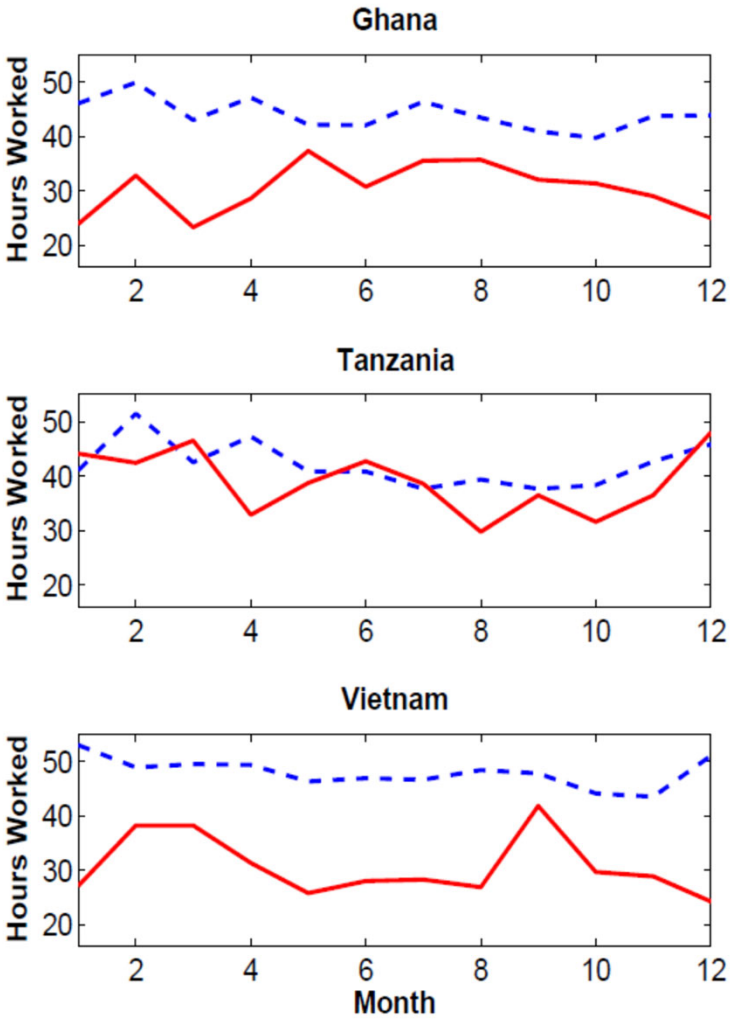
How does implementation at-scale targeting vary from pilots?

Would program effects vary over time and place?

Two facts about urban and rural areas

- Cities are more productive than rural areas *within* the same country.
- Cities offer higher wages

- There is *seasonal* unemployment, deprivation and hunger in rural areas



An arbitrage opportunity?

- Wages are 350% higher in cities
- Adjusting for hours worked, human capital, wages are 220% higher in cities
- Gap is larger in poorer countries

- *Should we move people into cities?*
- USA/Canada urbanized in the 19th century
- Should China pursue rural development, or *active* urbanization?

	All Countries
10th Percentile	1.3
Median	2.6
Mean	3.5
90th Percentile	6.8
Number of Countries	151

Productivity and Migration

- Large productivity gaps across regions within countries (Gollin et al 2014)
  - But workers remain in low productivity areas (Caselli 2005)

- Why?
  - Migration costs (Bryan and Morten 2018)
  - Income risk in urban areas (Lewis 1954; Bryan, Chowdhury, Mobarak 2014)
  - Rural amenities (Munshi & Rosenzweig 2016, Meghir et al 2017)
  - Urban disamenities (Lagakos, Mobarak and Waugh 2017)
  - Pollution?

- If pollution keeps skilled away from high-productivity places
  - Relocating pollution can improve productivity via re-sorting
  - Pollution can explain part of the spatial productivity gaps