

# Mobile Banking and Remittances: Evidence from Migrant Workers of Urban Bangladesh

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# Funding and Assistance

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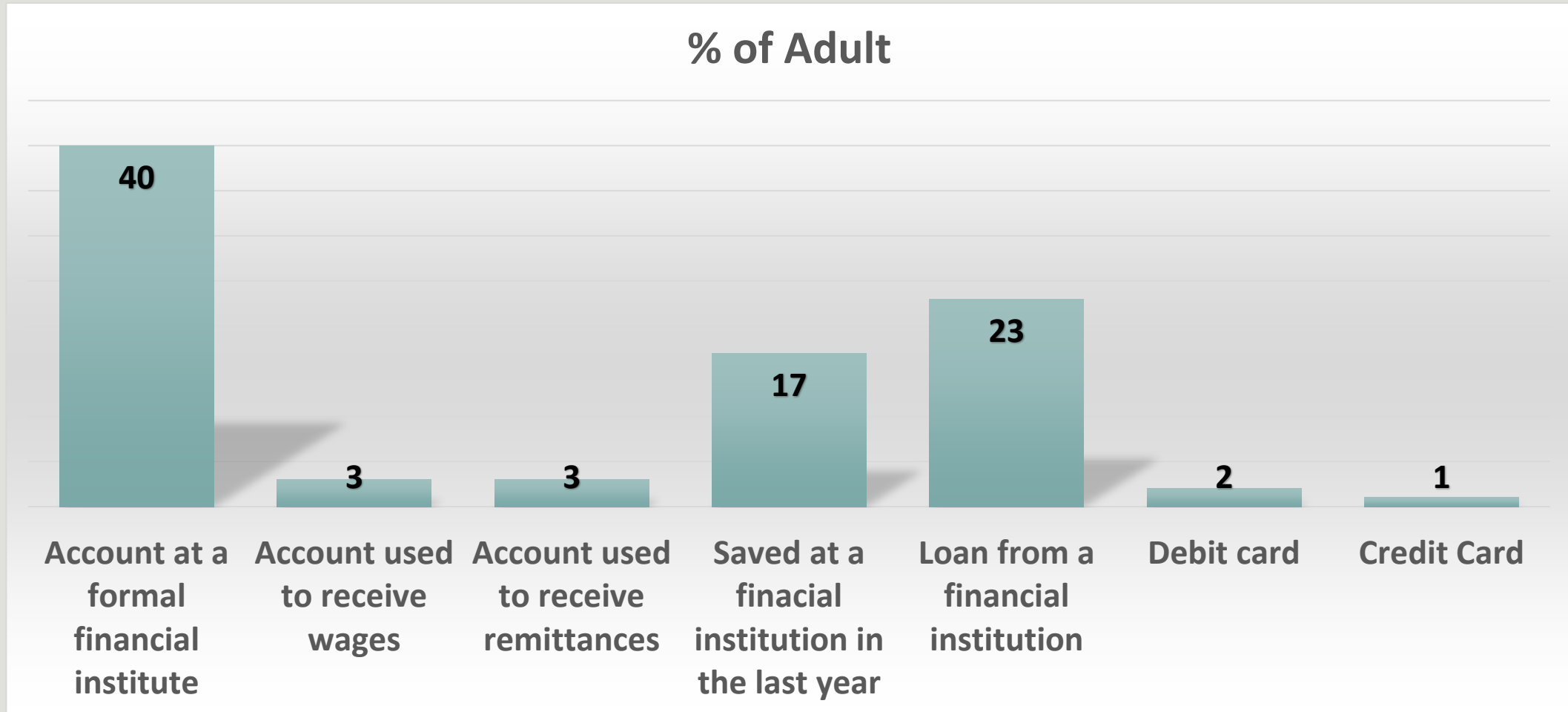
- Funders: IGC, Bangladesh.
- Other Funders: Gates/Financial Access Initiative, IMTFI
- Survey and implementation: Momoda Foundation
- Data: Saravana Ravindran

# Background

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- Providing financial access to poor and excluded population is still a challenge for developing countries.
- Basic banking services (like savings) are still not accessible by most of the people in developing countries (Armendariz and Morduch 2010).
- Bangladesh which is well-known for its micro-credit revolution still has 76% of its population unbanked.
- Financial inclusion is, therefore, viewed as a high policy priority for many developing countries, including Bangladesh.

# Financial Inclusion Scenario in Bangladesh



Source: World Bank Data 2012

# Motivation: remittance and savings

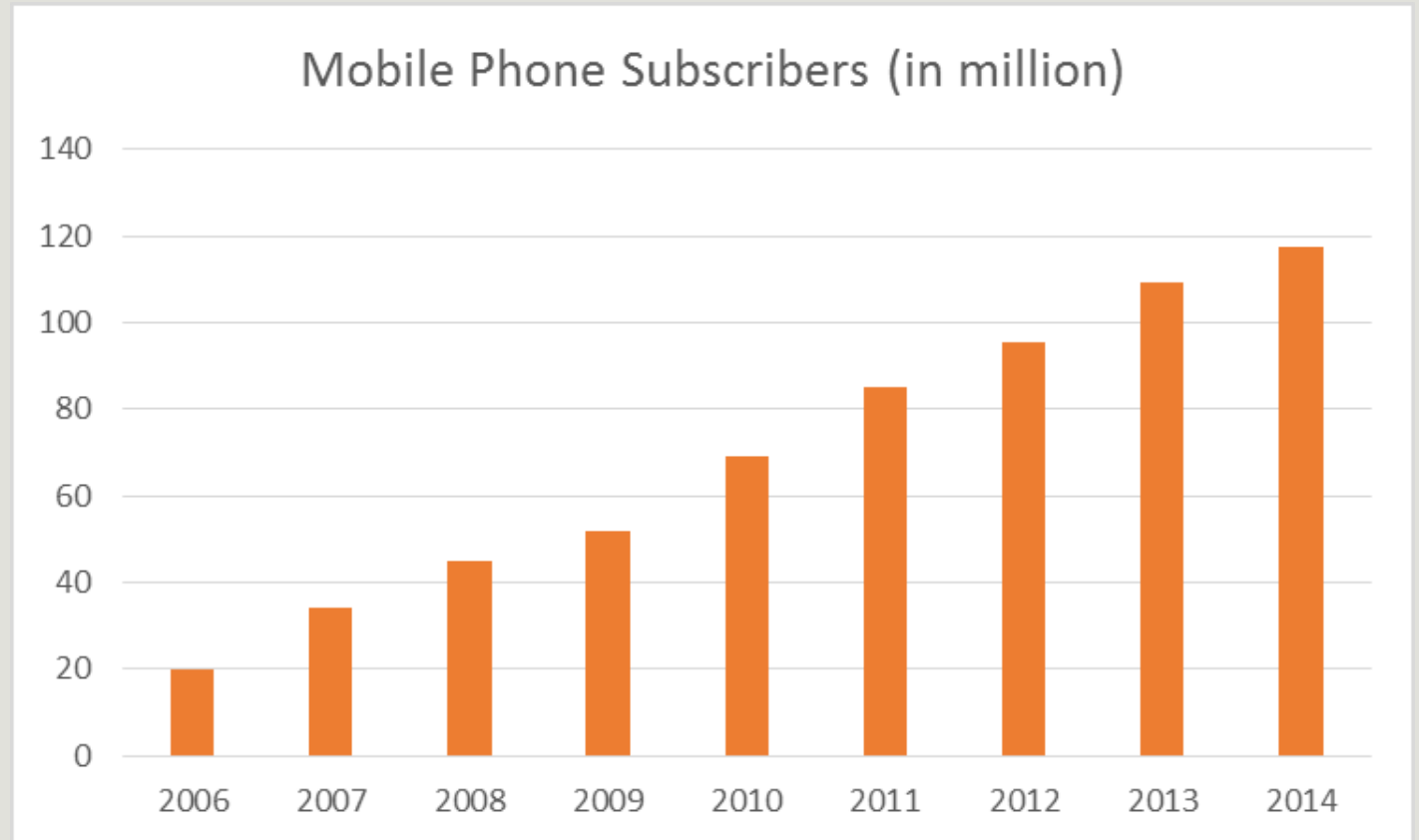
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- Bangladesh has a large migrant population.
- These migrating households depend on remittances for their day-to-day expenses.
- Typically ways of remittances are
  - hand-to-hand transaction,
  - informally through friends/relatives/colleagues
  - local transport bus drivers or through agents or courier service.
- These traditional methods are unreliable, fraught with delays, and involved substantial losses due to theft.

# Mobile Banking: A solution?

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Mobile technologies have rapidly expanded in the developing world, specially in Bangladesh



# Mobile Banking: A solution?

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- One notable adaptation of mobile technologies has been to provide broadly accessible banking services through the mobile platform, referred to as “mobile banking” or as “mobile money.”
- Advantage of mobile banking is
  - Quick access,
  - Direct transfer,
  - Reliable service and
  - Could be used as a saving device.

# How Mobile Banking works?

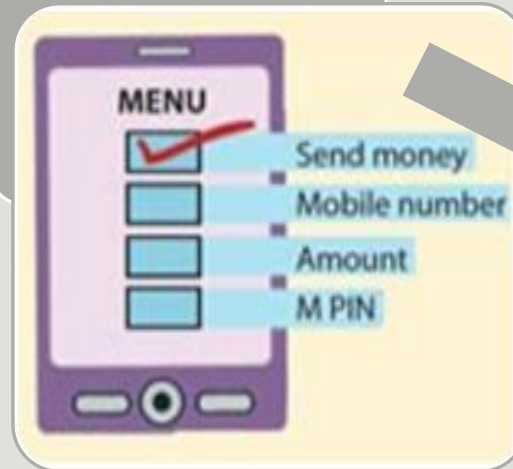
Bring money to a mobile banking agent.



Agent converts the money into digital currency



Sender can now choose options



- Receiver gets a SMS and goes to a nearby agent office to cash-out





# Overview: Bangladesh Finance

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**Microfinance:** After 4 decades, 21 million users. 90% women.

**Mobile money:** In 5 years, 21 million accounts (2015). 18% women. (Leesa Shrader, CGAP 2015)

# Mobile Money in Bangladesh

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***“[E]xperts at Bangladesh Bank, the country’s central bank, describe mobile money as a key strategy to expand financial access in this nation of 160 million people, where fewer than 30% have a bank account.”***

*- Wall Street Journal, 2015*

- Wide range of bank-based, interoperable mobile money providers: Dutch Bangla Bank, bKash, etc.
- Potential to mitigate economic shocks (Jack and Suri, *AER* 2014).

# Related Literature: Technology Adoption

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## Technology adoption in development

- Key to improvements in productivity and growth

## Adoption of financial products

- Dupas and Robinson, AER 2013
- Bursztyn, Ederer, Ferman, and Yuchtman, EMTA 2014

## Adoption of network goods

- Bjorkegren, Mimeo 2015

## Short-run subsidies and long-run adoption decisions

- Dupas, EMTA 2014

# Some recent literature on Mobile Banking

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- [“Mobile Banking: The Impact of M-Pesa in Kenya.”](#) Isaac Mbiti and David Weil.  
Forthcoming NBER Africa Project Volume.
  - [“Risk Sharing and Transaction Costs: Evidence from Kenya's Mobile Money Revolution.”](#)  
Tavneet Suri and William Jack, *American Economic Review*, Forthcoming.
- 
- However, all these studies are based on aggregate level administrative data-set.
  - There is so far no study that used individual/household level data.

# Research Questions

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- **Do people like to adopt mobile banking Technology?**
  - English interface? Difficulty to use? Trusting machine/mobile phones to deal with finance? Digital Divide?
- **What drives mobile banking adoption decisions and do peer and social influences play a role?**
  - To what extent can small interventions and training change adoption decisions?
  - Do peer effects and strategic interactions play a role in explaining those adoption decisions?
  - What is the effect of pro-social marketing on adoption decisions?
- **Once adopted, will they continue to use it?**
- **What are the welfare consequences of mobile banking adoption?**

# Gaibandha district, Rangpur

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One of poorest regions of Bangladesh, with exposure to monga (seasonal famine, September through November).

Rangpur has significantly lower rates of food consumption per capita than other regions.



# Recruiting Participants

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Core sample of participants recruited by using prior DFID and GUK SHIREE garments training program as a sampling frame

- Program targeted to the ultra-poor via wealth assessment
- Difficult to find all SHIREE participants – able to locate 1/3 of originally trained sample

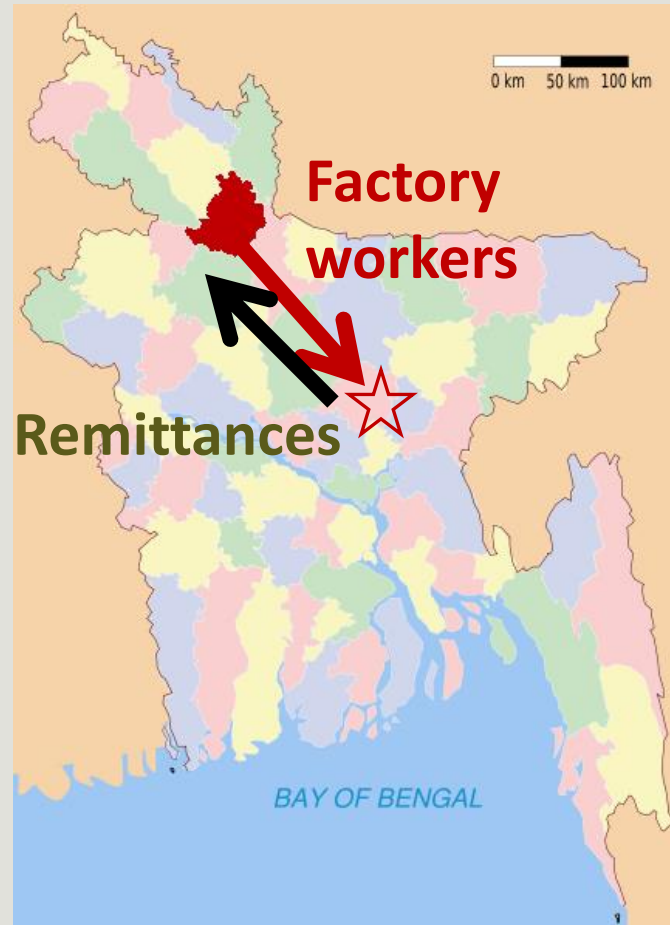
“Snowball sampling” based on this sampling frame to achieve an eventual sample size of 815 households with migrants

- Excludes households with migrant workers under the age of eighteen
- Includes 70 percent men and 30 percent women migrants

Sample recruitment took place between September 2014 and February 2015

# Gaibandha district, Rangpur

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# Research Collaboration: bKash

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- Leading mobile money service provided by BRAC Bank
- Mobile wallet and person-to-person transfers
- Individuals deposit and withdraw money through agent network
- 17 million individual user accounts by 2015. Handles about 70 million transactions per day (*Wall Street Journal*, 2015)

# Unique Migrant-Household paired sample

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**Rural families:** Rural families of migrants

**Urban migrants:** Migrants to Dhaka from these *same* rural households (70% male, 30% female).

Rural households trained through GUK

- Targeted for this intervention after identified as ultra-poor
- 99% have mobile phones
- 11 % have bank accounts
- Avg land: about 0.1 acre
- Many have incomes < \$1 per day per person

**Encouragement design:** Half of the sample is experimentally introduced to the technology

**Baseline interest:** Good brand recognition and high interest in adoption prior to the intervention

# Timeline

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**Baseline survey** (Dec 2014 to March 2015)

**Introduce bKash** (April 2015 to May 2015)

- Treatment: **415 households** (bKash training and incentive)
- Control: **400 households**
- Marketing: Within treatment arm, cross-randomized order in which households and migrants were approached – whether or not migrant is “first mover” – and pro-social marketing strategy

**Midline survey** (August 2015 to September 2015)

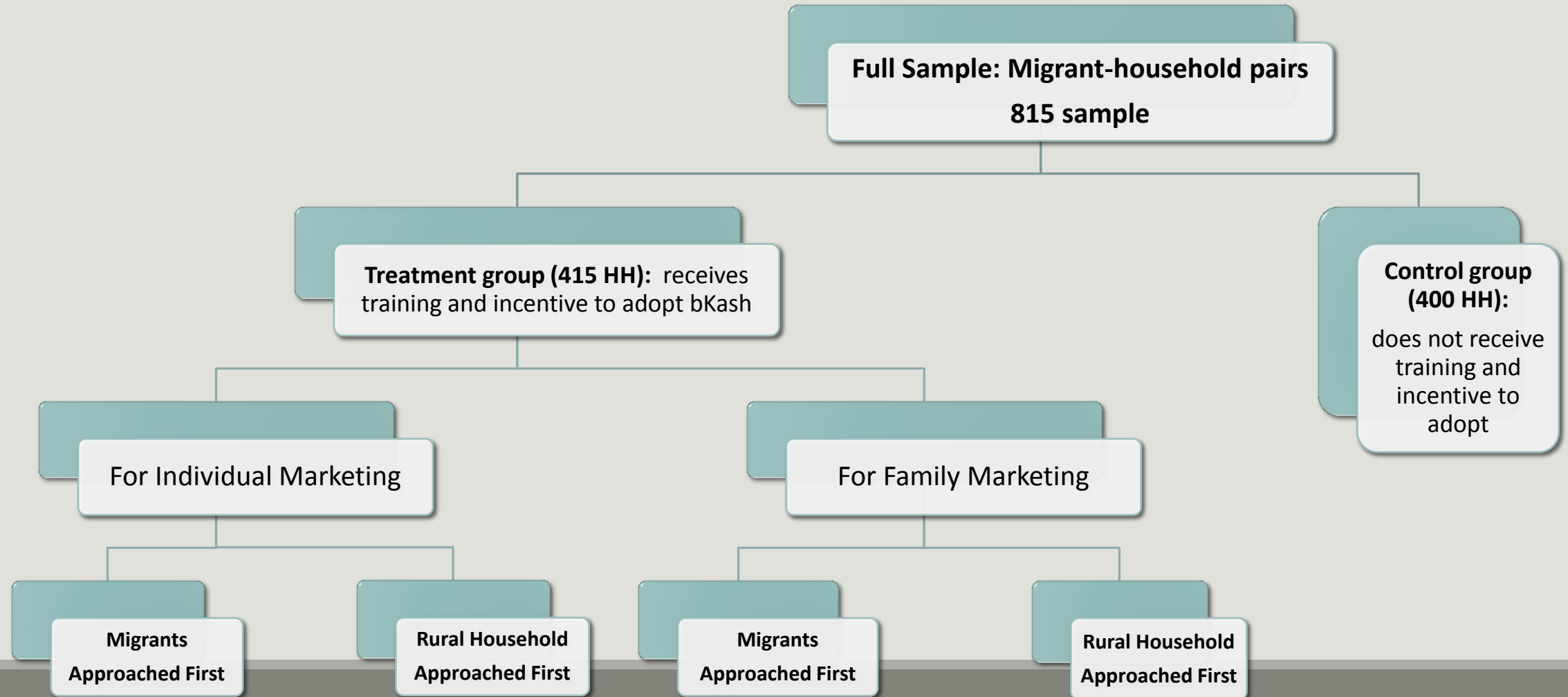
**End-line survey** (January 2016 to March 2016)

# Training Intervention

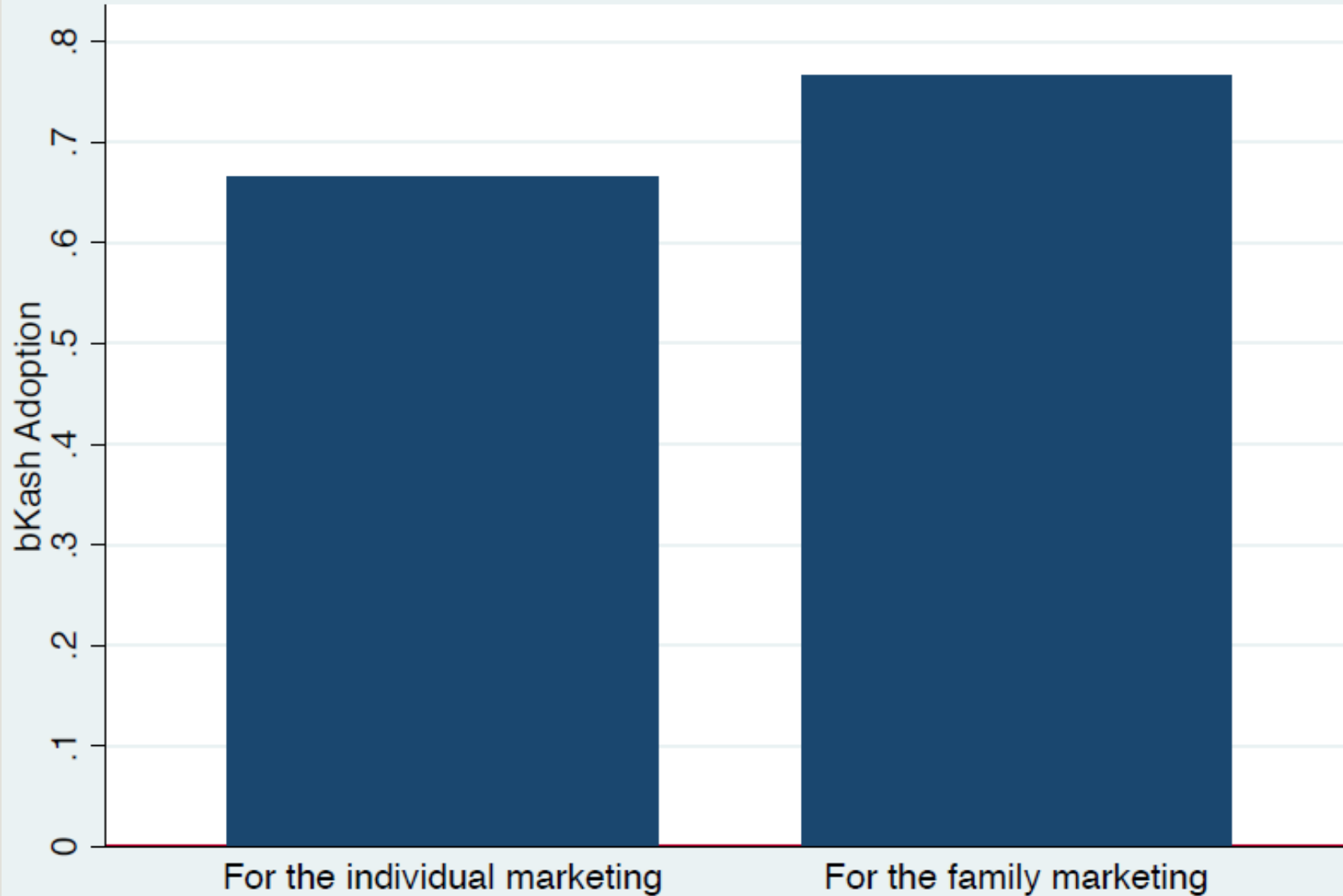
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- **30- to 45-minute intervention**
- **Information about bKash mobile money and poster (hard copy)**
- **Instructions on use**
- **Assistance with enrollment**
- **200 Taka (<3 USD) compensation for participation in the training**

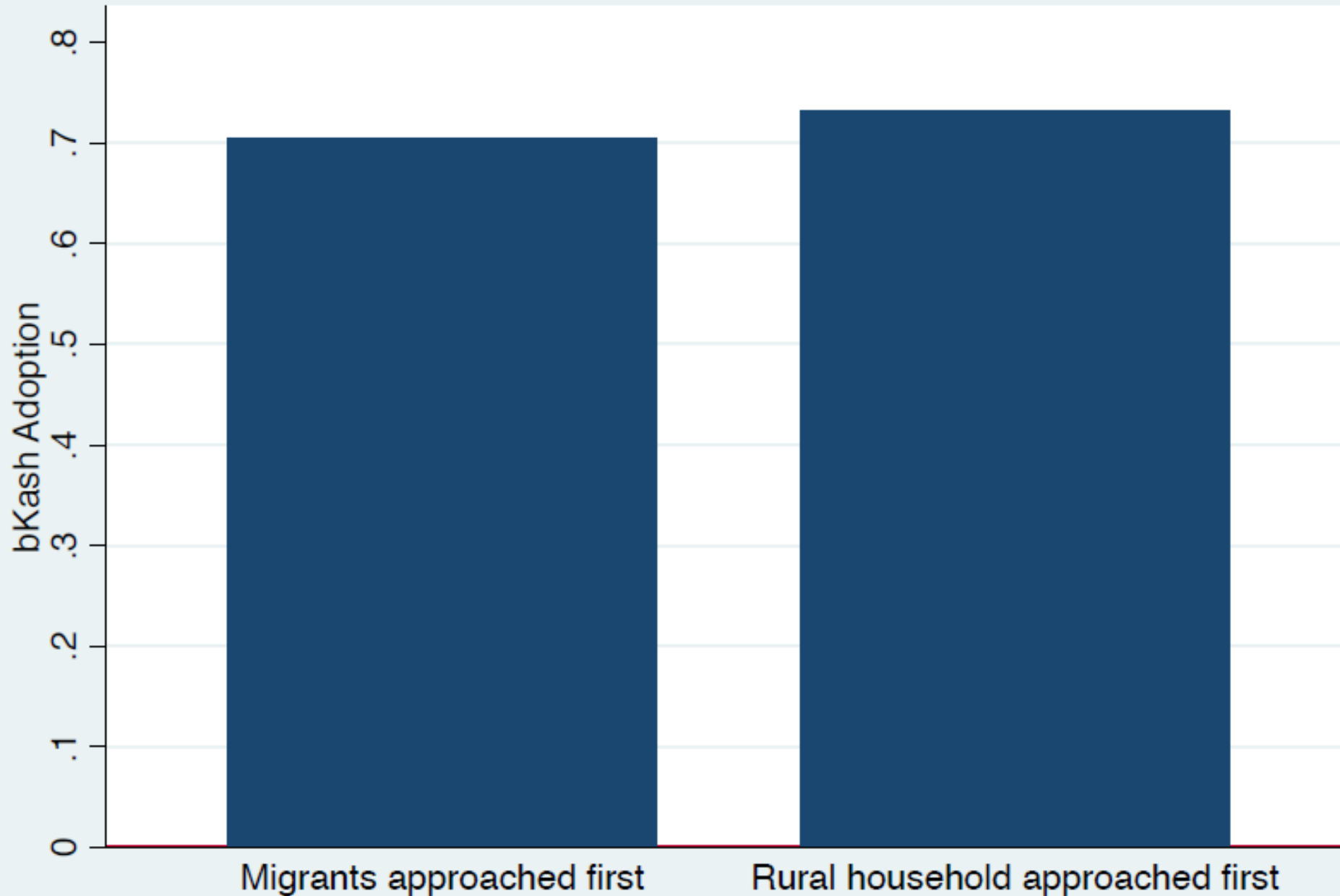
# Structure of Randomization: Adoption Experiment



## Impact of Family Marketing on Migrant bKash Adoption



## Impact of Family Influence on Migrant bKash Adoption



# Determinants of Adoption

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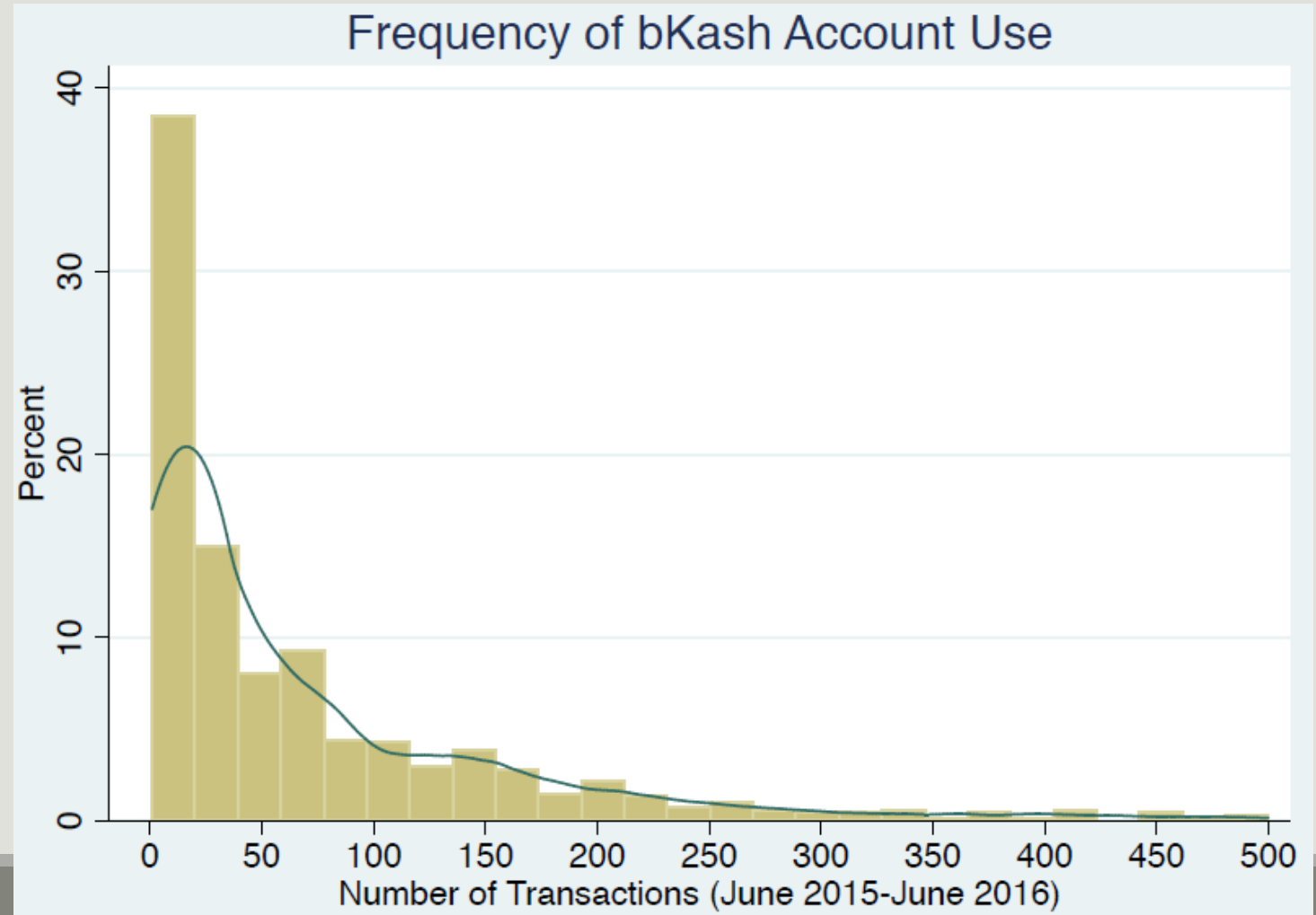
- High overall rates of adoption of bKash in the treatment group
- Overall being approached first or second has no significant impact on adoption rates
- Among women, “approached second” significantly raises adoption rates by 18 percentage points, indicating that family adoption decisions may raise the return to adoption more for women.
- For migrants, significant determinants of bKash adoption include age (+), education (+) and formal employment (+)
- For rural households, significant determinants of bKash adoption include education of the household head (+), dwelling ownership (+), and residence in a more central location



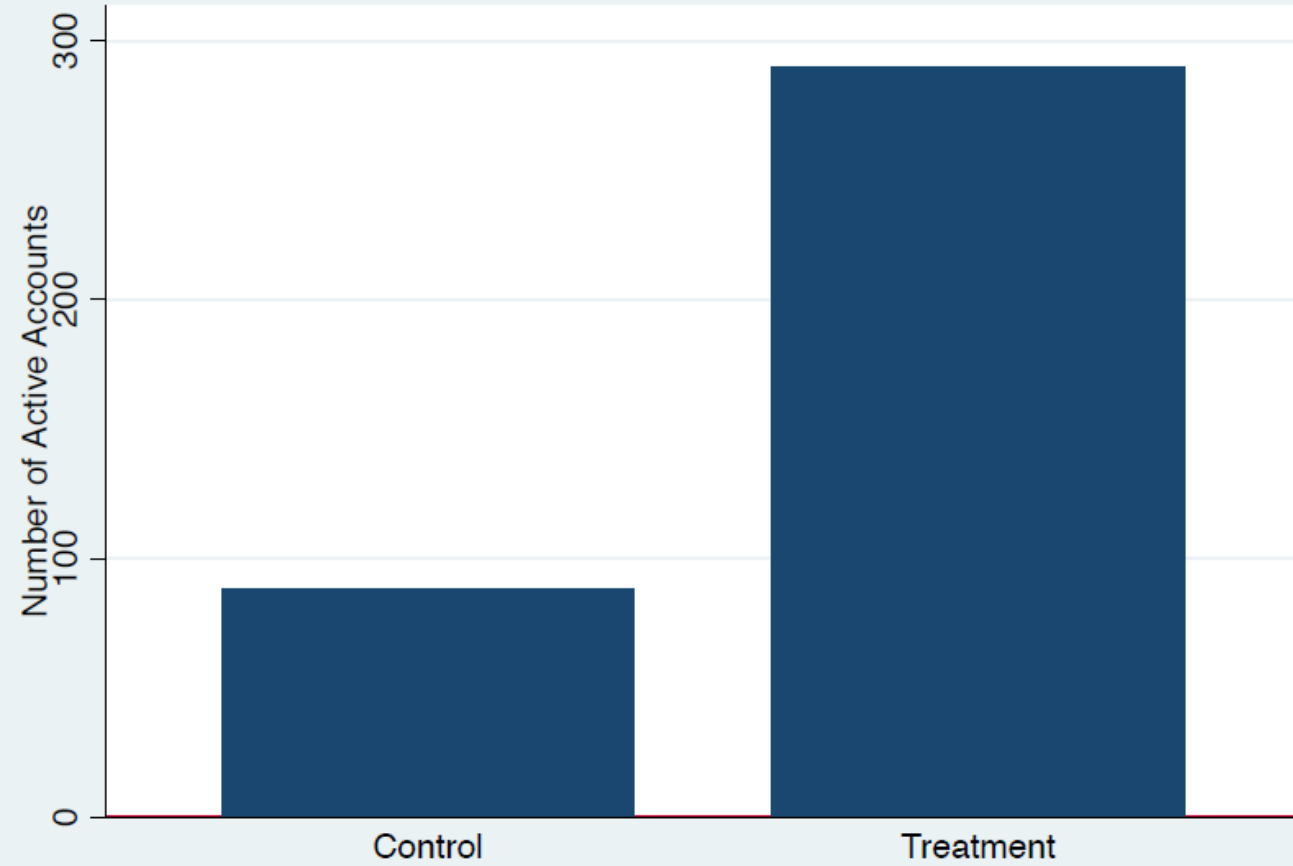
# Administrative data from bKash

About 40% rarely use accounts but a substantial tail uses often

- Kernel density plot emphasize that in fact, not too many individuals are near 0.
- In fact, only 27% of accounts perform less than 13 transactions over the 13 months (i.e. less than 1 transaction per month).

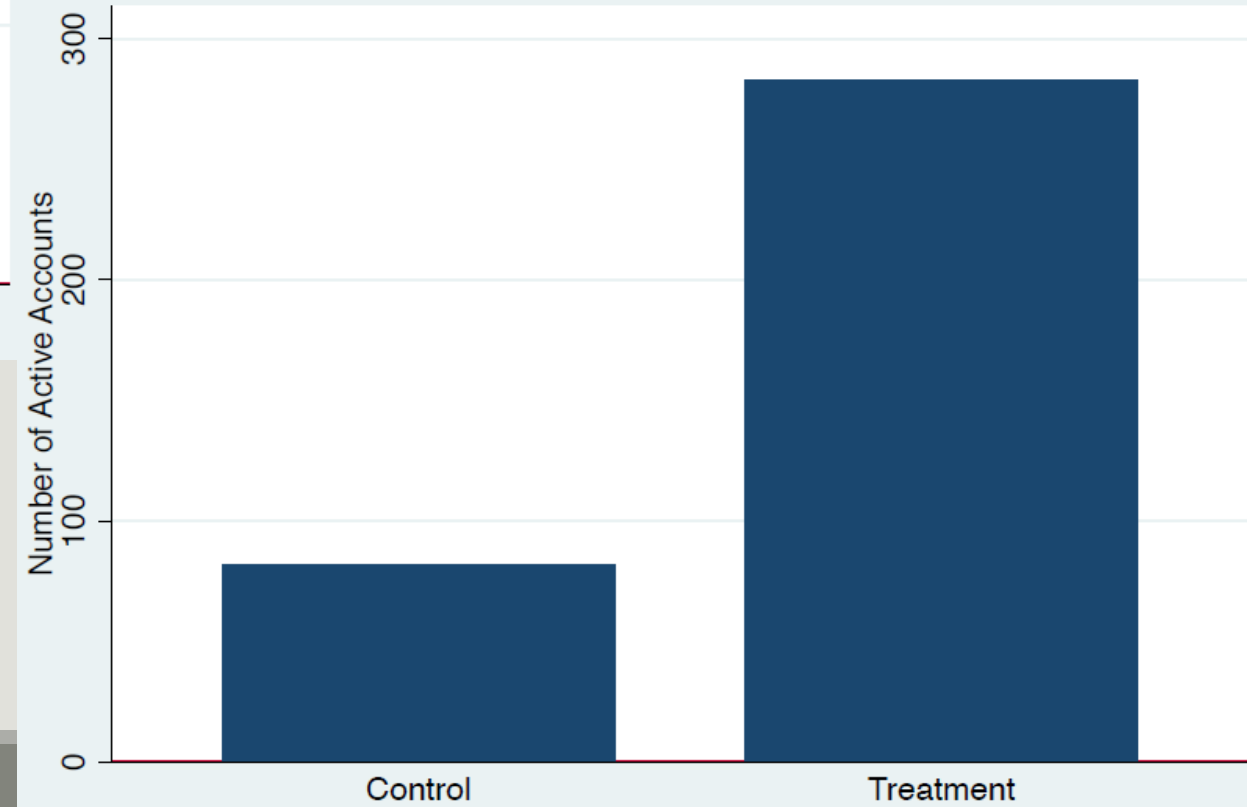


Impact on Number of Active Accounts - Rural Households



Active accounts

Impact on Number of Active Accounts - Urban Migrants

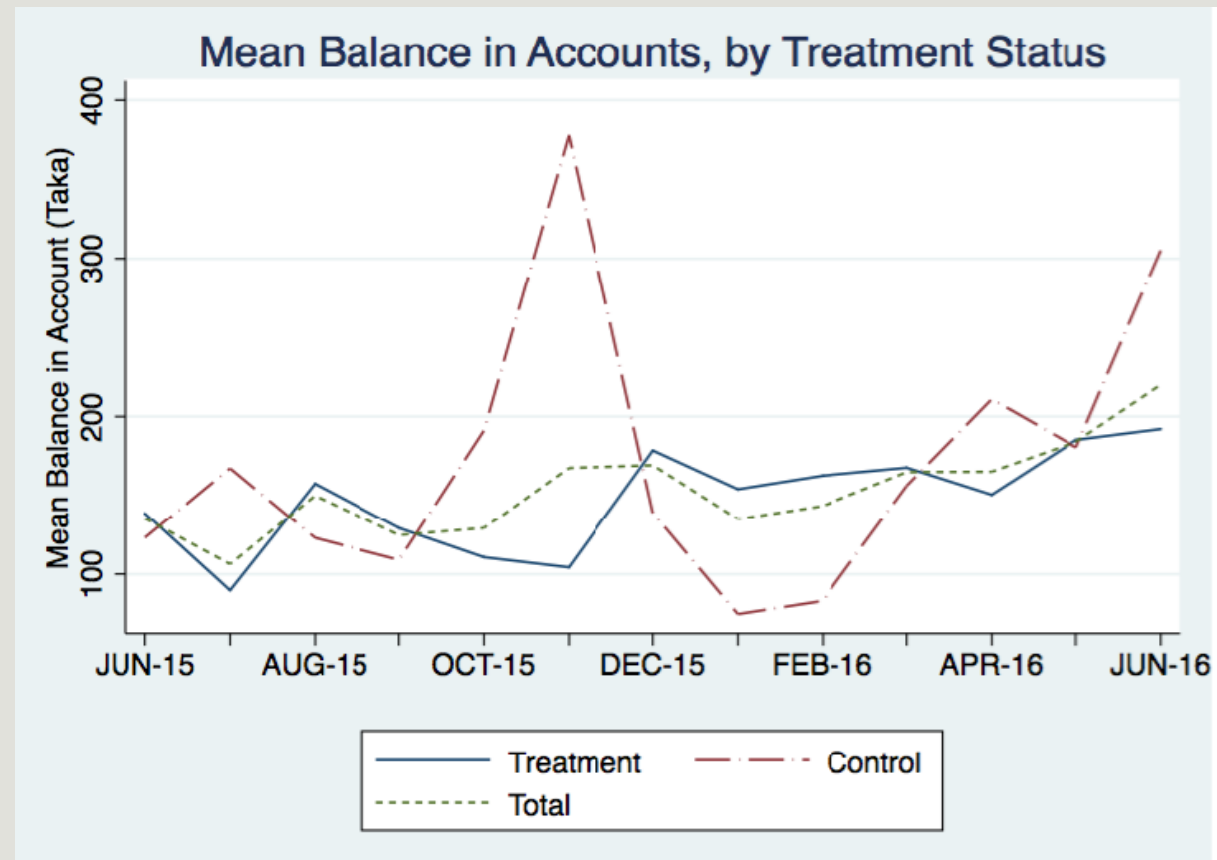


# Inactive accounts

Control group activity is higher - this goes back to the selection story for control account numbers in the bKash administrative data.

	Treatment	Control
Rural	43%	21%
Urban	32%	4%

Active Account = 1 if the household had an account that made any type of transaction during June 2015 to June 2016, and = 0 otherwise.



# Results: First stage

Sizeable increase in active use of mobile account

	Active bKash account	Active bKash account	Active bKash account	Active bKash account
bKash treatment	0.27***	0.26***	0.30***	0.30***
	(0.03)	(0.03)	(0.03)	(0.03)
Baseline controls?	No	Yes	No	Yes
	Rural	Rural	Urban	Urban
Obs	817	814	812	809

\*\*\*p < 1%. Standard errors in parentheses.

# Structure of Randomization: Impact of Mobile Banking on Welfare

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**Full Sample: Migrant-household pairs**  
815 sample

**Treatment group (415 HH):**  
receives training and incentive to adopt  
bKash

**Control group (400 HH):**  
does not receive training and incentive to adopt

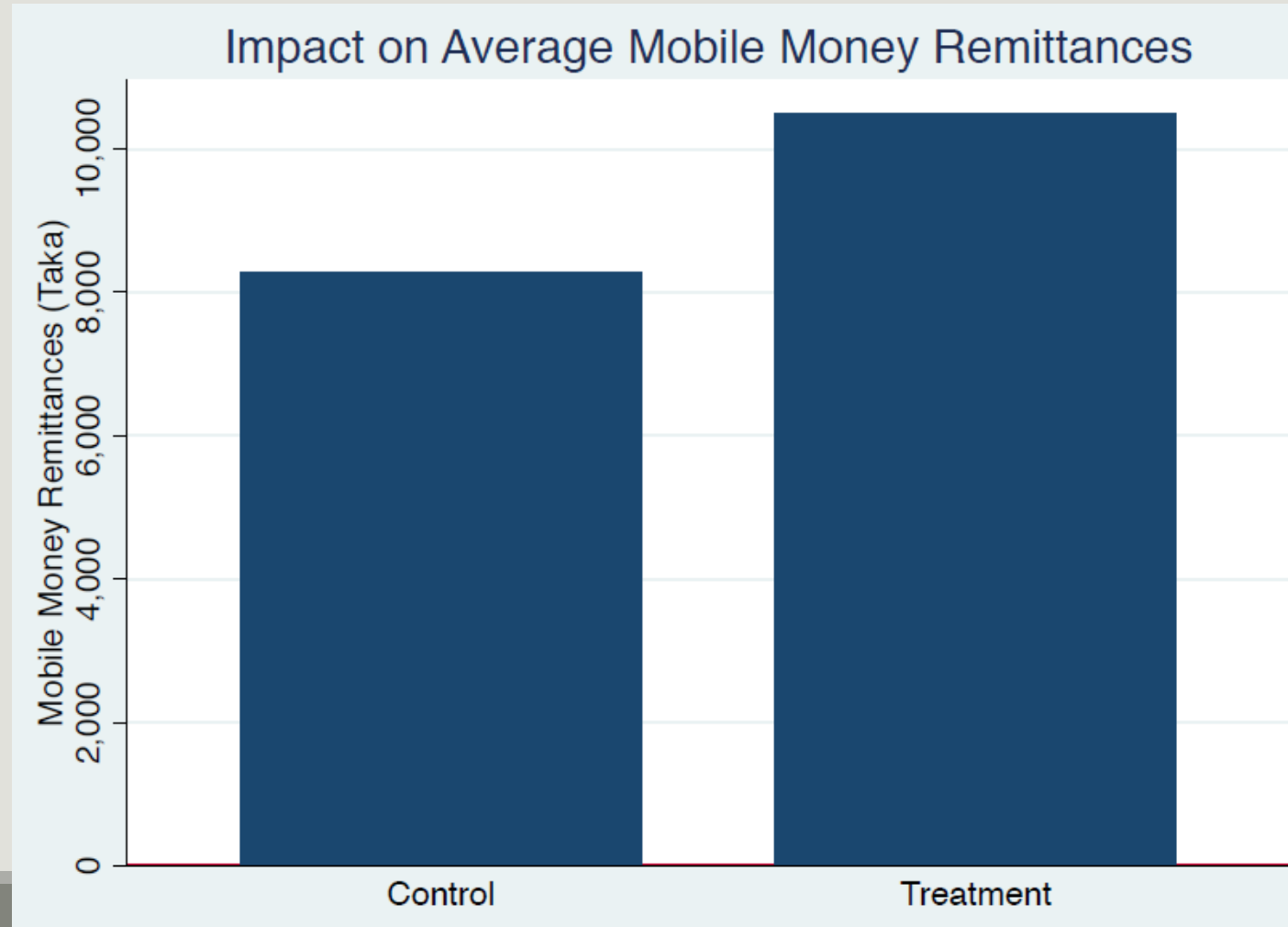
# Impact on Annual value of mobile remittances sent

## Urban migrants: More *mobile* remittances

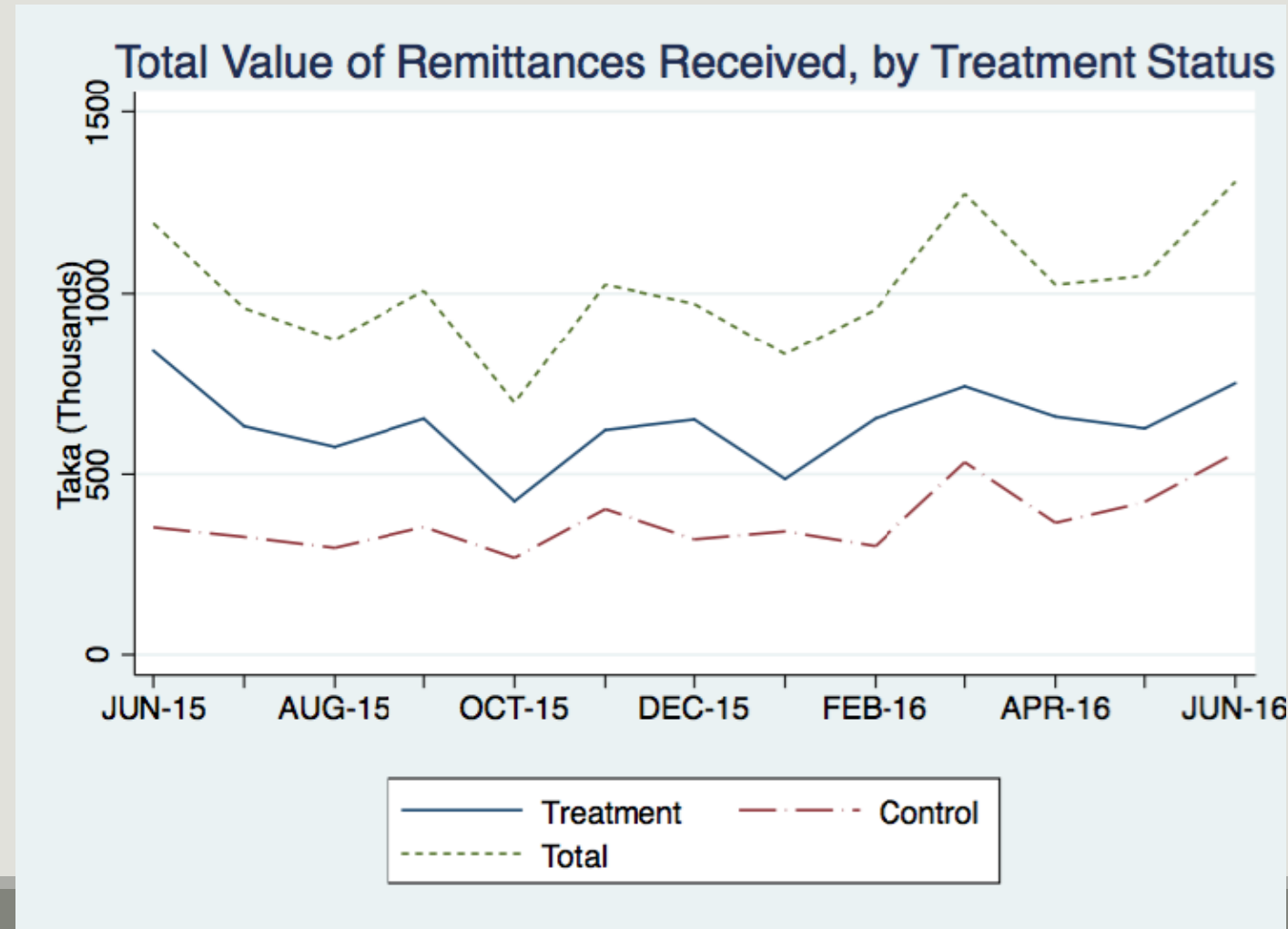
	Intention to treat	Intention to treat	Treatment on Treated	Treatment on Treated	
bKash treatment	2119*	2267*	7123**	7656**	\$97
	(946)	(934)	(3159)	(3161)	
Baseline controls?	No	Yes	No	Yes	
Obs	812	809	812	809	

\*\*p < 5%. Standard errors in parentheses. TOT is IV on having an active bKash account. Borrowing is an index of 2 variables.

# Impact on Annual value of mobile remittances sent



# Monthly remittances flow based on treatment status





# Impact on Annual value of remittances sent (combining mobile and traditional method)

**Urban migrants:** *Total* remittances not sig increased

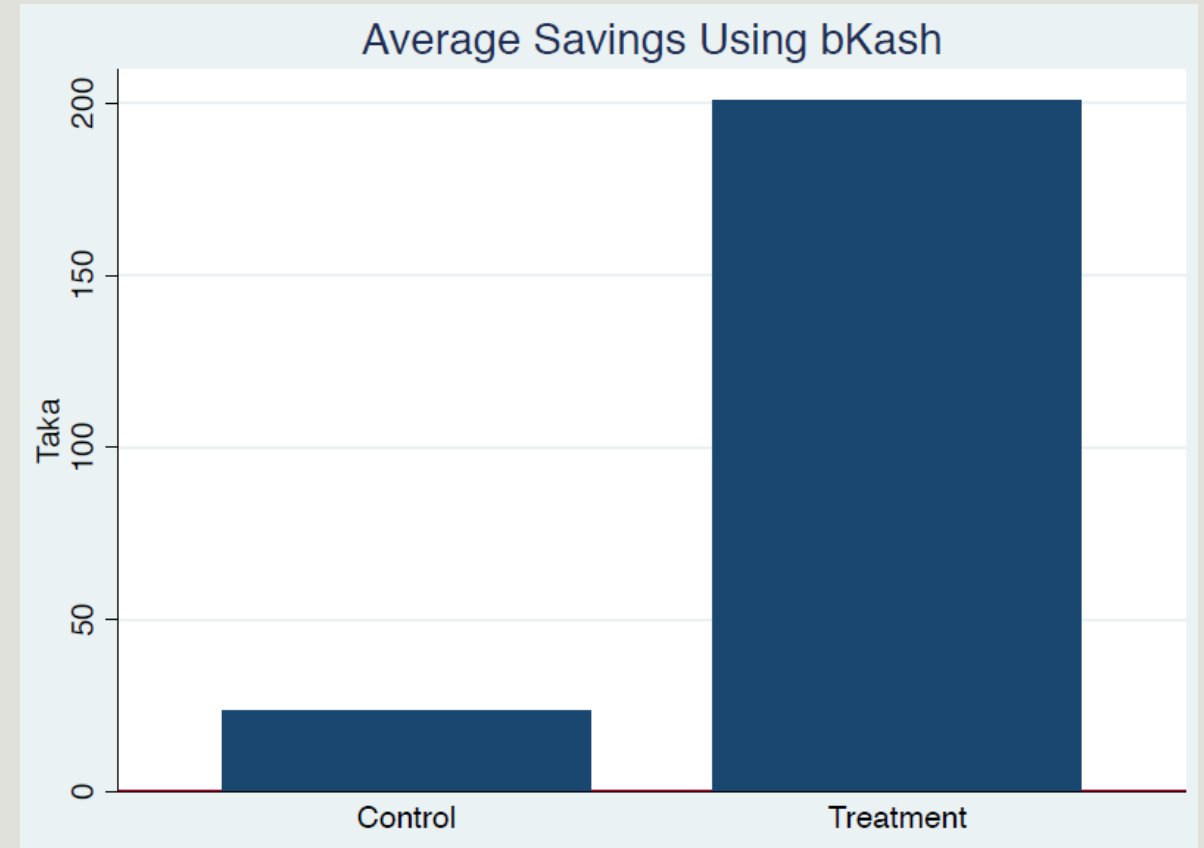
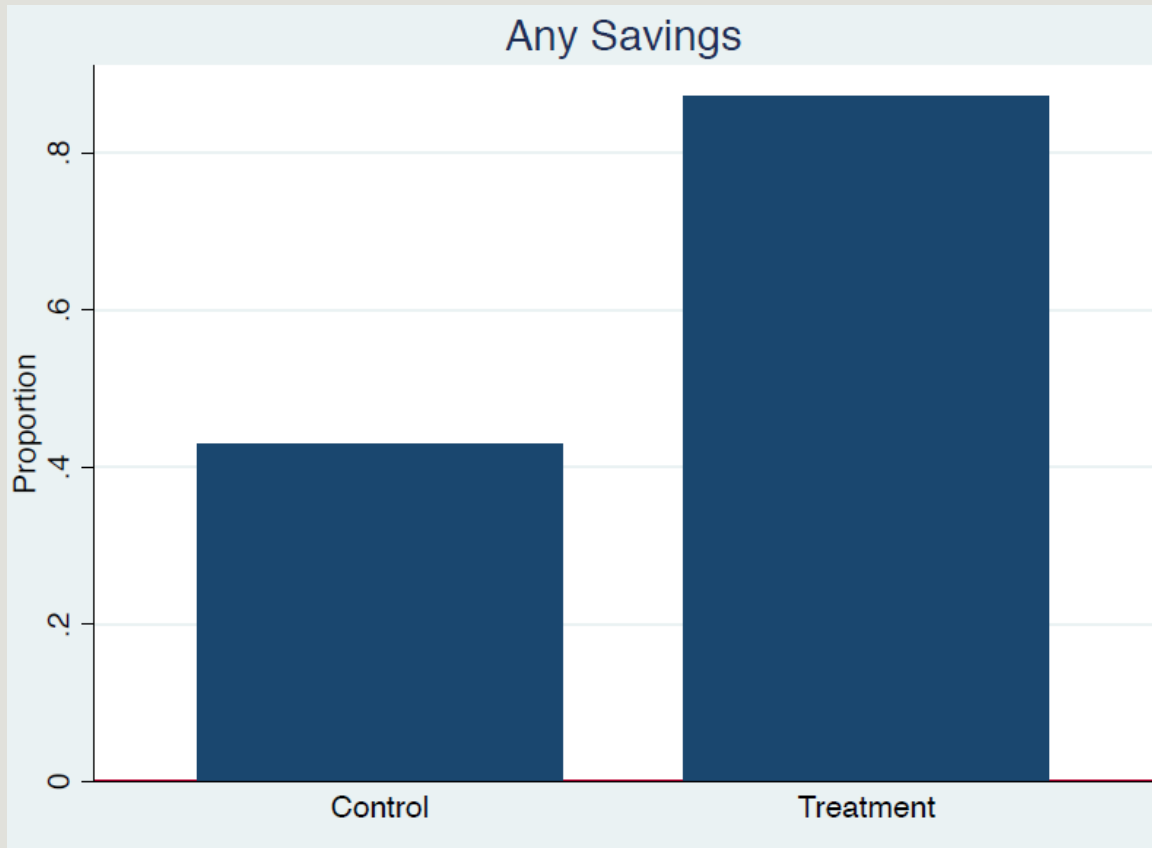
	Intention to treat	Intention to treat	Treatment on Treated	Treatment on Treated	
bKash treatment	1095	1198	3679	4057	\$52
	(1061)	(1030)	(3531)	(3458)	
Baseline controls?	No	Yes	No	Yes	
Obs	812	809	812	809	

\*\*p < 5%. Standard errors in parentheses. TOT is IV on having an active bKash account. Borrowing is an index of 2 variables.

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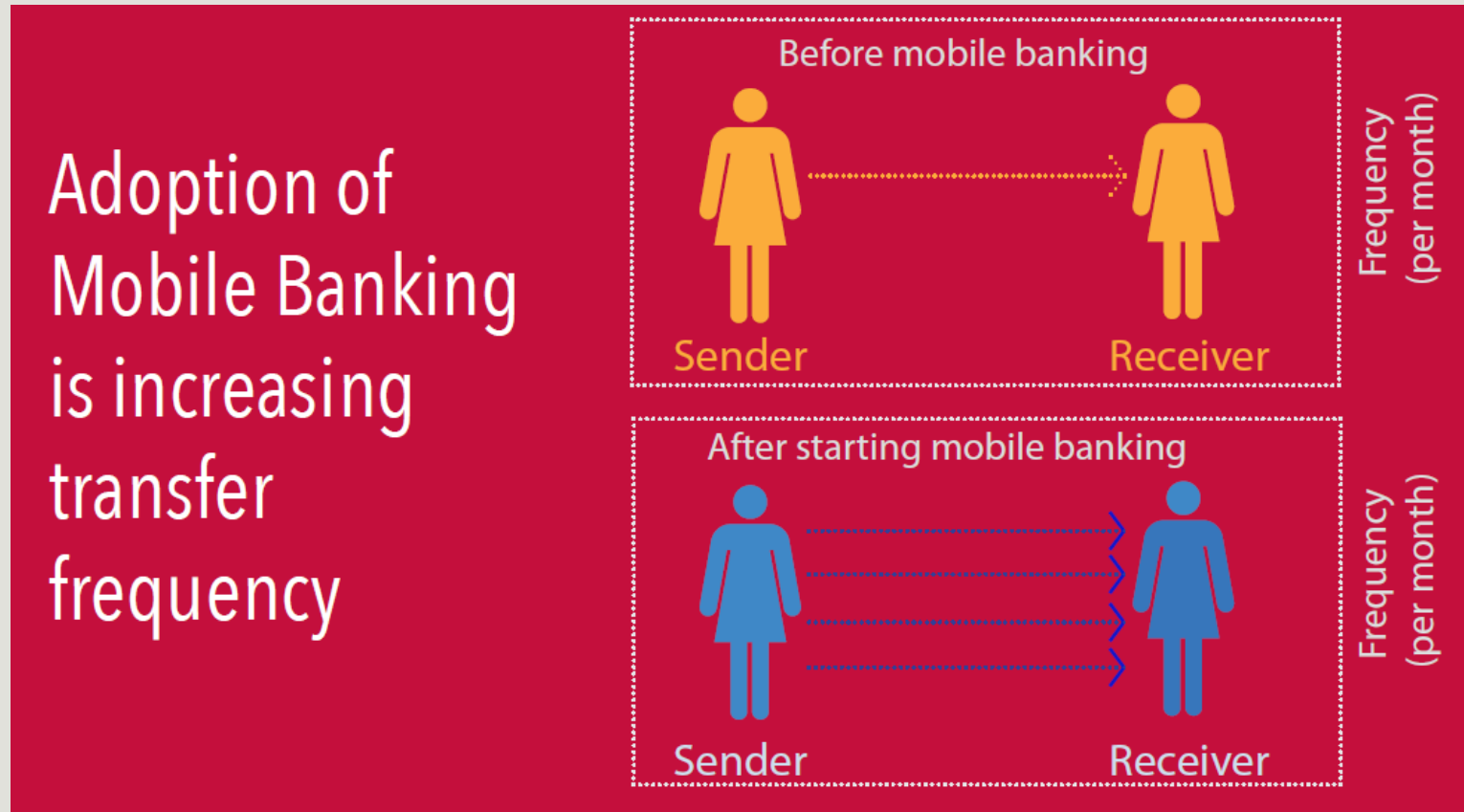
Does mobile banking help to save?  
At least for rural households?

# Impact on savings (rural households)



# Frequency of remittance transfer

## Impact Mechanism: Tackling liquidity constraints



# Impact on borrowing

## Rural

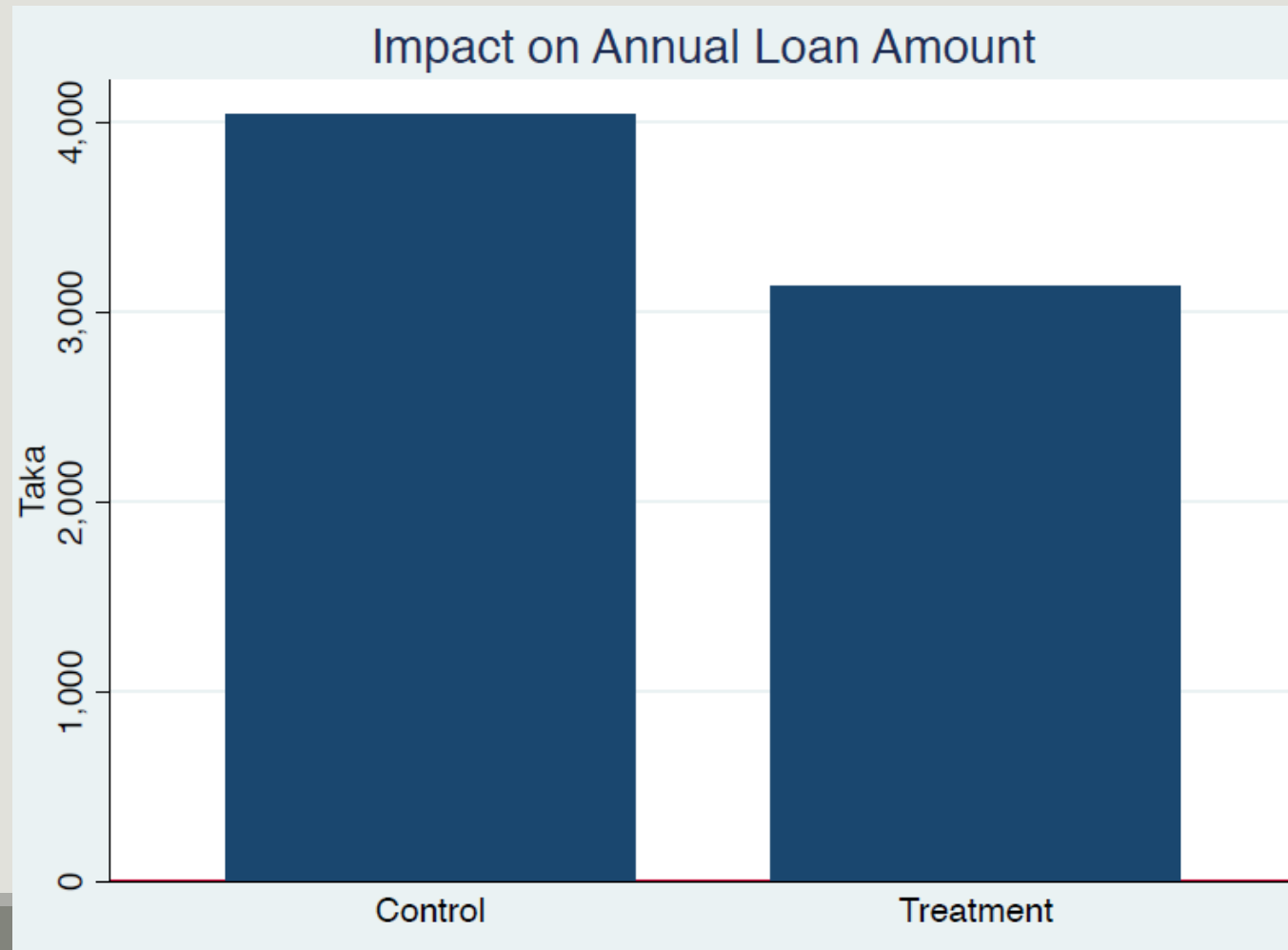
	Intention to treat	Intention to treat	Treatment on Treated	Treatment on Treated
bKash treatment	-0.24**	-0.24**	-0.92**	-0.89**
	(0.12)	(0.12)	(0.45)	(0.45)
Baseline controls?	No	Yes	No	Yes
Obs	817	814	817	814

< ½ sd

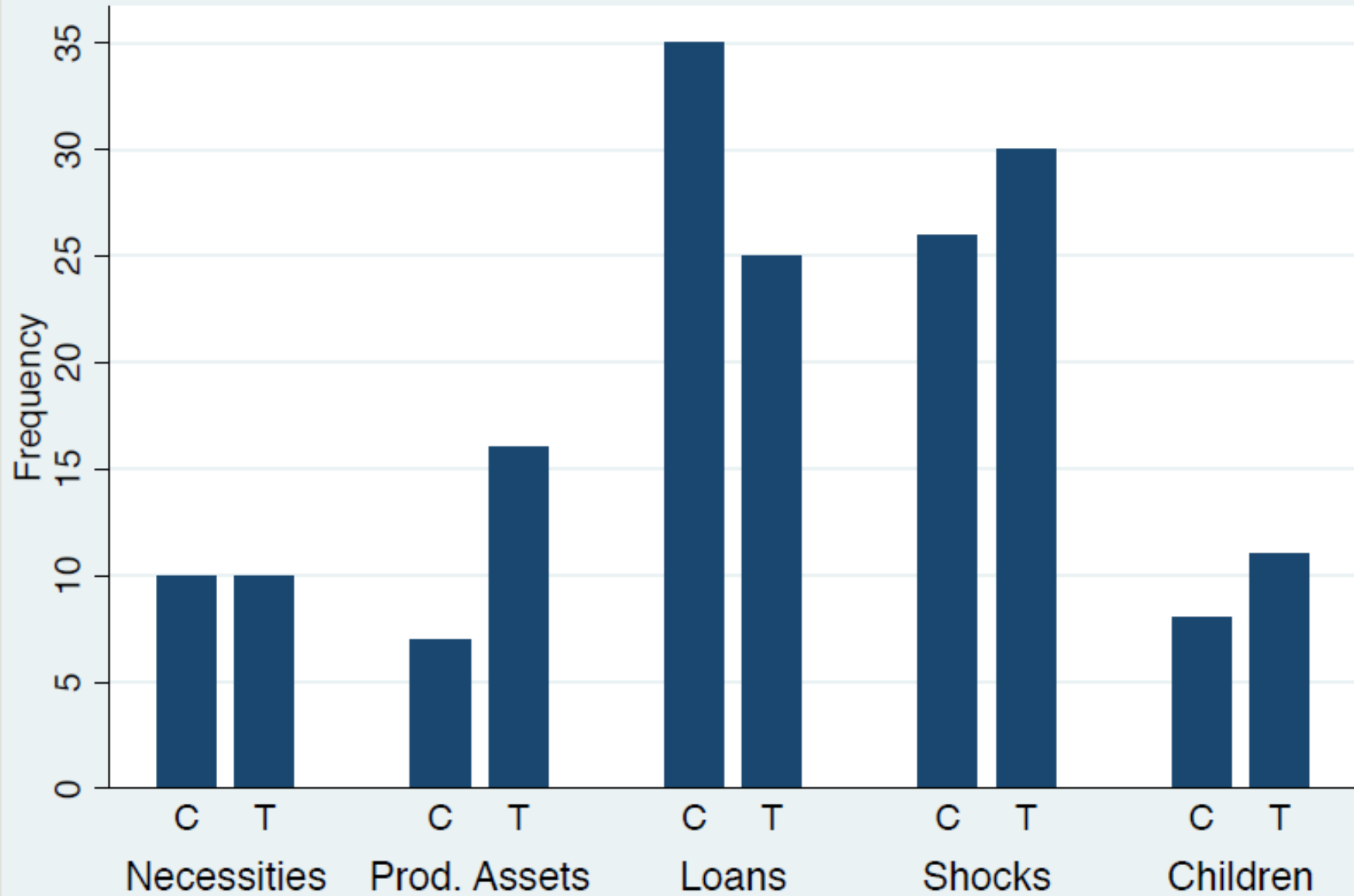
\*\*p < 5%. Standard errors in parentheses. TOT is IV on having an active bKash account. Borrowing is an index of 2 variables.

# Impact on borrowing (rural households)

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## Planned Use of Savings (Top 5 Categories)



# Rural Results

## Index construction

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**Agriculture (5):** Total agricultural profits, Total input costs (excluding labor). Own plot area, Total labor costs, Total number labor hired

**Assets (3):** Dwelling size, Total asset value, Total productive asset value

**Borrowing (2):** Needed to borrow, Total value of loans

**Child education (5):** Attendance, Passed exam, School enrollment, Study hours, Total fees

**Consumption and expenditure (2):** Total expenditure, Index of all other food security variables (12) - Average number of meals, monthly consumption of meat, milk, eggs, fish, fruits (for both normal as well as flood periods)

**Health (3):** Sick for a week or more, Total medical fees, Weeks absent

**Savings (3):** Saved past year, Savings amount, Savings frequency

**Social status (6):** Invitation to village meetings, Invitation to village-level weddings, Comfortable attending weddings, Decision-making role in village, Influence on community, Overall social status in village



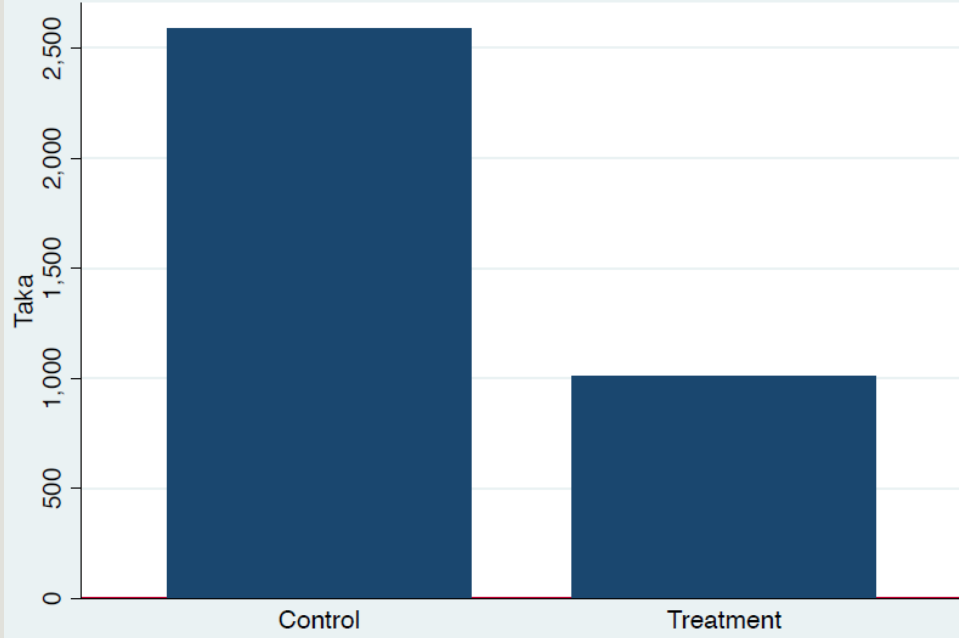
# Impact on children's education

## Rural

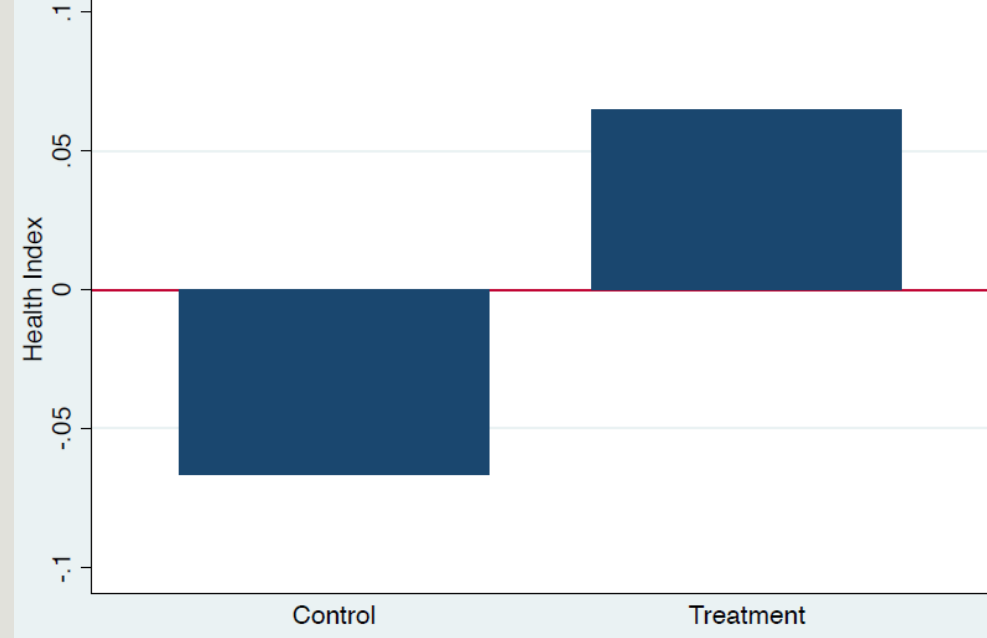
	Intention to treat	Intention to treat	Treatment on Treated	Treatment on Treated	
bKash treatment	0.24**	0.24**	0.92**	0.91**	< .2 sd
	(0.11)	(0.11)	(0.43)	(0.43)	
Baseline controls?	No	Yes	No	Yes	
Obs	817	814	817	814	

\*\*p < 5%. Standard errors in parentheses. TOT is IV on having an active bKash account. Child's education is an index of 5 variables.

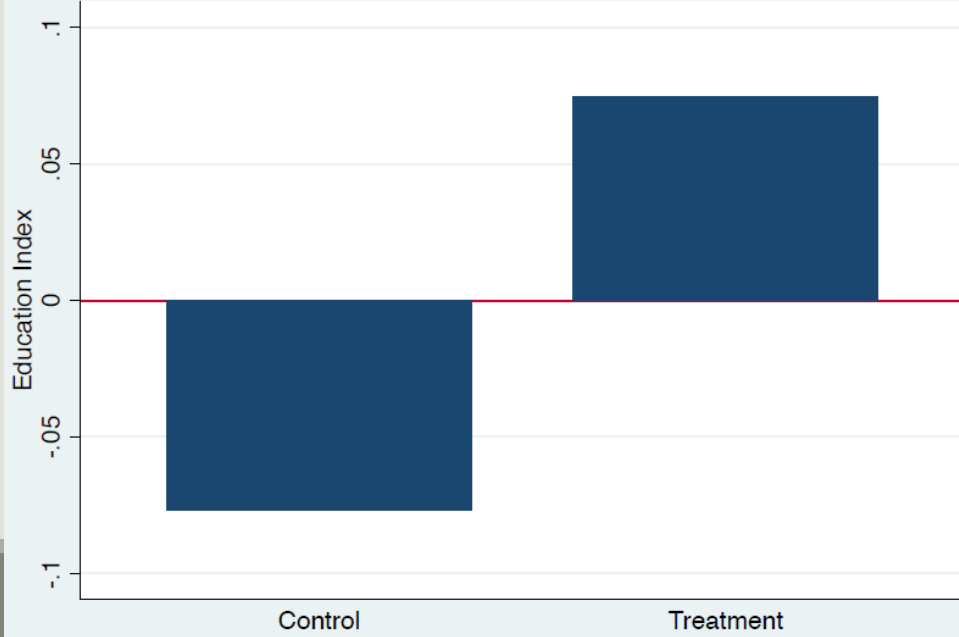
### Impact on Annual Medical Expenses



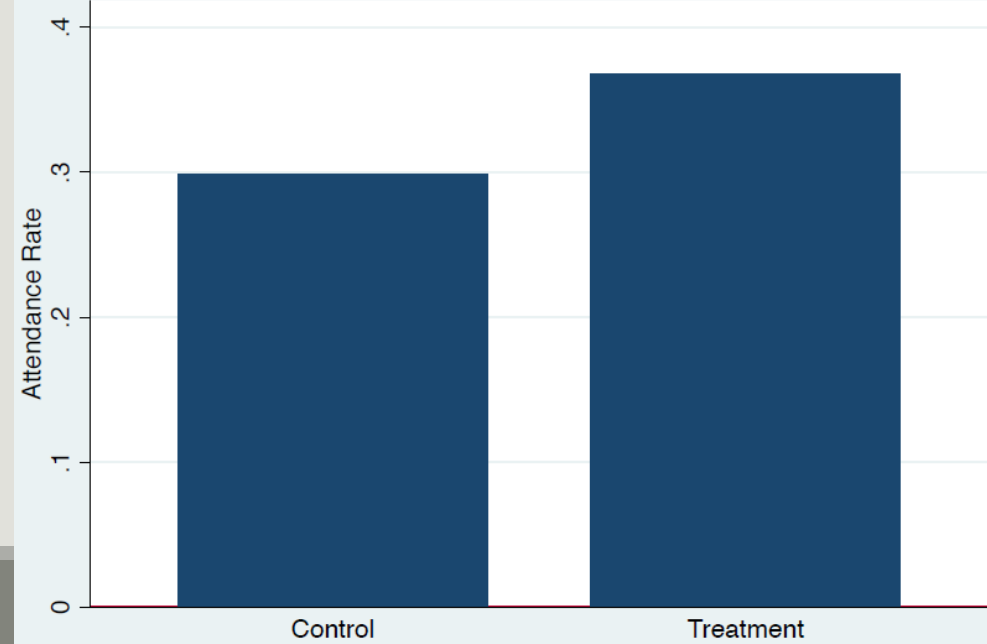
### Impact on Health



### Impact on Education

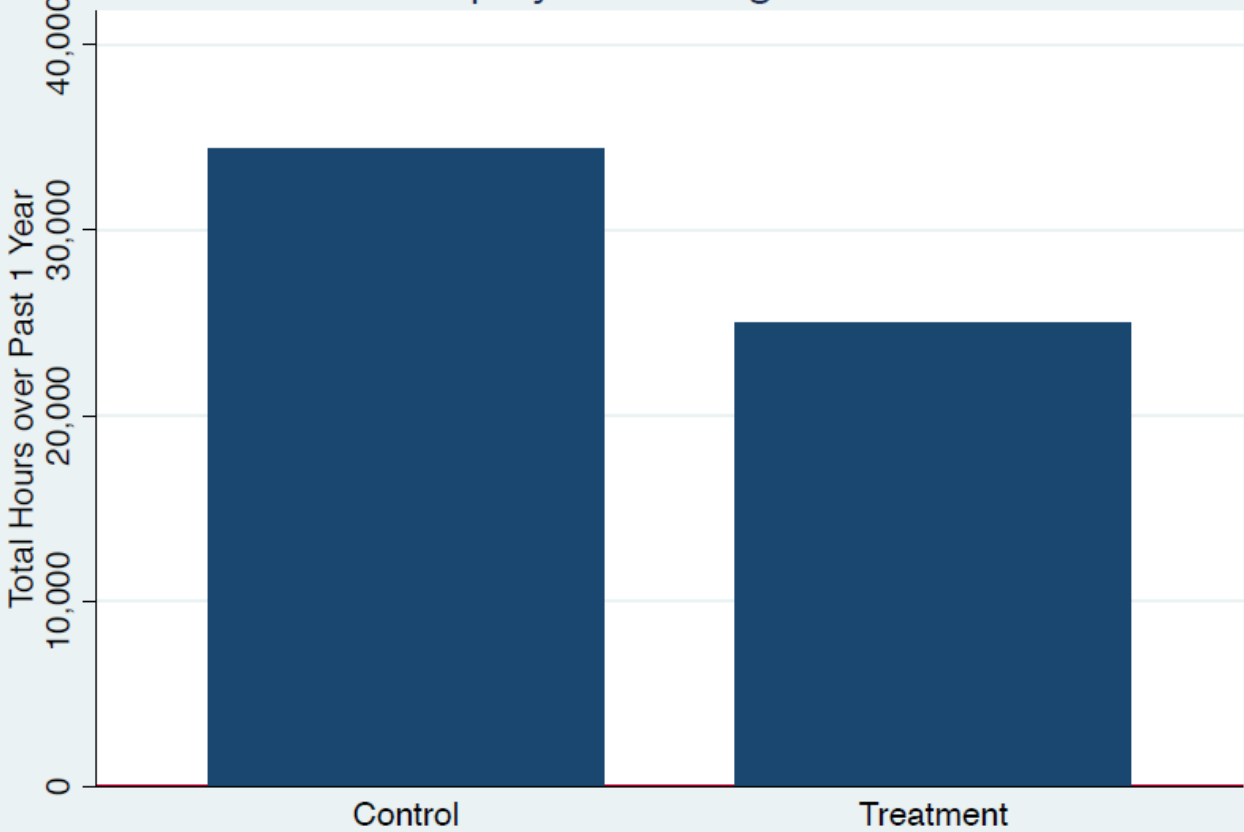


### Impact on School Attendance

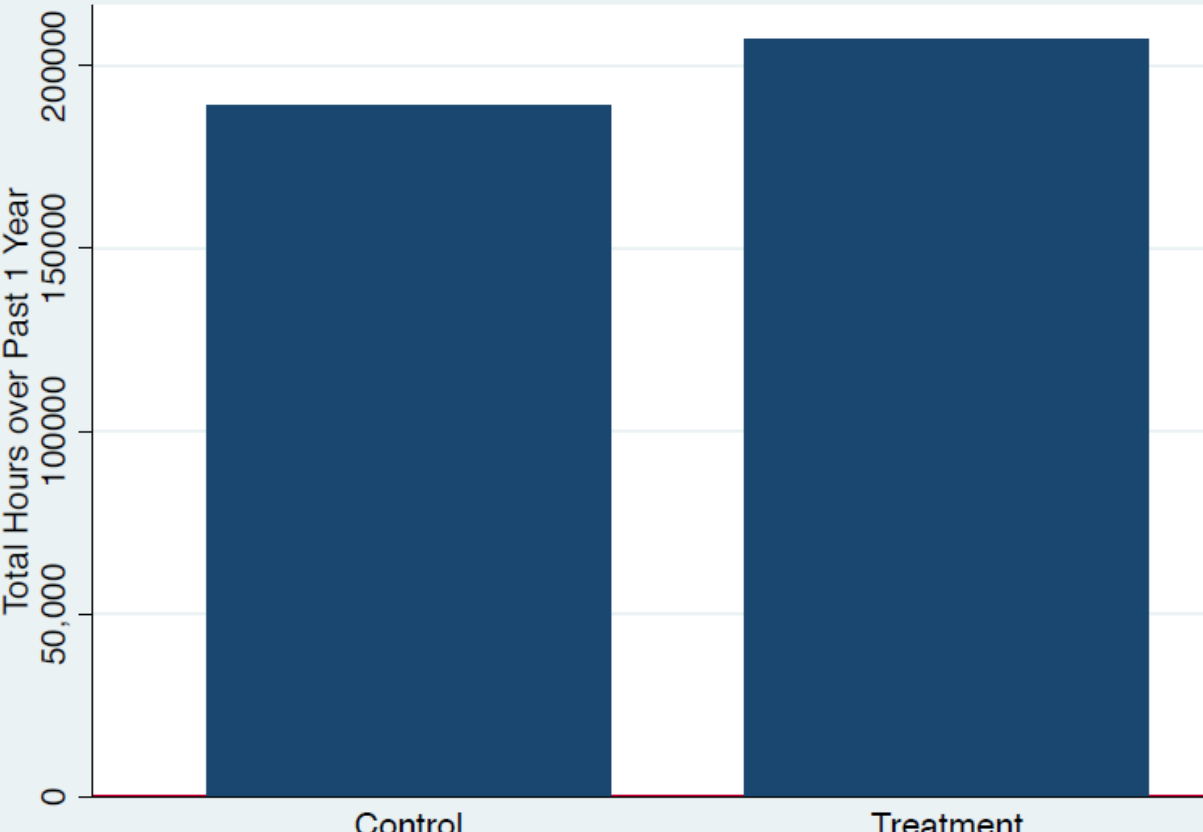


# Rural employment transition

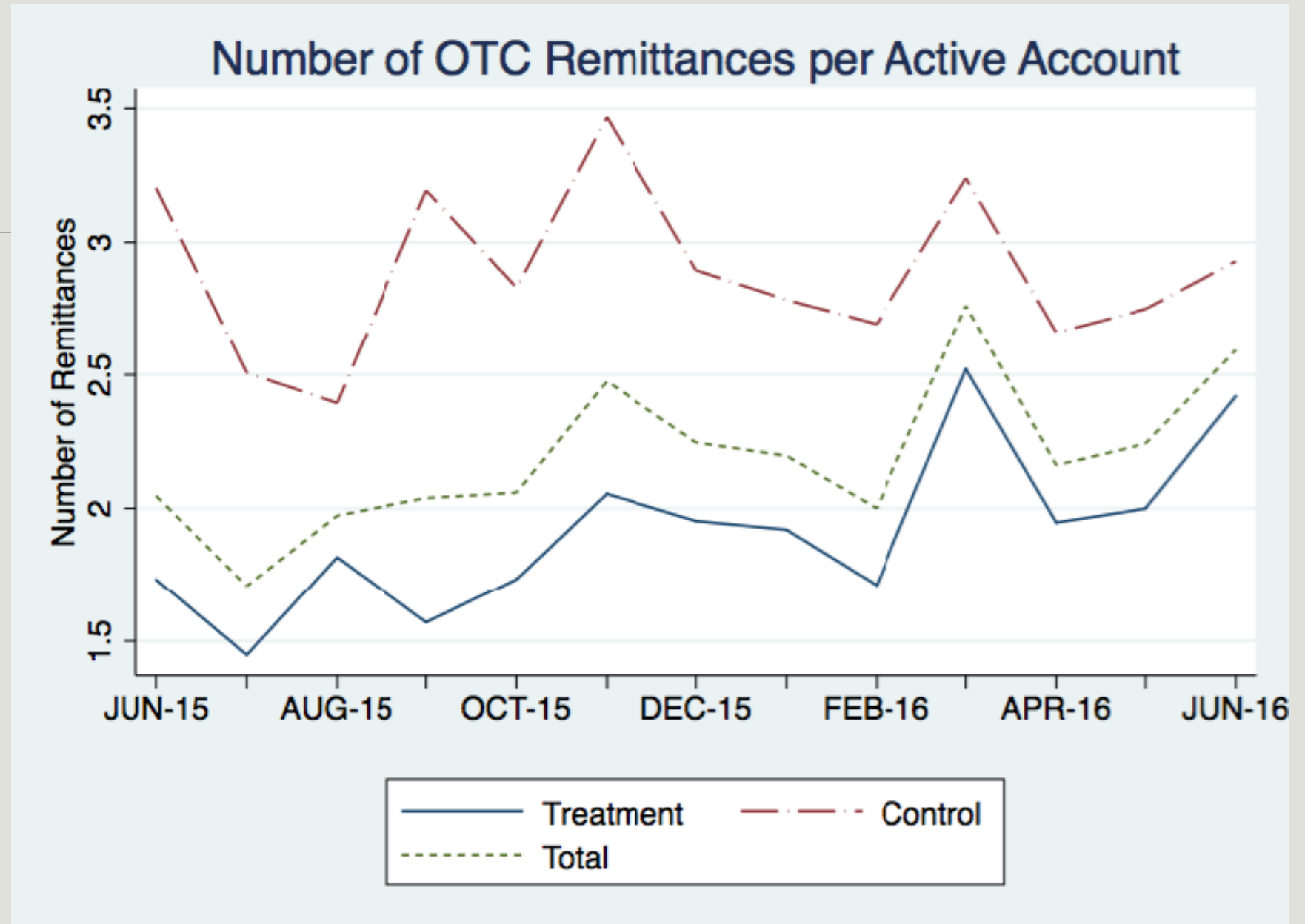
Employment in Agriculture



Employment in Business and Trade



# Impact on OTC



# Other impacts

## Rural

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No impacts on indices of:

- Agricultural output
- Assets
- Consumption
- Academic performance
- Social status

# Summary

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- **Remittances:** After 1.5 years, migrants are shifting toward sending remittances by mobile phone.
- Positive but no significant increase in ***total value*** of remittances. Little other impact on migrants.

**Rural:** Treatment households see some gains:

- Financial (less borrowing, more savings)
  - Social (health, children's education)
  - Suggestive transition from wage labor to trade and business sector.
  - No clear results on income, assets, spending, status
- Modest but reasonable

# Thank you

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An excerpt from our field work:

<https://www.youtube.com/watch?v=1SWX8dF6MUQ&feature=youtu.be>

Thank you very much  
Questions and comments are welcome





# Summary Statistics and Balance

Table I: Summary statistics by assignment to training intervention

	Treatment Mean	Treatment SD	Treatment N	Control Mean	Control SD	Control N	Treatment-Control p-value
Any mobile, rural	0.990	0.098	415	0.983	0.131	400	0.998
Any bank account, urban	0.108	9.311	415	0.110	0.311	400	0.943
Formal employee, urban	0.913	0.281	415	0.883	0.322	400	0.147
Average monthly income, urban	7.830	2.579	415	7.768	2.447	400	0.725
Female migrant	0.294	0.456	415	0.308	0.462	400	0.674
Age of migrant	24.041	5.262	415	24.040	5.106	400	0.998
Education of migrant	6.588	3.362	415	6.510	3.442	400	0.744
Tenure at current job, urban	1.407	1.579	415	1.350	1.483	400	0.594
Tenure in Dhaka, urban	3.424	1.845	415	3.493	1.749	400	0.587
Remittances in past 6 months, urban	17.279	11.916	415	18.243	12.564	400	0.261
Household size, rural	4.393	1.619	415	4.435	1.575	400	0.706
Number of children, rural	1.186	1.029	415	1.255	1.085	400	0.349
Household head age, rural	47.204	13.058	415	46.159	13.333	400	0.259
Household head female, rural	0.120	0.326	415	0.128	0.334	400	0.761
Household head education, rural	2.699	4.056	415	2.800	3.929	400	0.718
Decimal of owned agricultural land, rural	9.369	28.513	415	10.878	30.833	400	0.468
Number of rooms of dwelling, rural	1.814	0.730	415	1.818	0.762	400	0.954
Dwelling owned, rural	0.942	0.233	415	0.938	0.242	400	0.780
Gaibandha	0.501	0.501	415	0.528	0.500	400	0.453
Sadar	0.388	0.488	415	0.380	0.486	400	0.816
Other upazila	0.111	0.314	415	0.093	0.290	400	0.387

# “First-mover” and Pro-Social Marketing Treatments

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Within the treatment arm, randomized whether households or migrants were approached first for treatment to assess the impacts of prior treatment of the household on migrant mobile money adoption decisions

Within the treatment arm, then cross-randomized whether migrants are given individualistic or pro-social “family-oriented” marketing

- Stratified randomization
- Cross-randomized to ensure treatments are independent of one another