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

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ORGANIZED BY IGC | BIGD ON DECEMBER 18, 2016 @LAKESHORE HOTEL]
Funding and Assistance

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

- 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

<table>
<thead>
<tr>
<th>Financial Service</th>
<th>% of Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account at a formal financial institute</td>
<td>40</td>
</tr>
<tr>
<td>Account used to receive wages</td>
<td>3</td>
</tr>
<tr>
<td>Account used to receive remittances</td>
<td>3</td>
</tr>
<tr>
<td>Saved at a financial institution in the last year</td>
<td>17</td>
</tr>
<tr>
<td>Loan from a financial institution</td>
<td>23</td>
</tr>
<tr>
<td>Debit card</td>
<td>2</td>
</tr>
<tr>
<td>Credit Card</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: World Bank Data 2012
Motivation: remittance and savings

- 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?

Mobile technologies have rapidly expanded in the developing world, specially in Bangladesh.
Mobile Banking: A solution?

- 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?

1. Bring money to a mobile banking agent.
2. Agent converts the money into digital currency.
3. Sender can now choose options:
   - Send money
   - Mobile number
   - Amount
   - M PIN
4. Receiver gets an SMS and goes to a nearby agent office to cash-out.
Overview: Bangladesh Finance

**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

“[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

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


- 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

- 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

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

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
Research Collaboration: bKash

- 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

**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

**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

- 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

Full Sample: Migrant-household pairs
815 sample

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

For Individual Marketing
- Migrants Approached First
- Rural Household Approached First

For Family Marketing
- Migrants Approached First
- Rural Household Approached First

Control group (400 HH): does not receive training and incentive to adopt
Impact of Family Marketing on Migrant bKash Adoption

- For the individual marketing
- For the family marketing
Impact of Family Influence on Migrant bKash Adoption

- Migrants approached first
- Rural household approached first
Determinants of Adoption

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

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>43%</td>
<td>21%</td>
</tr>
<tr>
<td>Urban</td>
<td>32%</td>
<td>4%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Active bKash account</th>
<th>Active bKash account</th>
<th>Active bKash account</th>
<th>Active bKash account</th>
</tr>
</thead>
<tbody>
<tr>
<td>bKash treatment</td>
<td>0.27***</td>
<td>0.26***</td>
<td>0.30***</td>
<td>0.30***</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Baseline controls?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>Rural</td>
<td>Urban</td>
<td>Urban</td>
</tr>
<tr>
<td>Obs</td>
<td>817</td>
<td>814</td>
<td>812</td>
<td>809</td>
</tr>
</tbody>
</table>

***p < 1%. Standard errors in parentheses.
Structure of Randomization:
Impact of Mobile Banking on Welfare

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

<table>
<thead>
<tr>
<th>bKash treatment</th>
<th>Intention to treat</th>
<th>Intention to treat</th>
<th>Treatment on Treated</th>
<th>Treatment on Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>bKash treatment</td>
<td>2119*</td>
<td>2267*</td>
<td>7123**</td>
<td>7656**</td>
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<tr>
<td>Baseline controls?</td>
<td>No</td>
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<td>No</td>
<td>Yes</td>
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<tr>
<td>Obs</td>
<td>812</td>
<td>809</td>
<td>812</td>
<td>809</td>
</tr>
</tbody>
</table>

**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

Impact on Average Mobile Money Remittances

Mobile Money Remittances (Taka)

0 2,000 4,000 6,000 8,000 10,000

Control  Treatment
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

<table>
<thead>
<tr>
<th></th>
<th>Intention to treat</th>
<th>Intention to treat</th>
<th>Treatment on Treated</th>
<th>Treatment on Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>bKash treatment</td>
<td>1095</td>
<td>1198</td>
<td>3679</td>
<td>4057</td>
</tr>
<tr>
<td></td>
<td>(1061)</td>
<td>(1030)</td>
<td>(3531)</td>
<td>(3458)</td>
</tr>
<tr>
<td>Baseline controls?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs</td>
<td>812</td>
<td>809</td>
<td>812</td>
<td>809</td>
</tr>
</tbody>
</table>

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

Adoption of Mobile Banking is increasing transfer frequency

Before mobile banking

Sender  
Frequency (per month)
Receiver

After starting mobile banking

Sender  
Frequency (per month)
Receiver
### Impact on borrowing

#### Rural

<table>
<thead>
<tr>
<th>bKash treatment</th>
<th>Intention to treat</th>
<th>Intention to treat</th>
<th>Treatment on Treated</th>
<th>Treatment on Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>bKash treatment</td>
<td>-0.24**</td>
<td>-0.24**</td>
<td>-0.92**</td>
<td>-0.89**</td>
</tr>
<tr>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.45)</td>
<td>(0.45)</td>
<td></td>
</tr>
<tr>
<td>Baseline controls?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs</td>
<td>817</td>
<td>814</td>
<td>817</td>
<td>814</td>
</tr>
</tbody>
</table>

**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)
Rural Results
Index construction

**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

<table>
<thead>
<tr>
<th></th>
<th>Intention to treat</th>
<th>Intention to treat</th>
<th>Treatment on Treated</th>
<th>Treatment on Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>bKash treatment</td>
<td>0.24**</td>
<td>0.24**</td>
<td>0.92**</td>
<td>0.91**</td>
</tr>
<tr>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.43)</td>
<td>(0.43)</td>
<td></td>
</tr>
<tr>
<td>Baseline controls?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs</td>
<td>817</td>
<td>814</td>
<td>817</td>
<td>814</td>
</tr>
</tbody>
</table>

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

Employment in Agriculture

Employment in Business and Trade

Total Hours over Past 1 Year

Control  Treatment

Control  Treatment
Impact on OTC
Other impacts

Rural

No impacts on indices of:

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

- **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

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>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Treatment</th>
<th>Treatment</th>
<th>Control</th>
<th>Control</th>
<th>Control</th>
<th>Treatment-Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any mobile, rural</td>
<td>0.990</td>
<td>0.098</td>
<td>415</td>
<td>0.983</td>
<td>0.131</td>
<td>400</td>
<td>0.998</td>
<td></td>
</tr>
<tr>
<td>Any bank account, urban</td>
<td>0.108</td>
<td>9.311</td>
<td>415</td>
<td>0.110</td>
<td>0.311</td>
<td>400</td>
<td>0.943</td>
<td></td>
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<tr>
<td>Formal employee, urban</td>
<td>0.913</td>
<td>0.281</td>
<td>415</td>
<td>0.883</td>
<td>0.322</td>
<td>400</td>
<td>0.147</td>
<td></td>
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<tr>
<td>Average monthly income, urban</td>
<td>7.830</td>
<td>2.579</td>
<td>415</td>
<td>7.768</td>
<td>2.447</td>
<td>400</td>
<td>0.725</td>
<td></td>
</tr>
<tr>
<td>Female migrant</td>
<td>0.294</td>
<td>0.456</td>
<td>415</td>
<td>0.308</td>
<td>0.462</td>
<td>400</td>
<td>0.674</td>
<td></td>
</tr>
<tr>
<td>Age of migrant</td>
<td>24.041</td>
<td>5.262</td>
<td>415</td>
<td>24.040</td>
<td>5.106</td>
<td>400</td>
<td>0.998</td>
<td></td>
</tr>
<tr>
<td>Education of migrant</td>
<td>6.588</td>
<td>3.362</td>
<td>415</td>
<td>6.510</td>
<td>3.442</td>
<td>400</td>
<td>0.744</td>
<td></td>
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<tr>
<td>Tenure at current job, urban</td>
<td>1.407</td>
<td>1.579</td>
<td>415</td>
<td>1.350</td>
<td>1.483</td>
<td>400</td>
<td>0.594</td>
<td></td>
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<tr>
<td>Tenure in Dhaka, urban</td>
<td>3.424</td>
<td>1.845</td>
<td>415</td>
<td>3.493</td>
<td>1.749</td>
<td>400</td>
<td>0.587</td>
<td></td>
</tr>
<tr>
<td>Remittances in past 6 months, urban</td>
<td>17.279</td>
<td>11.916</td>
<td>415</td>
<td>18.243</td>
<td>12.564</td>
<td>400</td>
<td>0.261</td>
<td></td>
</tr>
<tr>
<td>Household size, rural</td>
<td>4.393</td>
<td>1.619</td>
<td>415</td>
<td>4.435</td>
<td>1.575</td>
<td>400</td>
<td>0.706</td>
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<tr>
<td>Number of children, rural</td>
<td>1.186</td>
<td>1.029</td>
<td>415</td>
<td>1.255</td>
<td>1.085</td>
<td>400</td>
<td>0.349</td>
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<tr>
<td>Household head age, rural</td>
<td>47.204</td>
<td>13.058</td>
<td>415</td>
<td>46.159</td>
<td>13.333</td>
<td>400</td>
<td>0.259</td>
<td></td>
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<td>Household head female, rural</td>
<td>0.120</td>
<td>0.326</td>
<td>415</td>
<td>0.128</td>
<td>0.331</td>
<td>400</td>
<td>0.761</td>
<td></td>
</tr>
<tr>
<td>Household head education, rural</td>
<td>2.699</td>
<td>4.056</td>
<td>415</td>
<td>2.800</td>
<td>3.929</td>
<td>400</td>
<td>0.718</td>
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<tr>
<td>Decimal of owned agricultural land, rural</td>
<td>9.369</td>
<td>28.513</td>
<td>415</td>
<td>10.878</td>
<td>30.833</td>
<td>400</td>
<td>0.468</td>
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</tr>
<tr>
<td>Number of rooms of dwelling, rural</td>
<td>1.814</td>
<td>0.730</td>
<td>415</td>
<td>1.818</td>
<td>0.762</td>
<td>400</td>
<td>0.954</td>
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<tr>
<td>Dwelling owned, rural</td>
<td>0.942</td>
<td>0.233</td>
<td>415</td>
<td>0.938</td>
<td>0.242</td>
<td>400</td>
<td>0.780</td>
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<td>Gaibandha</td>
<td>0.501</td>
<td>0.501</td>
<td>415</td>
<td>0.528</td>
<td>0.500</td>
<td>400</td>
<td>0.453</td>
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<td>Sadar</td>
<td>0.388</td>
<td>0.488</td>
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<td>0.380</td>
<td>0.486</td>
<td>400</td>
<td>0.816</td>
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<tr>
<td>Other upazila</td>
<td>0.111</td>
<td>0.314</td>
<td>415</td>
<td>0.093</td>
<td>0.290</td>
<td>400</td>
<td>0.387</td>
<td></td>
</tr>
</tbody>
</table>
“First-mover” and Pro-Social Marketing Treatments

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