

# Banking with Agents: Evidence from Senegal

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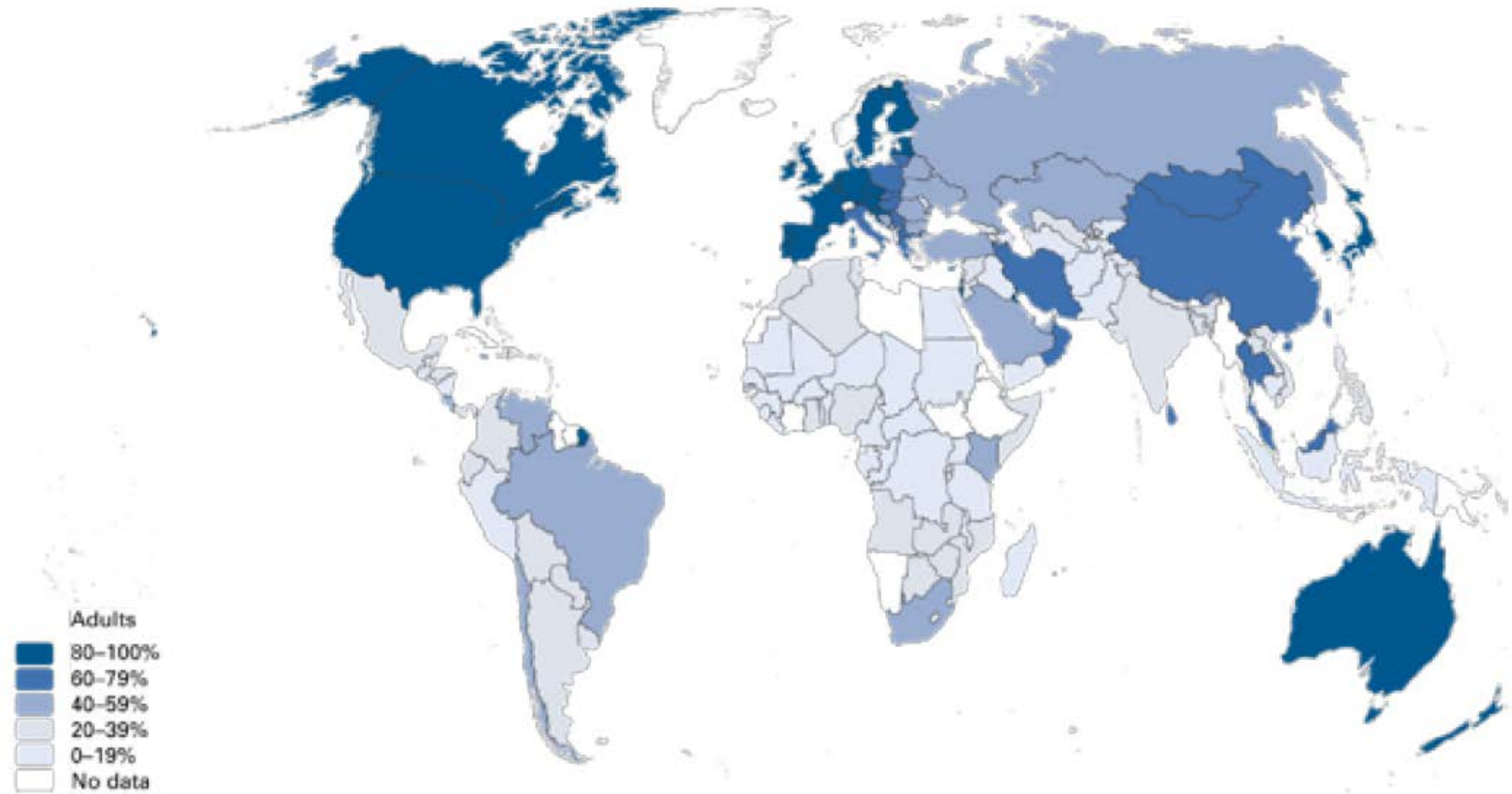
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## Motivation:

77 percent of adults living on less than \$2 a day report not having an account at a formal financial institution [Global Findex (2012)]

- Among the reasons of low take-up of bank accounts are:
  - Accounts are expensive
  - Transactions costs, both **physical** (distance and time) as well as **social** (different social class, unfamiliarity, etc)
  - Trust in financial institutions
- Bank agents are trusted local retailers that enable customers to make the same basic financial transactions as in a branch
  - Lower transactions costs

**MAP 1.1** Adults with an Account at a Formal Financial Institution



Source: Global Financial Inclusion (Global Findex) Database, World Bank, Washington, DC, <http://www.worldbank.org/globalfindex>.



MicroCred Branch, Dakar



MicroCred Agent, Dakar

# Research questions

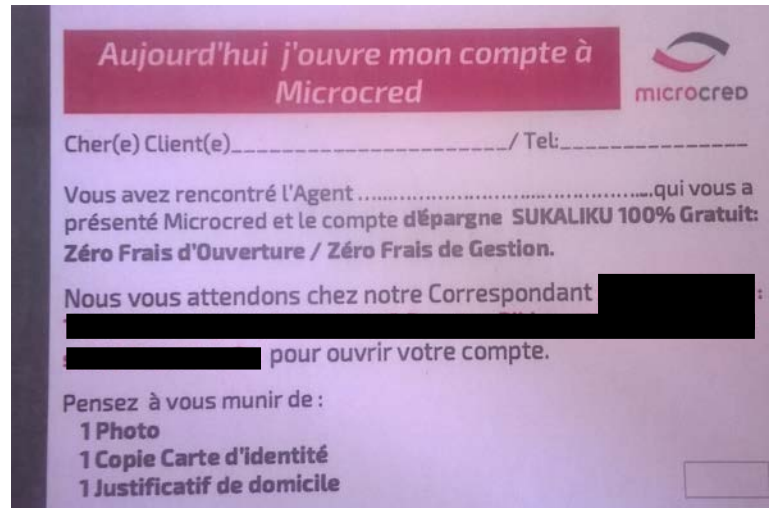
- Do MicroCred agents *lower* transaction costs?
- If so, what are the impacts on financial activity?
  - Are the poor more likely to open an account?
  - Do they perform more transactions (deposits, withdrawals, transfers, loan payments)?
  - Do they save more?

# What we do

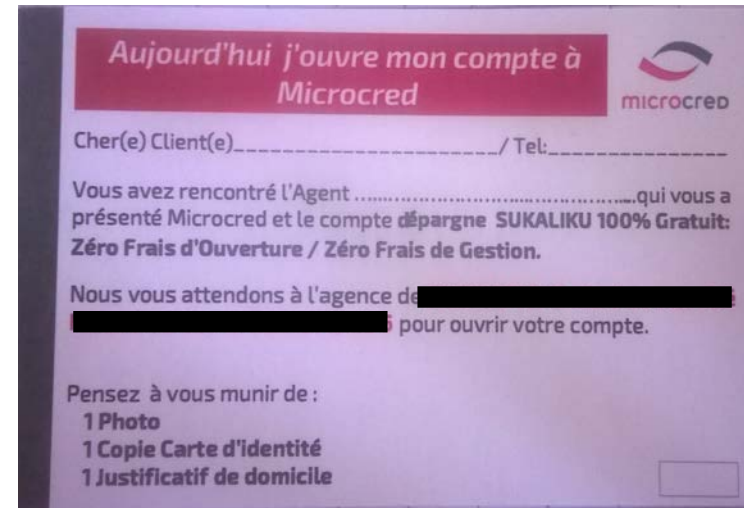
- To answer these questions we implement a field experiment with MicroCred, a microfinance institution in Senegal.
- Individuals living *equidistant* to a branch and an agent were provided **information** and encouraged to open savings accounts at either the **branch** or the **agent**
- Some also received a monetary **incentive** to open the account (1500 CFA or 2.6 USD)
- 5 experimental groups:
  - (i) Control; (ii) Info, No Incentive and Branch; (iii) Info, No Incentive and Agent; (iv) Info, Incentive and Branch; (v) Info, Incentive and Agent;

# Experimental design

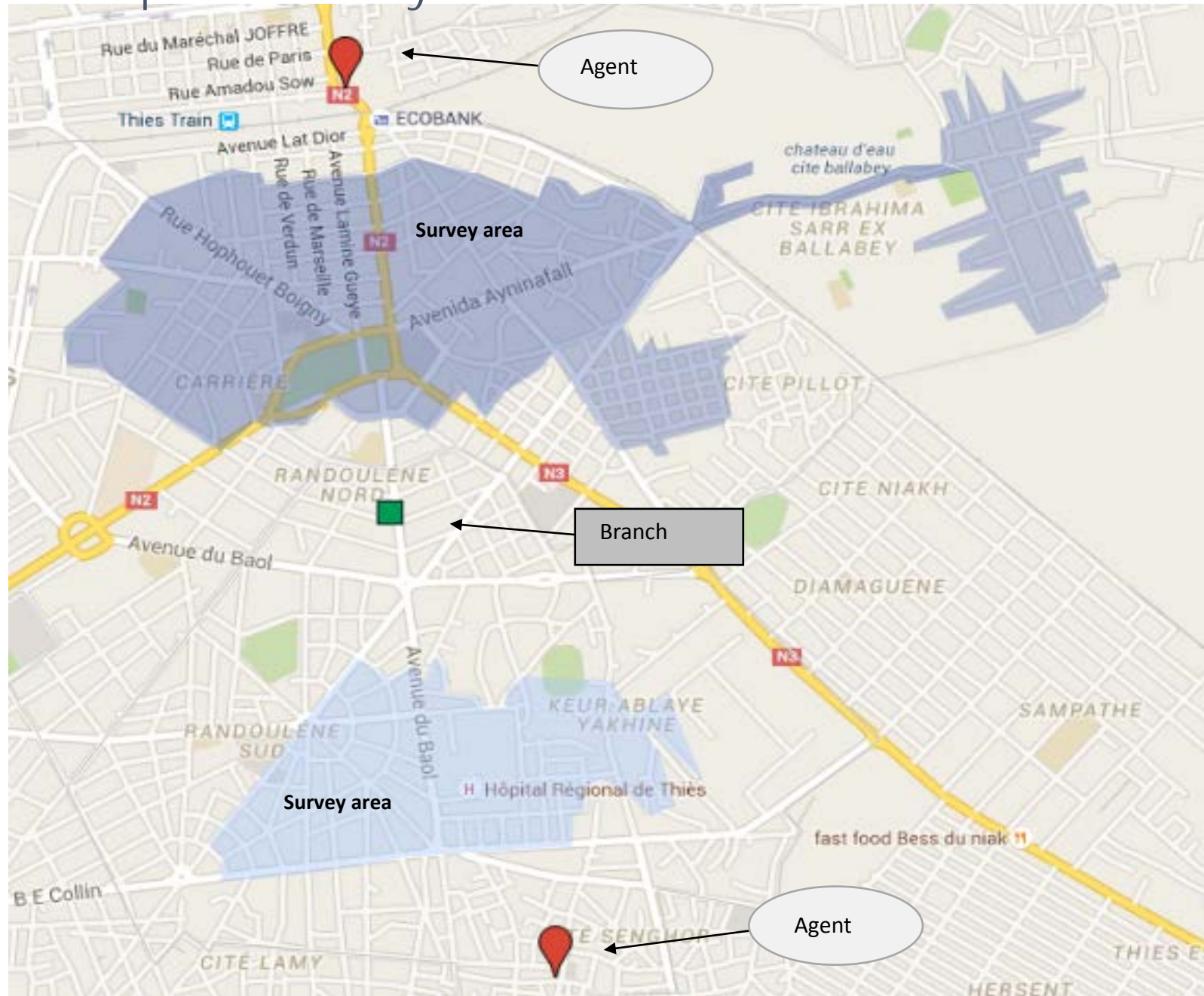
Card for respondent sent to Agent



Card for respondent sent to Branch



# Example of survey areas

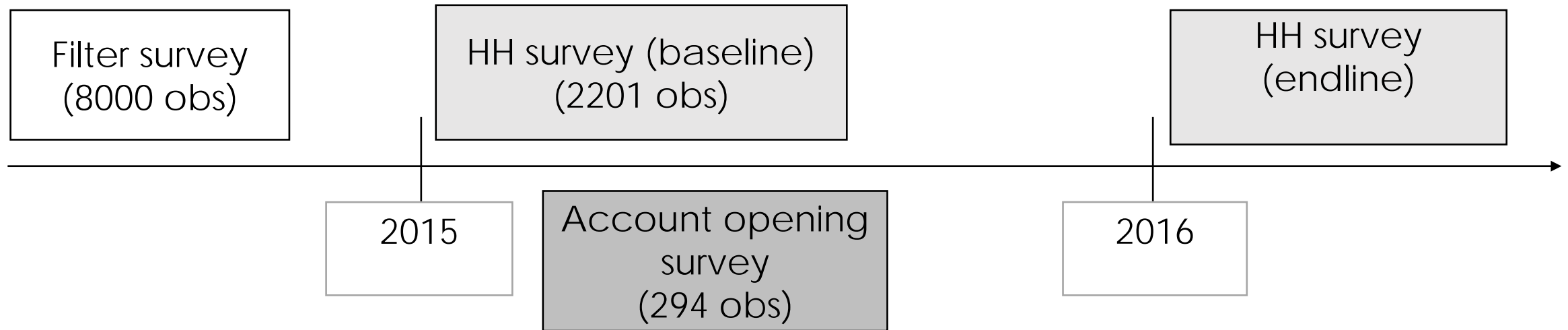




# Features of savings account

- No account opening or maintenance fees.
- No fees for transferring/ receiving money to/from other MC client.
- No minimum/ maximum amount to be kept in account.
- No fees for depositing money
- No withdrawal fees at branches (only at agent after 3rd withdrawal).
- Minimum withdrawal/ deposit amount is 500 CFA.

# Timeline



# Data

- **Neighborhood Survey**
- **Baseline survey**
  - Jan-March 2015
  - Socio-economic characteristics, money management practices, use of financial services (account holding, credit, savings, insurance and transfers)
- **Follow-up survey**
  - Jan-March 2016
  - Same questionnaire, some additional questions on savings with MicroCred
- **Administrative data**
  - Deposits, Withdrawals and location

# Empirical Model: Financial Activity

$$Y_{ij} = \alpha + \beta_1 Agent_i + \beta_2 Info_i + \beta_3 Incentive_i + \beta_4 Dist B_i + \beta_5 Dist A_i + \varepsilon_{ij}$$

Y = Account opening, N. Deposits, N. Deposits at a Branch, N. Deposits at an Agent, N. Withdrawals, N. Withdrawals at a Branch, N. Withdrawals at an Agent, Share transactions with Agent, Sum of Deposits, Sum of Withdrawals, Account Balance one year after.

Agent: 1 if sent to Agent

Info: Information about account provided

Incentive: Monetary incentive of 1500 CFA provided

Dist B: Distance to Branch

Dist A: Distance to Agent

	Account Opening	Active	Number of deposits			Number of withdrawals			Share of transactions with agent
	(1)	(2)	Total (3)	At branch (4)	At agent (5)	Total (6)	At branch (7)	At agent (8)	(9)
<i>Panel A: Full Sample</i>									
Agent (1=Yes)	0.008 (0.021)	-0.000 (0.045)	1.077*** (0.399)	0.008 (0.191)	1.069*** (0.319)	1.077*** (0.365)	0.228 (0.194)	0.849*** (0.256)	0.352*** (0.057)
Info (1=Yes)	0.111*** (0.025)	-0.022 (0.087)	-1.370 (1.231)	-0.156 (0.395)	-1.214 (1.104)	-1.971 (1.285)	-1.144 (0.908)	-0.827 (0.828)	-0.154* (0.093)
Incentive (1=Yes)	0.168*** (0.025)	-0.013 (0.085)	-1.448 (1.226)	-0.286 (0.378)	-1.161 (1.108)	-2.267* (1.269)	-1.404 (0.907)	-0.863 (0.810)	-0.047 (0.093)
Distance to branch (Km)	-0.003 (0.010)	-0.015 (0.035)	0.105 (0.543)	-0.509*** (0.168)	0.614 (0.500)	-0.279 (0.338)	-0.572*** (0.185)	0.294 (0.231)	0.176*** (0.035)
Distance to agent (Km)	-0.010 (0.008)	0.014 (0.030)	0.369 (0.432)	0.511** (0.224)	-0.142 (0.265)	0.448 (0.409)	0.542*** (0.196)	-0.094 (0.253)	-0.122*** (0.026)
Mean of dependent variable	0.242	0.342	1.699	0.836	0.863	1.509	0.780	0.729	0.122
Observations	2,088	501	501	501	501	501	501	501	175
R-squared	0.031	0.001	0.050	0.039	0.055	0.036	0.042	0.029	0.267

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Model	Average amount of deposits at agent in thousands FCFA (10)	Average amount of deposits at branch in thousands FCFA (11)	Average amount of withdrawals at agent in thousands FCFA (12)	Average amount of withdrawals at branch in thousands FCFA (13)	Sum of deposits in thousands FCFA (14)	Sum of withdrawals in thousands FCFA (15)	Account balance in thousands FCFA (16)
Panel A: Full sample							
Agent (1=Yes)	5.408** (2.648)	-2.639 (6.951)	4.648** (2.002)	4.231 (4.498)	89.740** (43.130)	98.230** (42.010)	0.081 (8.529)
Info (1=Yes)	-4.836 (5.422)	9.105 (7.767)	-2.692 (2.613)	5.010 (4.928)	-84.230 (81.570)	-86.850 (77.760)	7.907 (8.029)
Incentive (1=Yes)	-2.411 (5.686)	8.222 (9.031)	-1.950 (2.557)	2.139 (5.029)	-77.010 (78.110)	-95.250 (72.570)	16.050* (9.436)
Distance to branch (Km)	-2.279 (2.853)	-13.700*** (4.203)	0.883 (1.757)	-8.804*** (3.384)	-102.900** (50.570)	-98.980** (50.280)	-14.400** (6.402)
Distance to agent (Km)	3.481 (3.387)	11.810*** (3.729)	0.485 (2.108)	9.076** (4.215)	131.700* (77.270)	126.100 (77.160)	15.410*** (5.898)
Mean of dependent variable	6.773	18.667	5.096	13.251	109.383	92.505	19.001
Observations	502	502	502	502	502	502	502
R-squared	0.026	0.015	0.022	0.025	0.083	0.083	0.023

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Empirical Model: Nature of Transactions, Branch vs. Agent

$$Y_{ij} = \alpha + \beta_1 \text{Location}_j + \beta_2 \text{Agent}_i + \beta_3 \text{Info}_i + \beta_4 \text{Incentive}_i + \beta_5 \text{Distance}_i + \varepsilon_{ij}$$

Y = transport time, transport cost, waiting time, transaction time,  
unable to withdraw, unable to deposit

Location: 1 = Agent, 0 = Branch

Distance: Distance to most used location by respondent

# Nature of Transactions: Branches v. Agents

	Transport time in min	Transport cost in FCFA	Waiting time in min	Transaction time in min	Unable to withdraw	Unable to deposit	Trust in staff
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Location (1=Agent)	-1.785** (0.858)	-110.500* (58.260)	-8.289*** (1.623)	1.704 (1.161)	0.028 (0.037)	-0.006 (0.031)	0.031 (0.025)
Agent (1=Yes)	-1.758* (1.020)	-69.640 (74.510)	-2.946 (2.060)	-2.808** (1.371)	0.013 (0.033)	0.019 (0.028)	0.013 (0.028)
Info (1=Yes)	3.301** (1.567)	67.070 (57.900)	5.392* (3.134)	2.743 (2.256)	-0.060 (0.054)	-0.052 (0.045)	-0.026 (0.040)
Incentive (1=Yes)	2.478** (1.148)	84.050 (116.200)	3.719* (2.150)	-0.698 (1.591)	-0.029 (0.053)	-0.005 (0.046)	-0.032 (0.033)
Distance to branch (Km)	1.873*** (0.574)	72.750 (62.200)	0.875 (0.903)	0.528 (0.474)	-0.009 (0.020)	0.014 (0.012)	0.013 (0.011)
Distance to agent (Km)	-1.531*** (0.514)	-63.460 (61.540)	-1.067 (0.871)	-0.546 (0.465)	0.006 (0.019)	-0.015 (0.011)	-0.011 (0.011)
Mean of dependent variable	12.937	145.842	19.481	9.891	0.128	0.095	0.928
Observations	477	455	478	469	484	484	484
R-squared	0.054	0.010	0.052	0.024	0.006	0.008	0.007

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



# Conclusions

- Sending individuals to agents increases the number of deposits and withdrawals: Poor households become more financially active
- Trust, convenience, etc.
- Open Questions:
  - Do cash balances decline? Do savings increase?
    - Interesting set of real outcomes to explore:  
Consumption, risk-sharing, inventory in business, etc
  - Do mobile financial services hold promise in that they reduce transaction costs to zero?

# Randomization check

	N	Means					P-val of F-test
		Control	Info & Branch	Info & Agent	Info, Incentive & Branch	Info, Incentive & Agent	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gender (1=Female)	2200	0.511	0.544	0.546	0.498	0.538	0.420
Household head (1=Yes)	2200	0.417	0.432	0.394	0.376	0.428	0.190
Years of schooling	2200	7.027	6.685	7.067	7.041	6.551	0.679
More than 6 years of schooling	2200	0.620	0.600	0.619	0.602	0.568	0.679
Literacy (1=Yes)	2200	0.663	0.640	0.666	0.630	0.623	0.623
Survey language	2200	0.059	0.058	0.053	0.059	0.040	0.350
Age	2200	37.925	37.805	36.927	37.307	39.153	0.133
Professional status (1=Self-employed)	2200	0.356	0.407	0.359	0.350	0.413	0.090
Individual monthly income (in thousands of FCFA)	2200	96.524	107.562	95.969	100.130	99.213	0.111
Credit taken out (1=Yes)	2200	0.599	0.568	0.559	0.570	0.602	0.249
Savings account in family (1=Yes)	2200	0.527	0.521	0.481	0.517	0.538	0.094
Saving informally (1=Yes)	2200	0.995	0.980	0.980	0.970	0.977	0.006
Distance to branch (in km)	2088	1.778	1.424	1.761	1.542	1.629	0.349
Distance to agent (in km)	2088	2.017	1.590	1.945	1.761	1.782	0.512

Notes: Column 1 reports the number of observations. Columns 2-6 report means. Column 7 reports the p-value of F-test that in a regression of the variable against treatment indicators, all coefficients associated to treatment indicators are jointly zero.

# Theory (Miller-Orr Model)

- Individuals receive daily cashflow with variance  $\sigma^2$
- They decide how often to visit the bank between paying a transaction cost  $\tau$  each time they want to deposit or withdraw.
- In addition to the transaction cost, holding cash carries an opportunity cost in forgone interest.
- The optimal cash balance  $Z$  is given by the following formula:

$$Z = \sqrt[3]{\frac{3\tau\sigma^2}{4r}}$$

# Theory (Miller-Orr Model)

- The upper cash limit at which point the individual deposits funds is

$$H = 3Z$$

# Theory (Miller-Orr Model)

