





# The role of information and trust in the demand for mobile banking in Northern Peru.

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#### 1. Introduction

- We implement an RCT in which local ambassadors (Beca18 fellows) diffuse a new electronic wallet (BIM) in poor periurban and rural communities in Norther Peru.
- In the control group, external agents are in charge of information diffusion and training sessions.
- We find that training/info sessions attendance and BIM adoption is higher in the treatment group.
- We also find evidence of heterogenous treatment effects related to trust and local financial infrastructure.





#### 2. Financial Inclusion and BIM Adoption

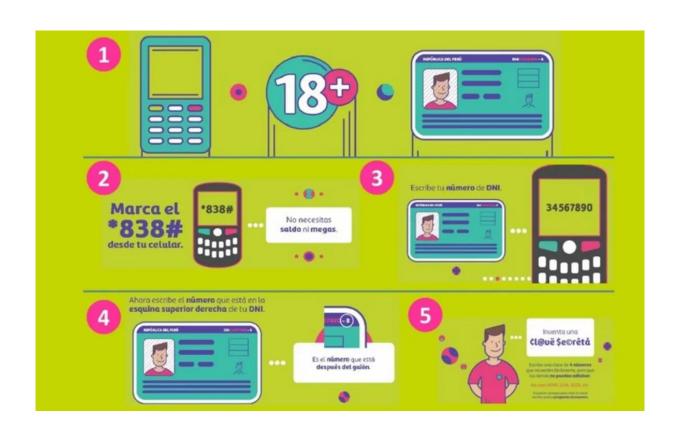
- ➤ Lack of financial inclusion restricts well-being and economic opportunities. By 2015, only 29% of adults in Peru had a bank account. Among the poorest 40%, only 18%.
- In 2015, the Peruvian Strategic Plan for Financial Inclusion was announced: special consideration given to electronic money platforms.
- In March 2016 Pagos Digitales Peruanos (PDP) launched the new BIM. Goal of 5 million BIM accounts by 2020.







Activating a BIM account required a basic cellphone (which more than 80% of the population owns) and the national identification card (DNI) number.









- Until December 2018, BIM only charged a fee for cash-out operations (1% of the total amount).
- Operating BIM does not require going to a bank agency to access funds nor physically meet to transfer wealth (as cash transfers do).





- For small entrepreneurs, BIM can facilitate business transactions. Its features are also relevant for poor households as cash transfers play an important role at smoothing consumption shocks (Suri and Jack, 2016).
- The \*838# platform was phased out in February 2019, due to the small adoption rates obtained through this mechanism.
- Up to January 2019, only 400,000 activated accounts.
- Official adoption rates in rural areas are unknown, but in our baseline survey adoption was below 1% (May 2018).





- Adoption of a new technology depends on a variety of factors (expected benefits, ease of use, etc.). Several studies identify trust as key factor (particularly in the financial sector).
- Research also points out to neighbor's influence, and more recently to the role of specific network members (Banerjee et al, 2013; Goyal et al, 2017).
- Several studies on the impact of EWs and promotion of adoption of EWs and related services (Dalton et al, 2018).
- Limited evidence on adoption at very early stages in contexts with no previous exposure to similar technologies.





### 3. Beca18 fellows as diffusers of information/technology

- ➤ Beca18: Social inclusion program in education. Provides scholarships to socioeconomically underprivileged students who obtain admission into a selected elite university.
- ➤ By 2016, close to 8,000 beneficiaries (mostly from rural and periurban areas) in the top 8 Peruvian private universities.
- ➤ Beca18 fellows can play a key role in the diffusion of information of a new technology in their community: Academic Ambassadors.





#### 4. Our Intervention

- ➤ In September 2017 We invited Beca18 fellows at a local elite university to participate in a project related to financial inclusion. We informed that approx. 60 would be randomly selected.
- Our study includes 118 Beca18 fellows, 60 in the treatment group and 58 in the control one.
- Those in treatment group were trained to provide information/training sessions about BIM to their household network (rhese sessions took place in July-August 2018)





- For individuals in control group, information to their network was provided by an external agent.
- Each fellow (in treatment and control groups) was asked to provide the names of their household network members. We randomly selected 8 to 10 members for our study.
- These are the individuals to which we provide the information/training about the new BIM (as well as the ones we interviewed in the baseline).





- Page Beca18 fellows in the treated group signed confidentiality agreements and committed not to provide any info about their trainings to Beca18 fellows outside treatment branch.
- ➤ Beca18 fellows in treated group received training on teamwork, soft skills, and financial inclusion. The BIM specific training was provided 3 to 4 weeks before they delivered the BIM sessions to their network in the field.
- External agents were not informed that they were providing information and training to a control group.
- Remember: Our treatment unit is the household network of the Beca18 fellow.







#### Figure 1: Training Materials

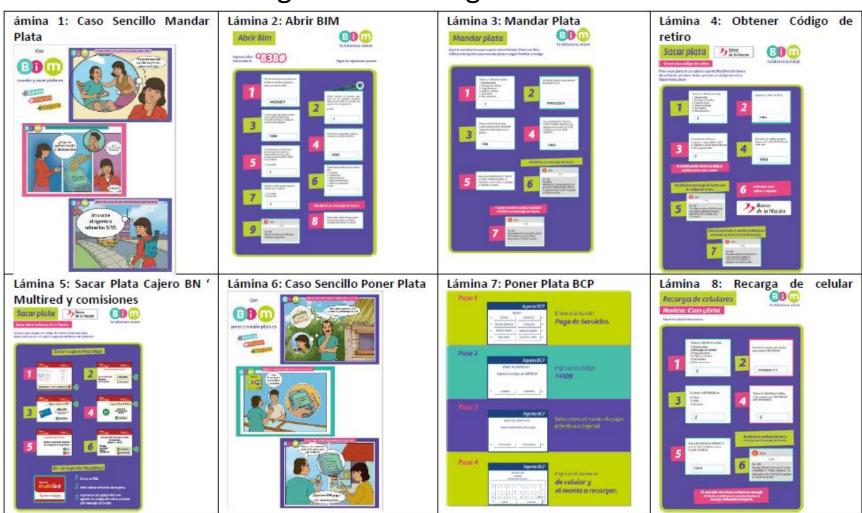








Figure 2: Information/Training Sessions









Figure 3: Intervention Area

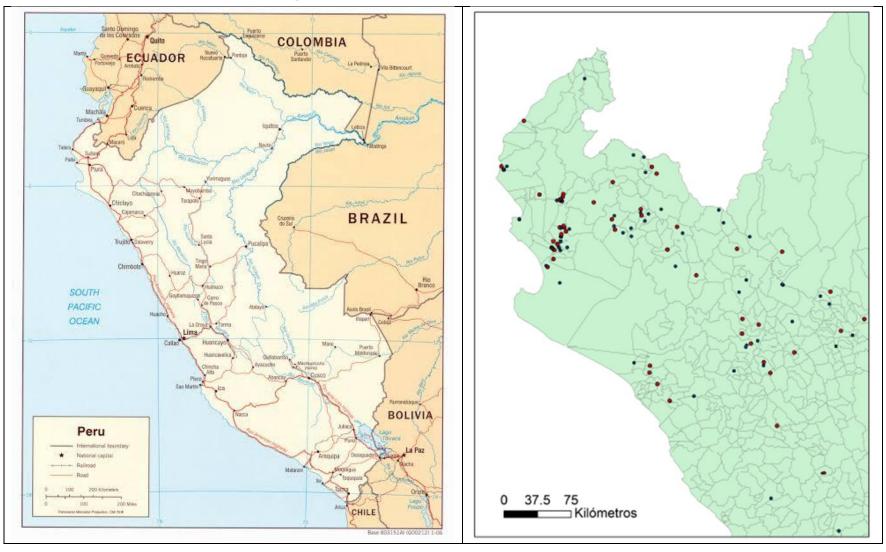








Table 2: Network members' characteristics: Treatment vs Control

	Avers	age	Test Diff	erence			
	Treatment	Control	Difference	Pvalue	N	Mean	$^{\mathrm{SD}}$
Head Gender (Male)	0.80	0.80	0.00	0.91	1,131	0.803	0.398
Head BiM: Knowledge	0.02	0.02	0.00	0.73	1,131	0.0230	0.150
Head BiM: Account	0.01	0.00	0.01	0.10	1,060	0.006	0.081
Head Age	47.59	46.91	0.68	0.54	1,131	47.27	12.85
Head has Primary School	0.38	0.35	0.02	0.61	1,131	0.368	0.482
Head has Secondary School	0.40	0.39	0.02	0.68	1,131	0.397	0.489
Head Cellphone	0.84	0.87	-0.03	0.25	1,131	0.856	0.351
Head Employment	0.78	0.84	-0.06	0.11	1,131	0.810	0.393
Spouse BiM: Knowledge	0.02	0.01	0.01	0.17	841	0.0178	0.132
Spouse Age	43.51	42.77	0.74	0.47	841	43.17	11.72
Spouse has Primary School	0.36	0.31	0.04	0.33	1,131	0.336	0.473
Spouse has Secondary School	0.25	0.25	0.00	0.96	1,131	0.252	0.434
Household owning a bank account	0.25	0.29	-0.04	0.32	1,131	0.271	0.444
Household Distrust	0.16	0.17	0.00	0.93	1,117	0.165	0.371
Transport Expenditure	74.01	96.03	-22.02	0.16	1,131	84.17	144.7
Food Expenditure	475.36	475.86	-0.50	0.99	1,131	475.6	306.8
Number of Rooms	3.28	3.14	0.14	0.38	1,130	3.217	1.869
Wall Material	0.44	0.41	0.02	0.70	1,131	0.425	0.495
Number of Restrooms	0.98	0.96	0.01	0.86	1,130	0.969	0.638
No. of obs.	609	522			·		
No. of networks	60	58					

Note: Network identifies the network members of the head and the spouse. Household Trust is based on the following question: "Which of the following options reflect more accurately your thoughts on the following statement: People only have the best intentions? 1: Always, 2: Most of time, 3: Sometimes, 4: Rarely, 5: Never." Individuals are considered distrustful if they answer 5. Wall Material takes the value 1 when the house's wall are brick or concrete, and 0 otherwise.





## 5. Empirical Results

$$Y_{in} = \alpha + \beta_1 Treated_{in} + X'_{in}\beta_2 + \epsilon_{in}$$







Table 3: Participation to the workshop

				Excluding Beca	18 parents
	(1)	(2)	(3)	(4)	(5)
	Attendar	nce: OLS	Attendance:	Attendance: OLS	Attendance:
			$Network^{+}$		$\mathrm{Network}^{\dotplus}$
Treatment	0.358***	0.354***	3.971***	0.397***	3.967***
	(0.0403)	(0.0410)	(0.400)	(0.0417)	(0.390)
Head Employment		-0.0554			
mpreyment		(0.0369)			
Constant	0.348***	0.395***	3.049***	0.287***	2.280***
	(0.0283)	(0.0440)	(0.251)	(0.0289)	(0.234)
N	1131	1131	118	1024	118
$R^2$	0.139	0.141	0.517	0.167	0.530
F	78.84	42.08	98.51	90.56	103.4
Region FE	Yes	Yes	Yes	Yes	Yes
Mean: Treated	0.70		6.93	0.67	6.14
Mean: Control	0.35		3.1	0.29	2.35

Notes: \*\*\*,\*\* and \* indicate statistical significance at the 1, 5 and 10 percent level. Standard errors clustered at the network level are presented under parenthesis. The dependent variable is an indicator of whether the invited participant attended the training workshop. All regressions include region fixed effects and are clustered at the student family network level. In Col. 4 and 5, sample size is reduced as we restrict the analysis by excluding Beca18 parents.

<sup>&</sup>lt;sup>+</sup> Col. 3 and 5: the outcome variable is the number of invited participants who attended the workshop.







Table 4: BIM Affiliation

				Excluding Beca	a18 family
	(1)	(2)	(3)	(4)	(5)
	Affiliation	on: OLS	Affiliation:	Affiliation: OLS	Affiliation:
			$Network^{+}$		$Network^{+}$
Treatment	0.0385***	0.0379***	0.420***	0.0239*	0.257**
	(0.0136)	(0.0135)	(0.136)	(0.0132)	(0.123)
Head Employment		-0.00834			
		(0.0164)			
Constant	0.0319***	0.0390**	0.351***	0.0314***	0.316***
	(0.00940)	(0.0166)	(0.0995)	(0.00866)	(0.0858)
N	1131	1131	118	1024	118
$R^2$	0.122	0.122	0.236	0.153	0.223
F	31.59	21.05	9.541	31.54	4.334
Region FE	Yes	Yes	Yes	Yes	
Mean: Treated	0.077		0.77	0.06	0.57
Mean: Control	0.036		0.33	0.036	0.3

Notes: The dependent variable is an indicator of whether the individual is affiliated to BIM. All regressions are controlled by geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%.

Columns 1,2 and 4 are controlled by the number of previous affiliations to BIM (before treatment).

<sup>&</sup>lt;sup>+</sup> We collapse the outcomes variables by student network. The outcomes variables become continuous, and represents the attendance or take up ratio per student network.







Table 5: BIM Usage

				Excluding Be	ca18 family
	(1)	(2)	(3)	(4)	(5)
	· /	e: OLS	Usage:	Usage: OLS	Usage:
			$\rm Network^{\dotplus}$		$Network^{\dotplus}$
Treatment	0.0129*	0.0141*	0.133*	0.00976	0.0915
	(0.00703)	(0.00717)	(0.0691)	(0.00745)	(0.0652)
Head Employment		0.0182***			
nead Employment		(0.00498)			
		(0.00450)			
Constant	0.00634	-0.00908**	0.0584	0.00644	0.0544
	(0.00385)	(0.00445)	(0.0361)	(0.00427)	(0.0359)
N	1131	1131	118	1024	118
$R^2$	0.00711	0.0110	0.0646	0.00932	0.0698
F	3.347	6.695	3.705	1.718	1.974
Region FE	Yes	Yes	Yes	Yes	Yes
Mean: Treated	.018		0.18	.014	0.13
Mean: Control	.007		0.07	.008	0.07

Notes: The dependent variable is an indicator of whether the individual uses BIM. All regressions are controlled by geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%.

 $<sup>^{\</sup>perp}$  We collapse the outcomes variables by student network. The outcomes variables become continuous, and represents the attendance or take up ratio per student network.





Table 6: 2SLS - BIM Affiliation

		Dependent Variable: BIM Affiliation						
				Excludi	ng Beca18 family			
	(1)	(2)	(3)	(4)	(5)			
			Seco	ond Stage				
Attendance	0.108***	0.108***	0.107***	0.0602*	0.0601*			
	(0.0401)	(0.0402)	(0.0407)	(0.0333)	(0.0334)			
Head of Household's Sex		0.0155	0.0165		0.0133			
		(0.0191)	(0.0200)		(0.0186)			
Head Employment			-0.00544					
1 0			(0.0174)					
Constant	-0.00407	-0.0168	-0.0127	0.0284	0.0177			
	(0.0414)	(0.0416)	(0.0422)	(0.0414)	(0.0409)			







#### 5.1. Heterogenous Effects

Table 7: BIM Attendance & Distrust

			Excluding B	eca18 family
	(1)	(2)	(3)	(4)
	Attendance: OLS	Attendance: OLS	Attendance: OLS	Attendance: OLS
Treatment	0.313***	0.310***	0.357***	0.355***
	(0.0460)	(0.0467)	(0.0482)	(0.0486)
Distrust	-0.136**	-0.140**	-0.139**	-0.145***
	(0.0549)	(0.0544)	(0.0547)	(0.0537)
Distrust $\times$ Treatment	0.184*	$0.177^{*}$	0.186*	0.179*
	(0.0950)	(0.0953)	(0.0971)	(0.0977)
Head Employment		-0.0606		-0.0652
- •		(0.0405)		(0.0435)
Constant	0.468***	0.519***	0.414***	0.469***
	(0.0605)	(0.0722)	(0.0642)	(0.0784)
N	829	829	746	746
$R^2$	0.139	0.142	0.166	0.169
Region FE	Yes	Yes	Yes	

Notes: Distrust is based on the following question "Which of the following options reflect more accurately your thoughts on the following statement: People only have the best of intentions? 1: Always, 2: Most of the times, 3: Sometimes, 4: Rarely, 5: Never". Individuals are considered distrustful if they answer 5. All regressions are controlled by geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%. We lost observations by including the Distrust variable because it includes missing values.







Table 8: BIM Affiliation: Distrust

			Excluding B	eca18 family
	(1)	(2)	(3)	(4)
	Affiliation: OLS	Affiliation: OLS	Affiliation: OLS	Affiliation: OLS
Treatment	0.0620***	0.0620***	0.0402**	0.0403**
	(0.0156)	(0.0155)	(0.0173)	(0.0173)
Distrust	0.0264	0.0263	0.0286	0.0289
	(0.0258)	(0.0258)	(0.0276)	(0.0276)
Distrust $\times$ Treatment	-0.0788**	-0.0790**	-0.0791**	-0.0789**
	(0.0377)	(0.0379)	(0.0370)	(0.0369)
Head Employment		-0.00102		0.00251
1 0		(0.0194)		(0.0185)
Constant	0.0478	0.0487	0.0617	0.0596
	(0.0452)	(0.0442)	(0.0495)	(0.0482)
N	829	829	746	746
$R^2$	0.0398	0.0398	0.0446	0.0446
Region FE	Yes	Yes	Yes	Yes

Notes: Distrust is based on the following question "Which of the following options reflect more accurately your thoughts on the following statement: People only have the best of intentions? 1: Always, 2: Most of the times, 3: Sometimes, 4: Rarely, 5: Never". Individuals are considered distrustful if they answer 5 All regressions are controlled by geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%. We lost observations by including the Distrust variable because it includes missing values.







Table 9: BIM Attendance & Referred Person being a Relative

				Excluding	Beca18 family
	(1)	(2)	(3)	(4)	(5)
Treatment	0.354***	0.347***	0.347***	0.394***	0.393***
	(0.0410)	(0.0416)	(0.0457)	(0.0422)	(0.0477)
Relative		0.0715*	0.0708		0.149**
		(0.0362)	(0.0674)		(0.0688)
Relative × Treatment			0.00117		-0.0412
			(0.0794)		(0.0816)
Constant	0.456***	0.447***	0.448***	0.401***	0.378***
	(0.0673)	(0.0677)	(0.0681)	(0.0738)	(0.0761)
N	1131	1131	1131	1024	1024
$R^2$	0.141	0.145	0.145	0.169	0.181
Controls	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes

Notes: All regressions are controlled by head employment, geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%.







Table 10: BIM Affiliation & Referred Person being a Relative

				Excluding	Beca18 family
	(1)	(2)	(3)	(4)	(5)
Treatment	0.0389***	0.0389***	0.0522***	0.0246*	0.0331**
	(0.0138)	(0.0145)	(0.0149)	(0.0140)	(0.0154)
Relative		0.000813	0.0340		0.0351
		(0.0187)	(0.0286)		(0.0299)
Relative × Treatment			-0.0548		-0.0365
			(0.0369)		(0.0375)
Constant	0.0480	0.0479	0.0408	0.0546	0.0477
	(0.0407)	(0.0400)	(0.0381)	(0.0441)	(0.0413)
N	1131	1131	1131	1024	1024
$R^2$	0.0249	0.0249	0.0272	0.0282	0.0301
Controls	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes

Notes: All regressions are controlled by head employment, geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%.







Table 11: BIM Attendance & BN ATM

					E	xcluding B	eca18 fami	ily
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.354***	0.351***	0.280***	0.228***	0.394***	0.392***	0.317***	0.265***
	(0.0410)	(0.0413)	(0.0563)	(0.0618)	(0.0422)	(0.0424)	(0.0569)	(0.0650)
BNATM		0.0207	0.0540	0.0000		0.0224	0.0504	0.0071
BNATW		0.0327	-0.0548	-0.0802		0.0334	-0.0584	-0.0871
		(0.0392)	(0.0580)	(0.0642)		(0.0405)	(0.0596)	(0.0640)
$BNATM \times Treatment$			0.160**	0.206**			0.167**	0.225**
			(0.0782)	(0.0852)			(0.0809)	(0.0878)
			(0.0102)	(0.0002)			(0.0000)	(0.0010)
Distrust				-0.117*				-0.119**
				(0.0611)				(0.0563)
-								
Distrust $\times$ Treatment				0.127				0.126
				(0.0952)				(0.0950)
Constant	0.456***	0.441***	0.487***	0.561***	0.401***	0.385***	0.432***	0.513***
Constant								
	(0.0673)	(0.0659)	(0.0726)	(0.0837)	(0.0738)	(0.0723)	(0.0789)	(0.0916)
N	1131	1131	1131	829	1024	1024	1024	746
$R^2$	0.141	0.142	0.148	0.152	0.169	0.170	0.176	0.181
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: BNATM is an indicator of whether there is a "Banco de la Nacion" ATM close to the individual. All regressions are controlled by head employment, geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%. We lost observations by including the Distrust variable because it includes missing values.







Table 12: BIM Affiliation & BN ATM

				Excluding	Beca18 family
	(1)	(2)	(3)	(4)	(5)
Treatment	0.0389***	0.0361**	0.0408**	0.0246*	0.0262
	(0.0138)	(0.0138)	(0.0159)	(0.0140)	(0.0164)
BNATM		0.0351**	0.0409		0.0344
		(0.0154)	(0.0247)		(0.0241)
$BNATM \times Treatment$			-0.0105		-0.00901
			(0.0295)		(0.0297)
Constant	0.0480	0.0315	0.0285	0.0546	0.0381
	(0.0407)	(0.0365)	(0.0340)	(0.0441)	(0.0365)
N	1131	1131	1131	1024	1024
$R^2$	0.0249	0.0299	0.0300	0.0282	0.0322
Controls	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes

Notes: BNATM is an indicator of whether there is a "Banco de la Nacion" ATM close to the individual. All regressions are controlled by head employment, geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%.







Table 13: BIM Attendance & Trust in Banks

					Е	xcluding E	Beca18 fam	ily
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.354***	0.323***	0.316***	0.270***	0.394***	0.369***	0.363***	0.330***
	(0.0410)	(0.0513)	(0.0518)	(0.0598)	(0.0422)	(0.0531)	(0.0536)	(0.0620)
BankTrust		-0.213*	-0.405***	-0.338***		-0.151	-0.316***	-0.291***
		(0.116)	(0.0438)	(0.0726)		(0.115)	(0.0637)	(0.0632)
$BankTrust \times Treatment$			0.386*	0.685***			0.326	0.689***
			(0.197)	(0.104)			(0.204)	(0.100)
distrust				-0.133**				-0.122*
				(0.0607)				(0.0645)
$Distrust \times Treatment$				0.243**				0.248**
				(0.121)				(0.123)
Constant	0.456***	0.479***	0.487***	0.502***	0.401***	0.445***	0.453***	0.473***
	(0.0673)	(0.0953)	(0.0948)	(0.0991)	(0.0738)	(0.0864)	(0.0856)	(0.0894)
N	1131	683	683	529	1024	622	622	480
$R^2$	0.141	0.123	0.126	0.137	0.169	0.157	0.159	0.176
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: BankTrust is based on the following question "Do you trust banks? 1: Very low , 2: Low, 3: Medium, 4: High, 5: Very high, 6: Missing". Individuals are considered trustful if they answer 5. All regressions are controlled by head employment, geographic region fixed effects and clustered at the student network level. Coefficients that are significantly different from zero are denoted by the following system: \*10%, \*\*5%, and \*\*\*1%. We lost observations by including the distrust variable because it includes missing values.





#### 6. Conclusions

- Access to information and trust influence de adoption of new technologies.
- Local ambassadors (Beca18 fellows in the Peruvian context) could serve as an effective channel to diffuse information about new technologies in their communities.
- The size of the treatment effect is related to trust and access to financial infrastructure.
- This strategy is more cost effective than the one that relies on external agents for training/information diffusion.

# The role of information and trust in the demand for mobile banking in Northern Peru

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Discussant
Gabriel Ramirez

#### Main Issue:

- Financial inclusion
- Use of e-wallet (digital payments)

# Main question:

→ How to achieve high adoption and usage rate of digital payment (e.g. e-wallet)?

# Some important elements:

1. Value: Perceived value of the product/service

2. Convenience: User-friendly features

3. Trust

4. Information

# This paper

1. Trust

2. Information (acquisition and lack of)

3. Impediments to product adoption

# Empirical design

1. Very good, natural experiment, opportune

2. Sound econometrics

3. Social ties capturing trust

4. Good proxy construction: e.g. trust

# Empirical design

1. Very good, natural experiment, opportune

2. Sound econometrics

3. Social ties capturing trust

4. Good proxy construction: e.g. trust

# Results: Trust

Of the agent/promoter:

- → Increases in attendance to workshops
- → Increases in account activation

Of the consumers:

- → distrusful people, less attendance
- Trusful people, more incline to take up

Of the system (Banks)

- → les attendance
- → interactions with trust in promoter

# Financial structure

 More developed → higher attendance, not activation/adoption

2. More perceived value, higher attendance

3. Ecosystem not part of study

# Mobile (e-wallet) demand (Process?)

1. Adoption/take-up or sign-up into service

2. Innfraestructure → convenience: user-friendly

3. Value for user → Ecosystem

→ High frequency transactions

# Concentrate (refocus paper)

Information diffusion and trust → what can be kept of the paper now.

2. Implications for scaling services: Need to have regulation, institutions, and/or transparency to replace trust in small setting

3. Financial structure → implications for launching services

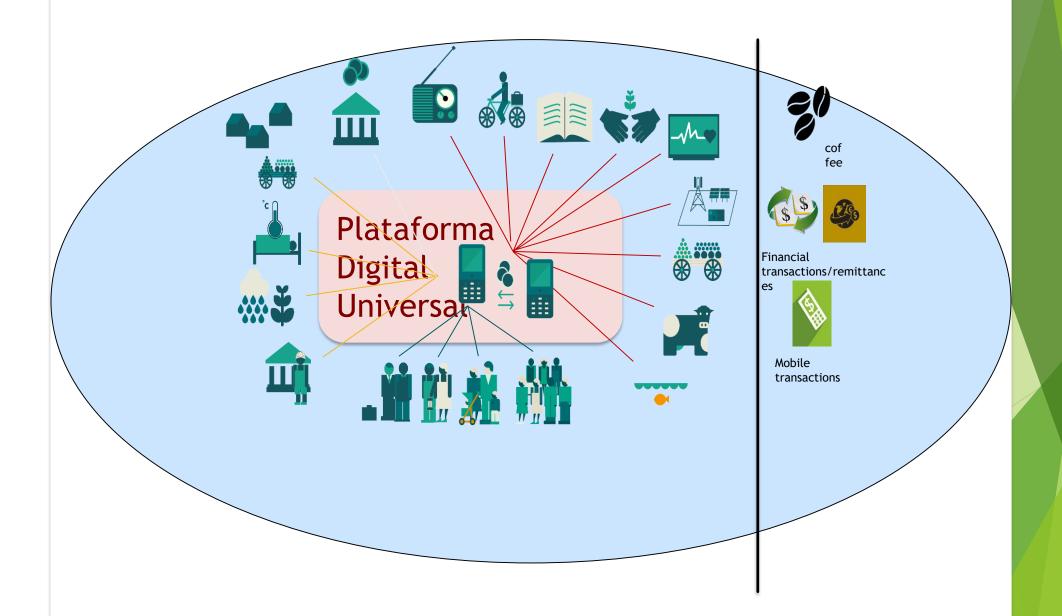
# Financial structure

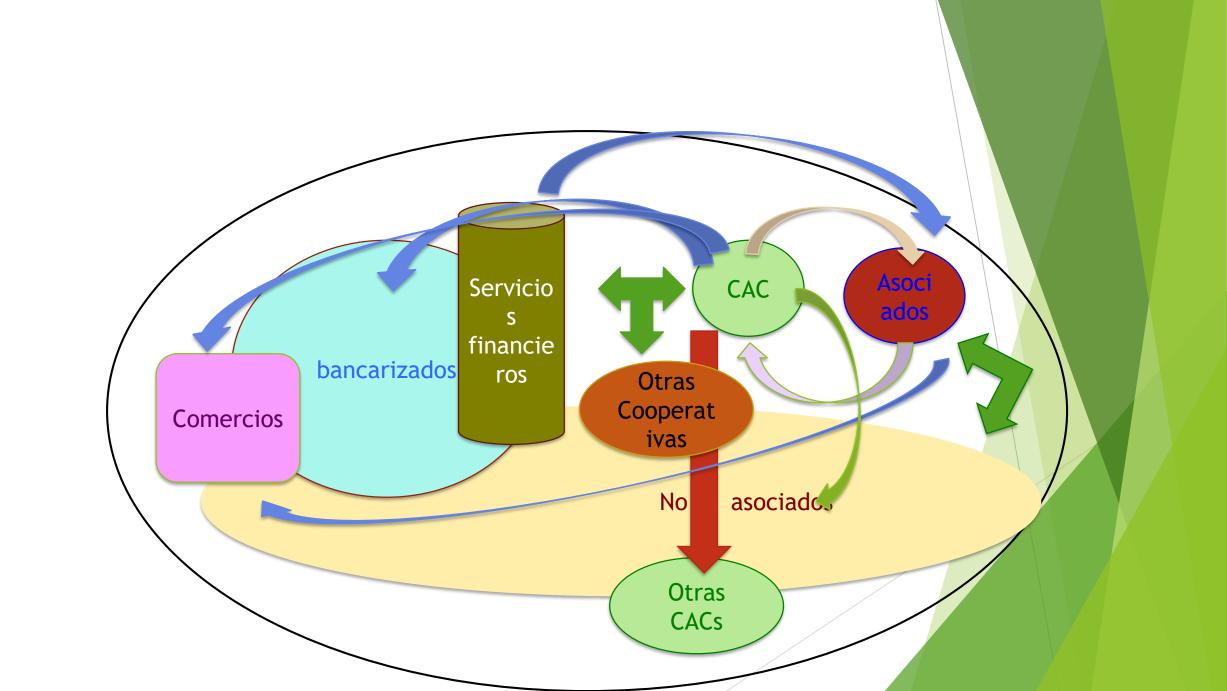
1. Customer device

2. Trainers ("first respondents/face contact")

3. Platforms (Ecosystem)

# Economía digital colectiva





# Some issues

 Role of information as captured by attendance to workshop ("social pressure?") → need to disentangle effect of peer/family pressure

2. Not an impact on demand for mobile banking

3. This paper is about attitudes of early stage (acceptance) / early steps in initiation