Centro Vernon Smith de ECONOMÍA EXPERIMENTAL
Universidad Francisco Marroquín

Remittance Responses to Temporary Discounts: A Field Experiment among Central American Migrants

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Seminario de Investigadores Económicos de Guatemala,
Banco de Guatemala, 30 de octubre de 2014

Motivating Ideas

- Migrant remittances are a huge and growing international financial flow to developing countries
  - over $404 billion sent to developing countries in 2013

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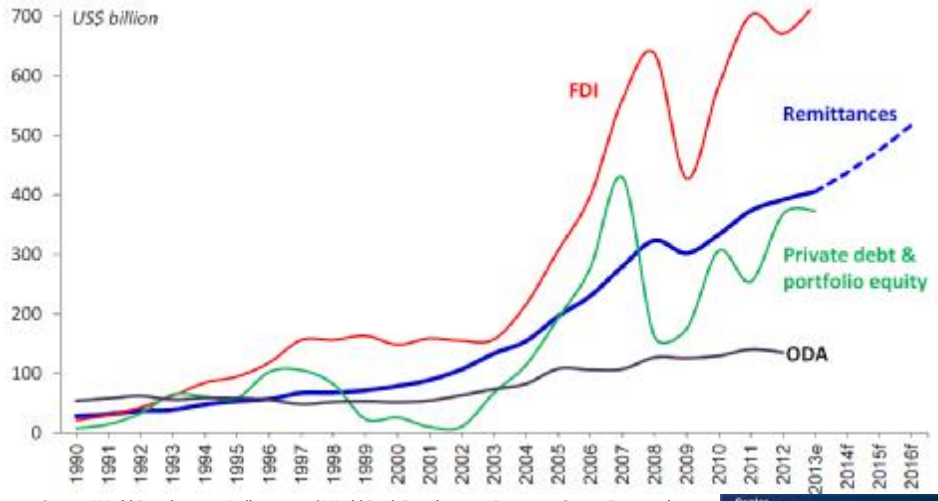
Remittances vs. other international financial flows



Source: World Development Indicators and World Bank Development Prospects Group. Data are in current US$, in total across developing countries (low & middle income as classified by World Bank).

Motivating Ideas

- Migrant remittances are a huge and growing international financial flow to developing countries
  - over $404 billion sent to developing countries in 2013
- Many studies document associations with or causal impacts on important development indicators
  - Health, education, housing, poverty, entrepreneurship, responses to shocks, etc.
- Great deal of interest among policymakers and development agencies in policy options for leveraging remittances for development goals

Motivating Ideas: Remittance policy approaches

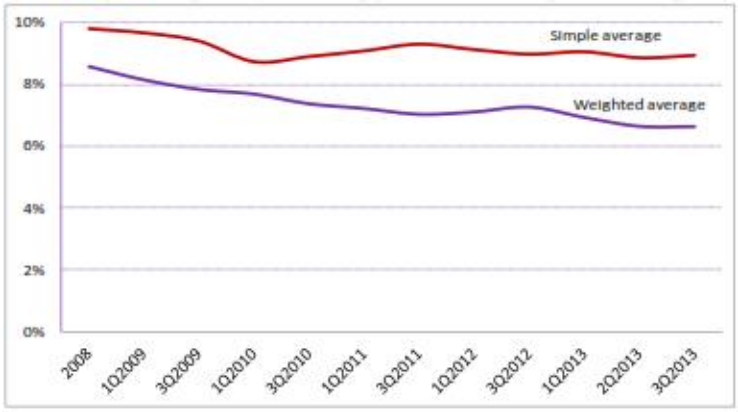
- Enhance financial literacy in transnational households
  - Doi, McKenzie and Zia (2012)
  - Seshan and Yang (2013)
- Enhance migrant control over remittance uses
  - Ashraf, Aycinena, Martinez, and Yang (2012)
  - Ambler, Aycinena, and Yang (2014)
  - De Arcangelis, Joxhe, McKenzie, Tiongson, and Yang (2014)
- Reduce communication costs (Batista and Narciso 2013)

Motivating Ideas

- But we are just starting to learn about the micro-economics behind remittances
  - We still know very little about what determines migrants' remittance-sending decisions
- In particular: little evidence on impact of remittance fees (on frequency or total amounts)
  - Typical fee structure: migrant pays a fixed fee for a remittance of up to a certain ceiling

Remittances Fees
(2008-2013)

Total cost of sending US$200 (including fees and exchange rate margins)



Source: World Bank, Remittance prices worldwide (Migration Development Brief 21, October 2013).

Motivating Ideas

- But we are just starting to learn about the micro-economics behind remittances
  - We still know very little about what determines migrants' remittance-sending decisions
- In particular: little evidence on impact of remittance fees (on frequency or total amounts)
  - Typical fee structure: migrant pays a fixed fee for a remittance of up to a certain ceiling
  - How responsive is migrant remittance-sending behavior to price?
  - Is prospect theory relevant for understanding migrant remittance flows?

Motivating Ideas: Prospect Theory

- Prospect theory (Kahneman and Tversky 1979, 1991) has been used to explain departures from expected utility framework in and out of the lab settings
- One observation: remittances are much less volatile than other international financial flows
  - Prospect theory provides an explanation: remittance recipients are loss-averse, so migrants try to keep remittances constant, even in the face of shocks
- Certain patterns of responses to temporary price discounts are consistent with prospect theory

Remittance Fees & Flows Literature

- Freund and Spatafora (2006)
  - Cross-country data to show that remittance fees are negatively correlated with total remittances at the country level.
- Gibson, McKenzie, and Rohorua (2006)
  - Migrants report that they would send more in remittances if fees were lowered (hypothetical survey question)
- Aycinena, Martinez, and Yang (2010)
  - Field experiment randomly assigning discounted prices for remittances with a particular MTO.
  - A $1 reduction in the price of a remittance leads to a $25 monthly increase in remittance payments.

Aycinena, Martinez, and Yang (2010)

- Field experiment that randomized remittance fees among migrants from El Salvador in the Washington, DC area
- Advantages of combining administrative and survey data:
  - Admin data from partner limits problems of measurement error
  - Survey of migrants allow to assess extent of switching from other remittance channels
- Limitations:
  - Most participants were not baseline customers of the partner institution, limiting the ability to observe full remittance behavior and raising concerns that the effects might be driven by switching remittance companies or sending remittances for others.
  - Data is not available for the period after the discounts expired, so the authors cannot observe long term trends in remittance behavior.

AMY (2010) Experimental Design

- Randomly allocated 1,400 Salvadoran migrants in Washington, D.C. to different remittance transaction fees
  - 50% probability of $9 fee
  - 10% probability for each of: $8, $7, $6, $5, $4
- Discount offered via a partner money transmission institution with 11 physical branches in DC area (and 64 bank branches in El Salvador)
  - Fee is for remittance of any size up to $1,500

Our Contribution

- We partner with money transfer company Viamericas
  - Generate sample of Washington, DC metro area migrants who send remittances to Guatemala or El Salvador
- Randomize the offer of a limited-time (10 week) discount on remittance fee
  - Randomization allows for causal identification of impacts
- Examine impacts on remittances during and after discount period using administrative and survey data

Advantages of our design

- Unique combination of administrative and survey data
- Admin data from partner institution limits problems of measurement error
  - We rely on existing customers to minimize switching from other remittance channels to be driving the effects
  - Pre-, during- and post- intervention admin data allow us to examine inter-temporal substitutions
- Survey data complements administrative data
  - Endline survey of migrants allows us to ask whether they are sending for third parties
- Discount is for PRR, to limit sending on behalf of others

Our Results: Preview

- We find increases in number of transactions and total amount sent
  - During discount period…
  - and up to 20 weeks after
- Not consistent with standard economic model
- Consistent with remittance recipients having reference-dependent preferences, which migrants don't fully anticipate
  - Behavioral biases may be important determinants of international remittance flows

Research Partner: Viamericas

- Money transfer company with headquarters in Bethesda, MD
- Vast majority of business occurs in person through independent agents in US
- Viamericas fees to Central America: $8 for transfers up to $1,000
  - Agents receive a commission for each transaction
- Funds paid out through pay point network in destination country

Sample, Logistics and Timeline

- Participants recruited among customers of 5 Viamericas agents (stores) in DC metro area
  - Recruitment occurred December 2012 - April 2013
- Approached after sending a remittance, and screened on:
  - Born in Guatemala or El Salvador
  - Sent remittance through Viamericas
  - Sent remittance to their primary remittance recipient
- Received $5 store credit for participation

Recruiting Locations

Project staff posted at agent locations, mainly during high traffic times and days of week

Recruiting Locations

Interior of two Viamericas agents locations

Sample, Logistics and Timeline

- After consent, short baseline survey administered
- Baseline followed by randomized treatment
  - Individual randomization, stratified within groups of 32 consecutively-administered surveys
  - 2x2 design with two randomly assigned treatment variables: price discount and education information
- Phone endline survey 10 weeks later
  - Implemented promptly after intervention (when discount expired): median lag of 2 days
  - Designed to capture remittance behavior during discount period

Fieldwork

Surveys and treatments conducted on the spot, in recruiting locations

Project Timeline

Enrollment & Baseline survey (late December 2012 – mid April 2013)

Intervention (10 weeks)

Follow-up survey (immediately after intervention expired)

Tracking of remittances at partner institution (Dec. 2011 – ongoing in 2014)

Randomized Treatments

- Price discount
  - Discount of $3.01 off remittance fee, valid for 10 weeks
  - For remittances sent to primary remittance recipient (PRR) at that agent location
  - Migrants receive a card with names and expiration date written on it
- Education information
  - Part of study on education and remittances in Central America
  - Migrants received an information sheet entitled “Why should I send remittances for education?”
  - Described earnings differentials in home country for different schooling levels

Education Information Treatments

- Migrants in treatment group received informational sheet entitled “Why should I send remittances for education?”
- The content focused on the low rates of secondary and tertiary school completion in home country and described the earnings differentials between those who had completed primary, secondary and tertiary schooling.
  - Separate sheets were created for Guatemala and El Salvador.
  - The surveyor went over the information in the sheet with the migrant and the migrant was given the flyer to take home.

Experimental Design

	No education information	*Education information*	
No discount	N = 232	N = 230	N = 462
Discount	N = 247	N = 232	N = 479
	N = 479	N = 462	

Individual randomization, stratified within groups of 32 consecutively-administered surveys

Effectively yields stratification by agent location and time

Experimental Protocols

1. Sample: Participants enrolled in Viamericas agent locations
   - Must have from Guatemala or El Salvador
   - Must have remitted to someone using Viamericas
   - Must have remitted to person whom they considered the primary remittance recipient

2. Enrollment after short baseline survey
   - Baseline collected basic demographic and remittance information

Experimental Protocols

3. Discounted fee randomly assigned
   - $3.01 discount (from $8.00 baseline price)
   - Cross-randomized with an intervention on returns to education information
   - Stratification on agent location (in groups of 32 surveys)
4. Discounted fee period (10-weeks)
5. End-line survey
   - Designed to capture remittance behavior during discount period
   - Completed ASAP after discount period had expired (median lag of 2 days)
   - 71% completion rate

The Experiment

Data Sources

- Survey Data
  - Baseline and follow up surveys
  - Demographic information
  - Self reported remittances, via Viamericas and other companies
- Administrative transaction data
  - All transactions sent through Viamericas to all recipients
  - 12 months prior, 10 week study period, 12 months after
  - Includes amount, date, fee, discount, and recipient
  - Not subject to measurement error common with self reported data

Main Estimation Strategy

For migrant *i* in stratification cell *j*, OLS reg of outcome *Y*:

$$Y_{ij} = \beta_0 + \beta_1 T4_{ij} + \beta_2 T3_{ij} + \beta_3 T2_{ij} + \delta_j + \varepsilon_{ij}$$

- Outcome variables of interest (Y_{ij}): Discounts, # of remittance transactions, transaction amounts
  - Remittance amounts in dollars as well as inverse hyperbolic sine transformation (IHST)
  - IHST of y = $\log(y+(y^2+1)^{1/2})$
- T_i = Treatment indicator

Threats to Identification

- Migrants may switch to Viamericas from other companies
  - Limit participation to existing Viamericas customers
  - Survey questions on use of other companies
- Migrants may intertemporally substitute remittances to take advantage of time-limited discount
  - Examine offsetting responses in post-discount period
- May use PRR as a "channel" to send remittances for other migrants and/or to other recipients
  - Survey questions on sending behavior

Sample Summary Statistics

Baseline summary statistics

Variable	Mean	N
Migrant is female	0.28	941
Migrant age	33.9	908
Migrant is from Guatemala	0.76	923
Migrant years in US	9.0	925
Migrant is married	0.57	941
Migrant's spouse lives in the US	0.51	519
Migrant number of children	2.0	941
PRR is female	0.77	939
Primary recipient is migrant's…		
...parent	0.38	941
...spouse	0.24	941
...sibling	0.15	941
...child	0.07	941

Sample Balance across Treatments

	P-values				
	T1=T2=T3=T4	T1=T2	T1=T3	T1=T4	*N*
Migrant is female	0.568	0.161	0.610	0.536	941
Migrant age	0.358	0.517	0.568	0.079	908
Migrant is from Guatemala	0.434	0.122	0.780	0.561	923
Migrant years in US	0.177	0.300	0.837	0.238	925
Migrant is married	0.024	0.156	0.008	0.009	941
Migrant's spouse lives in the US	0.976	0.822	0.843	0.933	519
Migrant number of children	0.442	0.247	0.123	0.237	941
PRR is female	0.926	0.866	0.538	0.641	939
Migrant remittances as percent of income	0.368	0.265	0.408	0.081	855
Migrant annual remittance to PRR ($) (survey reported)	0.874	0.639	0.883	0.448	934
Mirgrant annual remittance to other hhs ($) (survey reporte	0.185	0.907	0.126	0.618	920
Migrant number of recipient households	0.109	0.598	0.021	0.175	913
Number of transactions to PRR: Viamericas	0.886	0.449	0.659	0.849	932
Number of transactions to PRR: Other channels	0.544	0.760	0.286	0.902	932
Number of transactions to other recipients: Viamericas	0.157	0.148	0.042	0.675	629
Number of transactions to other recipients: Other channels	0.816	0.760	0.983	0.395	630

Sample Balance across Treatments

	T1=T2=T3=T4	T1=T2	T1=T3	T1=T4	*N*
Migrant's highest level of education is...					
…none	0.338	0.290	0.281	0.692	941
…primary	0.609	0.873	0.220	0.747	941
…secondary	0.685	0.289	0.403	0.302	941
…university	0.968	0.770	0.685	1.000	941
Primary recipient is migrant's…					
...parent	0.409	0.379	0.097	0.567	941
...spouse	0.174	0.407	0.316	0.275	941
...sibling	0.903	0.669	0.463	0.795	941
...child	0.314	0.438	0.363	0.454	941
Transaction data - previous 365 days					
All - total transactions	0.405	0.235	0.734	0.641	941
All - total amount ($)	0.394	0.406	0.936	0.369	941
All - mean transaction amount ($)	0.780	0.745	0.504	0.765	937
PRR - total transactions	0.730	0.951	0.457	0.717	941
PRR - total amount ($)	0.806	0.922	0.388	0.921	941
PRR - mean transaction amount ($)	0.692	0.461	0.856	0.290	930
Others - total transactions	0.144	0.091	0.826	0.736	941
Others - total amount ($)	0.026	0.236	0.218	0.123	941
Others - mean transaction amount ($)	0.634	0.480	0.327	0.214	749

Treatment Implementation

	Remittances sent during 10 week discount period		
	Mean discount	Total discount	Number of discounts used
Panel 1: All recipients			
T4: Discount + information	-0.975***	-4.214***	1.401***
	[0.0840]	[0.439]	[0.146]
T3: Discount only	-1.003***	-4.497***	1.496***
	[0.0827]	[0.451]	[0.150]
T2: Information only	0.0154	-0.0692	0.0231
	[0.0372]	[0.193]	[0.0642]
P-values for tests of coefficients			
T4 & T3 jointly equal to zero	0.000	0.000	0.000
T4 = T3	0.798	0.640	0.635
T4 = T2	0.000	0.000	0.000
T2 = T3	0.000	0.000	0.000
Observations	814	941	941
R-squared	0.29	0.205	0.205
Control group mean	-0.05	-0.19	0.06

Treatment Implementation

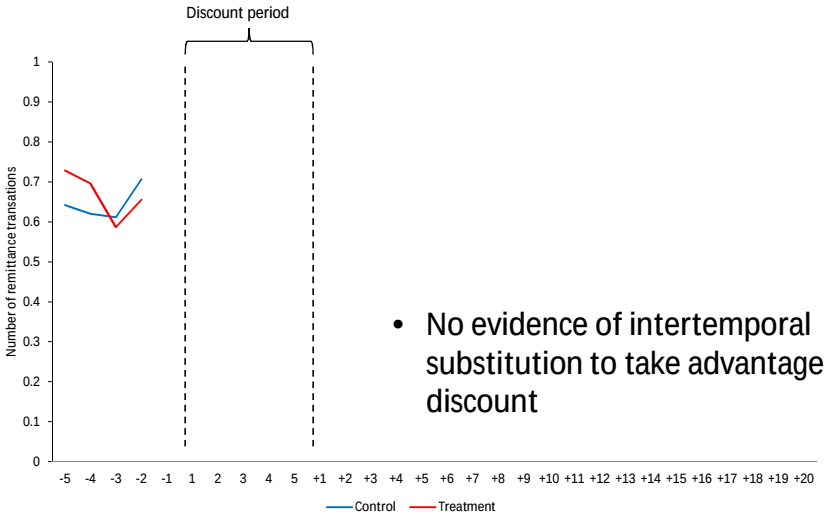
	Remittances sent during 10 week discount period		
	Mean discount	Total discount	Number of discounts used
Panel 2: All transactions to PRR			
T4: Discount + information	-1.414***	-3.876***	1.288***
	[0.109]	[0.418]	[0.139]
T3: Discount only	-1.499***	-4.218***	1.402***
	[0.106]	[0.447]	[0.149]
T2: Information only	0.0184	-0.0576	0.0191
	[0.0562]	[0.187]	[0.0621]
P-values for tests of coefficients			
T4 & T3 jointly equal to zero	0.000	0.000	0.000
T4 = T3	0.537	0.560	0.560
T4 = T2	0.000	0.000	0.000
T2 = T3	0.000	0.000	0.000
Observations	660	941	941
R-squared	0.399	0.192	0.192
Control group mean	-0.08	-0.19	0.06

Results

Treatment Implementation

	Remittances sent during 10 week discount period		
	Mean discount	Total discount	Number of discounts used
Panel 3: All transactions to other recipients			
T4: Discount + information	-0.139***	-0.338**	0.113**
	[0.0474]	[0.155]	[0.0514]
T3: Discount only	-0.204***	-0.279***	0.0941***
	[0.0544]	[0.0916]	[0.0304]
T2: Information only	-0.0136	-0.0116	0.00406
	[0.0183]	[0.0370]	[0.0123]
P-values for tests of coefficients			
T4 & T3 jointly equal to zero	0.000	0.001	0.001
T4 = T3	0.345	0.744	0.759
T4 = T2	0.008	0.049	0.050
T2 = T3	0.000	0.002	0.002
Observations	533	941	941
R-squared	0.146	0.067	0.067
Control group mean	0.00	0.00	0.00

Number of Remittance Transactions



- No evidence of intertemporal substitution to take advantage of discount

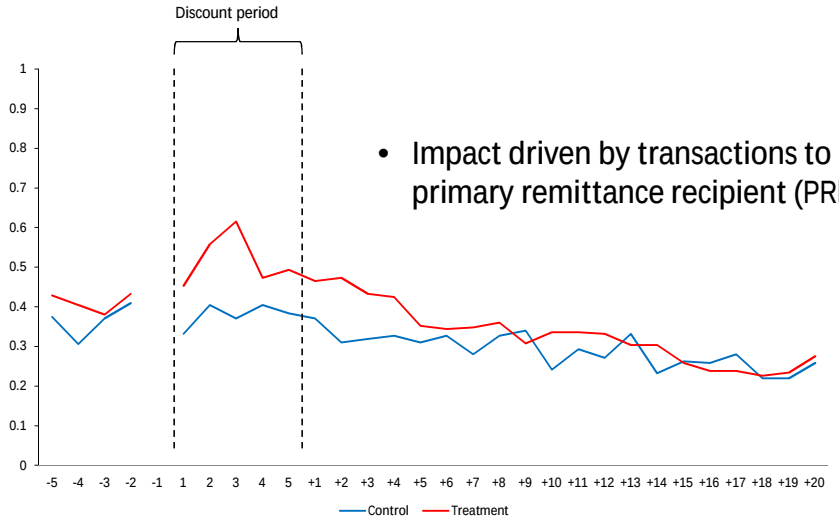
Time periods are 2-week intervals to reduce noise. Graph shows total number of remittances sent during the 2-week interval.

Results

Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 1: All recipients							
T4: Discount + information	0.290	-0.138	0.215	0.275	0.176	0.336	1.156
	[0.294]	[0.287]	[0.288]	[0.320]	[0.309]	[0.263]	[1.510]
T3: Discount only	0.563**	0.500*	0.256	0.0914	-0.0902	0.104	1.425
	[0.284]	[0.280]	[0.267]	[0.303]	[0.285]	[0.237]	[1.367]
T2: Information only	0.213	0.286	0.490	0.417	0.268	0.121	1.796
	[0.295]	[0.302]	[0.304]	[0.328]	[0.295]	[0.245]	[1.497]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.140	0.0566	0.601	0.677	0.659	0.429	0.558
T4 = T3	0.366	0.0240	0.885	0.534	0.363	0.354	0.853
T4 = T2	0.805	0.165	0.388	0.662	0.764	0.404	0.684
T2 = T3	0.251	0.473	0.432	0.288	0.199	0.942	0.796
Observations	941	941	941	941	941	941	941
R-squared	0.153	0.203	0.163	0.156	0.136	0.198	0.198
Control group mean	3.444	3.228	2.849	2.789	2.517	1.806	16.63

Number of Remittance Transactions



- Impact driven by transactions to primary remittance recipient (PRR)

Time periods are 2-week intervals to reduce noise. Graph shows total number of remittances sent during the 2-week interval.

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Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 2: All transactions to PRR							
T4: Discount + information	0.413**	0.133	0.197	0.318	0.226	0.298*	1.584
	[0.206]	[0.195]	[0.205]	[0.208]	[0.191]	[0.173]	[1.018]
T3: Discount only	0.691***	0.494**	0.162	0.142	-0.0355	0.158	1.612*
	[0.218]	[0.205]	[0.198]	[0.197]	[0.185]	[0.153]	[0.958]
T2: Information only	0.126	0.151	0.0714	0.120	0.190	0.166	0.824
	[0.212]	[0.206]	[0.210]	[0.199]	[0.199]	[0.157]	[1.004]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.00529	0.0460	0.590	0.310	0.312	0.220	0.174
T4 = T3	0.217	0.0715	0.859	0.382	0.152	0.400	0.978
T4 = T2	0.194	0.928	0.550	0.331	0.856	0.434	0.460
T2 = T3	0.0151	0.105	0.655	0.910	0.235	0.961	0.417
Observations	941	941	941	941	941	941	941
R-squared	0.111	0.143	0.108	0.143	0.108	0.142	0.149
Control group mean	1.897	1.638	1.517	1.392	1.237	0.793	8.474

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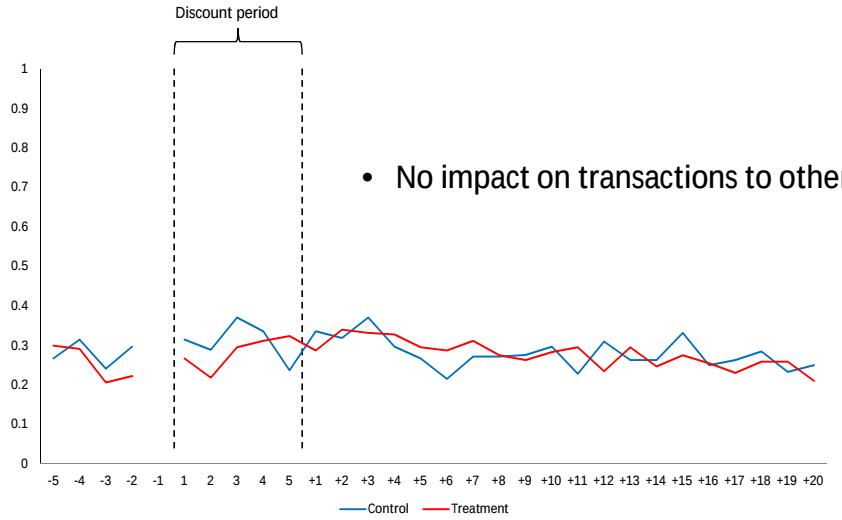
Number of Remittance Transactions



- No impact on transactions to others

Time periods are 2-week intervals to reduce noise. Graph shows total number of remittances sent during the 2-week interval.

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Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 3: All transactions to other recipients							
T4: Discount + information	-0.122	-0.271	0.0185	-0.0429	-0.0491	0.0378	-0.428
	[0.208]	[0.208]	[0.200]	[0.233]	[0.227]	[0.185]	[1.040]
T3: Discount only	-0.128	0.00608	0.0941	-0.0508	-0.0547	-0.0540	-0.187
	[0.193]	[0.198]	[0.187]	[0.235]	[0.212]	[0.171]	[0.962]
T2: Information only	0.0876	0.135	0.419*	0.297	0.0786	-0.0447	0.972
	[0.198]	[0.211]	[0.220]	[0.249]	[0.208]	[0.171]	[1.021]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.766	0.300	0.867	0.975	0.963	0.867	0.919
T4 = T3	0.978	0.161	0.696	0.969	0.979	0.600	0.809
T4 = T2	0.319	0.0532	0.0779	0.129	0.541	0.639	0.186
T2 = T3	0.273	0.519	0.130	0.119	0.478	0.953	0.235
Observations	941	941	941	941	941	941	941
R-squared	0.100	0.122	0.100	0.078	0.083	0.114	0.114
Control group mean	1.547	1.591	1.332	1.397	1.280	1.013	8.159

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Number vs. Amount per Transaction

- Are migrants sending remittances more frequently, but in smaller amounts?

Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 1: All recipients							
T4: Discount + information	-7.124	27.60	2.821	-25.46	79.19*	-6.766	38.95
	[38.05]	[38.02]	[39.94]	[46.60]	[43.55]	[52.19]	[29.37]
T3: Discount only	-34.66	3.676	28.09	-59.68	3.700	-43.46	-2.542
	[34.64]	[34.02]	[42.53]	[44.50]	[36.45]	[52.44]	[25.59]
T2: Information only	15.16	-3.815	17.92	-20.72	47.03	30.53	27.59
	[36.79]	[34.78]	[43.34]	[50.75]	[39.71]	[61.66]	[27.15]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.573	0.731	0.760	0.385	0.134	0.575	0.297
T4 = T3	0.458	0.500	0.525	0.397	0.0704	0.359	0.145
T4 = T2	0.580	0.386	0.714	0.918	0.474	0.473	0.707
T2 = T3	0.176	0.814	0.816	0.402	0.256	0.160	0.260
Observations	814	753	711	665	627	515	901
R-squared	0.060	0.059	0.038	0.047	0.083	0.077	0.047
Control group mean	363.7	347.3	348.4	381.7	306.5	328.9	335.5

Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 2: All transactions to PRR							
T4: Discount + information	6.136	54.81	45.15	53.84	97.15*	-1.804	58.24*
	[37.80]	[45.27]	[43.47]	[51.13]	[49.68]	[61.66]	[32.41]
T3: Discount only	-17.72	28.82	63.23	18.22	26.21	-4.051	2.766
	[35.10]	[41.58]	[47.64]	[50.97]	[40.23]	[68.30]	[29.55]
T2: Information only	35.97	-3.251	46.93	3.213	20.29	27.61	32.11
	[41.73]	[40.45]	[45.92]	[50.68]	[43.96]	[70.74]	[31.15]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.799	0.480	0.365	0.571	0.146	0.998	0.142
T4 = T3	0.532	0.541	0.709	0.513	0.148	0.964	0.0861
T4 = T2	0.505	0.185	0.971	0.346	0.144	0.626	0.446
T2 = T3	0.205	0.440	0.765	0.784	0.894	0.627	0.360
Observations	660	577	519	473	441	337	798
R-squared	0.067	0.069	0.048	0.075	0.102	0.065	0.043
Control group mean	344.0	328.8	316.0	334.7	295.5	314.6	323.0

Results

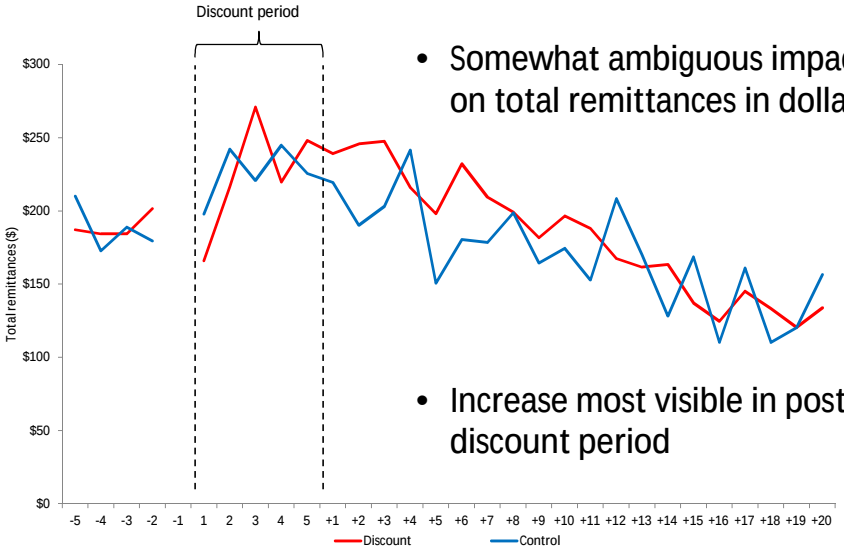
Number of Remittance Transactions

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 3: All transactions to other recipients							
T4: Discount + information	-38.65	4.762	-85.86*	-88.27	17.30	6.984	21.82
	[64.75]	[61.96]	[51.46]	[64.25]	[60.76]	[68.16]	[43.83]
T3: Discount only	-74.03	0.816	-36.34	-107.1*	-30.16	-57.97	3.761
	[58.20]	[49.55]	[55.29]	[58.06]	[53.97]	[64.66]	[38.94]
T2: Information only	-47.99	-3.208	-39.21	-61.84	21.32	-1.775	9.208
	[52.51]	[48.48]	[57.91]	[66.48]	[52.52]	[71.36]	[37.24]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.446	0.997	0.231	0.179	0.646	0.526	0.875
T4 = T3	0.569	0.949	0.309	0.716	0.369	0.309	0.681
T4 = T2	0.871	0.897	0.327	0.640	0.941	0.899	0.762
T2 = T3	0.602	0.931	0.958	0.438	0.303	0.400	0.886
Observations	533	506	472	466	427	358	769
R-squared	0.064	0.065	0.069	0.041	0.133	0.105	0.055
Control group mean	372.8	339.3	362.0	374.4	311.8	311.0	333.5

Number vs. Amount per Transaction

- Are migrants sending remittances more frequently, but in smaller amounts?
- Answer: No.
  - Impacts on mean transaction amount are not statistically significant, and coeffs mostly not large.
- Implication: Total money amount remittances may have risen

Total remittances in $ (to all recipients)



- Somewhat ambiguous impact on total remittances in dollars
- Increase most visible in post-discount period

Time periods are 2-week intervals to reduce noise. Remittances are total $ sent during the 2-week interval.

Effect on Remittances (IHST)

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 1: All recipients							
T4: Discount + information	0.141	-0.103	0.324	0.0764	0.0957	0.399	0.258
	[0.257]	[0.276]	[0.290]	[0.303]	[0.308]	[0.303]	[0.189]
T3: Discount only	0.400*	0.462*	0.495*	0.127	-0.0395	0.380	0.231
	[0.236]	[0.256]	[0.290]	[0.299]	[0.299]	[0.294]	[0.195]
T2: Information only	0.214	0.158	0.280	0.0699	0.142	0.218	0.234
	[0.250]	[0.269]	[0.300]	[0.308]	[0.301]	[0.306]	[0.199]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.213	0.0616	0.227	0.913	0.906	0.325	0.352
T4 = T3	0.270	0.0311	0.540	0.865	0.664	0.949	0.878
T4 = T2	0.773	0.343	0.880	0.983	0.884	0.552	0.895
T2 = T3	0.415	0.234	0.460	0.850	0.554	0.585	0.989
Observations	941	941	941	941	941	941	941
R-squared	0.109	0.186	0.134	0.143	0.142	0.220	0.130
Control group mean	6.202	5.779	5.249	5.076	4.719	3.573	8.219

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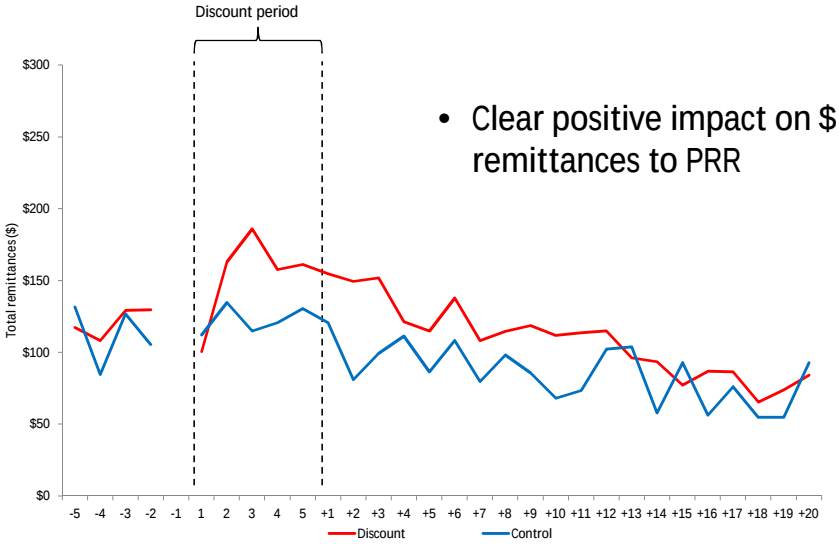
Remittances in $ (to PRR)



- Clear positive impact on $ remittances to PRR

Time periods are 2-week intervals to reduce noise. Remittances are total $ sent during the 2-week interval.

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Effect on Remittances (IHST)

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 2: All transactions to PRR							
T4: Discount + information	0.342	0.228	0.584*	0.368	0.374	0.553*	0.543*
	[0.304]	[0.316]	[0.319]	[0.319]	[0.319]	[0.287]	[0.292]
T3: Discount only	0.394	0.787**	0.338	0.389	-0.0797	0.556**	0.418
	[0.298]	[0.308]	[0.327]	[0.314]	[0.314]	[0.281]	[0.292]
T2: Information only	0.000852	0.0828	0.0350	-0.00562	0.130	0.504*	0.267
	[0.306]	[0.321]	[0.324]	[0.320]	[0.312]	[0.283]	[0.292]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.362	0.0293	0.186	0.386	0.317	0.0761	0.158
T4 = T3	0.861	0.0645	0.447	0.947	0.154	0.992	0.652
T4 = T2	0.272	0.645	0.0870	0.244	0.441	0.868	0.325
T2 = T3	0.193	0.0216	0.355	0.213	0.500	0.858	0.588
Observations	941	941	941	941	941	941	941
R-squared	0.086	0.129	0.086	0.137	0.109	0.157	0.093
Control group mean	4.772	4.016	3.625	3.346	3.121	2.001	6.588

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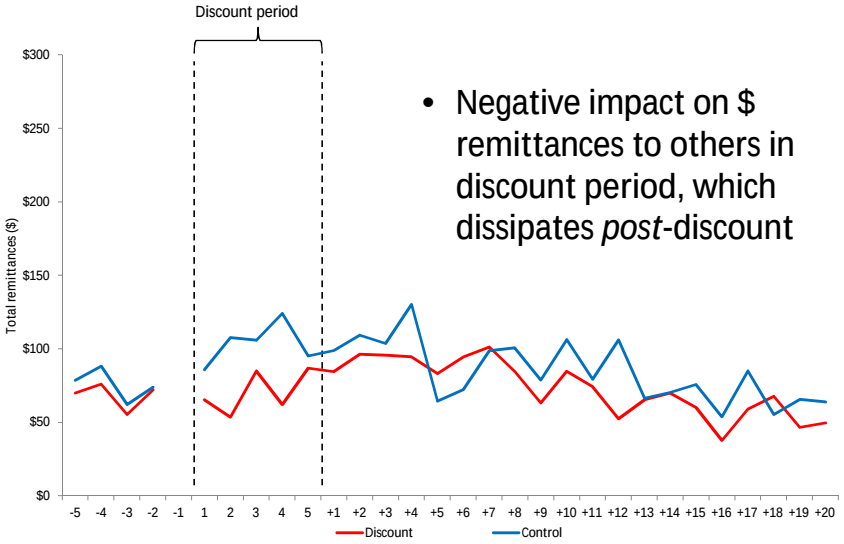
Remittances in $ (to other recipients)



- Negative impact on $ remittances to others in discount period, which dissipates *post*-discount

Time periods are 2-week intervals to reduce noise. Remittances are total $ sent during the 2-week interval.

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Results

Effect on Remittances (IHST)

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after	41 -50 weeks after	During & after
Panel 3: All transactions to other recipients							
T4: Discount + information	-0.496	-0.499	-0.0854	-0.282	-0.148	0.00887	-0.209
	[0.314]	[0.313]	[0.318]	[0.311]	[0.313]	[0.293]	[0.299]
T3: Discount only	-0.235	0.0547	0.239	-0.215	-0.0374	-0.0615	-0.0353
	[0.300]	[0.309]	[0.314]	[0.309]	[0.299]	[0.281]	[0.296]
T2: Information only	0.101	0.300	0.326	0.118	0.0880	0.208	0.263
	[0.309]	[0.311]	[0.317]	[0.318]	[0.310]	[0.291]	[0.294]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.288	0.153	0.565	0.640	0.888	0.963	0.759
T4 = T3	0.395	0.0779	0.305	0.829	0.720	0.805	0.563
T4 = T2	0.0596	0.0117	0.197	0.205	0.459	0.498	0.116
T2 = T3	0.268	0.433	0.783	0.288	0.681	0.341	0.313
Observations	941	941	941	941	941	941	941
R-squared	0.096	0.113	0.079	0.077	0.073	0.135	0.088
Control group mean	3.933	3.700	3.267	3.394	3.036	2.462	6.429

Results

Effect on Remittances (US$)

Transactions to all recipients	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after
Discount (D)	8.823	136.4	113.9	-30.81	1.112
	[89.35]	[90.26]	[89.95]	[83.87]	[75.87]
Discount + Information (D+I)	-8.097	16.54	52.35	63.48	161.9**
	[92.84]	[93.97]	[88.25]	[85.57]	[82.40]
Information (I)	-28.22	102.2	92.33	79.86	153.1*
	[89.39]	[94.68]	[89.45]	[86.89]	[80.20]
Observations	941	941	941	941	941
R-squared	0.123	0.195	0.150	0.162	0.128
Control group mean	1079	963.7	842.8	808.1	634.2

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

- Remittances truncated at 95th pctile to deal with outliers
- Results mostly consistent with IHST specification, but not statistically significant

Results

Effect on Remittances (US$)

	During discount period	1 -10 weeks after	11- 20 weeks after	21 -30 weeks after	31 -40 weeks after
Transactions to PRR					
Discount (D)	133.1*	150.1**	105.4*	35.48	53.37
	[68.59]	[63.00]	[63.47]	[63.93]	[54.58]
Discount + Information (D+I)	104.0	119.0*	137.9**	122.9*	148.9***
	[67.10]	[65.17]	[62.53]	[66.81]	[56.77]
Information (I)	24.27	51.55	58.01	31.69	87.19
	[67.00]	[63.75]	[60.34]	[61.65]	[54.80]
Observations	941	941	941	941	941
R-squared	0.080	0.122	0.105	0.122	0.104
Control group mean	569.7	464.0	408.2	413.1	307.7
Transactions to other recipients					
Discount (D)	-116.7**	2.229	-10.04	-45.25	-41.96
	[53.06]	[59.34]	[58.84]	[50.14]	[43.58]
Discount + Information (D+I)	-94.75*	-98.03	-81.17	-34.53	-0.844
	[57.12]	[59.56]	[56.86]	[51.58]	[48.48]
Information (I)	-11.38	48.24	34.25	47.82	57.38
	[57.16]	[61.07]	[60.61]	[56.06]	[49.51]
Observations	941	941	941	941	941
R-squared	0.090	0.121	0.087	0.069	0.060
Control group mean	446.8	434.4	388.3	342.9	28

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

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Results

Effect on Remittances (AMY 2010)

Dependent variable: Remittance flows sent per month via formal institutions (US$)

	(1)	(2)	(3)	(4)	(5)	(6)
Price	21.915**	25.092***				
	(9.34)	(7.036)				
Price = 5 (indicator)			75.480	31.355		
			(59.601)	(44.667)		
Price = 7 (indicator)			176.568**	83.151*		
			(87.002)	(42.645)		
Price = 9 (indicator)			18.551	22.054		
			(78.084)	(44.091)		
Price = 11 (indicator)			109.025*	96.262**		
			(59.861)	(41.862)		
Price = 13 (indicator)			146.813**	111.515***		
			(56.707)	(40.312)		
Price = 15 (indicator)					87.227**	80.732***
					(34.158)	(25.772)
Constant	408.750***	-22.283	290.814***	-270.125	290.814***	-269.067
	(71.249)	(202.855)	(24.838)	(196.804)	(24.838)	(196.751)
Marketing fixed effects		Y		Y		Y
Treatment fixed effects		Y		Y		Y
Stratification cell fixed effects		Y		Y		Y
Savings treatment indicator		Y		Y		Y
Baseline remittance controls		Y		Y		Y
Observations	1,400	1,400	1,400	1,400	1,400	1,400
R-squared	0.004	0.454	0.007	0.455	0.003	0.454

Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

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Effect on Remittances (AMY 2010)

Dependent variable: Remittance funds sent per month via partner institution (US$)

	(1)	(3)
Price	-21.943*	-25.092***
	(9.342)	(7.036)
Marketer fixed effects		Y
Treatment month fixed effects		Y
Stratification cell fixed effects		Y
Observations	1,400	1,400
R-squared	0.004	0.484

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes -- Dependent variable is average remittances sent per month through partner bank during 9-month period 3-11 months after treatment

Results

Effect on Remittances (AMY 2010)

Dependent variable: Remittance funds sent per month via partner institution (US$)

			(6)	(7)
Price < 8 (indicator)			57.227**	80.762***
			(24.183)	(25.772)
Marketer fixed effects		Y		Y
Treatment month fixed effects		Y		Y
Stratification cell fixed effects		Y		Y
Observations	1,400	1,400	1,400	1,400
R-squared	0.004	0.484	0.005	0.483

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes -- Dependent variable is average remittances sent per month through partner bank during 9-month period 3-11 months after treatment

Lower Impact of Treatment 4

- Impact of Discount + Information (D+I) consistently lower in magnitude than that of discount alone
- Could be due to "decoy effect" of the Information treatment
  - Ashraf, Aycinena, Martinez and Yang (forthcoming) find a decoy effect in an experiment on migrant control over home-country savings
- Encouragement to remit for education could have made migrants concerned about proper use of their remittances and thus reduced the impact of the discount

Additional Analysis

- Endline survey data helps rule out alternative explanations
- Discounts do not induce switching from other remittance companies to Viamericas
  - Sensible, since study participants selected on basis of being Viamericas customers at outset

Increase due to shifting channels?

	All channels		
	Dependent variable = Remittances sent to…		
	…all recipients	…the PRR	…other recipients only
Panel 1: Transaction amounts: Inverse hyperbolic sine transformation			
T4: Discount + information	0.372**	0.208	0.805**
	[0.160]	[0.193]	[0.325]
T3: Discount only	0.359**	0.266	0.704**
	[0.164]	[0.175]	[0.331]
T2: Information only	0.401**	0.388**	0.535*
	[0.157]	[0.167]	[0.318]
P-values for tests of coefficients			
T4 & T3 jointly equal to zero	0.035	0.289	0.022
T4 = T3	0.938	0.764	0.777
T4 = T2	0.845	0.326	0.437
T2 = T3	0.789	0.458	0.634
Observations	651	666	653
R-squared	0.081	0.075	0.115
Control group mean	6.986	6.792	1.776

Notes: Robust standard errors in brackets. Sample is migrants who completed the endline survey. All regressions include stratification cell fixed effects for survey group. Dependent variables are from the endline survey. *** p<0.01, ** p<0.05, * p<0.1

Results

Increase due to shifting channels?

	All channels			*Viamericas only*		
	Dependent variable = Remittances sent to…					
	…all recipients	…the PRR	…other recipients only	…all recipients	…the PRR	…other recipients only
Panel 1: Transaction amounts: Inverse hyperbolic sine transformation						
T4: Discount + information	0.372**	0.208	0.805**	0.524**	0.318	0.920***
	[0.160]	[0.193]	[0.325]	[0.215]	[0.234]	[0.318]
T3: Discount only	0.359**	0.266	0.704**	0.464**	0.341	0.752**
	[0.164]	[0.175]	[0.331]	[0.219]	[0.217]	[0.318]
T2: Information only	0.401**	0.388**	0.535*	0.547**	0.488**	0.631**
	[0.157]	[0.167]	[0.318]	[0.212]	[0.209]	[0.310]
P-values for tests of coefficients						
T4 & T3 jointly equal to zero	0.035	0.289	0.022	0.035	0.232	0.007
T4 = T3	0.938	0.764	0.777	0.769	0.917	0.629
T4 = T2	0.845	0.326	0.437	0.904	0.436	0.399
T2 = T3	0.789	0.458	0.634	0.681	0.474	0.726
Observations	651	666	653	575	602	637
R-squared	0.081	0.075	0.115	0.085	0.072	0.135
Control group mean	6.986	6.792	1.776	6.683	6.55	1.501

Notes: Robust standard errors in brackets. Sample is migrants who completed the endline survey. All regressions include stratification cell fixed effects for survey group. Dependent variables are from the endline survey. *** p<0.01, ** p<0.05, * p<0.1

Increase due to shifting channels?

	All channels			*Viamericas only*			*Other channels only*		
	Dependent variable = Remittances sent to…								
	…all recipients	…the PRR	…other recipients only	…all recipients	…the PRR	…other recipients only	…all recipients	…the PRR	…other recipients only
Panel 1: Transaction amounts: Inverse hyperbolic sine transformation									
T4: Discount + information	0.372**	0.208	0.805**	0.524**	0.318	0.920***	-0.243	-0.155	-0.118
	[0.160]	[0.193]	[0.325]	[0.215]	[0.234]	[0.318]	[0.180]	[0.144]	[0.118]
T3: Discount only	0.359**	0.266	0.704**	0.464**	0.341	0.752**	0.0104	0.0267	0.0127
	[0.164]	[0.175]	[0.331]	[0.219]	[0.217]	[0.318]	[0.201]	[0.162]	[0.138]
T2: Information only	0.401**	0.388**	0.535*	0.547**	0.488**	0.631**	0.0775	0.269	-0.149
	[0.157]	[0.167]	[0.318]	[0.212]	[0.209]	[0.310]	[0.202]	[0.181]	[0.112]
P-values for tests of coefficients									
T4 & T3 jointly equal to zero	0.035	0.289	0.022	0.035	0.232	0.007	0.253	0.365	0.475
T4 = T3	0.938	0.764	0.777	0.769	0.917	0.629	0.162	0.208	0.306
T4 = T2	0.845	0.326	0.437	0.904	0.436	0.399	0.085	0.014	0.756
T2 = T3	0.789	0.458	0.634	0.681	0.474	0.726	0.750	0.194	0.207
Observations	651	666	653	575	602	637	575	602	637
R-squared	0.081	0.075	0.115	0.085	0.072	0.135	0.108	0.118	0.063
Control group mean	6.986	6.792	1.776	6.683	6.55	1.501	0.468	0.284	0.267

Notes: Robust standard errors in brackets. Sample is migrants who completed the endline survey. All regressions include stratification cell fixed effects for survey group. Dependent variables are from the endline survey. *** p<0.01, ** p<0.05, * p<0.1

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Results

Increase due to shifting channels?

	All channels			*Viamericas only*			*Other channels only*		
	Dependent variable = Remittances sent to…								
	…all recipients	…the PRR	…other recipients only	…all recipients	…the PRR	…other recipients only	…all recipients	…the PRR	…other recipients only
Panel 2: Transaction amounts: Dollars									
T4: Discount + information	378.4***	245.7**	120.3**	436.2***	312.9***	120.9**	-20.96	-17.14	-4.243
	[127.3]	[105.5]	[52.37]	[122.6]	[98.13]	[51.53]	[13.84]	[10.76]	[6.351]
T3: Discount only	275.8**	157.0	112.0**	296.6***	210.4**	83.32*	26.01	-2.255	29.06
	[114.8]	[97.38]	[53.34]	[109.9]	[89.38]	[47.64]	[28.27]	[11.38]	[23.34]
T2: Information only	193.1*	141.8	45.84	166.5*	155.7*	39.80	19.43	25.18	-4.003
	[110.1]	[88.95]	[45.74]	[98.46]	[84.00]	[45.53]	[20.11]	[17.05]	[6.451]
P-values for tests of coefficients									
T4 & T3 jointly equal to zero	0.005	0.052	0.020	0.000	0.002	0.030	0.068	0.119	0.238
T4 = T3	0.448	0.422	0.898	0.313	0.353	0.541	0.065	0.080	0.131
T4 = T2	0.153	0.310	0.204	0.036	0.135	0.168	0.039	0.012	0.968
T2 = T3	0.478	0.869	0.271	0.253	0.572	0.433	0.833	0.097	0.157
Observations	651	666	653	575	602	637	575	602	637
R-squared	0.101	0.057	0.101	0.116	0.066	0.116	0.084	0.105	0.068
Control group mean	966	843.6	114	871.7	765.1	96.64	27.63	17.3	9.77

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Additional Analysis

- Endline survey data helps rule out alternative explanations
- Discounts do not induce switching from other remittance companies to Viamericas
  - Sensible, since study participants selected on basis of being Viamericas customers at outset
- Discounts do not induce migrants to use PRRs as "channels" for remittances
  - Either from other migrants
  - Or to other recipients

Increase due to sending for others?

	Have you asked PRR to distribute remittances within their household?	Have you asked PRR to distribute remittances outside their household?	Has someone within your household (not you) sent a remittance to PRR?	Has anyone outside of your household sent a remittance to PRR?	Have you sent remittances to others so that they will distribute them to PRR?	Has anyone given you money to send to PRR?	Has anyone given you money to send to PRR so that they distribute it to other people?
Panel 1							
T4: Discount + information	0.0222	-0.0197	0.00380	0.0417	0.0233	0.00385	0.0225*
	[0.0509]	[0.0433]	[0.0347]	[0.0284]	[0.0247]	[0.0128]	[0.0128]
T3: Discount only	-0.0169	-0.0214	-0.0515*	0.0590**	0.0221	0.00850	0.00789
	[0.0476]	[0.0416]	[0.0284]	[0.0266]	[0.0240]	[0.0140]	[0.00749]
T2: Information only	0.0251	-0.0389	-0.0120	0.0389	0.000116	-0.00320	0.00700
	[0.0491]	[0.0392]	[0.0305]	[0.0243]	[0.0191]	[0.0102]	[0.00603]
P-values for tests of coefficients							
T4 & T3 jointly equal to zero	0.743	0.852	0.095	0.051	0.532	0.828	0.148
T4 = T3	0.441	0.968	0.082	0.616	0.964	0.760	0.303
T4 = T2	0.955	0.642	0.636	0.931	0.350	0.554	0.270
T2 = T3	0.393	0.659	0.152	0.514	0.342	0.351	0.916
Observations	661	662	638	632	633	635	633
R-squared	0.08	0.08	0.07	0.09	0.07	0.05	0.05
Control group mean	0.27	0.18	0.09	0.03	0.03	0.01	0.00

Notes: Robust standard errors in brackets. Sample is migrants who completed the endline survey. All regressions include stratification cell fixed effects for survey group. Dependent variables are from the endline survey. *** p<0.01, ** p<0.05, * p<0.1

Persistence due to Mistakes?

- Are persistent impacts due to migrants not realizing discount has expired?
- Unlikely: follow-up survey (with 72% success rate) was conducted right after expiration and included questions alerting respondents to expiration
- Hard for mistakes to explain magnitude of post-expiration effect (nearly as large as discount period effect)
  - Or its duration (twice as long as discount period effect)

Persistency due to Prospect Theory?

- Model that incorporates recipient's loss aversion, reference dependence
  - Tversky and Kahneman (1991), Masatlioglu and Ok (2014)
- During discount period, migrant raises remittances, intending to reduce once discount expires
  - However, migrant does not fully anticipate shift in recipient's reference point for remittances
- Recipient now expects to receive the higher level of remittances
  - Recipient can enforce this through pressure/punishment ability used to enforce remittance agreements

Implications of Behavioral Explanation

- Temporary remittance price reductions could be an effective means of stimulating remittances in the short-term
  - E.g., in response to negative shocks
- The findings may not be revealing about impact of *permanent* reductions
  - Temporary reductions may have such large impacts precisely *because* they are temporary
    - Migrants naively intend to intertemporally substitute, but find that they can't reduce remittances later so quickly
  - With permanent reductions, no intention to intertemporally substitute

Summary of Results

- Reductions in remittance fees lead to: 1) increased frequency of remittances, and 2) increases in *total amount remitted*
- $3.01 reduction in ($8) fee leads to:
  - Increase of 16% in remittance transactions
  - No change in amount remitted per transaction
- No evidence of reductions in remittances sent via other channels or of inter-temporal shifts
  - In any case, we observe persistance effects during weeks that follow

Summary of Results

- Reductions in remittance fees lead to: 1) increased frequency of remittances, and 2) increases in *total amount remitted*
  - Results suggest behavioral factors may be at play
- Still much to learn about the micro-economic decisions behind remittances flows
  - Why do migrants choose frequent small payments over large, infrequent payments?
  - Are there self-control issues at play for migrants?
  - Are there recipient self-control problems that migrants anticipate?

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THANK YOU

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