Labeled Remittances: A Field Experiment among Filipino Migrant Workers in the UAE

Giuseppe De Arcangelis
Sapienza University of Rome

Dean Yang
University of Michigan

February, 2022

Labeled Remittances

A Field Experiment among Filipino Migrant Workers in the UAE[*]

Giuseppe De Arcangelis[†]   Dean Yang[§]

This Version: February 2022

Abstract

We conducted a randomized experiment of the impact of remittance labeling among Filipino migrant workers in the UAE. The ability to label remittances with the migrant's intended uses leads migrants with low levels of baseline (pre-treatment) remittances to increase their remittance levels. There is no effect of labeling for migrants with initially higher remittance levels. We also examined impacts of remittance labeling on household expenditures in treated migrants' remittance-recipient households in the Philippines. The labeling treatment does not lead to higher expenditures on uses that migrants report as priority items (in the full sample or in subsamples split by baseline remittances). There is only weak or mixed evidence that labeling leads to actual changes in household expenditures towards the purposes preferred by migrants.

Keywords: RCT, Philippines.

JEL Classification Codes: F24, O15, D19, C9.

[†]Department of Social Sciences and Economics, Sapienza University of Rome, giuseppe.dearcangelis@uniroma1.it
[§]Department of Economics, University of Michigan, deanyang@umich.edu

1 Introduction

Migrant remittances are one of the largest international financial flows to developing countries (World Bank 2021), but we are still learning what policies might increase their development impact. A key barrier to maximizing the development potential of remittances is that migrants who are sending these funds have limited ability to monitor or control how they are used by beneficiaries.

Migrants' preferences on how remittances should be spent often differ from the beneficiaries' preferences. Migrants often have a stronger preference that remittances be used for purposes that may have general development benefits in the long run, such as investment (in physical or human capital) or savings. However, beneficiaries often favor using these funds for immediate consumption (Ashraf et al 2015). These competing preferences, coupled with the migrants' limited control of funds, leads to migrants sending fewer remittances than they otherwise might (DeArcangelis et al 2015).

This project seeks to address this barrier by testing the impact of a simple, scalable and low-cost mechanism that allows migrants to both signal their preferences and exert greater control over the funds they send: labeled remittances. Through this mechanism, migrants are given the option to "label" their remittance with its intended purpose(s). The label is transmitted to the beneficiary along with the remittance amount. Simple labeling can potentially allow migrants to direct remittances to particular uses, and research suggests that it may be as effective as more direct mechanisms of control. In addition, labeling remittances may be less costly and more easily scalable than other approaches for directing remittances to specific uses.

The labeling mechanism is administered through a smartphone app called Padalapp. With the app, users can easily track the remittances they send to multiple recipients. When they record a remittance, they can notify their recipient via a free SMS or through a preferred smartphone application (e.g. WhatsApp). This notification can include a remittance label. The research team collects data via the app, tracking the remittances sent while also pushing weekly surveys to capture any remittances the migrant may have forgotten to record.

The logic behind the intervention design is that labeling will improve migrants' ability to direct remittances to their preferred uses, which will then lead to migrants sending more remittances and recipient households increasing expenditure on areas that migrants specify. To investigate the impacts of remittance labeling, we examine three categories of primary

outcomes – migrant participants' use of the labeling function, remittance volumes sent by migrant participants, and expenditure in households to which migrants remit back home.

The paper is organized as follows. In the next section we describe the experimental design. In Section 3 we provide take-up statistics. Section 4 presents the methodology and the econometric specification. The empirical results are shown in Section 5, and Section 6 concludes. Additional empirical results are reported in the Appendix.

2 Experimental Design

The study is implemented through a randomized controlled trial (RCT). A random subset of the study sample is offered a remittance labeling product (treatment group) while the remaining sample was not offered any labeling product (control group). A comparison of the two groups allows us to understand the causal impact of the ability to label remittances.

The study took place between 2018 and 2020. A baseline survey was first launched in September 2018 (wave 1), which was suspended in November 2018 after reaching half of the sample size while we worked with UAE Exchange to formalize our research partnership. The second half of the baseline (wave 2) resumed in February 2019 and ended in August 2019.

While participants were recruited on a rolling basis, they all experienced a 30-week follow-up period starting from the date of recruitment (baseline interview). By week 4, those who had complied with the participation requirements were considered retained while the others were dropped from the study. The retained participants were randomly assigned to the treatment or control group. Those assigned to the treatment group were randomly selected to receive the intervention starting week 6/7/8/9. All respondents, regardless of treatment assignment, completed the study after week 30, when an endline phone survey was administered.

The last endline survey interviews were completed in April 2020, marking the end of all data collection activities in this project.

Figure 1: Data collection timeline

Participant journey from week 0 to week 30
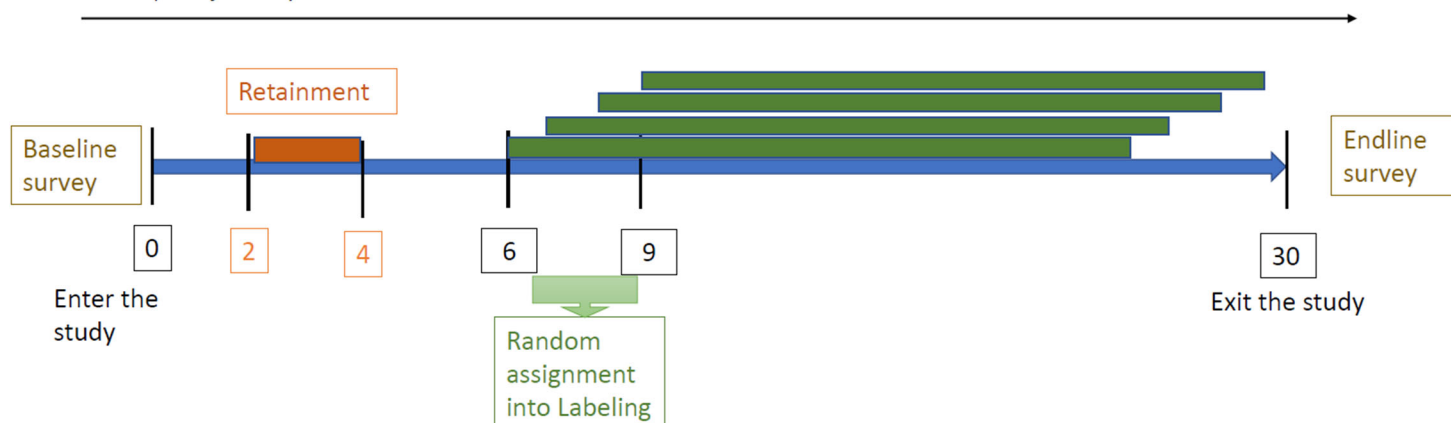
Half of our study sample was recruited via face-to-face intercepts of Filipino migrant workers (OFW) in the UAE at locations frequented by Filipino migrants. The other half of the sample was recruited in the context of a partnership between Innovations for Poverty Action (IPA) and UAE Exchange, a global money transfer operator. This second half of the sample was enrolled and surveyed at UAE Exchange branches.

Study participants are migrant workers from the Philippines living and working in Dubai and Sharjah in the United Arab Emirates (UAE). Participants consented and enrolled in the study via face-to-face intercepts in locations frequented by Filipino workers. Participants were expected to continue working in the UAE for the next twelve months and explicitly declared to agree to the study protocols (i.e. usage of the mobile application called "Padalapp" to record remittances, commitment for the whole twelve-month period, be available to answer weekly survey, etc.).[1]

Overall, 85 percent of respondents were recruited in Dubai and 15 percent in Sharjah. Approximately 50 percent were recruited inside the branch premises of UAE Exchange, and the rest were recruited in public areas where Filipinos frequently gather.

A total of 8,248 OFWs were initially recruited for the study and signed up for Padalapp. However, some individuals showed imperfect adherence to the study's data collection expectations with regard to remittance recording. We therefore considered a study participant to be retained in the sample only if they responded to at least two out of the first

---

[1] The list of questions that the migrants should agree with is available from the authors.

four weekly remittance surveys regardless of whether they actually recorded any remittances (see Section 4.5.2 for more on the weekly surveys). Through this sampling process we retained 4,458 migrant respondents, forming the study's migrant sample. The retention rates were similar regardless of location: 54 percent and 56 percent were retained in Dubai and Sharjah, respectively. 56 percent of those recruited within UAE Exchange branches were retained and 52 percent of those recruited elsewhere. Table 1 shows that the characteristics of the retained and non-retained sample are similar. The screening criteria of this study has not led to the exclusion of potential participants of certain observable characteristics, suggesting the retention criteria did not significantly limit the generalizability of the study's findings to the larger population of interest.

Table 1: Sample characteristics by retention status

Migrant respondent characteristics	Retained	Not retained
Respondent is female	74%	66%
Respondent is single	54%	53%
Respondent has children	54%	57%
Average age in years	35	37
Average years of stay in UAE	6.6	6.5
Monthly income is above median (AED 3001 or above)	55%	53%
Respondents' occupation:		
Sales and related	20%	19%
Office and admin support	21%	18%
Personal care and service	10%	11%
Food preparation and serving	9%	12%
Frequency of remittances to target household is monthly	85%	84%
Average monthly remittance amount to target household (AED)	1311	1220
Household respondent characteristics		
Household respondent is female:	74%	74%
Household respondent is migrant participant's:		
Parent	48%	46%
Sibling	20%	18%
Spouse	10%	12%
Child	12%	13%
Household respondent's residence in the Philippines:		
CALABARZON	19%	20%

National Capital Region	18%	19%		
Central Luzon	17%	17%		

2.1 Randomization

Retained participants were randomly assigned to either treatment or control groups.[2] To check whether the randomization achieved this comparability, we conduct balance tests on key observable characteristics. Table 2 shows there are no statistically significant differences between the treatment and control groups in terms of baseline indicators. In other words, the randomization successfully created two comparable groups.

Table 2: Balance on baseline migrant characteristics

	Treatment	Control	Difference	P
Sample size	*2213*	*2245*		
Migrant respondents				
Female	0.74	0.75	0.01	0.49
Single	0.58	0.59	0.01	0.58
Respondent has children	0.52	0.55	0.03	0.08
Age in years	34.61	34.62	0.01	0.95
Years in UAE	6.61	6.62	0.01	0.92
Monthly income is above median (AED 3001 or above)	0.56	0.54	-0.02	0.30
Respondents' occupation:				
Sales	0.20	0.20	-0.00	0.99
Admin	0.21	0.22	0.00	0.91
Personal services	0.10	0.11	0.01	0.31
Food services	0.09	0.09	-0.00	0.68
Household respondents				
Household respondent is female	0.76	0.75	-0.01	0.36
Household respondent is migrant respondent's				
Parent	0.50	0.49	-0.01	0.47

---

[2] The randomization was conducted using Stata. The research team assigned a unique random number to each participant on the list and then sorted the list in ascending order. We then assigned the first half of the list to the treatment group and the second half to the control group. The Stata program allows us to replicate the randomization results.

Spouse	0.11	0.10	-0.00	0.72
Sibling	0.20	0.22	0.02	0.06
Child	0.08	0.09	0.00	0.78
Sample size (if remits to household respondent)	*2148*	*2184*	*4332*	
Frequency of remittances to household respondent is monthly	0.87	0.88	0.01	0.40
Monthly remittance amount (pesos) to household respondent	16458.43	20534.40	4075.97	0.38
Wishes had more control over how household respondent uses remittances sent	0.40	0.41	0.01	0.55
Instructs household respondent on how to use remittances sent	0.56	0.57	0.01	0.35

2.2   Baseline Survey

Migrant Survey

Baseline data collection was carried out in two waves, the first from September to October 2018 and the second from March to August 2019.

The baseline questionnaire was tested in three pilots and reduced in length significantly in order to accommodate respondents' limited availability and to help mitigate refusals. The questionnaire has four modules -- introduction and consent, contact information and identifying target household respondent, remittance behavior, and demographics.

To identify which corresponding household in the Philippines we should interview, the migrant participants were asked to name (and provide contact information for) an individual in the Philippines who would be the recipient of a US$500 lottery prize (implemented by the research team among study participants). The study participant's choice identifies an individual (referred to as the "target beneficiary") and household (referred to as the "target household") in the Philippines whose well-being is important to the study participant. The question on the lottery prize also elicits the respondent's preferences regarding how the lottery prize should be used, with money amounts allocated across multiple possible categories (such as food, education, and housing), including an "other" category for free text entry. A respondent's choice of lottery prize allocation is regarded as a proxy for the respondent's perceived priority of household expenditure.

To incentivize participation, respondents were awarded a "certificate of participation" with

university logos. We also maintained a Facebook page for this study and asked respondents to like the page. We regularly posted pictures of respondents holding their certificates of participation on the Facebook page and announced the current number of participants. Seeing that a large number of fellow Filipinos are participating gave people more confidence in the study.

On the migrant participant side, we encountered challenges both during baseline data collection and follow-up data collection via Padalapp.

Refusals were the main challenge during the baseline. The interviews' duration, including a demonstration of Padalapp's functions, took approximately 20-30 minutes. In addition to time constraints, some respondents hesitated to participate because they were concerned about being asked questions related to their financial behavior and families in the Philippines. During the baseline's second wave, surveyors were stationed inside UAE Exchange premises, which helped build credibility and reduced suspicion.

During the follow-up period, some respondents showed decreasing participation over time, and in some cases stopped participating. Imperfect adherence could be caused by loss of interest, forgetfulness, or migration -- leaving UAE earlier than originally planned. When respondents failed to answer weekly surveys for at least 4 consecutive weeks, we conducted follow-up calls to remind them of the study and to understand why they stopped participating.

Household Survey

In the target household, the person interviewed was the person most in charge of the household finances (not necessarily the target beneficiary). During the welcome call, the household respondent was simply given an overview of the research study and asked if they would consent to being surveyed at a later date. No survey questions were asked in this welcome call. The purpose of this call was to establish a positive connection with the respondent to encourage high response rates during the endline survey, which took place 30 weeks later.

During the welcome call, target household respondents were also encouraged to use Padalapp. If they used Padalapp, they would be able to view the list of remittances that their respective migrant participants recorded under their name.

2.3 Remittance recording and weekly surveys

For 30 weeks after the baseline survey, migrant participants were required to use Padalapp to report their remittance data to the research team. Participants were asked to record information on each remittance they send with an incentivized scheme.

Data recorded included: recipient name and cellphone number, transaction currency amount and transaction date. Participants were asked to upload a photo of the transaction receipt showing all the above items so that the data can be verified. Records that included the receipt photo were awarded points. The number of points may randomly vary from week to week. Upon reaching 100 points, the participant was awarded with a gift certificate of their choice (for a supermarket, cellphone credit, or an online shopping platform) with a value of AED25 (UAE dirham) (US$6.81). Participants could also record remittances without the receipt photo but did not receive points for those records. Each time a remittance was recorded, the user was presented with an optional message intended for the recipient. The participant could freely edit the message before it was sent. The participant had the option to press "send" to deliver the message as a free SMS message or had the option of sending the same message via WhatsApp and Facebook Messenger.

Once a week, participants were administered a simple remittance survey. Participants were notified about the survey via in-app and text notifications, and filled out the survey within the app. The survey asked participants whether they have sent any remittances in addition to any they have recorded already, since the last date that they responded to the weekly survey. If they had recorded remittances since the last weekly survey, a list of those remittance records was shown. If the participant responded "no", the survey ended, and the participant received 10 points. If the participant responded "yes", the participant received 10 points and was brought to the section of the app for recording remittances. The respondent then recorded additional remittances and points were awarded accordingly for any records accompanied by receipt photos. Because participants could respond to the survey on different days, the recall period asked about was always the period since the last date on which the participant recorded a survey response (which accommodated potential non-response to the weekly survey).

By answering weekly surveys and recording remittances in Padalapp, participants were expected to be reporting a relatively full picture of their remittance behavior, particularly because the recall period was short.

2.4 Endline survey

Endline data collection was also carried out in two waves – the first from March to July in 2019 and the second from October 2019 to April 2020. We successfully interviewed 1,987 migrant respondents and 2,075 household respondents at endline, among whom 1,377 migrant and household respondents are paired.

The endline survey was administered via phone. Once a migrant respondent completed the 30-week follow-up period, IPA surveyors started calling both the migrant and household respondents for the endline phone survey.

To incentivize participation, household respondents were given 50 pesos (US$1) cell phone credit upon completion of survey; migrant respondents received additional points in Padalapp to reach the 100-point threshold so that they could redeem a voucher after the survey.

Similar to the household welcome calls, the main challenge in the endline survey was to reach the respondents via phone calls. Approximately 30 percent of the respondents were never reached at the endline.

Less than 10 percent of all respondents explicitly refused to participate, citing "not interested" and "too busy" as the most common reasons for refusal. In addition, approximately another 18 percent asked to reschedule the interview saying they were busy at the moment, though they were never reached again when surveyors called back. The survey duration might be a main contributor to people's explicit or implicit decisions to refuse participation. To collect detailed information on household expenditure and remittance use, our endline surveys lasted for 30-40 minutes on average.

3 Labeling: take-up and usage

The data on remittances of the treatment group are analyzed and are evaluated according to three take-up indexes:

- An indicator for ***general take-up of the labeling feature*** that records whether any remittance has been labeled (a dummy variable that takes the value of 1 if label is used)

- The ***number of remittances*** that have been labeled (a count variable)

- The ***total amount sent with labels*** (in PhP), summed across all transactions with labels; since migrants do not send remittances every week (our observation period), the data include many zeros and so we use two transformations:

  o Winsorizing at the 99th percentile of the full distribution of non-zero weekly amount

  o Taking the natural logarithm of the amount plus 1 PhP – i.e. ln (1 + amount)

Table 3 reports these statistics. Results from this analysis confirm a high and significant take-up in the treatment group. The probability of sending a labeled remittance is higher than 4.2 percent and significantly different from zero. The number of labeled remittances is significantly non-zero, amounting to 0.054 remittances per week. The weekly average amount (either winsorized or in logs) that was sent with labels is significantly different from zero. The last column of the table examines a "labeling index", a Kling et al (2007) index of the four other outcomes in the table. This labeling index is also positive and statistically significantly different from zero, as indicated in column (5).

Table 3: Treatment group take-up

	(1) Migrant has labeled at least 1 remittance this week	(2) Number of labeled remittances sent by migrant this week	(3) Amount of labeled remittances sent by migrant this week (winsorized)	(4) Log of amount of labeled remittances sent by migrant this week	(5) Use of Labeling Index
Mean	0.042	0.054	687.566	0.385	1.233
	(.001)	(.001)	(22.625)	(.008)	(.028)
t-value	47.701	41.693	30.389	47.074	44.445
Pr(T > t)	0	0	0	0	0
Observations	51395	51395	51395	51395	51395
# of respondents	2208	2208	2208	2208	2208

Table 4 shows the most commonly used labels and the frequency with which they were used. The three most common labeled remittances were for food, utility bills, and education

expenses.

Table 4: Label use	
Label	Percent among all labels chosen
Food	26
Utility bills	25
Education expenses	20
Medical expenses	10
Rent payment	6
Mortgage payment	5
Business expenses	5

4   Impact analysis: methodology and econometric specification

Besides the general take-up and usage, the impact of the labeling feature is investigated along the following two lines:

a) *Effect on migrant's remitting behavior* – we examine whether the treated migrants with the labeling function in Padalapp behave differently from the control group with respect to remitting to the target beneficiary and the target household. Once the labeling function is activated, when offered the labeling feature the migrant is naturally taken to think about budget allocations and may decide to adjust remittances along different margins. She may deem that she was sending too little or too much.

b) *Effect on target household expenditure allocations* – via the endline surveys to both the target household and the migrant, we can evaluate whether the labeling function had some effects on the expenditure allocations of the household; in particular, whether the suggestions of the migrant were (at least partly) followed and which mechanisms activated this behavioral change – more or better information and communication that could improve the agreement on budget allocations and the management of those allocations. The focus will be on the priority expenditure items that the migrant already picked when asked to indicate the target beneficiary and the target household with the lottery prize (see Section 2.2).

In analysis a), we compare the treatment and the control group values of the following remittance outcomes:

- Indicator: sent any remittances (1 if any remittance transactions, 0 otherwise)

- Number of remittances sent (count of number of remittance transactions)

- Amount sent: total in Philippine pesos (PhP), summed across all transactions,

  - winsorized at 99th percentile of the full distribution of non-zero weekly amount sent in the data

- Log of amount sent: natural log of 1+x, where x is total in PhP, summed across all transactions (not winsorized)

A Kling et al (2007) index of the above four variables in analysis b), we consider the expenditure data on the priority items of the target household from the endline survey. Each variable is reported in the household survey as total expenditure in the category in the last three (3) months in Philippine pesos (PhP). We recall the priority item categories: food, medical expenses, business expenses, education, housing,[3] phone/communication, clothes, and other. If two or more items are allocated the same amount in this question, we considered the union of these categories to be one "priority item".

We also examine impacts of the labeling treatment on the following secondary outcomes in the target household, measured in the endline survey. Data is recorded in the survey in Philippine pesos (PhP). Due to the potential existence of outliers, the variable is expressed in natural logarithms in the analysis. (If the variable x contains zeros, we take the natural log of 1+x).

- Total household expenditures
- Expenditures on food
- Expenditures on medical expenses
- Expenditures on business expenses
- Expenditures on education
- Expenditures on housing (as defined in footnote 2 above)
- Expenditures on phone and communication
- Expenditures on clothes

---

[3] The "housing" category will group utility bills, rent, mortgage payments, house construction and repairs, land and property down payments, and other free-text-entered housing-related expenditures.

- Expenditures on all other items

Econometric specification

The investigations for a) and b) above are performed with standard econometric models.

a) Impact of labeling treatment

The effect of labeling on the remitting behavior of migrants, as in analysis a) above, is estimated with the following ordinary least-squares regression equation for outcome Y_{it} of individual i in period (week) t. This regression estimates intent-to-treat (ITT) effects of the labeling treatment.

(1) $Y_{it} = \alpha + \beta\, T_{it} + \theta_i + \pi_t + \varepsilon_{it}$

T_{it} is an indicator that study participant i has been randomly assigned to the treatment group and that week t is on or after the randomly assigned week that the labeling function was enabled by the study. θ_i is an individual (study participant) fixed effect, and π_t is a week fixed effect. Individual fixed effects account for individual-specific time-invariant factors affecting remittances. Because the treatment is randomly assigned, individual fixed effects are not necessary for identification, but they improve precision by reducing residual variation, and also deal with chance imbalances across treatment and control groups that may exist in spite of random treatment assignment. Time fixed effects account for time-varying factors that are common to all observations and also help reduce residual variation. α is a constant term, and ε_{it} is a mean-zero error term. The coefficient β is the estimate of the causal impact of the treatment on remittances.

The impact of the labeling treatment on remittances can vary depending on some personal characteristics and therefore be heterogeneous along different dimensions. We estimated the regression equation (1) in subsamples defined by mutually exclusive values of the following baseline migrant characteristics (all of which are binary variables):

- Indicator: instructs remittance recipient or participates in decisions over how to use remittances

- Indicator: wishes had more control over how the recipient uses remittances

- Indicator: remittances sent (in pesos, total over pre-treatment weeks 1-5 reported in Padalapp) is above median

- Indicator: migrant sent at least one SMS to a remittance recipient via Padalapp in pre-treatment weeks 1-5

- Indicator: respondent is female

- Indicator: target beneficiary is study participant's parent

- Indicator: monthly income is above median

b) Impact on target household expenditure

For analysis b) above (the impact of the labeling treatment on target household expenditure on the study participant's priority item) as well as all *Secondary Analyses*, we estimate the following ordinary least-squares regression equation for outcome Y_i of the target household of study participant i. This regression estimates the intent-to-treat (ITT) effects of the labeling treatment. There are no period subscripts because there will be only one observation per household.

$$Y_i = \zeta + \sigma\, T_i + X_i' \gamma + \varepsilon_{it}$$

T_i is an indicator that the target household's migrant study participant (indexed by i) was assigned to the treatment group. A vector of baseline (pre-treatment) control variables X_i is included in the regression (specified below). They are not necessary for identification, but they improve precision by reducing residual variation and also deal with chance imbalances across treatment and control groups that may exist in spite of random treatment assignment. ζ is a constant term, and ε_{it} is a mean-zero error term.

The coefficient σ is the estimate of the causal impact of the treatment on the household-level outcome.

5   Results

The presentation of the results follows the distinction between the two econometric specifications above and refers to the two major questions of this project, i.e. the impact of labeling on remitting behavior of migrants and the impact on household expenditure.

a) Impact of labeling treatment

The general impact of labeling on the migrants' remitting behavior is presented in Table 5. The estimate of the effect of the treatment is the coefficient on the treatment indicator in equation (1) above for the different variables of interest. We find a significant effect on the probability of sending remittances (column (1) in Panel (a)), whereas for all the other outcomes the coefficient on treatment is small in magnitude and not statistically significantly different from zero.

Table 5: Main regression results: impact of labeling on remittances

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.007*	0.007	-29.784	0.054	0.013
	(0.004)	(0.006)	(122.030)	(0.039)	(0.012)
Control Mean	0.128	0.163	2338.500	1.191	0.000
Adjusted R-Squared	0.010	0.007	0.003	0.010	0.009
Observations	137927	137927	137927	137927	137927
# of Respondents	4451	4451	4451	4451	4451

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

We estimated the regression equation (1) in subsamples as described above and we report here the most interesting results. All the other estimates for subsamples are included in the Appendix.

Table 6 presents the treatment effects when dividing the sample according to the pre-treatment level of remittances sent. The estimated treatment coefficients indicate a consistent positive effect of labeling on all remitting dimensions when the sample included migrants that were sending below the median in the first 6-9 weeks before the labeling feature was activated in Padalapp. The same effects are not found in the other half of the sample whose migrants were already remitting more. The estimated coefficients are not statistically significant and some of them even point to a tendency to decrease the number of remittances and the amount sent. It appears that the possibility of labeling remittances via Padalapp has led migrants in the low-baseline-remittance subsample to send more remittances.

Table 6: Main regression results by subsamples based on migrant pre-treatment remittance levels

(a) Subsample: Remittances sent during pre-treatment period is ***below*** median

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.010***	0.012***	174.938**	0.083***	0.027***
	(0.003)	(0.004)	(73.573)	(0.031)	(0.009)
Control Mean	0.038	0.043	519.224	0.345	-0.265
Adjusted R-Squared	0.012	0.010	0.006	0.012	0.012
Observations	74632	74632	74632	74632	74632
# of Respondents	2408	2408	2408	2408	2408

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

(b) Subsample: Remittances sent during pre-treatment period is ***above*** median

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.001	-0.003	-335.823	-0.008	-0.011
	(0.007)	(0.012)	(242.877)	(0.068)	(0.022)
Control Mean	0.233	0.302	4466.707	2.182	0.310
Adjusted R-Squared	0.026	0.019	0.009	0.025	0.023
Observations	63295	63295	63295	63295	63295
# of Respondents	2043	2043	2043	2043	2043

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

Table 7 shows that there is also heterogeneity in the labeling treatment effect with respect to baseline income levels. The migrants for which the labeling feature triggers a significant increase are those with relatively higher income (i.e. income above the median).

Table 7: Main regression results by subsamples based on migrant pre-treatment income level

(a) Subsample: Respondent's monthly income is **below** median

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.002	0.003	15.825	0.008	0.004
	(0.006)	(0.009)	(162.837)	(0.056)	(0.018)
Control Mean	0.122	0.151	1821.709	1.111	-0.033
Adjusted R-Squared	0.010	0.008	0.003	0.010	0.009
Observations	61854	61854	61854	61854	61854
# of Respondents	1996	1996	1996	1996	1996

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

(b) Subsample: Respondent's monthly income is **above** median

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.011**	0.010	-56.196	0.093*	0.021
	(0.006)	(0.009)	(177.163)	(0.053)	(0.017)
Control Mean	0.133	0.173	2767.242	1.258	0.028
Adjusted R-Squared	0.010	0.007	0.003	0.010	0.008
Observations	76073	76073	76073	76073	76073
# of Respondents	2455	2455	2455	2455	2455

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

In Appendix Tables A1 through A5 we examine treatment effects in other subsamples defined by different baseline characteristics and survey responses, but do not find heterogeneity in treatment effects along other dimensions. We recall that Table 4 shows the most commonly used labels and the frequency with which they were used. The three most common labeled remittances were for food, utility bills, and education expenses.

b) Impact on target household expenditure

Given the positive impact of the labeling treatment on the subsample of low-baseline-remittances migrants, we now turn to asking whether there is also an impact on household expenditure patterns.

Table 8 presents regression coefficient estimates of the impact of labeling on log household

expenditures on the migrant's priority item, in total, and in different subcategories. We show estimates for the full sample (column 1) and for subsamples split by pre-treatment remittance levels (columns 2 and 3). Migrant priority expenditure items were reported by migrants in the pre-treatment (baseline) survey.

Table 8: Impact of labeling on household expenditures, various categories

	Treatment effect		
	(1)	(2)	(3)
	General	Below Median	Above Median
Log of household's expenditure on migrant's priority item	-0.200	-0.189	-0.225
Log of total household expenditures	0.039	0.088	-0.009
Log of household expenditures on food	-0.023	0.034	-0.076
Log of household expenditures on medical expenses	0.253	0.862***	-0.270
Log of household expenditures on business expenses	0.231	0.058	0.374*
Log of household expenditures on education	-0.432**	-0.429	-0.448*
Log of household expenditures on housing	0.050	0.117	-0.037
Log of household expenditures on clothes	-0.152	-0.251	-0.113
Log of household expenditures on phone and communication	-0.344**	-0.148	-0.476***
Log of household expenditures on all other items	0.102	0.275	-0.029

Stars indicate significance at the 10% (*), 5% (**), and 1% (***) levels.

The results do not actually point towards labeling moving household expenditures towards migrants' priority items (as migrants specified prior to treatment) – the point estimates in the first row are actually negative in sign (although not statistically significant). There is also no large or statistically significant impact on log total household expenditures (row 2). There is a scattering of effects on other specific expenditure items, including (surprisingly) negative impacts on educational expenditures. We can propose no obvious reason why the treatment may have reduced educational expenditures. There is a reduction in phone and communication expenditures, which may be due to the labeling messaging reducing the need for phone or communication expenditures. There is a positive effect on medical expenditures in the below-median remittances subsample.

Taken together, these results provide mixed evidence on whether labeling gives migrants more control over how their remittances are spent. Labeling does not lead to higher expenditures on migrant priority items. In only one area, medical expenses, is there a positive impact on expenditures. This increase in medical expenditures in the below-median-remittances subsample mirrors the increase in remittances seen in this subsample (Table 6a above), and so it is possible this reflects increased control on the part of migrants in this

subsample

6 Conclusion

We conducted a randomized experiment of the impact of remittance labeling among Filipino migrant workers in the UAE. The ability to label remittances with the migrant's intended uses leads migrants with low levels of baseline (pre-treatment) remittances to increase their remittance levels. There is no effect of labeling for migrants with initially higher remittance levels.

We also examined impacts of remittance labeling on household expenditures in treated migrants' remittance-recipient households in the Philippines. The labeling treatment does not actually lead to higher expenditures on uses that migrants report as priority items (in the full sample or in subsamples split by baseline remittances). In the low-baseline-remittance subsample, labeling does lead to higher medical expenses, but has no effect on any of several other household expenditure items. We view this as mixed evidence as to whether labeling leads to changes in household expenditures towards the purposes preferred by migrants.

It is possible that migrants in the low-baseline-remittances subsample believe that labeling will be effective at shifting household expenditure patterns, and therefore send more remittances in response to labeling being available. They may not realize that households are not actually substantially shifting their expenditures in response to labeling. This raises the possibility that migrants may later learn that labeling is not having an effect on household expenditure patterns and reduce their remittances as a result. This would mean that labeling has a short-term positive impact on remittance sending (for low-baseline-remittance migrants), but this impact declines or disappears in the long term.

The possibility of declining or disappearing treatment effects over the longer term means that it is valuable to continue to monitor remittances of study participants over a longer time frame, to ascertain whether treatment effects in fact do decline. If they do not, it could mean that migrants do not ever (fully) realize that household expenditure patterns are not shifting as they would desire, and so continue to send higher remittances in response to labeling. Alternately, it could mean that labeling positively affects migrant remittances via a different channel or mechanism (other than enhancing migrant control over household expenditure patterns). For example, migrants with access to the labeling feature may do a better job

budgeting and tracking how much they are sending in remittances, and perhaps become more likely to send more frequent and higher levels of remittances as a result. Exploring these possibilities is a high-potential area for future research on labeled remittances.

References

Ashraf, Nava, Diego Aycinena, Claudia Martinez A., and Dean Yang, "Savings in Transnational Households: A Field Experiment among Migrants from El Salvador," *Review of Economics and Statistics*, Vol. 97, No. 2, May 2015, pp. 332-351.

De Arcangelis, Giuseppe, Majlinda Joxhe, David McKenzie, Erwin Tiongson, and Dean Yang, "Directing Remittances to Education with Soft and Hard Commitments: Evidence from a Lab-in-the-field Experiment and New Product Take-up among Filipino Migrants in Rome," *Journal of Economic Behavior and Organization*, Vol. 111, March 2015, pp. 197-208.

Kling, Jeffrey, Jeffrey Liebman, and Lawrence Katz (2007): "Experimental Analysis of Neighborhood Effects," *Econometrica*, 75(1), 83–119.

Soman, D. and A. Cheema "Earmarking and partitioning: increasing saving by low-income households," *Journal of Marketing Research*, 48, 2011, pp. S14-S22.

Thaler, Richard, "Mental accounting matters," *Journal of Behavioral Decision Making*, 12, 1999, pp. 183-206.

World Bank (2021). *Resilience: Covid-19 crisis through a migration lens.* Migration and Development Brief, 34.

Appendix: additional results

Appendix Table A1. Main regression results in subsamples split by whether migrant participates in household decisions over how to use remittances

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.005	0.006	-117.340	0.039	0.008
	(0.006)	(0.009)	(172.784)	(0.053)	(0.017)
Control Mean	0.112	0.141	1985.027	1.043	-0.048
Adjusted R-Squared	0.011	0.008	0.003	0.010	0.009
Observations	66657	66657	66657	66657	66657
# of Respondents	2151	2151	2151	2151	2151

Subsample: Respondent DOES NOT participate in decisions over how to use remittances

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.009	0.007	51.759	0.067	0.019
	(0.006)	(0.009)	(171.895)	(0.055)	(0.018)
Control Mean	0.142	0.182	2665.292	1.329	0.044
Adjusted R-Squared	0.009	0.007	0.003	0.009	0.008
Observations	71270	71270	71270	71270	71270
# of Respondents	2300	2300	2300	2300	2300

Subsample: Respondent participates in decisions over how to use remittances

Appendix Table A2. Main regression results in subsamples split by whether migrant wishes they had more control over remittances

	(1) Migrant has sent at least 1 remittance this week	(2) Number of remittances sent by migrant this week	(3) Amount of remittances sent by migrant this week (winsorized)	(4) Log of amount of remittances sent by migrant this week	(5) Remittance Index
Treatment	0.006	0.009	-45.362	0.050	0.013
	(0.005)	(0.008)	(155.629)	(0.048)	(0.015)
Control Mean	0.120	0.152	2164.920	1.119	-0.023
Adjusted R-Squared	0.011	0.008	0.004	0.010	0.009
Observations	86925	86925	86925	86925	86925
# of Respondents	2805	2805	2805	2805	2805

Subsample: Respondent DOES NOT wish they had more control over how recipient uses remittances

	(1) Migrant has sent at least 1 remittance this week	(2) Number of remittances sent by migrant this week	(3) Amount of remittances sent by migrant this week (winsorized)	(4) Log of amount of remittances sent by migrant this week	(5) Remittance Index
Treatment	0.006	0.009	-45.362	0.050	0.013
	(0.005)	(0.008)	(155.629)	(0.048)	(0.015)
Control Mean	0.120	0.152	2164.920	1.119	-0.023
Adjusted R-Squared	0.011	0.008	0.004	0.010	0.009
Observations	86925	86925	86925	86925	86925
# of Respondents	2805	2805	2805	2805	2805

Subsample: Respondent wishes they had more control over how recipient uses remittances

Appendix Table A3. Main regression results in subsamples split by whether migrant sent any SMS message prior to treatment

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.005	0.004	-28.694	0.039	0.009
	(0.004)	(0.006)	(116.547)	(0.038)	(0.012)
Control Mean	0.094	0.117	1749.371	0.877	-0.097
Adjusted R-Squared	0.006	0.004	0.002	0.006	0.005
Observations	107193	107193	107193	107193	107193
# of Respondents	3459	3459	3459	3459	3459

Subsample: Migrant sent NO SMS to any recipient during pre-treatment period

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.004	0.003	-209.616	0.018	0.001
	(0.011)	(0.018)	(357.557)	(0.098)	(0.033)
Control Mean	0.242	0.317	4325.998	2.251	0.328
Adjusted R-Squared	0.032	0.025	0.011	0.031	0.029
Observations	30734	30734	30734	30734	30734
# of Respondents	992	992	992	992	992

Subsample: Migrant sent at least ONE SMS to any recipient during pre-treatment period

Appendix Table A4. Main regression results in subsamples split by whether migrant is male

	(1) Migrant has sent at least 1 remittance this week	(2) Number of remittances sent by migrant this week	(3) Amount of remittances sent by migrant this week (winsorized)	(4) Log of amount of remittances sent by migrant this week	(5) Remittance Index
Treatment	0.009	0.002	-99.967	0.075	0.012
	(0.007)	(0.010)	(218.455)	(0.065)	(0.021)
Control Mean	0.093	0.116	1773.140	0.873	-0.098
Adjusted R-Squared	0.007	0.005	0.002	0.007	0.006
Observations	35637	35637	35637	35637	35637
# of Respondents	1150	1150	1150	1150	1150

Subsample: Respondent is Male

	(1) Migrant has sent at least 1 remittance this week	(2) Number of remittances sent by migrant this week	(3) Amount of remittances sent by migrant this week (winsorized)	(4) Log of amount of remittances sent by migrant this week	(5) Remittance Index
Treatment	0.006	0.008	-8.133	0.045	0.013
	(0.005)	(0.008)	(145.610)	(0.047)	(0.015)
Control Mean	0.140	0.179	2532.641	1.301	0.034
Adjusted R-Squared	0.011	0.008	0.004	0.010	0.010
Observations	102290	102290	102290	102290	102290
# of Respondents	3301	3301	3301	3301	3301

Subsample: Respondent is Female

Appendix Table A5. Main regression results in subsamples split by whether target beneficiary is migrant's parent

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.011*	0.012	-31.564	0.082	0.022
	(0.006)	(0.009)	(177.637)	(0.057)	(0.018)
Control Mean	0.139	0.178	2523.894	1.288	0.031
Adjusted R-Squared	0.011	0.009	0.003	0.011	0.010
Observations	71026	71026	71026	71026	71026
# of Respondents	2292	2292	2292	2292	2292

Subsample: TB is NOT respondent's parent

	(1)	(2)	(3)	(4)	(5)
	Migrant has sent at least 1 remittance this week	Number of remittances sent by migrant this week	Amount of remittances sent by migrant this week (winsorized)	Log of amount of remittances sent by migrant this week	Remittance Index
Treatment	0.003	0.001	-30.910	0.021	0.003
	(0.005)	(0.008)	(166.749)	(0.051)	(0.016)
Control Mean	0.116	0.146	2137.570	1.086	-0.034
Adjusted R-Squared	0.009	0.006	0.003	0.009	0.008
Observations	66901	66901	66901	66901	66901
# of Respondents	2159	2159	2159	2159	2159

Subsample: TB is respondent's parent