CGAP

FINTECHS
AND
FINANCIAL INCLUSION
LESSONS LEARNED

Five Innovation Areas

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INTRODUCTION

A**S FINTECH COMPANIES TARGETING POOR AND** underserved customers grow and scale, there is a lack of granularity on how their business models solve pain points in financial inclusion and what the industry can learn from the iterations in their business models. CGAP launched a fintech initiative in 2016 to better understand these innovations and draw clear linkages to financial inclusion, where they existed. We worked with 18 fintechs in Africa and South Asia that targeted financial services to low-income or underserved customers in their markets. Our goal was to learn about the innovations and generate insight on whether (i) the services work as stated, (ii) create value for underserved customers, and (iii) ease age-old pain points in delivering financial services to the underserved. Our insights are detailed in "Fintechs and Financial Inclusion." This paper is a companion piece that takes a closer look at each of the fintechs in our study. To frame our research, we grouped the 18 fintechs into five different areas innovation areas:

- Interactive customer engagement

- Smartphone-based payments

- Connections-based finance

- Location-based smallholder finance

- De-risking unproductive expenses

In each case, we describe the service that was piloted, the nature of our testing, and emerging lessons. Since the products in the pilots differed widely, each pilot has its own metrics for success. Some pilots have quantitative metrics, while others have qualitative metrics. As is the nature of start-up innovation, not all pilots were successful. In fact, few were successful in exactly the way we envisioned. When they were successful, we saw the spark of innovation and impact burning bright and shining a light on financial inclusion of underserved customers. Even when pilots were not successful, they exposed areas that need to be reconsidered and reworked. These were just as valuable. We also conducted independent research with the staff and customers of seven of the start-ups, in collaboration with the Busara Center for Behavioral Economics.

INNOVATION **1**:
INTERACTIVE CUSTOMER ENGAGEMENT

PILOTS WITH JUNTOS, ARIFU, AND PEOPLE'S PENSION TRUST tested, Interactive Customer Engagement. These fintechs use mobile phones and other communication technologies to offer interactive engagement with customers that reduces the cost and effort of engaging with them. They ease complaint resolution, feedback gathering, and information dissemination. The result is greater use, trust, and loyalty.

Juntos

Juntos enables automated two-way conversations through mobile messaging with customers using financial services. The messaging is customized, dynamic, and friendly. Juntos adapts the frequency and content of messages based on customer reactions. This tailored communication makes financial services more accessible and interactive and can help build more confidence in financial services providers (FSPs). FSPs can use Juntos to initiate conversations with customers to engage them and to influence their engagement over time. This can help FSPs reach specific targets (e.g., to drive uptake and use of existing or new products or cross-sell products and services). While its delivery channel is low-tech, Juntos uses processes on the back-end to analyze the effect of different messaging strategies and to identify the best messaging strategies for its clients.

PILOT
CGAP and Juntos worked with mobile money providers Tigo Money in Paraguay and Mynt in the Philippines to test Juntos' ability to increase mobile wallet use among customers. In each case, Juntos developed a tailored messaging strategy by iterating test messages on a treatment group, measuring its effects, and over time narrowing down to the ones with the most effective impact. The messages first established relationships with customers and then gave them information about how to better use the products. The platform identified over time which SMS communications strategies built successful relationships and adapted the strategies accordingly to drive increase in mobile wallet use.

RESULTS

The messaging service increased customer use of mobile wallets in different ways. In Paraguay, customers who participated in the SMS conversations showed a 21 percent increase in mobile wallet transactions after two months. In the Philippines, customers transacted 7 percent more after four months. In both cases, SMS messaging proved to be a scalable way for providers to interact with their customers and drive key business metrics like frequency of transactions, including with customers who have dormant accounts. It also was a cost-effective way of communicating with agents.

FIGURE 1. **Average number of transactions during treatment month and one month after treatment**

Metric definition:
The average number of menu transactions represents the average of menu transactions completed per user in a given month

Average menu Txns: Monthly Menu Txns per User (JUNTOS vs. Control)

We observed that the Juntos treatment achieves impact not only in the month of treatment but also the month after.
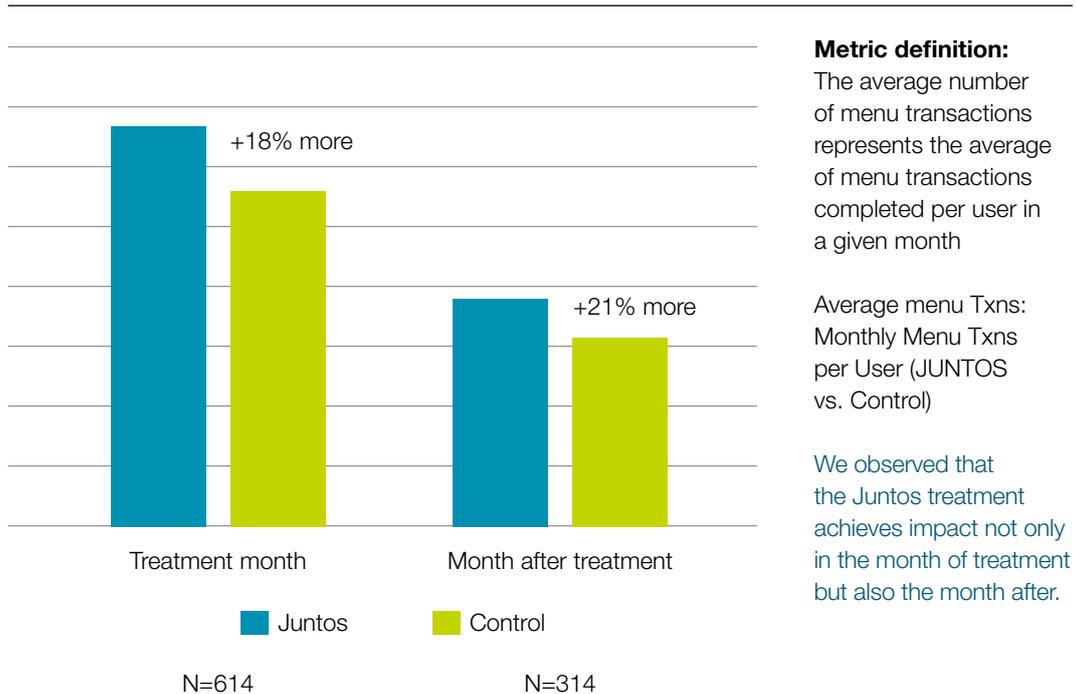
LESSONS LEARNED

1. Juntos' ability to generate robust analytics on engagement on its platform and with the consequent increase in use of the financial services was integral to understand its value proposition to the customer and to the FSP.

2. Communications strategies with each FSP were different, highlighting the fact that lessons are context-specific, and not one-size-fits-all. Spending the time to test and learn what works for each audience and tailoring the relationship can make a significant difference.

In the case of Tigo Money, some of the most successful strategies for building customer relationships included:

- **Sharing social proof.** Sharing hypothetical stories (based on real use cases) of people successfully using their mobile wallets motivated customers to use their own wallets.

- **Gradually increasing messaging.** Sending more than four messages in the first week of engagement had a negative effect. Starting with one or two messages a week and then increasing the messaging frequency over time was more successful.

- **Providing information.** Customers demonstrated more interest in messaging experiences that included "secret tips" as a part of the conversation, as opposed to general instructive information.

- **Initiating question-and-answer conversations.** The communications strategy that led to the highest increase in number of transactions established customer relationships through question-and-answer conversations that asked customers to share their financial experiences. This format personalized the conversation and distinguished it from mass-marketing campaigns.

FIGURE 2. **Examples of conversations between Juntos and a customer**

> Start little by little to save for major purchases. Set aside P100 each week. What are you saving for?

> Christmas gift for my family, noche buena, media noche, and new years eve.

> Did you get your GCash Mastercard? Text YES or NO

> No...how do I get one?

> You can get a GCash Mastercard from any Globe Store for a cheap value of P150.

> What are the benefits that I'll get if I sign up for one?

> Tell us why you stand in line at the bank and and we can show you how to save time by using GCash. A. Send Money / B. Save Money / C. Ask Questions

> C

> Have GCash-related questions we can help you with? You can always text us for more information. Or call 2882 for technical issues. All for free.

> Where can I deposit money to my GCash card, aside from Globe Centers?

> You may load your GCash at the following: Globe Stores, Puregold outlets, SM, Tamunting or Villarica pawnshop branches. Hope this helps!

> Thank you very much.

> You're welcome. We are happy to help you!

■ Juntos
■ Customer

In contrast, the most successful strategies for Mynt were:

- **Offering choices.** Customers were able to select the language they wanted to use—English, Tagalog, or Taglish (a frequently used blend of Tagalog and English).

- **Shaping the conversation.** Customers chose the topics of conversation (saving, using Mynt socially, building a business, etc.). These tests resulted in response rates of up to 38 percent.

- **Feeling heard.** Customers were particularly engaged when asked to share their feedback about the service, the product, or why they had not been using it. They shared specific, actionable product feedback.

Arifu

Arifu is a digital platform that provides personalized learning tools and information on products and services for underserved and underbanked customers. It partners with FSPs and targets their current and potential customers. Using SMS, it advises and educates users with the financial information and then links them to specific financial services offered by the FSP. Arifu tests customers at the end of an information module and uses results to track and influence user engagement and learning. If its FSP partner is able to integrate its customers' data with the Arifu platform, Arifu can measure progress on the platform and tailor its messaging to suit specific business goals. such as reducing dormancy and increasing use.

PILOT

In 2016, CGAP and Mercy Corps Agrifin Accelerate partnered with Arifu and Equity bank in Kenya to engage 100,000 Equity customers and noncustomers, especially women, youth, and smallholder farmers, through digital learning opportunities. Arifu sought to improve customer financial skills, business skills, and ultimately the use of Equity financial services. We focused on change in behavior related to account opening, dormancy reduction, and loan uptake, after customers had been targeted with modules on financial skills and business skills. At the end of each module, customers took a test, and the platform linked them to appropriate Equity products.

RESULTS

Before this project, Equity's learning programs were focused on three, somewhat overlapping, segments—women, youth, and smallholder farmers. Before launching the pilot, CGAP and Arifu researched these segments to better target the content. The research showed that, while demographic differences such as gender and age were important, more significant differences in information needs arose from customers' income flow and the types of business they ran. Successful female business owners defied every stereotype associated with lack of agency. They were not particularly interested in learning how to balance budgets; they wanted to understand how to access larger loans to expand their growing businesses. On the other hand, if a customer struggled with how to shape infrequent income into a manageable financial plan, age and gender were less important.

There was more than just a customer's demographics at play. Individual financial advice needed to be closely tied to income streams, and business advice needed to be based on the stage and nature of the business. Customers should be directed to customized

FIGURE 3. **Segments emerging from Arifu research with customers**

INDIVIDUAL SEGMENTS		BUSINESS SEGMENTS		
Day-to-day earner	Steady earner	Aspiring business	Full-time business	Agricultural business
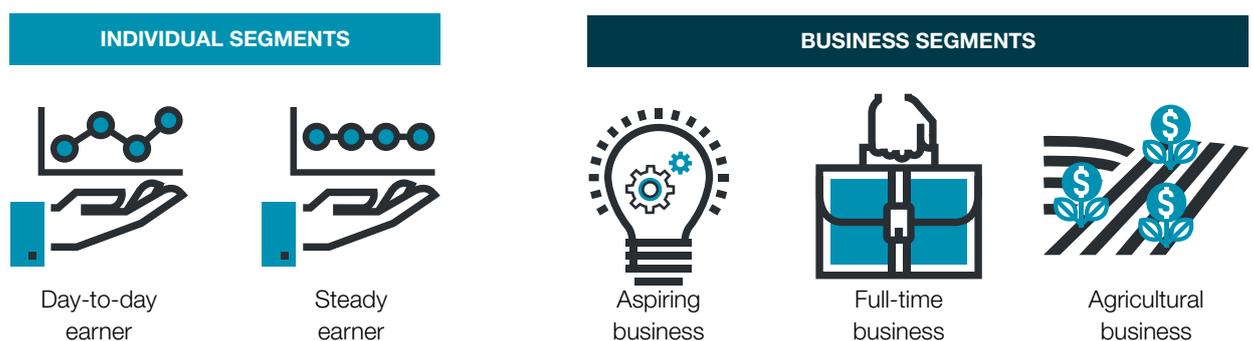
business advice, based on their stage and nature of earning, rather than exclusively focusing on their age and gender. These findings informed the structure of the modules and the algorithms behind the SMS content customers would see when they engaged with the Arifu platform.

At its launch, Arifu reached 223,396 learners, which was more than expected. However, 70 percent of users engaged with 10 messages or fewer, which was lower than expected. Customer engagement with Arifu's content correlated significantly with greater financial knowledge among customers. But the lack of randomized and comprehensive customer data from Equity during, before, and after the pilot prevented us from fully doing the following:

1. Measuring Arifu's effect on the use of financial services, such as account opening, deposits, withdrawals, and loans. As a result, it was not possible to conclusively show whether Arifu content could drive improved financial and business knowledge and lead to greater financial engagement.

2. Iterating, improving, and further testing changes with customers, based on changes in customer engagement with financial services.

However, Arifu was able to collect important demographic and preference information from its customers through initial customer research and within the first few SMS interactions on the Arifu platform. While there was not enough evidence to show that Arifu could change customer engagement, with better data analytics, Arifu may be able to help an FSP like Equity Bank to implement a segmentation strategy by better profiling and segmenting its current and potential customers' needs. In fact, after this project concluded, Arifu secured an independent contract with Equity Bank to expand engagement with 500,000 of its customers.

LESSONS LEARNED

Historically, financial literacy programs for the underserved have delivered mixed results, yet technology has the potential to deliver customized information and knowledge that is cheaper, scalable, and effective. However, technology itself is not enough; efforts need to focus on understanding the underserved community's need for information. It is also crucial to have robust mechanisms to measure the effects on engagement with financial services. Contracts between the learning platform vendor and the FSP need to include an adequate degree of data sharing, which improves the platform's ability to produce useful insights.

People's Pension Trust

People's Pension Trust (PPT), in Ghana, is a unique example in this group. PPT is a fully licensed pensions company that offers pensions to informal workers in Ghana, so that they can build a financial cushion for their old age. PPT customers save through lump-sum contributions (in cash or mobile money) and are promised return rates that exceed inflation, including fees. In cases of emergencies before retirement, members can withdraw up to 50 percent of nominal contributions without penalties.

Informal workers have volatile incomes, and it is difficult for them to make a monthly contribution for their old age. Without information and interaction that explains pensions products, they are unsure how the money grows and may not prioritize saving for the long term. Thus, they tend not to enroll in pensions, and when they do, they do not contribute regularly. Hence, it is rare to find a viable business model for this challenging product.

Many people assume that the poor don't want pensions. But PPT found that customers want safety nets for old age and that the key to driving engagement with pensions is better interactions, both physical and digital, that build customer trust. The problem becomes finding a viable business model. PPT sought to use communication technologies to test the effectiveness of increased interaction and behavioral nudges on pension contributions, thereby, creating a stable business model for informal pensions.

PILOT

PPT partnered with several organizations ranging from farmers associations, savings groups, and Vodafone Cash to reach a larger number of potential customers. At the end of the first quarter in 2018, PPT had rapidly grown its customer base from 400 to 8000, with each customer depositing an average of 18 times during the pilot period.

Simultaneously, CGAP and PPT conducted extensive behavioral testing to understand which digital nudges, such as SMS and phone calls, could complement physical interactions and cost-effectively encourage greater use. Nearly 1600 people participated in the pilot. They were divided into one control group and three treatment groups, each testing the effectiveness of different treatments. We used a combination of treatments such as SMS, mobile-money rewards, and automatic deductions on mobile wallets. The pilot ensured that a sparse but effective agent network was available to encourage customers to save regularly.

RESULTS

At the end of the pilot, the average one-time contribution was GHS 11. The average total contribution per active client over the pilot period was GHS 105, with 10 contributions per client on average. Each of the treatment groups showed greater engagement than the control group—on average, the treatment groups had 10 percentage points higher contributing clients (42 percent) than the control group (32 percent). In addition, withdrawals were lower than expected. The pilot assumed a 40 percent withdrawal rate while the actual withdrawal rate was only 15 percent.

The soft commitment group that had a set target savings amount achieved 62 percent of its goal; the average of all clients that had a target was 47 percent. However, the combined effort by PPT staff and the treatments had a modest effect on increasing the rate of clients using mobile wallets.

These results should be interpreted carefully. The results of the tests may have been affected by the fact that some agents gave extra time and attention to customers in the treatment group. Although the combined efforts of PPT staff and the treatments did increase the rate of clients using mobile wallets significantly, results were still low in absolute numbers. Even with strong financial incentives, up to GHS 50, to use the mobile wallet, only 7 percent of the 200 clients changed from cash payments to mobile payments despite calls and text messages. We concluded that people can be nudged to save for old age, but perhaps PPT's customer base cannot be nudged using only digital approaches yet.

In the end, no clear approach to PPT's overall strategy emerged. Additional analysis of treatment results and in-person research with a subset of customers showed that the considerable variation in occupation and location of customers indicated diverse needs for engagement, varied levels of activity, and differentiated delivery models.

LESSONS LEARNED

The pilot made it clear to PPT that it would need to reinvent its business model. It had to balance technology and "human" (high-touch) interaction in a cost-effective way, while at the same time being customer-centric and maintaining a long-term vision. Using the segmentation results as a guide, PPT focused its operations on three client segments: (i) rural cocoa farmers who operated within large semi-formal cocoa associations; (ii) urban market customers who require substantial face-to-face contact; and (iii) Vodafone clients who are completely digital. In the first two high-touch customer segments, agents would have targets to nudge customers toward digital payments. (See Table 1 for a summary of PPT's segmentation strategy.)

TABLE 1. **PPT's segmentation strategy**

Segment	Need	Strategy
Urban market vendors	Customers operate in volatile urban markets in Accra and in volatile professions with volatile earnings. Many competitors for long-term savings product with agents visiting daily.	High costs because many in-person visits are necessary. Assign 2 agents to jointly manage 2–4 markets together so they can substitute for each other, as needed. Visit every customer weekly, but slowly convert 10-20% to digital every few months.
Rural cocoa farmer associations	Strong "formal" and organized informal associations. Looking for formal pensions they can contribute to. But remotely located with low digital capabilities.	Moderate costs because cost of acquisition is high, but costs decrease after acquisition. Appoint and train agents within the associations. They would be both customers and sales agents. Keep regular communication between headquarters and these agents and make monthly visits. It is not necessary to set up expensive branches and agent forces. Slowly convert 10-20% to digital every few months.
Vodaphone customers	Comfortable with fully digital experience.	Low costs. Remain 100% digital. Low operation costs. Focus on steady, older customers who can become regular pension contributors.
Small business customers	Employees of small companies without pension plan and/or individuals who want to save additional money.	Low costs. Require a fully digital experience and full access to account details. Contribute high amounts with each deposit and will help balance costs for lower-income groups.

INNOVATION **2**

SMARTPHONE-BASED PAYMENTS

PILOTS WITH WAVE MONEY, NALA AND HOVER, AND FUNDU were conducted to better understand how the spread of smartphones and mobile-phone use has spurred fintechs to create innovative applications that leverage intuitive user interfaces and user experiences (UI/UX) to reduce dormancy in payments and encourage greater use. These applications are for the mass market, underserved customer. They are often designed to use less data and storage and to appeal to younger, tech-savvy, yet largely underserved, populations in emerging markets.

Wave Money

Wave Money, in collaboration with CGAP and Small Surfaces, created a digital application for mobile-based payments in Myanmar. Since Myanmar has over 80 percent smartphone penetration, Wave money saw an opportunity to offer easy-to-use payment services to low-income customers.

PILOT

The pilot tested a mobile wallet app for smartphones that leverages the principles of human-centered design. After iterative customer research, prototyping, and testing, the pilot focused on low-income users' experience with the interface and its features. (For more details, see Gregory Chen, "The Power of Smartphone Interfaces for Mobile Money," CGAP blog post, 6 October 2016, http://www.cgap.org/blog/power-smartphone-interfaces-mobile-money).

RESULTS

Customers indicated that the application makes it easier for them to transact, specifically to pay bills. The app reduced the potential for errors in the payment amount or in the account being paid. It offered a more user-friendly interface than that of USSD. However, when it comes to finance, despite user-friendly features, a large part of the customer base still prefers to transact primarily through agents. It is hard to estimate the impact of the app because USSD was never widely used, and therefore, there was no baseline with which to compare app-based use. (See Figure 4.)

FIGURE 4. **Wave Money screens**

LESSONS LEARNED

Some lessons learned from the pilot may be useful to any company looking to build an app, especially companies that are targeting low-income customers.

- Allow new users to explore the service before they register for full use. Video, images, or text can be used to explain how the service can be useful.

- Provide in-app guidance by using the GPS location feature on smartphones and access to agents' addresses and phone numbers so that users can find the most convenient or most reliable agent. Access to agents is critical for mobile money.

- Initial application sign-up is a barrier. Reduce the number of steps in the application process and make each step simple and clear to speed customer acquisition.

- Customers dislike navigation within hierarchical USSD menus. Allow users to navigate directly to what they want through "quick access" options.

- Avoid "navigating" and focus on "doing" within menus. Use a short list of options. Avoid technical jargon; instead, offer direct links to action steps. Users prefer quick visual cues over text. Select visual cues carefully to link to users' experience with enough visual detail to communicate but not too much detail, which overwhelms.

- Iterate on clear icons that local users can understand. Icons that are initially expected to work often end up confusing customers. It is critical to test prototypes in local environments.

- Use plain language and make it consistent with how people communicate locally. Choose words that are locally used in everyday discussion.

- Leverage Android design practices that are familiar to users. Input fields, push notifications, header bars, menus, and other patterns should be consistent with design and navigation users may already be familiar with. For example, new apps in the Kenyan market have adopted language, flows, and visual cues in line with M-Pesa.

- Present a few choices based on customers' past use or popular actions. Where possible, build in prefilled and prioritized choices based on each user's prior use.

- Use information already saved to the phone to help users quickly fill in transactions and to help reduce key-punching errors. Apps can speed up many transactions and decisions by automatically pulling information from a user's contact list.

- Provide space for feedback. This will reduce customer frustration and improve complaints handling, while it also builds user confidence and proficiency.

- Allow customers to confirm steps and reassure them along the way by reinforcing each action.

- Allow customers to review past transactions as reminders, for evidence in the event of a mistake and for peace of mind. The app should have interactive features that customers can use to easily repeat past transactions. Where possible, create opportunities for users to view the status of a transaction.

- Give users clear pathways to resolve problems. Don't make users feel as if it is their fault when something goes wrong. Handling errors is an opportunity to address customers' frustrations.

- Customized, simple keyboards make it easier for users to input their information and navigate the app.

- Provide a fee calculator alongside transactions as an immediate, easy-to-use tool for users.

- Transactions can take place over several screens. Consolidate summary transaction information onto one screen so that users can feel confident in what they are doing, and they will likely make fewer errors.

- Make finding the account balance easy. The design should allow users to easily hide their balance on the screen away from the prying eyes of family or others. Users want quick information on their balances and privacy.

NALA and Hover

We worked with two companies on this pilot. NALA is a smartphone-based mobile app that uses USSD to communicate to mobile money providers. The interface is secure and enables users to pay for goods and services, make person to person (P2P) transfers, withdraw money from different agents, and buy airtime bundles, while relying only on USSD and not on expensive data packages. This approach encourages the use of mobile payments among a large group of customers who have smartphones, but only limited data packages. Unique features such as "transaction history" and "budgeting tools" and the ability to manage several SIMs provide customers with more information, builds trust and confidence in mobile payments, and increases the range of use cases beyond P2P transfers. NALA's partner, Hover, provides developers the technology to integrate mobile money into their applications, even when APIs and payment integration do not exist.

PILOT

CGAP supported Hover, a technology solutions provider, and NALA, a Tanzanian fintech to conduct (i) user-experience testing to design and improve the payment app interface and usability, (ii) explore opportunities for features that could be added to the NALA app, and (iii) understand the core value proposition that resonated with customers. The goal was to understand specific barriers and challenges of different customer segments and how the app could be designed to help overcome these.

RESULTS

Qualitative results show impact in use, specifically for bill payments. Many customers reported using agents for payments before NALA because transactions were complicated and they were afraid to make mistakes. Many switched to using the NALA self-service app because their earlier concerns were mitigated. Some users had more than one account saved for a given service because they were using the app to make payments for family members who did not have a smartphone.

After measuring and analyzing the mobile money use patterns of 59 people over a six-month period, Hover and NALA found that overall frequency increased by more than 20 percent once those 59 users began transacting through the NALA app. Additionally, their average weekly balance gradually increased over time. This may suggest that as use increased, customers increasingly began using their mobile money account as a store of value.

Comparing the mobile money use of 59 customers before and after their first NALA transaction showed that, after NALA was introduced:

1. The overall number of transactions per user per month increased by ~22 percent.

2. Users made more frequent debit transactions, but of lesser value per transaction.

3. Users' average running balance increased and became more stable.

The chat support feature, where users could provide feedback or ask questions, was important in building customer trust in the app, especially in the early days, post launch. Despite significant effort to simplify onboarding based on customer feedback, many users still struggle to complete the onboarding on their own and the chat support feature was actively used. A challenge in providing standardized instructions was that some of the steps, specifically those related to permissions to access the Contacts and other functionalities, differed by smartphone, so the ability to provide tailored support through the chat was valuable. (See Figure 5.)

FIGURE 5. **NALA application screens**
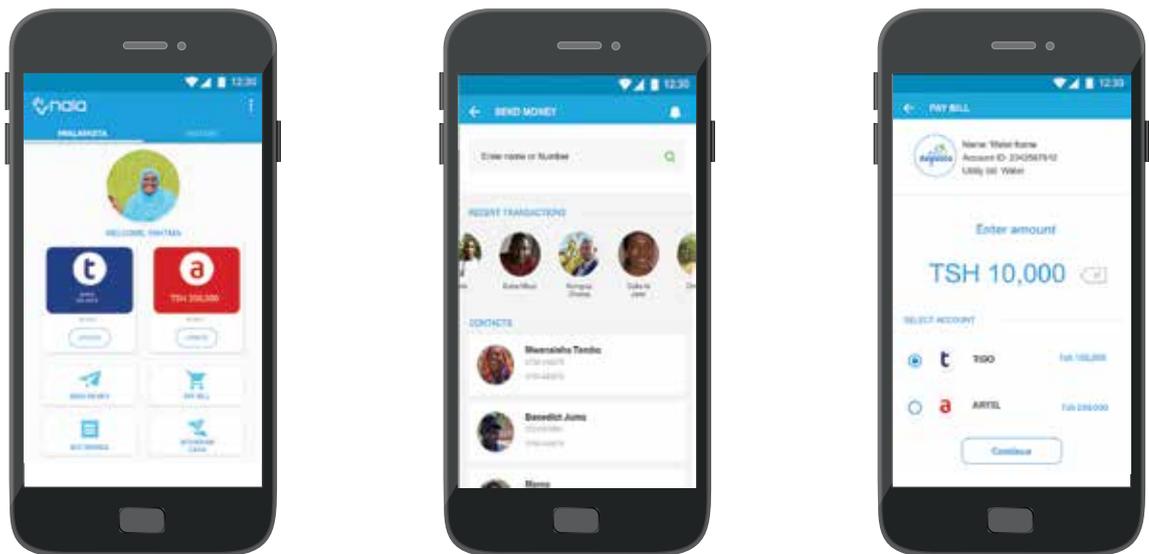
LESSONS LEARNED

NALA succeeded because of its aspirational appeal to its customers, many of whom were young and came from middle- or low-income communities. Customers valued an application that was built by Tanzanians and had a "cool factor" without being expensive. Many users mentioned that the app was a unique way to make payments—it was something different that they could show to their friends. The pilot gave us insight on the features customers wanted in a smartphone app for payments. These insights may apply to apps in other emerging markets:

- The ability to send money by selecting a contact from the phonebook, rather than typing the number, is convenient and reduces stress of errors.

- A list of various utility accounts (i.e., for water/electricity, etc.) on the app's interface reduces the potential to enter the wrong bill pay number or account number, which is more likely to happen when manually entering each transaction.

- Customers valued the ability to have several wallets for several SIMs because they usually used more than one SIM.

- The ability to use the app offline without turning their data on was particularly relevant for users in remote areas that have poor connectivity and for users who bought data from one provider using a wallet from another.

- The ability to view information about past transactions in the app helped customers to keep track of their spending.

- Transacting through NALA is secure. NALA uses multilayer encryption, making it the most secure method of transferring money in Tanzania.

NALA was launched for public download from Google Playstore in May 2018 and currently ranks number three in the list of Top Free Finance apps in Tanzania. The app recently won the EcoBank Africa Fintech challenge and the Apps Africa Award for Disruptive Innovation for 2018. It currently has over 10,000 active users.

Eko Financial Services—Fundu

Eko's Fundu app uses engaging UI/UX features to give customers a secure and fast way to get cash from fellow Fundu users, ATMs, and other cash-out points, on the go. The app is built on India's Unified Payments Interface (UPI), a platform developed by the Indian government for secure access to bank accounts. It leverages the UPI database to swiftly facilitate connections and transactions. The app is targeted at millions of Indian customers who have recently acquired smartphones, have bank accounts, primarily earn and spend in cash, and have surprisingly few cash-out points (ATMs) near them. For this customer, access to cash, daily, is still crucial, and Fundu encourages them to leave cash in their digital wallet, because the service promises to facilitate cash-on-demand, when the customer needs it. If successful, this app can lead the way for other digital financial services.

PILOT

The Fundu app pilot aimed to learn from the app's engagement with at least 5000 customers and to test the effectiveness of three of its key features—location match (Google map), relationships matching (contact book), and time specification (clock). The pilot sought to evaluate the effectiveness of each step of the Fundu customer journey as users connect their bank account and request cash. The app finds another user willing to exchange cash with the user making the request. This other user must be physically nearby. Fundu also estimates the time it will take users to reach the point of exchange. (The app finds a user if the person making the request does not have an existing user, ATM, or Eko agent in their contact book.)

Because of the small user base during the pilot and to ensure app activity, Eko integrated its agent base into Fundu, so that customers could exchange cash with an Eko agent, if a regular user match is not available. (See Figure 6.)

FIGURE 6. **Fundu application screens**

RESULTS

During the pilot, 13,362 people downloaded Fundu; 9834 of them linked their social identity, 7749 linked their bank accounts, and 4107 successfully completed a cash exchange. Half of these exchanges occurred at a cash point, such as an Eko agent, not with a completely app-generated user match. Eko hopes that app-generated user matches will grow as the network grows.

LESSONS LEARNED

Fundu's success hinges on the availability of a large acceptance network that can respond to requests for cash. This is not easy to build from scratch, and Eko relied on its existing agent network to facilitate early transactions. It would have needed to reassess and adapt the Fundu business model if the network grew. Regulation issues also mired Eko, since it marketed Fundu as an ATM but it was not fully licensed to provide cash out services.

CONNECTIONS-BASED FINANCE

T HE MATONTINE, SOCIAL LENDER, M-CHANGA, PREZESHA, and Patasente pilots sought to shed light on connections-based finance. Fintechs are using digital technologies to help customers connect to social, entrepreneurial, and community networks to gain access to small amounts of credit when cash-flow gaps arise in business and life. These services build customers' creditworthiness and access to finance through existing or new connections. The small amounts keep the risk low for the fintech and its FSP partners. The timeliness of credit helps customers better plan for cash-flow gaps and emergencies.

MaTontine

MaTontine, in Senegal, uses a mobile payments platform to digitize traditional savings circles known as tontines, which typically involve customers saving a fixed amount monthly, and each member receiving a lump sum winning of all the contributions in a given month. These monthly contributions continue until every customer has "won" once. MaTontine leverages the natural cycles of regular digital payments and winnings of the tontine to provide small loans to regular members. These loans are repaid when the customer wins her share of the contributions. The lower risk allows MaTontine to considerably reduce the cost of borrowing, and with regular payments, it can build payment histories for each customer and offer larger loans and other financial services as time goes on.

PILOT

Before the MaTontine pilot could launch, it needed to establish key partnerships with MFIs and other financial institutions for bundling financial services with the tontine platform and with nonprofits that had access to a large sample of savings groups.[1] The pilot was targeted at women in savings groups who earned less than US$5/day. It offered them the following:

- Access to a digitized tontine platform with mobile payments, SMS reminders for making one's contributions, and notifications on winnings and the group's contribution.

- Access to credit advances and insurance.

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1   Credit in the form of advances on winnings (at 6 percent of their transaction costs or the equivalent of 12 percent interest); life insurance provided by SUNU Assurances (at a rate of 3,600 FCFA per year), and medical insurance provided by PMAS (at a rate of 8,500 FCFA per year).

FIGURE 7. **MaTontine member groups**

Member Information

- Average size of groups
- Number of tontine groups
- Number of members
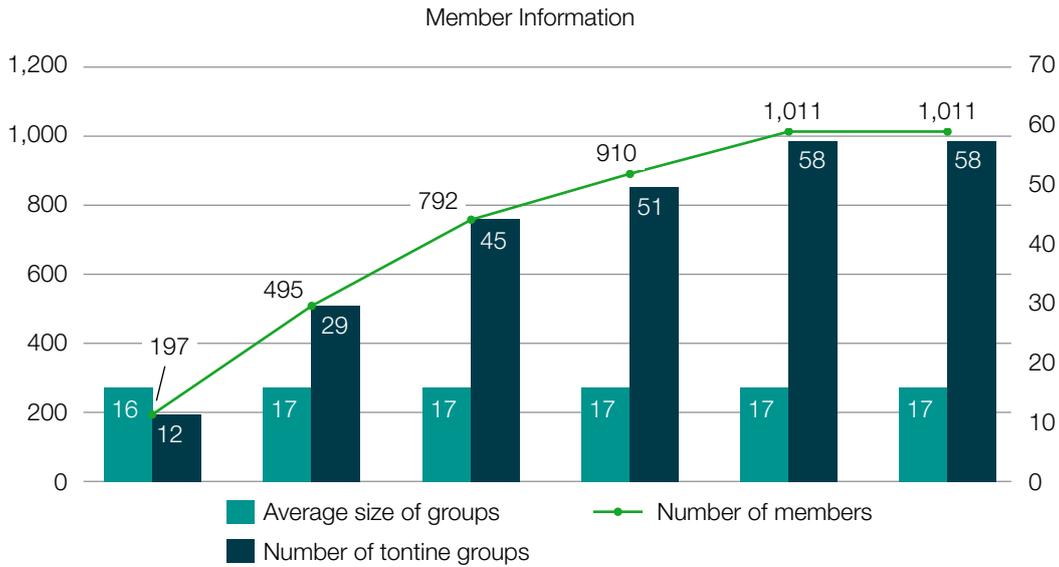
RESULTS

MaTontine registered 1047 members across 62 tontines during the six-month pilot. (See Figure 7.) Ninety-five percent of these members are women. The total amount saved on the platform to date (15 March 2019) is 88,934,060 FCFA (approximately $153,000). The expected savings through the complete lifecycles (remaining three months on average) of the groups is 62,258,180 FCFA (approximately $108,000).

At any given point, MaTontine lent to only half of the members on the platform to minimize its risks. The repayments depended on all members paying on time. As of 15 March 2019 MaTontine, made loans to 602 members of the 1,047 totaling 76,003,200 FCFA (~$131,000). At the time of writing, they had recovered 36,167,280 FCFA (~$63,000) and had 39,835,920 FCFA (~$69,000) outstanding.

The overall default rate has remained steady at 3 percent. MaTontine also tested a small subset of groups in which customers did not know the other members. For this group the default rate was higher at 8 percent. This confirmed its theory that to keep default rates low it must recruit members of existing tontine groups.

MaTontine believes defaults are low because regular payments were tied to future advances for the other half the group. The average contribution made by an entire group is about is US$510, double the contribution forecasted. When MaTontine spoke to its members, it discovered that customers saved the maximum as a group, so they could get the highest advance possible. Unlike other types of lending that put people at risk of borrowing more than they can afford, MaTontine's advances are based on members' future winnings. So, they can borrow only an amount they can afford to pay back.

The MaTontine pilot faced many challenges related to Senegal regulations. First, the pilot's business model had to be radically changed to lend to customers directly, because MaTontine was not allowed to partner with an MFI and offer loans on its behalf. Other challenges arose with the insurance regulator for the health and medical insurance offered on the platform, but these issues were eventually resolved.

LESSONS LEARNED

Until MaTontine builds a larger group of customers, its success hinges on its partnerships with other FSPs, especially its credit partners, and their partners' willingness to lend to MaTontine customers. MaTontine cannot control the user interface of its mobile partner and faces high API integration charges, which it cannot incur at this point. However, initial results of the pilot are noteworthy, and its high engagement shows that customers might be willing to overcome inadequacies of the mobile payment interface to access timely cash-flow relief. In fact, MaTontine is on its way to slowly building its customer base. It recently signed an agreement with Cofina, Mastercard Foundation, and World Banking and Savings Institute to offer Cofina its platform to lend to 50,000 users over the next four years.

Social Lender

Social Lender, in Nigeria, offers digital credit based on social reputation. Instead of providing traditional forms of collateral (the norm for this segment in Nigeria), applicants provide access to their social network by sharing their contact information. These social contacts in turn validate the identity of their friend or family member and sometimes agree to guarantee a portion of the loan.

Two versions of the Social Lender product were piloted: an SMS-based product targeted at the lowest income customers and a web-based product (with Sterling Bank) that required people to connect their social media accounts with a smartphone or computer, which was targeted to customers with bank accounts but who did not qualify for the bank's traditional products.

PILOT

The SMS-based product provided 600 loans to the target customers, and the web-based product provided 540 loans to target customers.

RESULTS

The scoring based on social data was able to correctly rank borrowers: borrowers with higher social scores showed lower default rates on their loans. There was a 30-point difference in the delinquency rates of loans from people in the top 20 percent of scores compared to the bottom 20 percent of scores. The model seemed to be more predictive for smartphone-based customers, who were able to provide more data, than for feature phone customers, but the samples were not large enough to enable a robust assessment. The mobile (USSD) interface allowed many low-income customers to access loans for the first time. About 60 percent of first-time borrowers who repaid their loans have returned to apply for another loan.

Know-your-customer (KYC) requirements were met using Nigeria's Banking Verification Number (BVN). Data analysis showed that several users had applied several times before they were approved. Many of the denials were because of KYC challenges. To validate an identity, the name entered into the system had to be an exact match to the name associated with BVN. This was an issue for many customers who had long names that they were used to shortening.

LESSONS LEARNED

Although Social Lender will need to continue working on its model as it incorporates more data, early results show promise because it was able to effectively ranked customer risk. A digital approach had worked for an earlier smartphone pilot; however, the lower-income segment targeted in this pilot required an element of human interaction. Not only did Social Lender need to help people understand the product, it also had to overcome trust barriers. Most lenders in this area require collateral, so people suspected that a product that did not require collateral was a scam. Social Lender addressed this in two ways. It hired agents to educate customers and explain the product to them in person, and it recruited ambassadors—respected people from the target communities who received a commission for successful referrals—to promote the product and vouch for its authenticity. Social Lender will need to balance the operation costs for these measures with a scalable business model. If a large base of customers successfully repays and comes back for more loans, these costs could be reduced.

M-Changa

M-Changa, an online fundraising platform, allows customers to leverage their connections digitally to access funds for emergencies or life events. It seeks to facilitate Kenya's long tradition of communal fundraising called harambees (Swahili for "all pull together"). Participants in these fundraisers contribute money to cover other low-income people's everyday financial needs, such as medical expenses, funerals, and school fees, or to raise funds for entrepreneurial activities. For the financially excluded, this pooling of resources can be an important lifeline.

M-Changa does not offer loans; it helps customers seek traditional social giving through digital channels, which makes it cost effective for customers to access their networks and even expand beyond their network, when a cash-flow emergency arises. The product acts as a safety net to address unexpected needs like funerals or medical emergencies, which poor people often can't afford on their savings alone.

PILOT

CGAP partnered with M-Changa and the Busara Center for Behavioral Economics to conduct a series of lab experiments with 664 people in Kibera, Nairobi, to better understand what motivates people to contribute to harambees.

RESULTS

The experiments revealed that people have three main motivations for giving: trust, reciprocity, and altruism. Trust is when a giver contributes funds as a form of informal insurance for the future, with the expectation that the recipient will reciprocate when a need arises. Reciprocity refers to repayment for an act of giving. Altruism is when a giver contributes without expecting anything in return.

M-Changa givers contributed more when they believed they had something in common with recipients. They contributed the most when they perceived themselves to be part of the same social group, even when there was not a direct or known connection. Contribution amounts were also higher when recipients were part of a giver's existing social network. If someone learned that others were giving more than they were, they were more likely to increase their contributions. Communication between givers and recipients also fostered greater contributions by building trust and possibly a sense of shared identity.

LESSONS LEARNED

Technology can be used to strengthen traditional financial relationships by reducing friction and providing visibility. It can also be used to help people expand and maintain their networks, especially with people who are geographically apart (e.g., members of a rural community who may have moved to an urban area).

The pilot also provided a better understanding of how to make the platform more effective and to encourage contributions. For example, anchoring fundraising messages around the three key motivators could increase use. A heading that reads "Give today, receive tomorrow" could inspire reciprocity-driven contributions. A message like "Giving now increases your chance of succeeding with a future fundraising campaign" could be used to encourage trust-driven giving.

Fostering a sense of community on a fundraising platform is likely to increase use. One way to create a sense of shared identity is to allow users to display their affiliations, such as their universities or chamas (traditional savings groups), and to form interest-based groups online. Providers could also add gamification elements to strengthen ties among people who don't have real-world ties. For example, a provider could show all users a ranking of the week's top fundraisers and reward the winner by contributing to his or her campaign. Providers could also include features like message boards or chat rooms that make it easier for users to communicate and build trust.

As technology becomes ever more central to financial relationships, understanding the drivers of traditional giving among low-income populations is a first step toward designing better digital fundraising solutions. If technology can maintain the core elements that have traditionally driven use while reducing costs and expanding networks, it can deliver products that meet people's needs and are actively used.

Pezesha

Pezesha, in Kenya, is a person-to-person (P2P) lending start-up. Since the pilot, Pezesha has shifted its business model to focus more on helping underserved people understand and improve their credit profile and connect them to bigger lenders.

PILOT

The Pezesha pilot aimed to better understand how peers affected borrower behavior. Peer-to-peer platforms are founded on the premise that individuals are more likely to feel a bond with those from their social circles and, hence, have a higher likelihood of repaying loans from peers. However, a counter-argument is that borrowing from an institution may be taken more seriously because of the perceived implications of not repaying (i.e., credit reporting bureau blacklisting). There is little research that explores this experimentally.

Pezesha offered fixed 30-day loans of 1,000, 2,000, 3,000, 5,000, 6,000, and 10,000 Kenyan shillings (US$1 is about KSh 100). The pilot included 468 borrowers, each of whom took one loan. Participants were randomly allocated into a control group (233 participants) and treatment group (235 participants). The control group received only the standard reminder messages while the treatment group received the same, plus an additional message on days 29 and 30. This message stressed that the loan was given by a peer (a fellow Kenyan). The outcome of interest was whether sending extra SMSs with a clear P2P framing increased timeliness and overall repayment rates.

RESULTS

The findings did not support any statistically significant difference in repayment rates based on the origin of funds, suggesting that platforms might better serve lenders by pooling funds and funding a portfolio of loans versus one-on-one lending.

LESSONS LEARNED

There was no evidence that peer-to-peer framing increases loan repayment. Experimentally, there was no significant or even suggestive effect. There was some evidence that this framing could increase retention, thus increasing the chances of the borrower taking a second loan with the same lender. Customers who received an SMS ("Your lender thanks you and recommends you for a second loan") and a call ("Other Kenyans have benefitted from your timely repayment and your lender, a fellow Kenyan, is grateful") were more likely to take a second loan with Pezesha.

Patasente

Patasente manages an online merchant platform for invoice factoring by connecting microbusinesses with private lenders in Uganda. In any supply chain, buyers often struggle to find reliable suppliers that can deliver a product and wait 30–90 days for payment, and suppliers struggle to fulfill orders without payment on delivery because it affects their cash flow. This is particularly true for microbusinesses that cannot secure loans against their invoices, also known as receivables finance, from their suppliers or banks. Patasente publishes these loan requests as well as a credit scores based on the buyer's credit history. Private lenders, who represent another customer segment, can view loan requests and credit assessments and choose to finance these loans to earn higher-than-average risk-based returns. Through the platform, businesses and their clients can also do online procurement and settle payments.

PILOT

The pilot tested the ease of engagement on Patasente's platform and the predictive power of its credit scoring model. While the online platform worked for low-income urban businesses, Patasente wanted to target rural dairy farmers and their supply chains that didn't have smartphones or computers. The pilot tested Patasente's newly designed USSD interface, which would work on basic phones through a USSD menu, mobile payments, and SMS records of transactions.

Patasente targeted supply chains of various sizes and types, from rural dairy farmers, to urban air-conditioning suppliers. Within each supply chain, it built strong relationships with both buyers and suppliers. It used past invoice and business data within the chain to generate credit scores for suppliers, who would become potential borrowers when they were ready with their invoices. Simultaneously, it sought private lenders who would join the platform and pick loans to fund. Each type of platform user (whether lender, buyer, or supplier/borrower) could use the platform to make digital payments. Additionally, buyers could maintain business records of their invoices and suppliers.

RESULTS

Patasente is in a very early stage of development; therefore, the pilot was small. Pilot results show engagement and relevance to a real customer problem, but more large-scale piloting is warranted.

During the pilot, 723 users (buyers, borrowers, and lenders) generated 3685 transactions (invoices, payments). The platform provided close to 200 loans to just over 50 different borrowers for a total of more than $500,000 in loans, of which more than half was financed by lenders (with the balance financed by Patasente). Since the supply chains varied in size, loans ranged from US$10 to US$10000 and interest rates ranged from 7 percent to 15 percent. All 170 loan applications were decided in less than 72 hours; loans were disbursed in as quickly as two days after loan request (for microbusinesses) and up to nine days (for medium-size businesses).

The dairy supply chain was the lowest-income segment and the most underserved. Seeing their orders in SMS gave some low-income dairy farmers greater certainty in the demand for their produce and helped them better plan their production targets and increase productivity to meet them. Farmers also seem to benefit from the SMS prompts for each transaction with information about quantities supplied, which avoids conflicts between farmers and cooperatives that typically arise when milk "disappears" during transport. Patasente can give dairy buyers, and microbusinesses in general, business tools (including the payment platform) to track their orders and better manage their businesses. A small lender group interviewed said that Patasente gives them access to investments that are small but that have relatively high returns, an alternative to saving.

LESSONS LEARNED

Patasente has the potential to close an important cash-flow gap in microbusinesses and bring greater information and efficiencies to the system. The repayment rate was substantially high and shows a willingness of customers to engage, and perhaps qualify for bigger loans. But the success of services like Patasente, which are based on two-sided or multi-sided networks, hinges on growing each side robustly and ensuring adequate connections.

The Patasente business model needs further iteration around building strong credit scores for each supplier, improving information on each supply chain, and then expanding the lender group that agrees to assess risk based on the credit score and lend. Testing across different pricing models for each supply chain and each lender group may be useful.

Patasente is doing many things both on the platform (facilitating planning, payments, buying, and selling) and across segments (suppliers, buyers, and lenders) and value chains (dairy and air conditioner solutions). Patasente will need to keep its focus and expand strategically.

INNOVATION **4**

LOCATION-BASED SMALLHOLDER FINANCE

F ARMDRIVE, APOLLO, AND PULA ARE EXAMPLES OF FINTECHS that use digital technologies and alternative data sources to reduce cost and expand access to financial services, such as credit and insurance, and to other valuable extension services for smallholder farmers.

FarmDrive

FarmDrive, in Kenya, provides digital loans to smallholder farmers.

PILOT

The Farmdrive pilot tested the potential for satellite data to improve credit-scoring models. The biggest challenge to leveraging satellite information was the inaccuracy of the farmers' location. Addresses in rural Kenya were not precise enough to allow for mapping farmers to the relevant satellite data at a granular level, and therefore, the data did not significantly improve FarmDrive's ability to assess the farmer.

RESULTS

The pilot could not identify any predictive power of satellite data for the Farmdrive portfolio.

LESSONS LEARNED

The pilot provided insights into crucial aspects of making this technology work:

- **Merging different location data.** Satellite images need to be leveraged with exact farmer location data, which was lacking in this pilot.

- **Building a scoring model.** Image-based models need to be included as an input to an overall credit-scoring model that contains other factors and variables.

- **Using a relevant loan performance sample.** A model is only as strong as its proven predictability. An initial model using location-based data needs to be iterated and tested through several cycles of loans and repayment.

Apollo Agriculture

Apollo Agriculture delivers input finance and customized advice to smallholder farmers. It offers a customized package of seed and fertilizer, farming advice, and credit to maize farmers in Kenya. It leverages mobile phones, agronomic machine learning, and remote sensing to de-risk its loans and deliver its product cost effectively.

Apollo Agriculture captures the GPS boundaries of all customers' farms and uses satellite data as an input to its credit model. After customers are approved for a loan, they receive a mobile voucher via SMS, which they bring to their local agrodealer to redeem for inputs, which are customized to the size of their farm. Thereafter, customers receive voice-based training to their feature phones. The training covers topics such as planting and addressing pest problems as well as support with financial literacy and a healthy path to repayment. Loans are paid back through mobile money. Although small and steady payments are encouraged, payments are not due until after harvest; due dates are adjusted without penalties for farmers whose harvest was delayed because of weather or other reasons.

PILOT

The Apollo pilot tested (i) the predictive power of satellite imagery in credit assessment of farmers and (ii) the effect of automated and customized nudges delivered via SMS and IVR technology on farmer repayment behavior. Apollo offered loans to 1016 farmers out of about 6000 applicants. Recipients were selected based on minimal criteria to generate an unbiased sample from which Apollo could test different modeling approaches.

RESULTS

Apollo developed several credit models and tested them against the loan repayment data for the 2017 season. The model that relied on satellite data performed well, although the results could not be fully generalized because of the small sample size and concerns that the data covered only one year of weather. Apollo offered loans in two wards: one that faced no major hazards and the other that was affected by drought and an outbreak of armyworm pests. This resulted in wide differences in repayment across the wards. Therefore, while the pilot showed promise, it did not conclusively demonstrate the predictive power of satellite data for credit risk analysis. However, several elements of the business model were effectively tested in this initial pilot, for example:

- **Gender.** While the portfolio had roughly the same number of female and male borrowers, Apollo saw materially different repayment rates depending on the borrower's gender, with women showing better repayment than men.

- **Timing.** While many customers made small payments throughout the season, most of the loans were cleared at the repayment deadline in mid-December.

- **Communication.** Apollo's low-touch approach requires that it effectively communicates with customers digitally throughout the season. During the pilot they therefore tested the ability of customers to engage with Apollo via SMS and interactive voice response (IVR) technologies. Experiments demonstrated that customer engagement was notably higher with IVR communications compared to SMS messaging alone, prompting Apollo to focus on IVR for customer communication.

- **Messaging and nudging:** Purely behavioral nudges were not effective at incentivizing early repayment, with the treatment and control groups showing very similar results. However, interventions involving lotteries where farmers participated by making a partial payment did prove to incentivize small prepayments.

LESSONS LEARNED

Although more testing is needed to accurately assess the potential for satellite data, several elements of the business model were effectively tested in this pilot:

- **Remote assessment model.** Apollo's model to cost effectively gather farmer location and data proved effective and scalable. This is a promising result because having a cost-effective way to gather information is critical to scaling and expanding access.

- **Input distribution.** Fulfillment via local agrodealers, whereby customers brought a mobile voucher they received from Apollo for their inputs to their local agrodealer to redeem, proved to be cost effective and logistically simple to manage (relative to direct delivery by Apollo).

- **Insurance.** Although bundling weather insurance with the loan product helped improve recoveries from the ward that suffered from drought, many farmers did not correctly understand the bundled product and what this meant in terms of their repayment obligations. This highlighted the importance of effective communication when introducing more complex financial products.

Pula

Current business models for smallholder yield-based insurance involve sampling yields at a community level.[2] This increases delivery costs, limits scale, and increases the price for customers. Pula is experimenting with digital technologies and data to create efficiencies and lower prices in the smallholder insurance sector. It sought to build a new algorithm based on existing yield and insurance data along with new satellite data to drastically reduce the need for yield sampling and to allow the product to be delivered to more smallholders in remote rural areas, cheaply.

PILOT[3]

Pula wanted to develop an algorithm that predicts individual farmer yields with satellite data to reduce insurers' costs. Its past work with local agribusiness partners enabled it to compile significant amounts of audited yield and other smallholder data—like fertilizer and seed use. From July to November 2017, Pula collected over 1,000 direct yield measurements across several northcentral Nigerian states and compiled about 15,000 yield measurements from the past seven years from local agribusiness partners who work with smallholders. Several analytical firms were engaged to evaluate how strong a correlation could be achieved between the yields observed and the satellite data and to assess whether this correlation model could be used to predict yields by looking at certain variables from satellite data.[4]

2   Generally, the field sampling required by insurers to determine average yields in each community or unit of area insured is costly and imposes a heavy logistical burden—in the Pula context, farm yield measurements are notoriously expensive, each costing US$25–50.

3   See Emilio Hernandez, Rose Goslinga, and Victor Wang, "Using Satellite Data to Scale Smallholder Agricultural Insurance" (Washington, D.C.: CGAP, 2018). https://www.cgap.org/research/publication/using-satellite-data-scale-smallholder-agricultural-insurance

4   Data variables observed included precipitation, light reflection from the soil, and soil temperatures, among others. Satellite data sets used include CHIRPS, Sentinel, Lansat, and MODIS, which are all publicly available.

RESULTS

Initial results showed that statistical models based on satellite data did not explain individual farm-level yield observations (only 10–20 percent of farm yield variations were explained). However, the models did provide a better prediction of the average yields in Local Government Areas (LGAs).[5] In this case, 60 to 80 percent of the variation of average yields was explained. These results were not deemed good enough to be applied by partner insurers and reinsurers given that the predictive power is considered low, even at the LGA level.

The challenge to define an implementable satellite and yield data correlation model that would reduce smallholder insurance costs led to innovating in unexpected ways. The initial results forced Pula to rethink its analytical approach. Noting that aggregating analysis at the LGA level improved the prediction, Pula reformulated the initial question. Instead of using satellite data to predict individual farm yields, it focused on using these data to define the boundaries of units of area insured that are much larger than the LGA and that have a common yield distribution.

By aggregating the area units further, Pula sought to improve the ability to predict average yields in these areas while reducing the total number of crop cuts or yield measurements required. Common yield distributions within these insured units could help maintain the basis risk levels already achieved in the current market. Over time, as more yield samples are gathered, basis risk could be further reduced.

Despite having yield data from local agribusiness actors who had strong incentives and expertise to ensure accuracy, yield observations were highly concentrated in the range of 2–5 metric tons per hectare. This means there was little variation in yields observed, which makes it difficult for statistical models to find a correlation with satellite data. Because lower yields by the more vulnerable households were not observed much, the model could not determine a stronger yield and satellite data correlation.

To get more variation in yields observed, Pula collected over 2,500 additional yield measurements in northcentral Nigeria between January and May 2018. This time, efforts were made to sample areas where poor yields were expected. In addition, a large data set from western Kenya with over 6,300 observations was added to test the model, given that the area seemed to have greater yield variation following a drought in 2016.

A machine-learning algorithm was developed to define the borders of new and larger units of area to insure—Agro-Ecological Zones (AEZs). The satellite and yield data were used to reveal those areas where yields naturally followed a normal distribution, thereby showing only one mean. These areas were then used as units of area insured, if the distribution's variance was not too large. The precipitation variable within the Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) satellite data set was used to generate AEZs.

AEZs were validated through two approaches. First, AEZs predicted average yields collected directly from the field during 2017 and 2018. Second, these AEZs predicted insurance payouts observed over the two previous years in Pula's policy portfolio.

The practical implication of the model is that, for regions currently covered by Pula in Nigeria and Kenya, the machine-learning model reduced total costs of yield sampling for area-yield index insurance by about 43 percent. This represents a significant reduction when considering expanding the product nationwide.

5   LGAs are areas of government administration that are traditionally used as the units of area to insure

LESSONS LEARNED

The final approach used moved away from the initial goal of developing an algorithm that predicts individual farmer yields with satellite data to one that defines larger units of area insured, which translates into operational savings for area-yield index insurance products. This approach is one of potentially several. Practitioners and development actors can adapt it to speed up innovative satellite data applications that improve efficiency and effectiveness within smallholder insurance markets.

The pilot also showed that it is critical for insurers to partner with public and private actors to facilitate access to accurate yield data, past and present, which are needed to complement satellite data. Yield data are most useful when they come from a wide spectrum of smallholders, including vulnerable ones who tend to be excluded from well-structured value chains. Partnerships with private actors can ensure accurate yield data from commercial smallholders, but partnerships with public actors who have access to yield data from more vulnerable smallholders are important, too. This not only ensures insurance products are appropriate for poorer smallholders, but it also is a key factor in robust correlations between satellite data and client losses. Larger yield data sets that cover larger geographical areas and longer periods of time may eliminate the need for yield sampling.

DE-RISKING NONPRODUCTIVE FINANCE

T ULAA, BIOLITE, AND MICROENSURE ARE EXAMPLES OF
fintechs that help low-income people pay for unexpected or big expenses
through de-risked credit, while using unique features to reduce risk for
the financier.

Tulaa

Tulaa is a technology start-up in Kenya that provides inputs on credit to smallholder farmers
and brokers the sale of their crops at harvest time. Its digital platform enables farmers to
order agricultural inputs such as fertilizers and to apply for a loan to purchase them. Tulaa
conducts a credit assessment using a proprietary tool based on alternative data. If the loan
is approved, Tulaa pays the nearest retailer for the stock and sends an electronic voucher
to the farmer for collection. The average loan size is US$150, and the loan is tied specifically
to fertilizer, seed, and crop protection products in the horticulture sector. At the time of the
pilot, Tulaa was not providing the credit itself, but rather it was working through local MFIs.

PILOT
The Tulaa pilot tested how well Tulaa's platform serves as a gateway for an MFI to assess
new customers and to provide them loans in time for the planting season. The pilot also
tested behavioral and nudge techniques to increase uptake of loans and input purchases
on the platform. Tulaa wanted to test whether it could improve the farmer's customer
experience and engagement through:

- Detailed information gathering at acquisition through agent-held tablets and a data
  collection application.

- Call-center and agent interactions during loan-assessment periods.

- Customized SMS reminders and information during the collateral deposit period and
  loan repayment period to ensure timely compliance.

RESULTS

During the pilot, 4,500 farmers applied for input loans via the Tulaa platform. Of these, Tulaa's MFI partner approved 442 loans, and Tulaa distributed 3,031 bags (167 metric tons) of fertilizer and 1,254 units of crop protection to farmers. Loan repayment data that the MFI possessed was not available.

LESSONS LEARNED

The most significant issues in this pilot were the time required for the MFI to conduct a loan assessment and the cumbersome data-sharing process between Tulaa and the MFI. These obstacles resulted in fewer loan applications being assessed in a timely manner before the planting season. Without the permissions to lend directly and the adequate debt financing to do so, Tulaa depended on external partners for its model to work. This also prevented Tulaa from contacting and nudging its customers in time to deposit loan collaterals on time, which would have resulted in more loan approvals. As a result, it was not possible to assess the relationship between Tulaa's behavioral and nudge techniques and the increase in loan uptake.

Tulaa learned that if it does not offer loans directly, it must ensure key aspects in a partnership agreement with MFIs and banks. These agreements must include:

- Complete system integration through an API.

- Mandatory training of FSP staff, including those in branches, before launch.

- Complete visibility into incentives for branch staff and loan officers.

- Clearly defined project governance structures.

In the end, these conditions were very difficult to meet, and Tulaa opted to start lending from its balance sheet. Hillary Miller-Wise, Tulaa's CEO, noted that while this decision certainly increases financial risk for the company, it enables Tulaa to control the customer experience and ultimately the company's reputation in the market.

Tulaa knew that handling the logistics on its own was necessary at the beginning, but ultimately it was not easily scaled. After the pilot, the company began its transition away from direct delivery through third-party logistics companies toward localized fulfillment by independent agro-vet retailers.

Biolite

Biolite is an energy company and social enterprise that provides low-income customers in Kenya, Uganda, and India access to cooking, charging, and lighting devices. It focuses on the design, manufacture, and servicing of its products and partners with FSPs to provide customers with financing options for the purchase.

PILOT

CGAP supported Biolite, in partnership with MFI Juhudi Kilimo, to test the predictive nature and effectiveness of credit scoring based solely on the use of Entrepreneurial Finance Lab's (EFL's) psychometric scoring tool. The objective was to test if such a tool would allow MFIs to reduce loan processing time and potentially reach lower-income rural segments.

RESULTS

Testing the tool proved complicated because it was imbedded into the more rigid processes of the MFI (designed for productive group loans not individual consumption) that limited the use of the tool as the deciding factor. Although EFL's tool has proved successful in other tests, given several challenges around implementation, the sample generated though this pilot did not prove to have predictive value. The project also faced several obstacles, such as a complicated and extended election period in Kenya and a change in the MFI's operational and distribution model which slowed sales significantly and didn't produce as much data as was needed for a robust assessment.

LESSONS LEARNED

Farmers generally needed help moving through the tool, which resulted in a significant time commitment to take the test and in the increased potential for agents to influence the results—both knowingly and unknowingly—though their interventions and explanations. Also, lack of connectivity meant that farmers could not get a result and a response in the field, which presented logistical challenges when the products had already been taken by staff. Juhudi separately conducted other pilots of the psychometric scoring tool and had positive results. Therefore, it would be important to look across different pilots and identify factors that make the technology work.

MicroEnsure

MicroEnsure provides life, accident, and hospital insurance via mobile phone to 50 million registered customers in 15 countries, through partnerships with mobile network operators. However, these models cover only catastrophic needs, not day-to-day risk events. To provide a solution for minor health events that may nonetheless disrupt low-income customers' lives, MicroEnsure designed Fearless Health—an integrated insurance and credit product—to help customers get the inpatient and outpatient care they need without delaying treatment because of the costs.

PILOT

The Fearless Health pilot launched in 2016 with three key features: on-demand loans for primary healthcare at outpatient clinics, medical advice by phone (whereby customers text their health questions by SMS and receive a call from a doctor), and insurance for inpatient care that provides a cash payout if a customer or family member suffers a health emergency that requires three or more nights at a hospital.

Limiting the insurance component to inpatient care only, while offering loans for outpatient needs, allowed MicroEnsure to keep premiums low because administrative costs related to outpatient claims tend to drive up premiums. By bundling financial products in this way, MicroEnsure hoped customers could experience the benefits of insurance without having to make costly, separate insurance premium payments.

MicroEnsure viewed the loans as the key way to introduce customers to Fearless Health's other features. It marketed the loans at participating clinics to help patients cover the cost of their treatments. During borrowers' loan repayment periods, borrowers were insured and had access to the telephone health information service. Mobile money was essential to the product, and all payments to and from customers were digital. From MicroEnsure's perspective, cash was not viable given the potential for multiple payouts per client in

addition to receiving loan repayments on a regular basis. For customers, receiving loans and hospital cash payouts quickly via digital channels was critical so they could pay for immediate expenses.

RESULTS

The Fearless Health pilot confirmed that there is a high demand for the product among customers who do not have enough funds for outpatient care. Further, Fearless Health customers spent more at the clinics than noncustomers, which provides a business case for clinics to welcome the product and reduce the potential negative impacts of undertreatment because of patient liquidity constraints. However, it also showed that MicroEnsure's plan to offer the credit to patients when they were at the clinics and needed it most should be reconsidered. Most patients at clinics had already brought enough cash to cover minor outpatient expenses. The target market for Fearless Health did not bother coming to clinics because they lacked funds. The pilot suggested that MicroEnsure would need to find ways to market the product outside of clinics.

LESSONS LEARNED

Customers indicated that the feature they valued most was duration of insurance coverage. The other factors—amount of coverage and number of family members covered—were also important, however, and a combination of all three increased people's willingness to pay for Fearless Health. This suggests that the preferred solution should cover family members and offer a reasonable coverage amount, but that extending the duration of coverage should be emphasized.