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Partnership for **FINANCE** *in a* **DIGITAL AFRICA**

Digital Finance Evidence Gap Map Analysis

Paving the impact pathway

Caribou Digital

AUTHORS

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The views presented in this paper are those of the authors and the Partnership, and do not necessarily represent the views of the Mastercard Foundation or Caribou Digital.

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ABOUT THE PARTNERSHIP

The Mastercard Foundation Partnership for Finance in a Digital Africa (the "Partnership"), an initiative of the Foundation's Financial Inclusion Program, catalyzes knowledge and insights to promote meaningful financial inclusion in an increasingly digital world. Led and hosted by Caribou Digital, the Partnership works closely with leading organizations and companies across the digital finance space. By aggregating and synthesizing knowledge, conducting research to address key gaps, and identifying implications for the diverse actors working in the space, the Partnership strives to inform decisions with facts, and to accelerate meaningful financial inclusion for people across sub-Saharan Africa.

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Digital Finance Impact; Evidence Gap Map Report

This report is a companion to the interactive Digital Finance **Evidence Gap Map** (EGM) and the shorter "**Snapshot 16: Digital Finance Impact Evidence Summary**".

"Paving the impact pathway" attempts to lay the foundation to understand and accumulate impact evidence on the effects of Digital Finance on low income clients. The report describes the context, methods, and detailed findings of the literature review used to develop the Digital Financial Services Evidence Gap Map (EGM).

This report corresponds to version 1.0 of the Digital Finance EGM launched in November 2017. We concluded the literature review for this version in May 2017. We are aware that some relevant Digital Finance impact studies have been released recently, in addition to several studies that are in progress. These will be added in subsequent versions of the Digital Finance EGM.

Any comments or queries should be directed to Niamh Barry (**niamh@cariboudigital.net**).

Executive summary

Background

The Digital Finance community rests on, and is in many ways an extension of, the knowledge, practices, and evidence pertaining to the effects of traditional (analog) financial service products on resource-constrained clients. Numerous studies and systematic reviews have explored the effect of traditional credit, savings, and insurance products.[1] Despite this growing evidence base, less systematic attention has been paid to the ways in which the digitization of these products and services (against a background of economies, which themselves are becoming more digitized) may alter or improve the prospects for impact at low cost and/or broad scale. Our impact literature mapping exercise, intended to scan and assess the state of knowledge of digital financial products and services beyond those available through traditional or analog channels and business models. Our focus is on understanding whether there is an incremental benefit for the client when the design and or delivery of these products is digitized.

Methodology

We used an iterative process to develop the framework for Digital Finance inputs and client outcomes. We initially developed a basic framework, which evolved during the literature review process. In establishing the inclusion framework, we developed both a Digital Finance glossary and a set of screening criteria. A glossary of Digital Finance was developed to identify and classify Digital Finance studies before screening them against our inclusion criteria. We used snowball sampling and mining bibliographies to search for studies that met our inclusion criteria. We then coded the data for each included study, including information about the Digital Finance product or service, the outcomes measured, and the direction of the impact. The Evidence Gap Map (EGM) will evolve to include other outcomes not outlined here that might emerge from future research. We are tracking several impact studies that are "in progress" and those that were released after the initial literature review. These will be included in the next version of the Digital Finance EGM.

High level findings

Evidence on various Digital Finance products' impact on low income clients is relatively small but growing. The Digital Finance EGM matrix of 17 Digital Finance product categories, 14 Design & Delivery categories, and 10 outcome categories contains 40 completed impact studies. The largest number of studies have focused on Digital Finance category of digital payments and transfers. Adoption of the Digital Finance product is the most frequently cited client outcome, followed by improvements in savings behavior and improvements in income. Most studies have been conducted in sub-Saharan Africa (SSA), where the East African market was dominant. The evidence base is still lacking as very little evidence exists on the client-level impact of digital savings, credit, and insurance on client outcomes, particularly beyond the adoption of the Digital Finance product.

1 Karlan et al., "Research and Impacts of Digital Financial Services"; Cull, Ehrbeck, and Holle, "Financial Inclusion and Development: Recent Impact Evidence."

Contents

Acronyms

ATM	Automatic Teller Machine
B2B	Business to Business
B2G	Business to Government
B2P	Business to Person
CGAP	Consultative Group to Assist the Poor
DFS	Digital Financial Service(s)
DIS	Digital Information System
D2P	Donor to Person
EGM	Evidence Gap Map
FI	Financial Inclusion
FSP	Financial Service Provider
G2P	Government to Person
IPA	Innovations for Poverty Action
MCF	Mastercard Foundation
MNO	Mobile Network Operator
PayGo	Pay as you Go
POS	Point of Service
P2P	Person to Person
RCT	Randomized Control Trial
SMS	Short Messaging Service
SSA	Sub-Saharan Africa
ToC	Theory of Change

1 Background

The Digital Finance community rests on, and is in many ways an extension of, the knowledge, practices, and evidence pertaining to the effects of traditional (analog) financial services and products on resource-constrained clients. Numerous studies and systematic reviews have explored the effect of traditional credit, savings, and insurance products.[2] From these studies, we understand that the studies on the effect on welfare have yielded mixed results for credit, positive results for savings, and some promising results for insurance. The benefits to be gained are highly dependent on the product, its Design & Delivery, and the demographics of those receiving it.

Despite this growing evidence base, less systematic attention has been paid to the ways in which the digitization of these products and services (against a background of economies, which themselves are becoming more digitized) may alter or improve the impact at low cost and/or broad scale. Our impact literature mapping exercise, scanned and assessed the state of knowledge of digital financial services and products beyond those available through traditional or analogue channels and business models. We focus on examining whether there is an incremental benefit for the client when the design and or delivery of these products is digitized. In some cases, digitization makes the inconvenient and expensive convenient and cheap. In other cases, it makes the impossible possible (scalable, accessible, and cost effective).

The delivery and design of digital products is different, and we cannot assume the same effects of digital products, just as we cannot assume the same effects of two varieties of savings products. We recognize the concerns about the design of digital credit solutions in terms of not only high interest rates,[3] but also the growing number of clients who are being blacklisted by credit bureaus for outstanding loans[4] due to either gaming the system or a lack of understanding of the system. Additionally, we are aware that many financial services for low income and rural populations are delivered in a group setting, and digitization may disrupt the existing social architecture, leaving its overall effect uncertain.[5]

Our attention is on the "Next Generation of Financial Services." We see the future of financial services as increasingly digital; thus, over time, our analysis will encompass more of the total evaluation space.

This report provides a detailed overview of the findings from the literature review that was conducted during the development of the Digital Finance Evidence Gap Map (EGM). The **interactive EGM** and this supporting narrative provide a summary of the impact of Digital Finance on various low-income clients, their households, and communities. **Snapshot 16: Digital Finance Impact Evidence Summary** provides a more succinct summary.

The Digital Finance EGM and supportive companion reports intend to:

- Empower practitioners, donors, and policy makers with the ability to engage in evidence-based decision-making by providing a user-friendly tool that enables the user to access evidence quickly and efficiently
- Facilitate the strategic use of scarce research funding and enhance the potential for future evidence synthesis by identifying the key "gaps" in the available evidence, thus indicating where future research should be focused

2 Karlan et al., "Research and Impacts of Digital Financial Services"; Cull, Ehrbeck, and Holle, "Financial Inclusion and Development: Recent Impact Evidence."
3 Cook, Tamara, and McKay, Claudia, "How M-Shwari Works: The Story So Far."
4 Wright et al., "Where Credit Is Due—Customer Experience of Digital Credit in Kenya."
5 Harigaya, "Effects of Digitization on Financial Behaviors."

Report structure

In section two of this report, we set the context for Digital Finance impact on low income clients using the theory of change (TOC). In section three, we provide the methodology for the literature review. Section four presents the high-level findings, and section five details what we know for each Digital Finance product. Section six concludes with a set of considerations for future Digital Finance impact research.

2 Theory and impact

While we classify various digital credit, savings, insurance, payment, and transfer products in the category of Digital Finance, we also recognize that Digital Finance is not a homogeneous category. We have developed a broad client impact pathway within our **Theory of Change** (ToC)—see diagram below on client impact—that speaks to the theorized combined impact of the diverse Digital Finance products rather than the impact of each individual Digital Finance product. There is value in untangling each Digital Finance product from the broad category and deepening our understanding of not only the changes in the lives of low income users that each of these products can catalyze, but also the ways in which the users experienced this change.

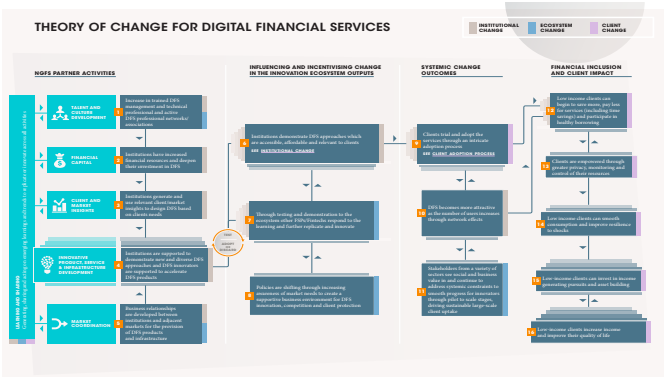
The impact pathway for an insurance product is likely to be different from that for a savings product. They *may* arrive at similar outcomes but take different paths to the destination.

Delving deeper into the various impact pathways that each Digital Finance product may take, we recognize that the nuanced ways in which each product may be designed and delivered can alter the path. A default contribution savings product using mobile money and an agent assisted wireless deposit at a Point of Service (POS) may produce different results. Adding client training or bundling the product with other Digital Finance products or a digital information system (DIS) may significantly alter the ways in which change is experienced.

We must also consider the markets in which these Digital Finance products are offered. Beyond the ecosystem environments, which can support innovation or create barriers, we must consider other factors that challenge the impact pathway. Heeks and Baliur[6] highlighted a few them, but most pressing in our context are 1) the social systems, which are concerned with underlying socio-economic and cultural factors, such as those that affect the financial needs of the poor, and the 2) socio-technical systems, which are concerned with understanding the interrelationships between social systems and technologies. This would include examining the organizational and institutional factors that act as intermediaries between the technologies and users.

We have much to learn as a sector, and our Digital Finance EGM represents our efforts to build the foundations of this learning to gather the evidence, to build an EGM for Digital Finance, to call for more evidence to fill the gaps, and to call for a reallocation of resources when we are overflowing with evidence.

This will permit us to begin to form the impact pathways for each Digital Finance product, as evidence emerges, and provide the sector with the capacity to delve into the details on the market and social conditions in which the Digital Finance product was or was not successful in catalyzing change.



Theory of Change *(click to enlarge)*

6 Heeks and Bailur, "Analyzing E-Government Research."

3 EGM methodology

Our EGM methodology is broadly based on the approach outlined by Snilstveit et al.[7] Below, we discuss the different stages in the development of the EGM. These were:

- Developing the scope of the EGM
- Setting screening criteria
- Developing the coding framework
- Building out the EGM

We used an iterative process to develop the framework for inputs and outcomes. We initially developed a basic framework, which evolved during the literature review process. If future research incorporated other outcomes not outlined here, the EGM would evolve to include them.

The EGM identifies inputs (independent variables) in the rows and outcomes (dependent variables) in the columns.

— *Inputs—independent variables*

The input variables have been organized into "Digital Finance product or service" and "Design & Delivery." The Digital Finance element highlights the impact of various Digital Finance products, and the "Design & Delivery" element enables us to highlight the effect of interventions to drive further usage of these services, for example, a digital savings product that uses two-way SMS to improve savings behavior. The two are often combined. Some studies have tested a Digital Finance product against a different Digital Finance product or no Digital Finance product at all while others may have tested a training on a Digital Finance product against no training on a Digital Finance product. Each reviewed study reported on a Digital Finance product, with several studies also including an additional design and delivery mechanism in the review. In version one of the EGM, 22 out of 40 studies referenced both a Digital Finance and a design and delivery mechanism. The remainder discussed only the Digital Finance product.

These two elements are layered to see the interplay between the two. Our objective is to review the Digital Finance product that was studied, the level of evidence, and in some cases, a design and delivery mechanism intended to deepen its impact.

— *Outcomes—dependent variables*

The outcomes in the columns highlight the impact of the various inputs. These outcomes are aligned with the Digital Finance TOC. The client or household level impact in the TOC are based on a review of various impact studies and theoretical impact pathways. These outcomes represent what we as an industry have learned or hypothesized to date. The EGM will be updated with additional outcomes in the future as new client outcomes are measured.

We added "Digital Finance adoption" as an outcome to highlight the uptake and usage of various Digital Finance products, particularly when using more nuanced design and delivery mechanisms. However, Duncombe and Boateng[8] discussed, and we concur, that the process of adoption is the linking mechanisms between the functionality of the technology and the needs of the users. It can only highlight potential but not actual impact on the lives of the clients.

7 Snilstveit et al., "Evidence Gap Maps—A Tool for Promoting Evidence-Informed Policy and Prioritizing Future Research."

8 Duncombe and Boateng, "Mobile Phones and Financial Services in Developing Countries."

Screening criteria

In establishing the inclusion framework, we developed both a Digital Finance glossary and a set of screening criteria. We developed a glossary of Digital Finance products to identify and classify Digital Finance studies before screening them against our inclusion criteria. The glossary of various Digital Finance products can be seen in the box below.

DFS
The provision of a range of financial services, including payments, credit, savings, and insurance, which the client can access and receive through digital channels. DFS models usually employ agents or intermediaries to assist with cash-in and out of the system. We include over-the-counter (OTC) transactions and direct deposit within the realm of digital financial services.

Digital Channel
Internet, mobile phone (smartphone and feature), ATMs, POS terminals, NFC-enabled devices, chips, electronically enabled cards, biometric devices, tablets, phablets, and any other digital system. Adapted from AFI Global guidelines on Digital Finance Terminology.[9]

Mobile Money
A range of digital financial services accessible via a mobile phone. Funds are loaded into, withdrawn from, and stored in an electronic wallet, rather than a bank account. Depending on the local law, the issuer may be a third-party mobile network operator (MNO) or financial institution.

Mobile Banking
A range of banking services accessible via a mobile phone. Funds are loaded into, withdrawn from, and stored in a bank account. The issuer of these services is a licensed financial institution.

Over-the-Counter (OTC) Transactions
A transaction that the agent conducts on behalf of a customer from either the customer's or agent's digital account.

Payments and transfers
Enable clients to send or receive money via a digital channel. We have defined 10 variations of payments and transfers below:

1. **Person-to-person (P2P):** Any transfer of funds from one individual's account to another.
2. **Person-to-Government (P2G):** Any transfer of funds from an individual's account to a government held account, including the paying of taxes and fees.
3. **Business-to-Government (B2G):** Any transfer of funds from a business account to a government held account, including the paying of taxes and fees.
4. **Business-to-Business (B2B):** These include the transfer of funds between two organizations engaged in commercial activities.
5. **Bill Payment:** These include payments made by a biller of billing organization in exchange for services provided.
6. **Merchant Payment:** These include payments made from an individual to a retailer, or online merchant, in exchange for goods or services.
7. **International Remittances:** These include cross-border transfers of funds from one individual's digital account to another. These include direct account-to-account remittances as well as those completed through an intermediary MTO (money transfer organization).

- **Bulk Disbursement/High Volume Payments:** A payment made into an individual's DFS account. These are one-to-many transactions and include:
  8. **Government-to-person (G2P):** Including disbursement of government benefits and salary payments.
  9. **Business-to-person (B2P):** Including salary and business payments.
  10. **Donor-to-person (D2P):** Including cash transfers.

9 AFI, "Digital Financial Services Basic Terminology."

Sophisticated Financial Services
Adapted from GSMA definitions. Sophisticated Financial Services include credit, savings, and Insurance products.[10]

Digital Credit
For credit to be classified as digital, the client must use a digital channel to receive and repay the loan. Intermediaries, such as loan officers or agents of the credit providing institution, may also be used.

Digital Savings
To be defined as savings, the service must enable clients to save money in a dedicated account that provides principal security and in some cases an interest rate. To be classified as digital, the client must use a digital channel to deposit and withdraw from the savings account. The client should be able to store value electronically in the savings account. Intermediaries, such as loan officers or agents of the savings account providing institution, may also be used.

Digital Insurance
The service must allow clients to manage risks by providing a guarantee of compensation for specified loss, damage, illness, or death. The client should be able to pay the premium using a digital channel and receive the claim using a digital channel.

After comparing studies against the glossary, we used screening criteria to help us further refine and exclude unrelated studies.

First, as per the glossary, the input is a Digital Finance product or a Digital Finance intervention.

Second, studies address the Digital Finance as the defined research area. Only studies dealing with Digital Finance as a core issue were included in the review.

Third, the outcome had to consider client level impacts and the effect of Digital Finance on at least one of the following had to be tested:

1. Client adoption
2. Savings behavior and value
3. Engaging in healthy borrowing
4. Paying less (money and time) for financial services
5. Empowerment through greater privacy, monitoring, and control
6. Consumption smoothing[11]
7. Shock preparedness, response
8. Physical, educational, and emotional welfare
9. Investment in income-generating pursuits and asset building
10. Income

Fourth, the client outcomes must be either directly or at least indirectly applied to the un/under-banked users in the global south.

It is important to note that the scope of the review crossed academic boundaries. We have included studies with and without a counterfactual evidence. Given the complexity of the Digital Finance space, a single "meta-analysis" of Digital Finance interventions may disregard useful signals from the research literature. We believe that this mixture of studies will provide more in-depth information concerning the processes of change and contribute more to the theory of impact pathways.

EGM coding framework

After screening, studies were coded into various categories of interest. Beyond basic information on authors, publication dates, and study location, the main coding categories included 1) the study methodology, 2) the client level outcome(s) on which the study reported, and the 3) the impact level. We outline the coding framework for these three main categories in this section.

— *Coding study methodology*

Within our framework, we included all research methods that met the screening criteria. Using the table below as an overarching heuristic to frame impact measurement approaches, we coded various studies as I, II, III, or IV. Our goal was to convey that while box I is the easiest fit for impact evidence, boxes II, III, and IV can all inform our understanding of impact if we are careful about linking the studies, avoiding overweighing II and IV. A good theory of change (in a world of sparse evidence) can and should carefully draw from all four boxes.

10 Hege Aschim, "Revising Our Definitions for Credit, Savings and Insurance Enabled by Mobile Money."
11 Researchers often use consumption smoothing and improved resilience interchangeably. We have defined these separately.

		Spirit of study: More like "programmatic/product" evaluation. Inform TOCs to guide products, policy, business models, and/or investment	Spirit of study: More like "academic" theory building. Creating theory to yield generalizable models of how the physical, economic, and social world work
Nature of evidence Does it have counterfactual evidence?	**Yes**	I Programmatic RCTs. A/B testing. Econometric and big data approaches, (some) meta-reviews Example: *Harigaya, Tomokxo. 2016. "Effects of Digitization on Financial Behaviors: Experimental Evidence from the Philippines."*[12]	II Foundational empirical social science—lab experiments, econometric model testing, etc. Example: *Sekabira, Haruna, and Martin Qaim. 2016. "Mobile Phone Technologies, Agricultural Production Patterns, and Market Access in Uganda."*[13]
	No	III Action Research, Narratives, Design thinking, Case Studies, "best practices", etc. Example: *Aker, Jenny C and Kimberley Wilson. 2013. "Can Mobile Money Be Used to Promote Savings? Evidence from Northern Ghana".*[14]	IV Ethnographies, Qualitative social science Example: *Morawczynski, Olga. 2009. "Exploring the usage and impact of "transformational" mobile financial services: The case of M-PESA in Kenya".*[15]

— *Coding client outcomes*

To code each outcome, we further classified the client outcomes into various potential measures, as shown below.

1 **Client adoption**
Before/after assessment of client use of a various Digital Finance products.

2 **Savings behavior**
Example measures of improved savings are changes in savings balance and transactions frequency.

3 **Healthy borrowing**
Example measures of healthy borrowing are related to good terms of borrowing: Interest rates, repayment time, clients' perceptions of the credit terms as fair, defaulters, blacklisting, changes in borrowing frequency, changes in decisions on loan size and frequency.

4 **Paying less (money and time) for financial services**
Example measures of paying less for financial services are: clients changing the time spent to access financial services and clients changing costs associated with accessing financial services.

5 **Client empowerment**
Example measures of empowerment are: Changes in bargaining power and independent access to DFS, control, and privacy. Measures often focus on women but are open to other disempowered or excluded populations

6 **Consumption smoothing**
Example measures of consumption smoothing: Changes in managing existing debts, changes in ability to balance income and expenses, particularly in lean periods, and the ability to financially plan for the future. It was noted that researchers often use consumption smoothing and improved resilience interchangeably. We have defined these terms separately.

7 **Changes in shock preparedness, response**
Example measures of being better prepared to deal with shocks: Changes in severity of coping strategies adopted, use of insurance, savings, formal credit or ePayments in times of economic stress, and ability to retain major assets following a shock.

12 Harigaya, "Effects of Digitization on Financial Behaviors."
13 Sekabira and Qaim, "Mobile Phone Technologies, Agricultural Production Patterns, and Market Access in Uganda."
14 Aker and Wilson, "Can Mobile Money Be Used to Promote Savings?"
15 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services."

8 **Changes in physical, educational and emotional welfare**
Example measures of welfare include investment in own or children's education, reduction in household health issues, ability to obtain preventative care or seek health care when needed, general physical security, food security, nutrition, social cohesion, stress and subjective emotional well-being.

9 **Changes in investment in income generating pursuits and asset building**
Example measures of investment and asset building include changes in enterprise investment, occupations, and asset acquisition.

10 **Changes in income**
Example measures of income include diversification of income sources, changes in income, and per capita consumption.

— *Coding of impact*

Impact was coded into one of the three categories:

1 Positive: Changes positively affected the client's outcomes.

2 Negative: Changes negatively affected the client's outcome.

3 No effect: No clear change in the client's outcomes emerged, or the results were not significant.

This approach to coding impact is broad to accommodate the mixture of methodologies in the EGM.

A note on conflict of interest

We have noted studies that may present a conflict of interest. These studies include those that were 1) implemented by organizations evaluating their own products and/or 2) written by the organization who funded or provided technical assistance to a product. We have also noted studies that were not conducted by an independent third party. These studies account for 13 out of the 40 studies. These are available upon request.

Building out the EGM

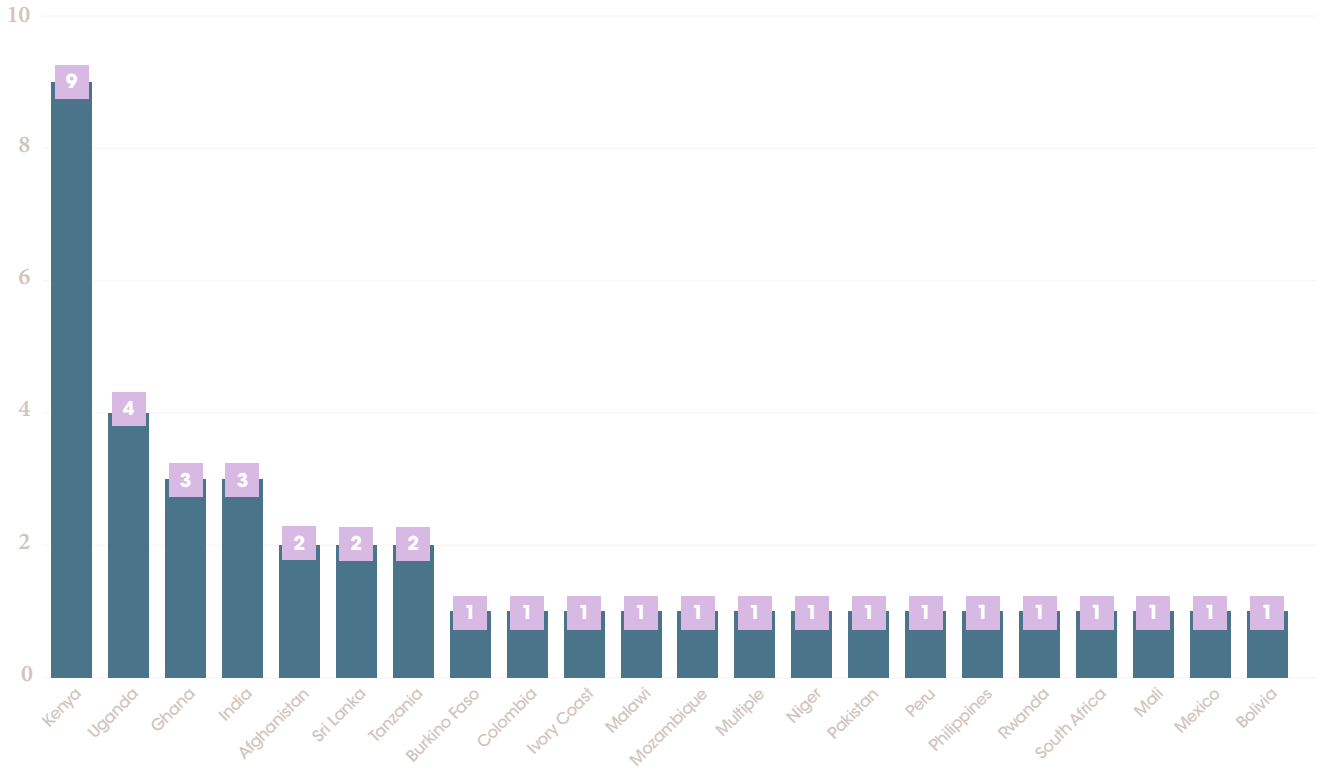
Between November 2016 and May 2017, we screened hundreds of studies using snowballing sampling and mining bibliographies. At the time of launching version one of the DFS EGM, we have identified 40 studies that looked at various client level outcomes, of which 26 (65%) offered counterfactual evidence. The remaining 14 (35%) were ethnographic, social science, action, or case studies. We are tracking several impact studies that are 'in progress' and those that were released after the initial literature review. These will be added into the next version of the DFS EGM, expected to come out in mid-2018.

4 High level review of Digital Finance impact evidence

This section presents the high-level insights from the Digital Finance impact literature review.

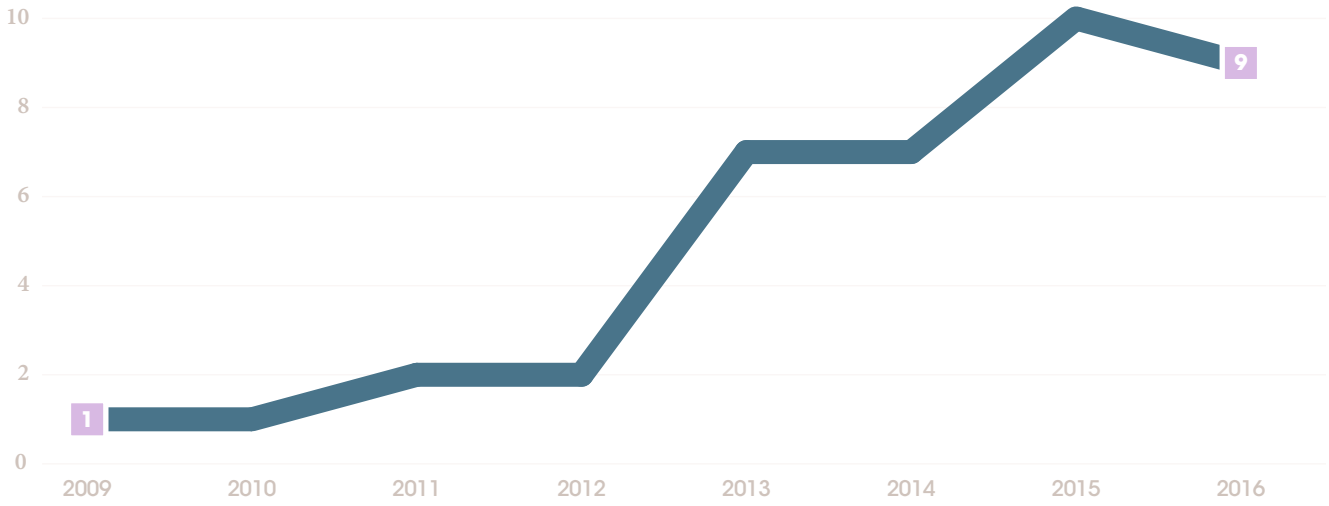
Sub-Saharan Africa (SSA) is highly represented. Overall, 21 countries are represented in the EGM. SSA dominates the literature, with 65% (n=26) of the studies. Within SSA, Kenya accounts for 35% (n=9) of the literature on Digital Finance impact.

Number of studies by country



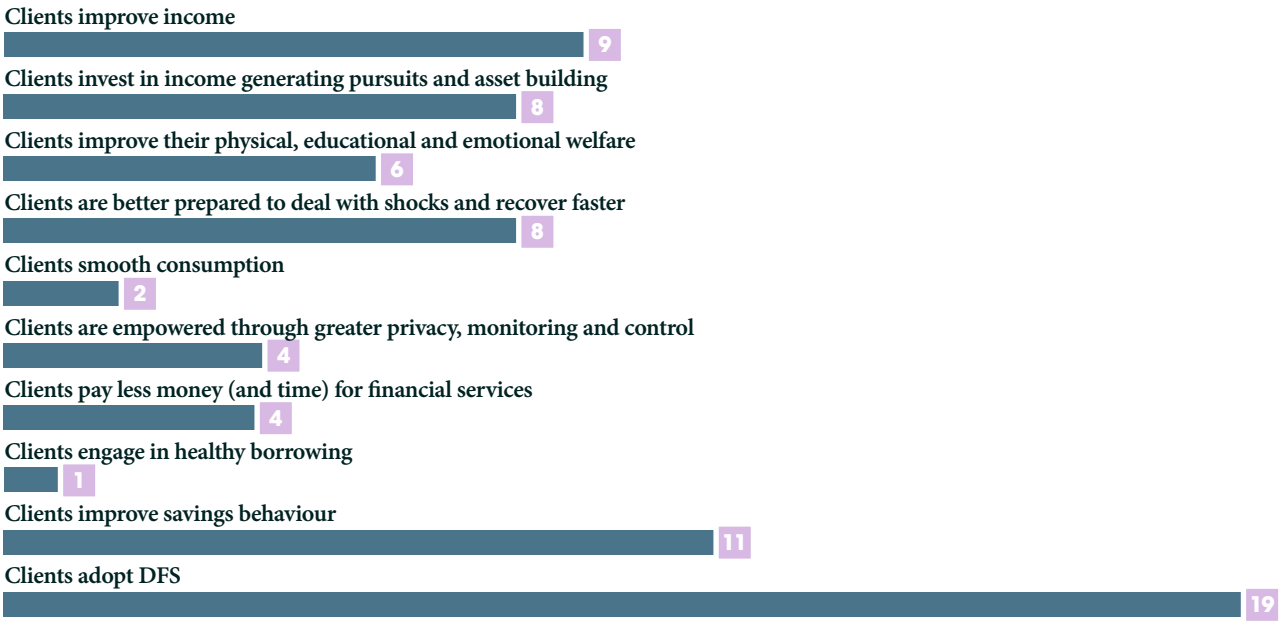
Positive trend on number of publications. While the total number of studies is not large, we see a positive trend in the number of studies published each year. Not surprisingly, about half the studies (n=19) were published in 2015 and 2016.

Number of DFS client impact studies published per year



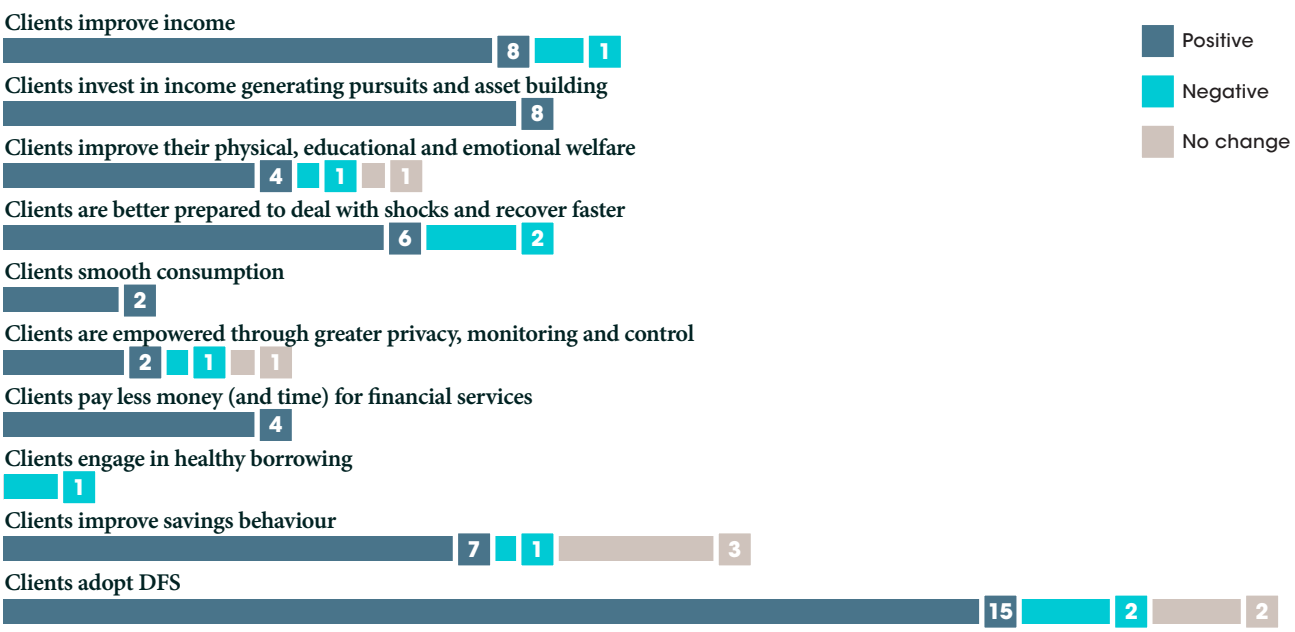
Emphasis on Digital Finance adoption as an outcome. Across the 40 studies, there are 72 information points linked to the 10 outcomes of interest. Over a quarter (26%; n=19) of the outcomes have focused on the adoption of a Digital Finance product. Increasing savings (15%), income (13%), income investing, and response to shocks (both 11%) were the next most frequently evaluated areas. This information shows the researchers' outcome focus per a particular Digital Finance product.

Number of times an outcome was evaluated

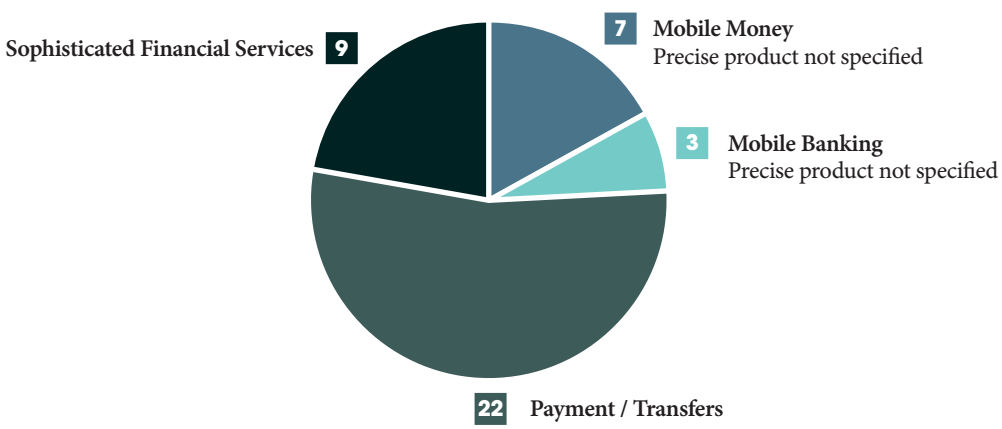


The distribution of outcomes evaluated under each Digital Finance product is of greater importance when determining resource allocation. Digital credit, savings, and insurance all have significant evidence gaps beyond adoption, as a result, we lack an understanding of how financial inclusion fundamentally influences the lives of the low-income populations.

Positive learning results for the broad Digital Finance sector but mixed at a prodtuct level examination. While the number of studies currently available is small, considering the diversity of Digital Finance products, we see positive, negative, and no effects of various Digital Finance products on the outcomes. However, 77.8% of the reported effects were positive, 9.7% were negative, and 12.5% were non-significant. However, when examining each Digital Finance product by outcome and level of impact, we see that the volume of digital payments and transfer and mobile money studies drive the positive results. We have little to say about the effect of digital credit, savings, and insurance products.



Digital payments and transfers is the most fully formed, evidenced based, pathway to client impact. Across the 40 studies, 41 Digital Finance products were evaluated for various client level outcomes. Digital payments and transfers accounted for 54% (n=22) of the impact evaluations. When broad mobile money studies (studies that evaluated mobile money in a broad sense and did not specify the Mobile Money product used) are included in this category, this increased to 71% (n=29) of studies. In 86% (n=19) of the studies coded as payments and transfers, mobile money was the mechanism used to make payments and transfers.



Under payments and transfer products, all outcome areas have been evaluated except "Healthy Borrowing". We see limited evidence that digital payments and transfers improve savings behaviors,[16] though improved savings in a G2P Cash Transfer program has been proposed in Mexico through access to ATMs cards.[17] Theoretically, the association of digital payments and transfers with savings behaviors is not strong. If we viewed digital payments and transfers as the means to increase access to quick cash, individuals would use them for their immediate needs; however, other products may be preferred when saving for a longer-term purpose.

Research has shown that B2P and D2P are cost effective, although evidence to suggest a broader use of Digital Finance beyond the receipt of digital salary or cash transfers is limited.[18] However, evidence suggests that digital payments reduce time and cost of travel.[19]

Receiving remittances in times of shocks is a frequently cited case of the digital payments and transfers usage, and research supports that this is the case for the East African Market.[20] However, as shown in the Pakistan example, where digital payments have not taken off to the same extent, this was not the case. This highlights market specific effects of digital payments and transfers.[21]

Income investing and welfare and income gains are highly populated with evidence, which supports that digital payments and transfers can result in improvements either through less leakages, direct income, or informal loans remitted.[22]

Sophisticated Financial Services are under-evaluated, and they have focused on improving product adoption. Nine studies on Sophisticated Financial Services were located. Seven of these examined savings, with only one study for credit products and one study for insurance products.

Under digital savings, we learn much about product adoption;

- Two-way SMS has the potential to boost the savings behaviors of clients[23]
- Products designed with minimal frills and those that are simple to access have seen successful uptake[24]
- Integration with existing services that customers already know how to use has positive adoption effects[25]
- Additional steps outside the deposit and withdraw cycle of savings may deter users[26]
- Default contribution with additional employer contributions can improve savings behaviors of employees[27]
- User fees affect client uptake[28]
- Product design needs to carefully consider the use case of women[29]

16 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Innovations for Poverty Action and CGAP, "Financial Inclusion for the Rural Poor Using Agent Networks in Peru."

17 Bachas Pierre et al., "Inducing Trust and Savings in Financial Institutions through Debit Cards."

18 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Aker et al., "Payment Mechanisms and Antipoverty Programs."

19 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services"; Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity"; Aker et al., "Payment Mechanisms and Antipoverty Programs."

20 Mirzoyants, "Mobile Money in Tanzania the Financial Inclusion Tracker Surveys Project—Use, Barriers and Opportunities"; Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy"; Jack and Suri, "Risk Sharing and Transactions Costs."

21 Mirzoyants, "Mobile Money in Pakistan—The Financial Inclusion Tracker Surveys Project—Use, Barriers and Opportunities."

22 Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy"; Aker et al., "Payment Mechanisms and Antipoverty Programs"; Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity"; Sekabira and Qaim, "Mobile Phone Technologies, Agricultural Production Patterns, and Market Access in Uganda"; Munyegera and Matsumoto, "Mobile Money, Rural Household Welfare and Remittances: Panel Evidence from Uganda"; Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services"; Kirui et al., "Impact of Mobile Phone-Based Money Transfer Services in Agriculture: Evidence from Kenya."

23 Valenzuela, Holle, and Noor, "Juntos Finanzas—A Case Study."

24 Callen et al., "What Are the Headwaters of Formal Savings?"; Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience."

25 Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience."

26 Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"

27 Blumenstock, Callen, and Ghani, "Mobile-Izing Savings with Automatic Contributions."

28 Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"; Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience"; Schaner, "The Cost of Convenience?"

29 Schaner, "The Cost of Convenience?"

However, the potential impact pathway of digital savings is under-evaluated, as only one study looked beyond adoption and saving behaviors to evaluate the client's ability to respond to shocks. This study found no effect.[30]

Two studies examined the adoption of one digital insurance product and one digital credit product. Their findings help us learn about the ways in which an investment in intermediated support help adopt new technology for loan repayments[31] and about the potential of the freemium model in micro insurance.[32]

The Digital Finance industry is growing, with GSMA, which only reports on mobile based products, reporting year-on-year growth in the number of live products.[33] The deficiency in evidence is stark in comparison to the growth in products.

Lessons from mobile banking provide a cautionary account of unintended consequences when changing from analogue to digital. As many financial services for low income and rural populations are delivered in a group setting, digitization may then disrupt the existing social architecture, leaving its overall effect uncertain. One study that examined the digitization of a group product reported negative effects on deposits, savings balances, borrowing, welfare and income.[34] Weakened group cohesion and sensitivity to transaction fees were cited as the drivers of these effects. This was primarily among members who live near banking locations at baseline and have stronger connections to their microfinance groups. While positive effects on lowering the costs of transactions are clear, the unintended consequences further down the impact pathway were eventually unearthed. Without an impact evaluation, these would not have been revealed.

Conceptual clarity of studies. Seven studies examined mobile money and three examined mobile banking. These are broad terms that may encompass multiple products, but the studies did not or could not specify the singular or multiple products used. This affects the utility of these studies, as we are unclear on what Digital Finance elements were tested and how we can apply the results.

Four out of the five studies on the longer-term outcomes of mobile money used a diverse set of definitions of a mobile money user, with 1) proximity to a mobile money agent, 2) *"has mobile money on their own or another phone"* and 3) *"ever used"* mobile money being examples of the independent variable descriptions. While sophisticated statistical methods are being used to control for confounding variables, it is difficult to discern their contribution and understand why and how these effects may be associated with mobile money alone. Baumüller[35] reached a similar conclusion in her literature review of mobile phone enabled services and stated that "most studies do not assess impact in relation to usage. Rather, research tends to distinguish between users (or those with access to the mobile service) and a control group and then compare impacts for the entire groups irrespective of usage patterns." Access or "ever used" mobile money are significant leaps to an active user definition and the benefits they may gain. These studies nonetheless provide insights into and suggestions about the effect of mobile money, however, more defined measurements are recommended.

30 Romero and Nagarajan, "Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi."
31 Salima Fazal Karim and Alexandra Tyers, "Case Study Swadhaar, Accion and Airtel Money: Mobile Money for Female Customer in India."
32 Zetterli, "Can Phones Drive Insurance Markets? Initial Results from Ghana."
33 GSMA, "2015: Mobile Insurance, Savings & Credit Report."
34 Harigaya, "Effects of Digitization on Financial Behaviors."
35 Baumüller, "The Little We Know."

Hesitancy to show negative impact. As mentioned, a recent study on the effects of digitizing banking groups in the Philippines reported a negative effect on a number of client outcomes.[36] A study on the use of ATM cards to increase bank account use in Kenya found positive effects on male and joint accounts but negative effects on women's account usage.[37] Seven studies on various types of accounts, e.g., D2P, B2P, G2P, P2P, and mobile savings, yielded null results regarding some of the studied outcomes.[38] While it is difficult to quantify, it appears that publication bias might account for limited reports on negative and unintended consequences.

36 Harigaya, "Effects of Digitization on Financial Behaviors."

37 Schaner, "The Cost of Convenience?"

38 Aker et al., "Payment Mechanisms and Antipoverty Programs"; Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Innovations for Poverty Action and CGAP, "Financial Inclusion for the Rural Poor Using Agent Networks in Peru"; Mirzoyants, "Mobile Money in Pakistan – The Financial Inclusion Tracker Surveys Project – Use, Barriers and Opportunities"; Romero and Nagarajan, "Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi"; Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"; Guerin and Sangar, "Mobile Money and Financial Inclusion in Mali: What Has Been the Impact on Saving Practices?."

5 Digital Finance product level analysis

This section provides an in-depth review of the impact evidence per Digital Finance product. Each Digital Finance product analysis has the following sections:

- Digital Finance studies overview
- Analysis of evidence by client outcomes
- Summary of impact evidence

Client level impact of digital payment and transfer products

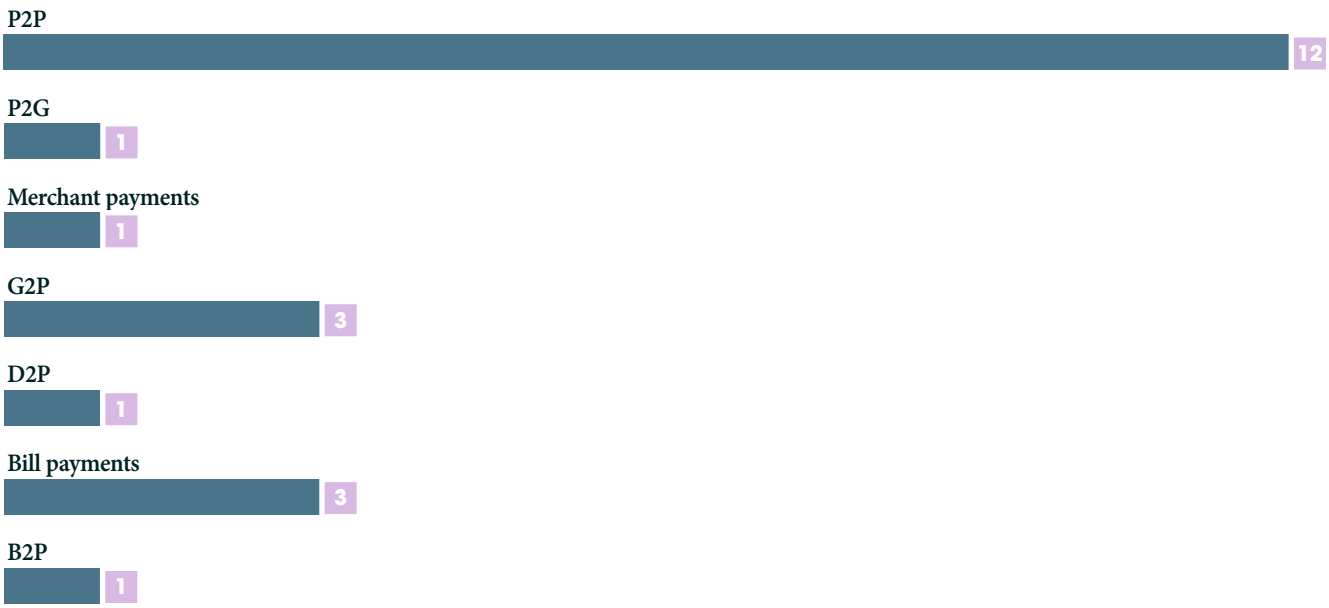
Digital payment and transfer studies overview

Payments and transfers is the most frequently evaluated Digital Finance product and account for 51% (n=22) of all the studies. The studies covered 14 countries, with Kenya being the most frequently evaluated market (n=5), and East Africa accounting for 50% (n=11) of all payment and transfer studies.

Overall, 86% (n=19) of the studies used mobile money as the payment and transfer mechanism, with one study using mobile banking, another one using smart cards to disburse funds, and one other study using ATM cards. Beyond mobile money channels, products also incorporated client training,[39] integration with PayGo products,[40] and Government policy,[41] as additional interventions to drive adoption and use.

Not all payment and transfer variations were equally evaluated, with P2P accounting for 55% (n=11) of the payment and transfer studies. The graph below shows the number of studies by variation. No studies were sourced on B2G, B2B, or International remittances that would fit within the inclusion framework.

Number of payment and transfer studies by variation



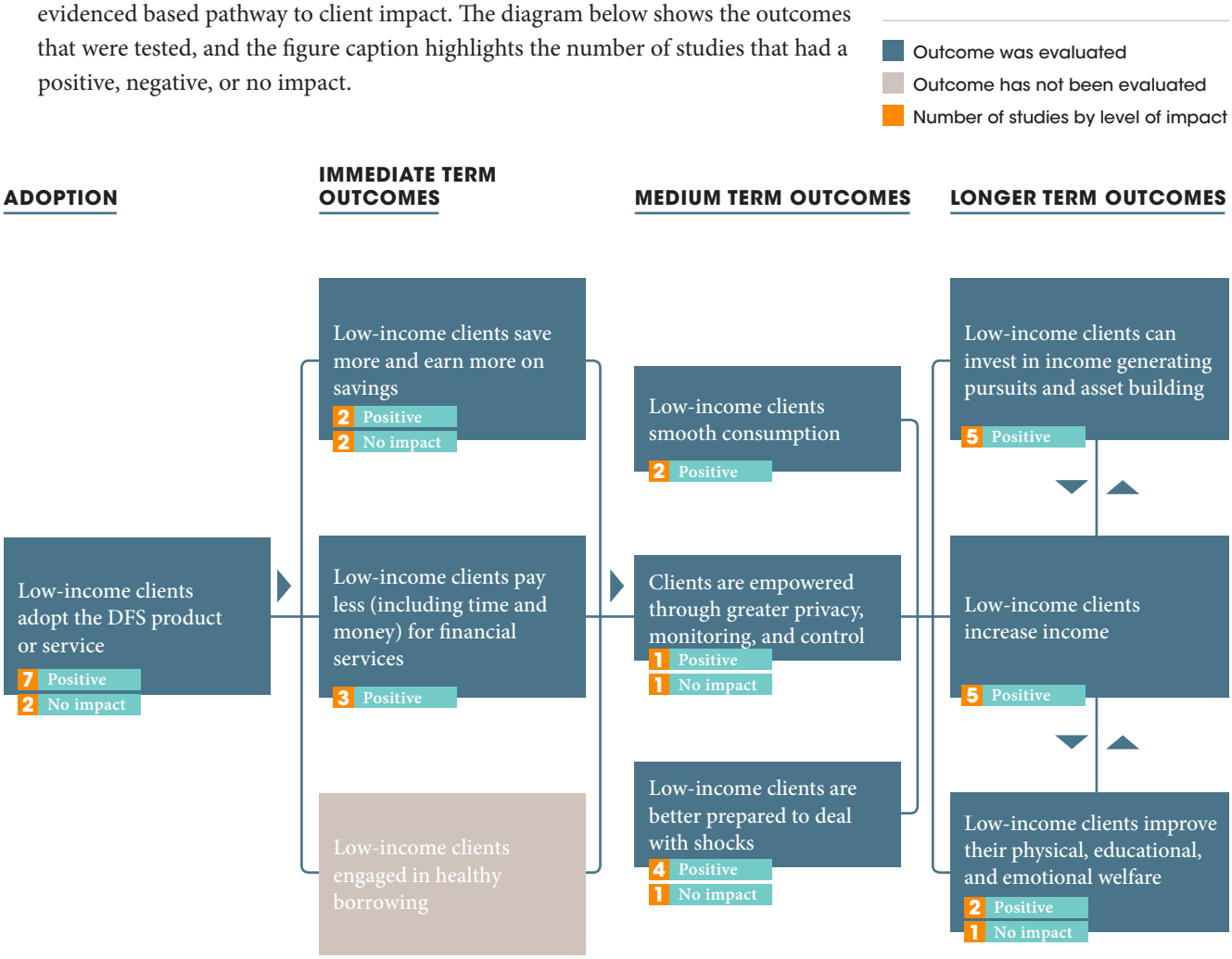
39 Aker and Wilson, "Can Mobile Money Be Used to Promote Savings?"; Batista and Vicente, "Introducing Mobile Money in Rural Mozambique"; Innovations for Poverty Action and CGAP, "Financial Inclusion for the Rural Poor Using Agent Networks in Peru."

40 "Fenix International"; Cohen, "Mobile for Development Utilities Mobisol Pay-as-You-Go Solar for Entrepreneurs in Rwanda"; Waldron and Wolvers, "Daily Energy Payments Powering Digital Finance in Ghana."

41 Frydrych, "Mobile Money Facilitates 1.7 Million School Fee Payments in Côte d'Ivoire."

Outcomes evaluated

Under payment and transfer products, all outcome areas, except "healthy borrowing," were evaluated across the 22 studies. Payments and transfers is the most fully formed evidenced based pathway to client impact. The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no impact.



Impact of digital payment and transfer products

— *Impact of P2P*

As P2P studies account for the majority of studies under payment and transfers, we have separated what we know about P2P from the other variations of digital payments and transfers.

Adoption

In markets where mobile money is relatively new or uptake is low, P2P products have seen success with targeted client training. In Mozambique, the mKesh roll out was tested with community level information meetings. Researchers found that targeted individuals were 7–9% more likely to make a deposit and 12% more likely to receive a transfer.[42] In Ghana, Aker and Wilson[43] found greater adoption of P2P services when training was coupled with access to mobile phones. In the sensitization only group, approximately 8–10% of individuals in the "mobile raffle and sensitization" group made transactions, with the usage being between 25–31%.

Clients save more

In Bolivia, during qualitative interviews, clients of Tigo money stated that they save more through receiving digital transfers.[44]

Clients pay less for financial services

Digital payments are theorized to reduce the cost of using financial services. This could occur due to smaller fees, reductions in the cost of travel, opportunity costs of travel (i.e., not being able to work), and time savings. One P2P study tested this outcome and found that clients of digital payments

42 Batista and Vicente, "Introducing Mobile Money in Rural Mozambique."
43 Aker and Wilson, "Can Mobile Money Be Used to Promote Savings?"
44 Rocabado and Balderrama, "Hand Held Wealth? Mobile Money & Food Production in Rural Potosi."

reported paying less for access. M-PESA users in Kenya reported sending more remittances because of the money they saved on sending transfers via M-PESA.[45]

Clients smooth consumption

The potential rapid availability of digital payments and transfers may help clients improve their consumption and manage income flows over time. Evidence to support this theory comes from the Kenya M-PESA program. Several farmers asserted that M-PESA enabled them to space out their spending and that sending money "in bits" helped manage temptations.[46] Additionally, we also see evidence that M-PESA users significantly increase their overall consumption expenditures by 11.8%, whereas non-users reduce theirs by about 3% when shocks occur.[47]

Clients are empowered through greater privacy, monitoring, and control

In Kenya, female M-PESA users said that they frequently used the application to store their "secret savings."[48] These savings were used to purchase household items, pay for healthcare, pay for school fees, and invest in business. The women explained that they preferred to store money outside of the home because it decreased the risk of it being found and stolen by their husbands. They further explained that they preferred M-PESA to the bank because it was accessible. They did not need to travel to town to deposit or withdraw their money. They had more privacy, as they could check their account balances from home without their husbands knowing what they were doing. Some of the women also claimed that they were using M-PESA to pay and collect proceeds from a savings merry-go-round group. This decreased the risk of their husbands finding out that they had collected cash.

Clients are better prepared to deal with shocks

Like consumption smoothing, receiving digital payments or transfers in times of economic shock could help clients improve their resilience. Four out of the five studies that tested this hypothesis found positive effect of digital payments and transfers on client resilience. In Kenya, we see evidence that users are more likely to receive remittances when faced with an economic shock (9.4%), with an 11% higher probability of receiving a remittance for users in response to a shock.[49] In Tanzania, among households with mobile money users, 13% received remittances to help them cope with a shock compared with 9% of households with no mobile money users.[50] However, in Pakistan, it is rare to receive remittances in response to a negative economic shock. Only one household with mobile money users and nine households without mobile money users received remittances to help them cope.[51] This suggests that the effects are market specific.

Invest in income generating pursuits and asset building

With additional income received from transfers and or/costs saved on using a digital channel, savings and or remittances may be invested in income generating pursuits and asset building. Three evaluations looked at M-PESA's impact in Kenya and found that the use of M-PESA increases employment by 12%.[52] M-PESA was also highlighted to provide new employment beyond agents, for example "M-PESA boys" would be paid a commission to conduct an M-PESA transaction on another's behalf.[53] In terms of assets, Kirui et al. found that the value of household annual agricultural input use was $42 more for mobile money users compared to their counterparts. Regarding agricultural commercialization, the results showed that the level of commercialization is 37% higher among users of mobile money.[54]

Clients' improved welfare

Under welfare, we include changes in education, health, general security, food security, stress and subjective emotional well-being, and social cohesion. Payments and transfers have the potential to improve client welfare through cost savings, which can be invested elsewhere; time savings, which can allow more time for productive activities; personal security through limiting the amount of physical cash on a client; and psychological reassurance through the potential knowledge that assistance can be provided if a financial shock occurs. Positive welfare outcomes were found for education expenditure through P2P transfers. When faced with a shock, the difference between users and nonusers in the propensity to spend on education was 9.6%, furthermore, a 9.1% difference in food expenditure was observed among users and non-users of mobile money payments and transfers.[55]

45 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services."
46 Morawczynski.
47 Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy."
48 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services."
49 Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy"; Jack and Suri, "Risk Sharing and Transactions Costs."
50 Mirzoyants, "Mobile Money in Tanzania the Financial Inclusion Tracker Surveys Project – Use, Barriers and Opportunities."
51 Mirzoyants, "Mobile Money in Pakistan – The Financial Inclusion Tracker Surveys Project – Use, Barriers and Opportunities."
52 Mbiti and Weil, "Mobile Banking."
53 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services."
54 Kirui et al., "Impact of Mobile Phone-Based Money Transfer Services in Agriculture: Evidence from Kenya."
55 Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy."

Clients increase income

Digital payments and transfers can enhance clients' financial well-being both directly as well as through the effect of a broader ecosystem. Direct income gains were seen in Uganda, with users seeing a 31% difference in off-farm incomes.[56] Additional research has also demonstrated that users had a 13% increase in household per capita consumption following the adoption of mobile money services.[57] In Kenya, evidence is also emerging on income gains of users. Users were shown to earn more from farming activities,[58] and another study reported that 77% of households reported an increase in income since using M-PESA.[59] However, some urban users noted that the advent of digital payments brought increasing demands from rural relatives that negatively affected their own income flows.[60]

— *Non-P2P digital payments and transfers Impact*

Non-P2P programs are combined here, as the evidence is sparse overall.

Adoption

Under product adoption, we find evidence that PayGo (P2B) increases the overall adoption of mobile money. Evidence from three partnerships of MNOs and PAYGO solar companies in Uganda, Ghana, and Rwanda shows that PayGo users become more active mobile money users, and, in some cases, they become first time users.[61] With the adoption of merchant payments, Juntos and Tigo Tanzania found that a two-way SMS conversations can improve adoption of merchant payments by 30%.[62] In the Ivory Coast, we find that Government Policy has substantial power to encourage P2G digital payments, with 99% of school fees now being paid digitally.[63] However, no compelling evidence was found that recipients of D2P and B2P programs were more likely to send or receive transfers compared to individuals receiving cash based payments.[64]

Clients save more

Researchers have also evaluated the hypothesis that digital payments and transfers may lead to better savings behavior through allowing balances to accumulate. Two studies tested this theory and found no effects. A G2P program in Peru found that receiving digital payments had no effect on savings behavior.[65] Similarly, a mobile salary payment program (B2P) in Afghanistan found no difference in the value of savings among employees receiving and not receiving their salary via mobile money (Blumenstock et al., 2015).[66] However, improvement in savings in a G2P Cash Transfer program in Mexico through access to ATMs cards was suggested.[67]

Clients pay less for financial services

Looking at a D2P and a G2P program, we see positive outcomes of paying less for accessing cash. In Niger, recipients of a mobile cash transfer program travelled shorter distances to obtain their transfer compared to their manual cash counterparts, saving 20 hours over the program's life, which would amount to $7.50 in savings.[68] In India, the total time required to collect a social program payment fell by 22 minutes through the use of smartcards.[69]

Clients are empowered through greater privacy, monitoring, and control

In Niger, D2P recipients, all of whom were women, reported that the mobile transfer was less observable by other household members, thereby allowing them to temporarily conceal the arrival of the transfer. The study found that D2P recipients were more likely to travel to weekly markets, spend more on children's clothing, and be involved in the sale of household grains compared to those in other treatment groups. In addition, improved diet diversity results were strong. These results, taken together with more diverse uses of the cash transfer, greater diet diversity, and increased cultivation of women's cash crops, provide some evidence that the D2P mechanism could have changed intra-household decision-making, thereby allowing women to have greater control over the spending of the cash transfer and to engage in consumption and production decisions. Nevertheless, author cited that these results are suggestive at best and more research is needed.[70]

56 Sekabira and Qaim, "Mobile Phone Technologies, Agricultural Production Patterns, and Market Access in Uganda."
57 Munyegera and Matsumoto, "Mobile Money, Rural Household Welfare and Remittances: Panel Evidence from Uganda."
58 Kirui et al., "Impact of Mobile Phone-Based Money Transfer Services in Agriculture: Evidence from Kenya."
59 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services."
60 Morawczynski.
61 Waldron and Wolvers, "Daily Energy Payments Powering Digital Finance in Ghana"; Cohen, "Mobile for Development Utilities Mobisol Pay-as-You-Go Solar for Entrepreneurs in Rwanda"; "Fenix International."
62 Juntos Global, "The Tigo Pesa—Juntos Partnership: Increasing Merchant Payments through Engaging SMS Conversations."
63 Frydrych, "Mobile Money Facilitates 1.7 Million School Fee Payments in Côte d'Ivoire."
64 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Aker et al., "Payment Mechanisms and Antipoverty Programs."
65 Innovations for Poverty Action and CGAP, "Financial Inclusion for the Rural Poor Using Agent Networks in Peru."
66 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan."
67 Bachas Pierre et al., "Inducing Trust and Savings in Financial Institutions through Debit Cards."
68 Aker et al., "Payment Mechanisms and Antipoverty Programs."
69 Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity.
70 Aker et al., "Payment Mechanisms and Antipoverty Programs."

Invest in income generating pursuits and asset building

In Niger's D2P program, we see evidence that mobile money transfer households are more likely to cultivate marginal cash crops. Mobile money transfer recipients had greater flexibility in choosing the time to cash out, which could have freed up their time to engage in more productive activities.[71] In Bolivia, some clients of Tigo money stated that they purchase business assets following receipt of transfers.[72]

Clients improve welfare

A mobile salary payments program (B2P) in Afghanistan did not find evidence that digital payments increased the employees' perception of physical security, as hypothesized.[73] However, in a D2P cash transfer program in Niger, participants who received the transfer via mobile money used cash to buy more diverse types of goods, and they were more likely to purchase protein and energy-rich foods. This resulted in 9-16% improved diet diversity, with children consuming a third of a meal more per day.[74]

Clients increase income

In India, biometrically authenticated cards for workers reduced leakages of government social payments and led to a 24% increase in earnings in treatment households.[75]

Summary of payments and transfers Impact

- Bill payment integration with a PayGo service has been demonstrated to increase overall mobile money usage.[76]
- Government Policy can drive large scale mobile money adoption.[77]
- Evidence that digital payments and transfers improve savings behaviors is limited,[78] though accessing an ATM card may help.[79] Theoretically, there is not a strong association between digital payments and improved savings. If we viewed digital payments and transfers as the means to increase access to cash, individuals would use digital payments and transfers to plan for immediate needs; however, when saving for a long-term goal, other products may be preferred.
- In markets where digital payments and transfers are new concepts or uptake is low, client training and handholding may improve product adoption.[80]
- B2P and D2P, may be cost-effective but there is limited evidence to suggest broader adoption beyond the receipt of salary or cash transfers.[81]
- The existing evidence suggests that time and cost of travel are reduced using digital payments, though often the financial provider's fees are not included in the analysis model.[82]
- Digital payments and transfers have been found to improve women's privacy and control over their resources.[83]
- Receiving remittances in times of shock is a frequently cited case of digital payments and transfers, especially in the East African Market[84] but not in the Pakistan example. This highlights market specific effects of digital payments and transfers.[85]
- Evidence supports that digital payments and transfers can improve income investing and welfare and income gains either through less leakages, direct income, or informal loans remitted.[86]

71 Aker et al.

72 Rocabado and Balderrama, "Hand Held Wealth? Mobile Money & Food Production in Rural Potosi."

73 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan."

74 Aker et al., "Payment Mechanisms and Antipoverty Programs."

75 Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity.

76 "Fenix International"; Waldron and Wolvers, "Daily Energy Payments Powering Digital Finance in Ghana"; Cohen, "Mobile for Development Utilities Mobisol Pay-as-You-Go Solar for Entrepreneurs in Rwanda."

77 Frydrych, "Mobile Money Facilitates 1.7 Million School Fee Payments in Côte d'Ivoire."

78 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Innovations for Poverty Action and CGAP, "Financial Inclusion for the Rural Poor Using Agent Networks in Peru."

79 Bachas Pierre et al., "Inducing Trust and Savings in Financial Institutions through Debit Cards."

80 Batista and Vicente, "Introducing Mobile Money in Rural Mozambique."

81 Blumenstock et al., "Promises and Pitfalls of Mobile Money in Afghanistan"; Aker et al., "Payment Mechanisms and Antipoverty Programs."

82 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services"; Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity"; Aker et al., "Payment Mechanisms and Antipoverty Programs."

83 Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services"; Aker et al., "Payment Mechanisms and Antipoverty Programs."

84 Mirzoyants, "Mobile Money in Tanzania the Financial Inclusion Tracker Surveys Project—Use, Barriers and Opportunities"; Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy"; Jack and Suri, "Risk Sharing and Transactions Costs."

85 Mirzoyants, "Mobile Money in Pakistan—The Financial Inclusion Tracker Surveys Project—Use, Barriers and Opportunities."

86 Suri, Jack, and Stoker, "Documenting the Birth of a Financial Economy"; Aker et al., "Payment Mechanisms and Antipoverty Programs"; Muralidharan, Niehaus, and Sukhtankar, "Building State Capacity"; Sekabira and Qaim, "Mobile Phone Technologies, Agricultural Production Patterns, and Market Access in Uganda"; Munyegera and Matsumoto, "Mobile Money, Rural Household Welfare and Remittances: Panel Evidence from Uganda"; Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services"; Kirui et al., "Impact of Mobile Phone-Based Money Transfer Services in Agriculture: Evidence from Kenya."

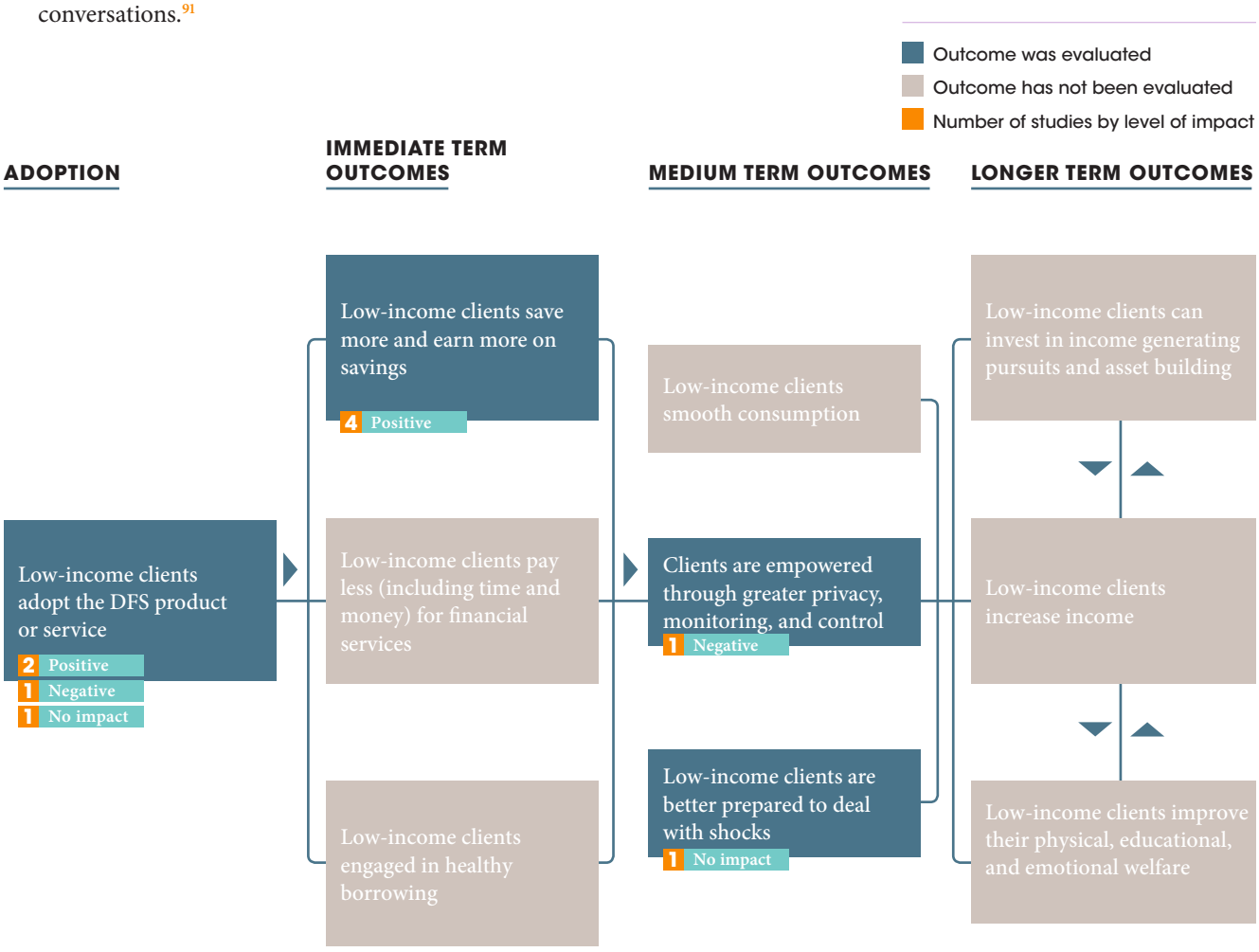
Client level impact of digital savings products

Digital savings studies overview

Seven studies evaluated the effect of digital savings products in six countries. The digital savings products highlighted various design and delivery mechanisms to increase the adoption of products and improve client outcomes. These ranged from mobile money channels,[87] digitally equipped roving agents,[88] access to ATM cards,[89] fee variations,[90] and two-way SMS conversations.[91]

— *Outcomes evaluated*

Under savings products, four outcome areas were evaluated across the seven studies. These were 1) adoption, 2) clients' increased savings, 3) clients' empowerment through greater privacy, monitoring, and control, and 4) improved ability to respond to shocks. The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no effect.



87 Blumenstock, Callen, and Ghani, "Mobile-Izing Savings with Automatic Contributions."

88 Romero and Nagarajan, "Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi"; Callen et al., "What Are the Headwaters of Formal Savings?"

89 Schaner, "The Cost of Convenience?"

90 Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—`The Indian Experience"; Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"

91 Valenzuela, Holle, and Noor, "Juntos Finanzas—A Case Study."

Impact of digital savings products

Adoption

Three studies examined the adoption of various digital savings products. The studies demonstrate the importance of product design and delivery. Utilizing behavioral science through a two-way SMS was shown to increase savings account usage.[92] Between 2013 – 2014, Juntos and Bancolombia partnered to increase client adoption of agent and mobile channels. Three months after the introduction of Juntos, active new accounts increased by 32.5% and average account balances increased by 50% compared to the control group.[93] Simple steps that mirror a potential client's own savings behavior could be important for product uptake. A mobile savings product called for users to purchase regular mobile phone top-up scratch cards and add funds to a formal savings account at a bank. This may have proved too complicated, with 71% of the sample never using the system and 11% of the sample using the system only once.[94] We also noted that with the same product, clients may be sensitive to fees. The product was tested with a 0%, 2%, 4%, and 8% user fee. Those in the zero-fee group were 7% more likely to have made at least one deposit compared to those in the 8% fee group; however, this difference was not significant. In Kenya, a study examined the effect of accessing ATM cards to increase saving account usage.[95] ATM cards reduced the over-the-counter withdrawal fee by 50% and allowed card holders to make withdrawals outside of bank hours. The ATM treatment led to 2.1 more transactions over the next 2.5 years (a 68% increase). The treatment increased both the number and value of deposits and withdrawals. However, while the ATM treatment had positive effects on joint accounts and accounts owned by men, it had a negative effect on female owned accounts. The hypothesis is that women were less incentivized to save when their partner could also have access to their account via their ATM card; thus, product designs need to account for why and how women use their savings accounts at banks.[96]

Clients save more

Four studies examined the immediate outcome of clients saving more. In Afghanistan, default contribution was, not surprisingly, found to increase employees' savings contribution, but it may have longer term behavioral changes. Blumenstock[97] found that employees who were assigned default contribution rate of 5% were 40% more likely to contribute to the account 6 months later compared to individuals who were assigned a contribution rate of zero. In India, low cost and easy access to mobile savings products have had a positive effect. Using a cell phone model, SimpliBank allowed customers to have a zero balance and deposit and withdraw at a lower cost compared to bank clients. Overall, 90% of users felt that their ability to save has increased with the mobile banking services and that the low cost, low maintenance accounts encouraged users to deposit rather than spend small amounts.[98] In Sri Lanka, a study found positive results via increased availability of savings deposits through regular roving agents equipped with a wireless POS device to collect saving deposits. The number of transactions per month quadrupled in the treatment group, flow of savings into bank accounts almost doubled, and overall savings increased by more than 15% per month.[99]

Clients are empowered through greater privacy, monitoring, and control

As noted under the adoption outcome, a study in Kenya tested the effects of ATM cards on savings account usage, revealing that the use of male and joint accounts increased while the use of accounts owned by women was negative or close to zero. The results suggest that ATM cards targeting individuals with below-median bargaining power significantly decreased bank account use by 0.30 standard deviations units. In contrast, ATM cards given to individuals with above-median bargaining power increased account use by 0.20 standard deviation units.[100]

Better response to shocks

One study examined the client's ability to respond better to economic shocks using savings accounts. No effect was found on clients' ability to respond to shocks through improved access to a savings product.[101] In Malawi, roving agents equipped with a mobile ATM visited rural areas to provide access to savings products. The results indicate that having an active savings account did not result in a reduction of sub-optimal coping behaviors in response to financial shocks.[102]

92 Valenzuela, Holle, and Noor, "Juntos Finanzas—A Case Study."
93 Ibid..
94 Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"
95 Schaner, "The Cost of Convenience?"
96 Ibid.
97 Blumenstock, Callen, and Ghani, "Mobile-Izing Savings with Automatic Contributions."
98 Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience."
99 Callen et al., "What Are the Headwaters of Formal Savings?"
100 Schaner, "The Cost of Convenience?"
101 Romero and Nagarajan, "Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi."
102 Ibid..

Summary of digital saving products impact

- Two-way SMS has the potential to boost the savings behaviors of clients.[103]
- Savings products designed with minimal frills that are simple to access have resulted in successful adoption.[104]
- Integration with existing services customers already know how to use has positive adoption effects, for example in EKO's model, the mobile number is the bank account number of the customer, allowing individuals to transact by simply dialing numbers on their mobiles.[105] Additional steps outside the deposit/withdraw cycle of savings may deter users.[106]
- Default contribution with additional employer contributions can improve savings behaviors of employees.[107]
- User fees could affect client uptake.[108]
- Product design needs to carefully consider the social and cultural norms of women and individuals with limited bargaining power.[109]

103 Valenzuela, Holle, and Noor, "Juntos Finanzas—A Case Study."

104 Callen et al., "What Are the Headwaters of Formal Savings?"; Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users – The Indian Experience."

105 Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience."

106 Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"

107 Blumenstock, Callen, and Ghani, "Mobile-Izing Savings with Automatic Contributions."

108 Mel et al., "Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?"; Mani, "Effects of Mobile Banking on the Savings Practices of Low Income Users—The Indian Experience"; Schaner, "The Cost of Convenience?"

109 Schaner, "The Cost of Convenience?"

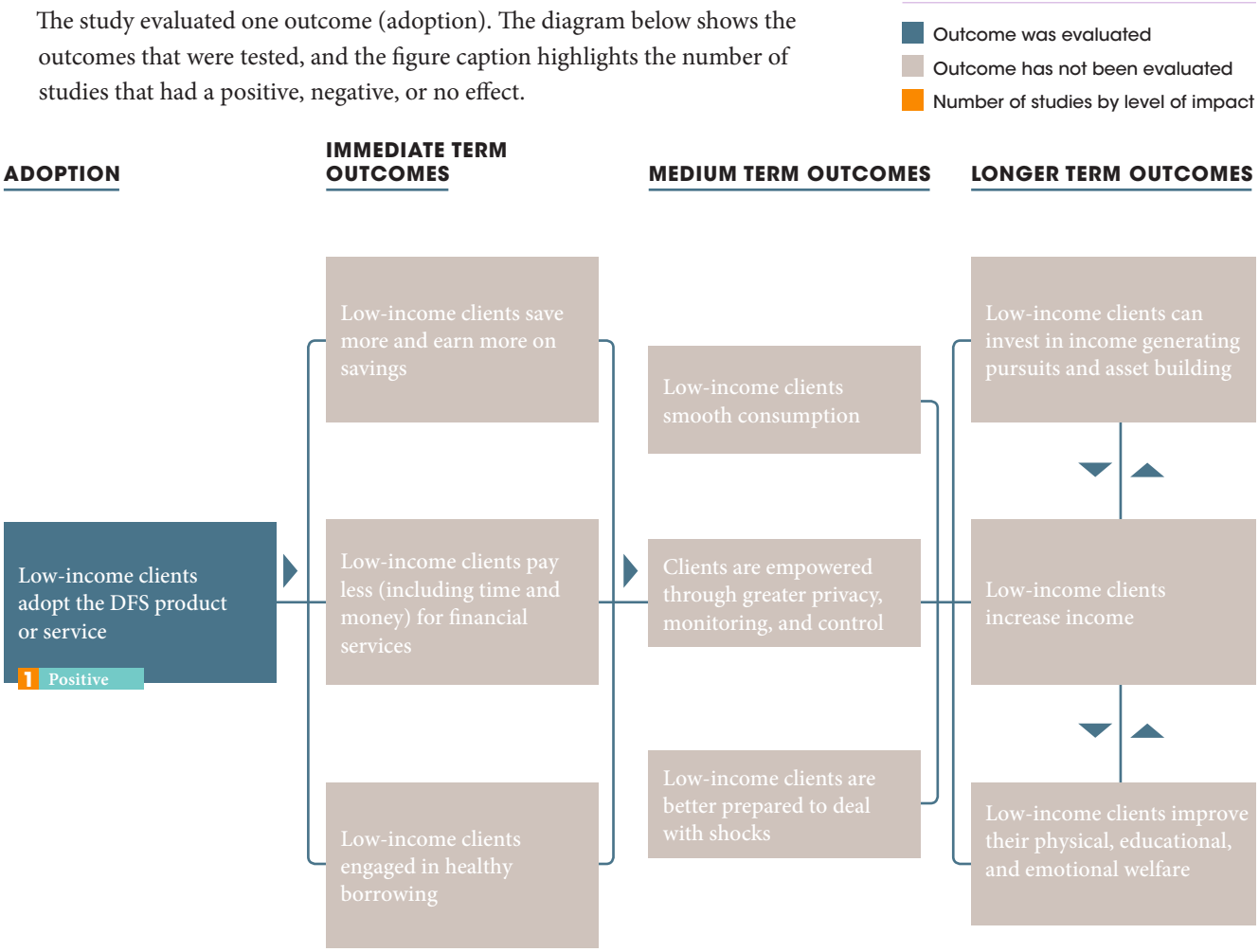
Client level impact of digital credit products

Digital credit studies overview

Only one study evaluated the effect of a digitally enabled credit product. The product used mobile money as mechanism to repay loans directly rather than through a bank. The product delivery included local peer educators.[110]

— *Outcomes evaluated*

The study evaluated one outcome (adoption). The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no effect.



110 Salima Fazal Karim and Alexandra Tyers, "Case Study Swadhaar, Accion and Airtel Money: Mobile Money for Female Customer in India."

Impact of digital credit products

Adoption

In India, a digital credit product used local peer educators to "handhold" new female customers. The results showed that 69% of new clients and 84% of peer-assisted customers used the mobile money channel for loan repayments. These results suggest that the peer educators helped increase uptake of the credit product.[111] Of the new customers surveyed in the post-launch survey, 36% reported using mobile money for transactions other than loan payments and savings. This increased to 47% for the peer educator-assisted group. Both numbers were considerably higher compared to the pilot average of 5%.[112]

Summary of credit product impact

- In environments where mobile money uptake is low, an investment in intermediated support can help adopt new technology for loan repayments.[113]

111 Salima Fazal Karim and Alexandra Tyers, "Case Study Swadhaar, Accion and Airtel Money: Mobile Money for Female Customer in India."
112 Ibid.
113 Ibid.

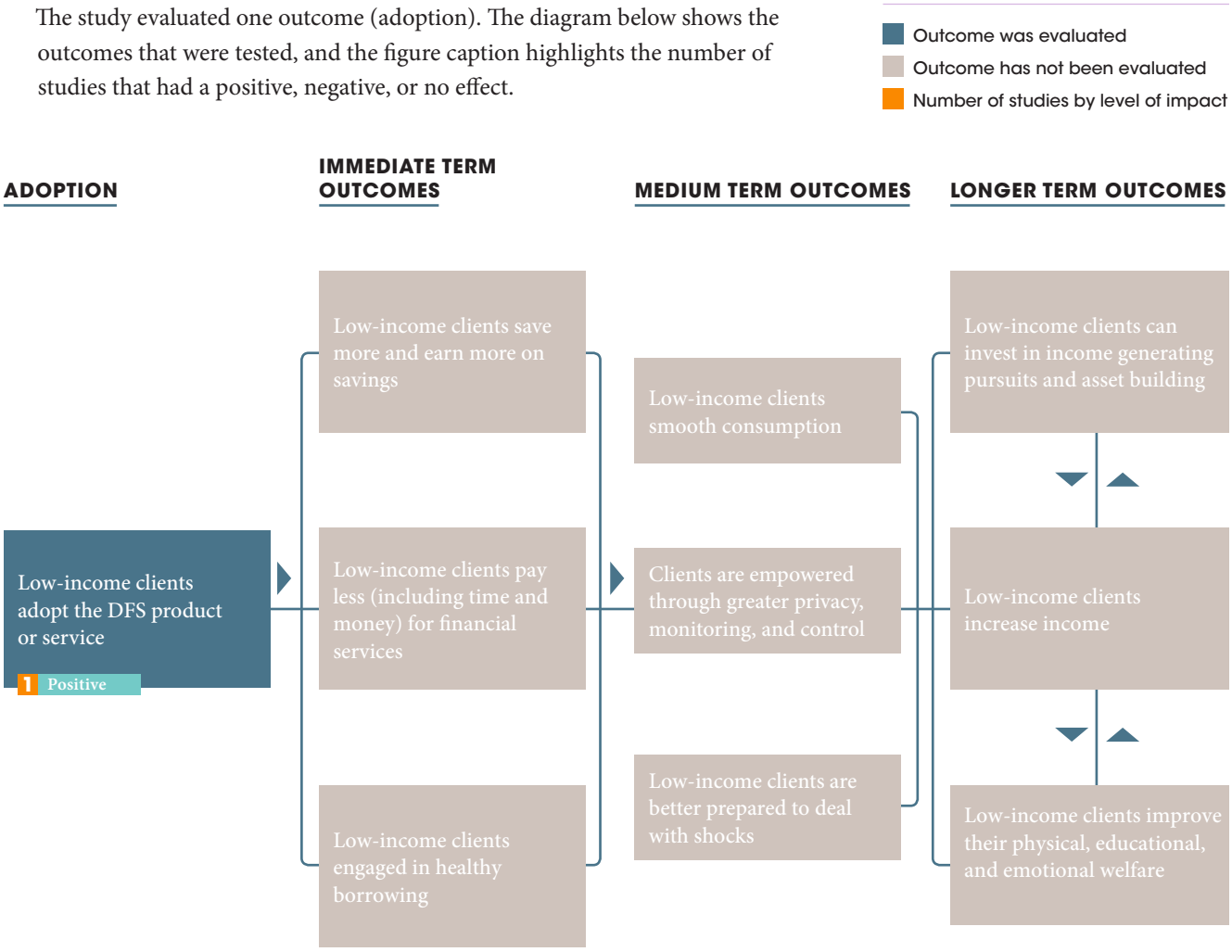
Client level impact of digital insurance products

Digital insurance studies overview

Only one study evaluated the effect of a digitally enabled insurance product. The product used clients' airtime usage to provide free life insurance. Beyond the free offer, the insurance cover could be increased with a monthly cost $0.68.[114]

— *Outcomes evaluated*

The study evaluated one outcome (adoption). The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no effect.



114 Zetterli, "Can Phones Drive Insurance Markets? Initial Results from Ghana."

Impact of digital insurance products

Adoption

Tigo Ghana has demonstrated the benefits of a freemium model and low fee add-ons by offering clients the option to double their free insurance coverage by paying a low fee of US$ 0.68 per month, giving them a guaranteed sum of up to US$ 1,040. More than 55% of Tigo clients have selected the paid-for cover. In a single year, the number of insured clients has increased from zero to 270,000 paying customers in a market segment where only 7% had insurance previously.[115]

Summary of insurance products impact

- The freemium model has an immense potential in micro insurance. Low monthly fees automatically deducted for greater value insurance has convinced over half of the previously uninsured clients to opt in.[116]

115 Zetterli.
116 Zetterli.

Client level impact of mobile money products

Mobile money studies overview

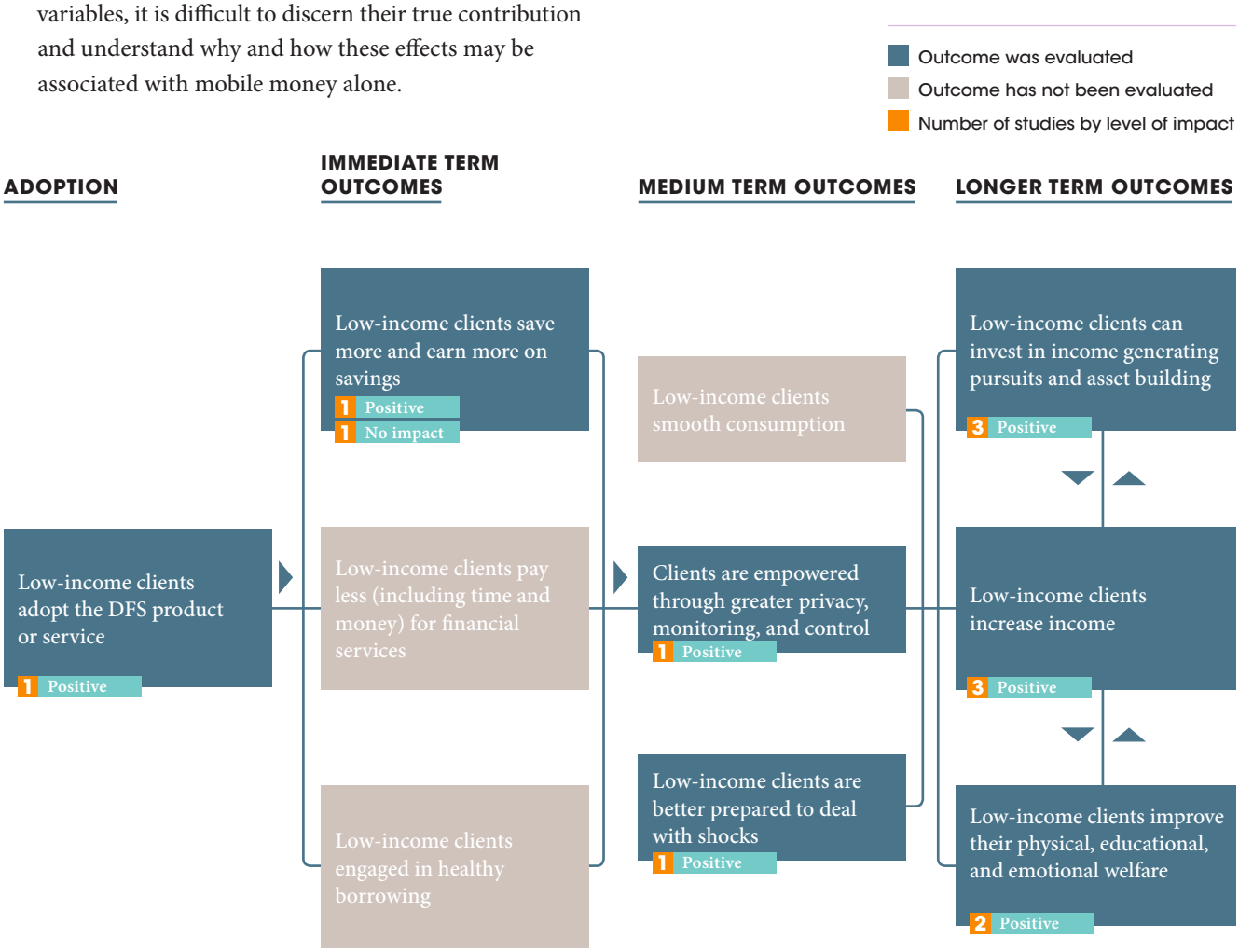
Seven studies evaluated the effect of mobile money on clients. No specific mobile money product has been specified in these studies. Mobile Money is a broad term that may encompass multiple products but the study did not or could not specify the singular or multiple products used.

Four out of the five studies on the longer-term outcomes of Mobile Money used a diverse set of definitions of a mobile money user, including 1) proximity to a mobile money agent, 2) "having mobile money on their own or another phone," and 3) "ever using" mobile money. While sophisticated statistical methods are used to control for confounding variables, it is difficult to discern their true contribution and understand why and how these effects may be associated with mobile money alone.

Four studies were conducted in East Africa, one in Burkina Faso, one in Mali, and one covered multiple markets.

— *Outcomes evaluated*

Seven outcome areas were evaluated across the seven studies. These were 1) adoption 2) increased savings, 3) clients' empowerment through greater privacy, monitoring, and control, 4) improved ability to respond to shocks, 5) income generation, 6) welfare, and 7) income. The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no effect.



Impact of Mobile money products

Adoption

Understanding and designing for cultural and gender norms can improve adoption of mobile money. In Somaliland, Telesom Zaad hired female staff in main centers to register new ZAAD female customers. The number of registered women increased quickly from 17% of customer base in 2009 to 24% one year later.[117]

Clients save more

In Kenya, access to mobile money agents correlated with a change in the log of total financial savings.[118, 119] However, in Mali, evidence that Orange Money users save more is limited.[120]

Clients are empowered through greater privacy, monitoring, and control

Suri and Jack[121] found that access to mobile money agents had pronounced effects on women. Interquartile effect on extreme poverty was 9.2% off a base of 43.3% or by 22% among female-headed households. The interquartile effect on $2-per-day poverty in female-headed households was 8.6%. The same study also reported 185,000 women switching occupation, from subsistence agriculture to retail or business (higher risk/return occupations) and reduced reliance on multiple part-time jobs.[122]

Clients respond better to shocks

Using access to mobile money using their own cell phone or another cell phone as a classification for users, Ky and Rugemintwari[123] found a positive effect on users' ability to save for health emergencies in Burkina Faso.

Clients invest in income generating pursuits and asset building

Evidence from Kenya suggests that mobile money use is associated with more investment in business,[124] higher spending on business assets,[125] and switching to more lucrative occupations.[126] This may have been driven by increased money circulation through M-PESA and lower transactions costs for vendors using M-PESA to obtain their stock.[127]

Clients improve welfare

Mobile money use in Uganda was associated with a decrease of 0.20 index points in the food insecurity index and a 9% increase in monthly food expenditure.[128] The transaction volume rather than the frequency of use was a significant factor. In Kenya, mobile money users identified food security as a more important effect. This was mentioned in terms of increased agricultural productivity, improved access to nutritious food and a variety of foods, and better access to agricultural inputs on time.[129] Increased money circulation and expansion of local markets are also related to the food security identified in the communities.

Clients improve income

Evidence from Kenya shows correlations of mobile money use and higher incomes. Panel data on smallholder farmers shows that ever using mobile money was associated with an estimated income increase of 40% relative to the mean income of non-users.[130] Suri and Jack[131] showed that access to mobile money agents was related to an increased per capita consumption level, particularly for women. In a qualitative study, the highest-ranked effect by the focus group participants increased money circulation due to a greater volume of money flowing into and out of the communities and a faster flow of money within the community to boost local consumption.[132]

117 Pénicaud Scharwatt and Minischetti, "Reaching Half of the Market: Women and Mobile Money."
118 including self-reported cash plus balances in bank accounts, savings clubs or rotating savings and credit associations, and mobile money accounts
119 Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."
120 Guerin and Sangar, "Mobile Money and Financial Inclusion in Mali: What Has Been the Impact on Saving Practices?"
121 Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."
122 Ibid.
123 Ky Serge and Rugemintwari, "Does the Adoption of Mobile Money Affect Savings? Evidence from Burkina Faso."
124 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya."
125 Kikulwe, Fischer, and Qaim, "Mobile Money, Smallholder Farmers, and Household Welfare in Kenya."
126 Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."
127 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya."
128 Murendo Conrad and Wollni, "Mobile Money and Household Food Security in Uganda."
129 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya."
130 Kikulwe, Fischer, and Qaim, "Mobile Money, Smallholder Farmers, and Household Welfare in Kenya."
131 Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."
132 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya."

Summary of mobile money impact

- Improving women's rates of mobile money adoption can be achieved through female targeted training programs that consider local cultural norms.[133]
- Mobile money use correlated with better response to shocks,[134] investment in income generating pursuits,[135] improved food security,[136] and higher incomes.[137]

133 Pénicaud Scharwatt and Minischetti, "Reaching Half of the Market: Women and Mobile Money."

134 Ky Serge and Rugemintwari, "Does the Adoption of Mobile Money Affect Savings? Evidence from Burkina Faso."

135 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya"; Kikulwe, Fischer, and Qaim, "Mobile Money, Smallholder Farmers, and Household Welfare in Kenya"; Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."

136 Murendo Conrad and Wollni, "Mobile Money and Household Food Security in Uganda"; Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya."

137 Plyler, Haas, and Nagarajan, "Community-Level Economic Effects of M-PESA in Kenya"; Kikulwe, Fischer, and Qaim, "Mobile Money, Smallholder Farmers, and Household Welfare in Kenya"; Suri and Jack, "The Long-Run Poverty and Gender Impacts of Mobile Money."

Client level impact of mobile banking products

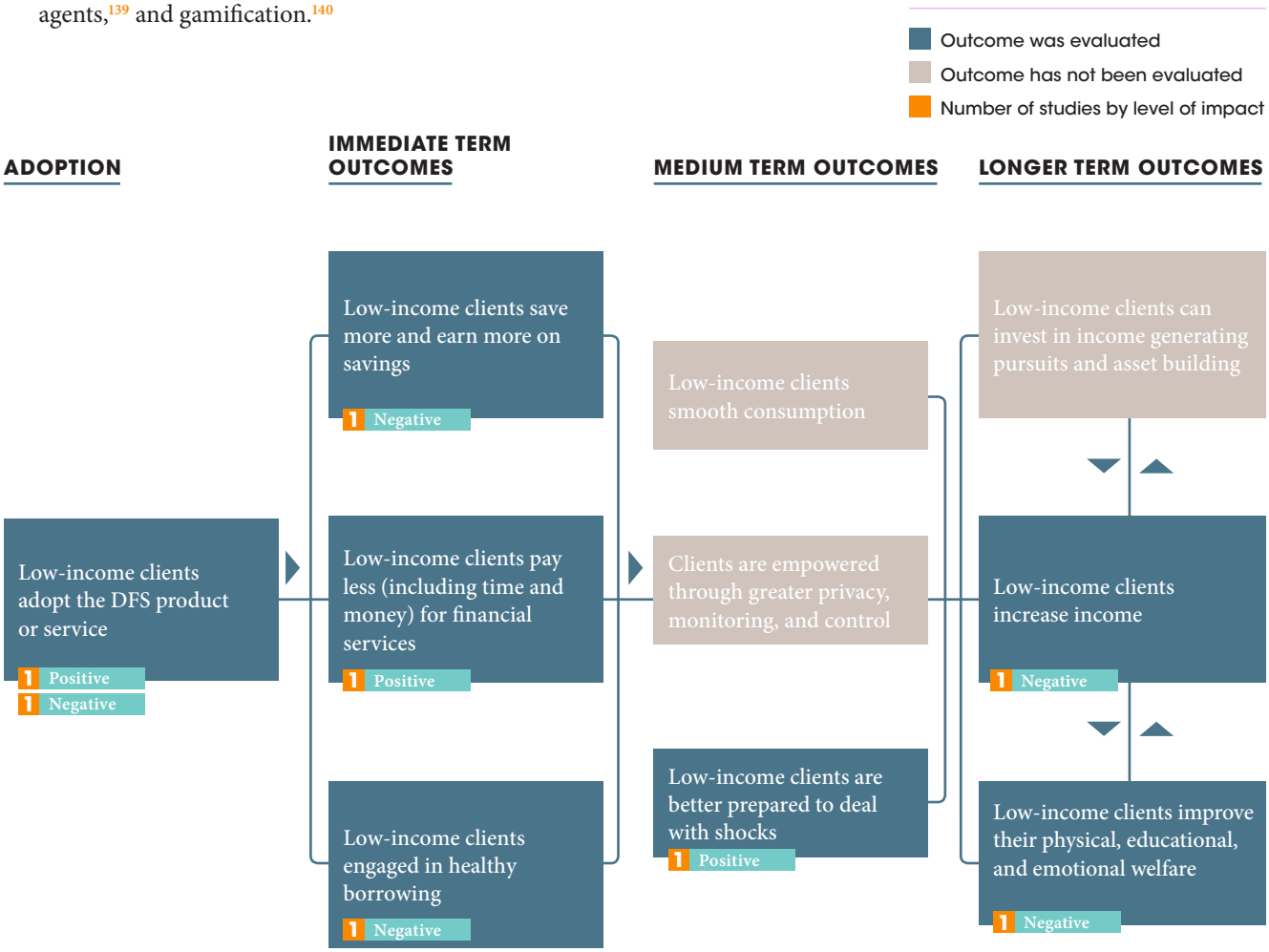
Mobile banking studies overview

Three studies evaluated the effect of mobile banking on clients. No specific mobile banking product has been specified in these studies. Mobile banking is a broad term that may encompass multiple products, but the study did not or could not specify the singular or multiple products used.

Design and delivery variations within the mobile banking studies include financial training,[138] access to agents,[139] and gamification.[140]

— *Outcomes evaluated*

Seven outcome areas were evaluated across the three studies, including 1) adoption 2) increased savings, and 3) lower payments for financial services, 4) healthy borrowing, 5) improved ability to respond to shocks, 6) welfare, and 7) income. All outcomes beyond adoption were taken from one study. The diagram below shows the outcomes that were tested, and the figure caption highlights the number of studies that had a positive, negative, or no effect.



138 Pénicaud Scharwatt and Minischetti, "Reaching Half of the Market: Women and Mobile Money."
139 Harigaya, "Effects of Digitization on Financial Behaviors."
140 Koning, "Customer Empowerment through Gamification Case Study: Absa's Shesha Games."

Impact of mobile banking products

Adoption

Through the delivery of financial training to women in rural villages in Papua New Guinea, MiCash, a microfinance branch, increased active customer rates and reported that 90% of MiCash accounts were active monthly after training.[141] In South Africa, various gamifications that included questions and a habit reinforcing activity were shown to increase transactions by 29%. Those who did not play showed a decline of 2% during the same period. Cash prizes were provided in this study.[142] However, in a study in the Philippines, we see a negative treatment effect when a financial institution transitioned from an analog channel to a digital banking channel. Treated members near transaction points were 34% more likely compared to their counterparts in control centers to avoid frequent deposits due to associated fees in the 2.5-year follow-up survey.[143]

Clients save more

In the Philippines, the introduction of mobile banking resulted in a 20% decline in the average daily balance and a 25% decline in the likelihood of weekly deposits over two years.[144] The follow-up survey provides evidence that weakened peer effects of group banking and increased fee sensitivity drove the decline in savings.

Clients borrow more and on fair terms

The Philippines mobile banking experiment found that the digitization of group banking almost tripled overdue loan repayments.[145]

Cost of accessing financial services

Despite the negative effects on adoption, the Philippines mobile banking experiment increased the convenience of transactions. In addition to increased flexibility of transactions in the stores which operated every day, conservative estimates based on survey data suggest a time savings of 30% for a deposit and 70% for a withdrawal transaction. These changes correspond to the opportunity cost saving.[146]

Clients respond better to shocks

Two and a half years later, treated members who lived far from transaction points continued to save at the Bank and reported higher use of savings and increased assistance from friends during shocks compared to their counterpart in the control group.[147] At the same time, they were somewhat more likely to be a net giver—give more than receive from friends—on a daily basis, suggesting that easier access to savings may have improved the coping capacities of both the treated households and their social networks.[148]

Clients improved welfare

Mobile banking removed the requirement for group meetings, which were previously used to interact with the bank's agents. The Philippine experiment found that mobile banking significantly lowered group cohesion, which was measured using an index of self-reported attendance at center meetings, interactions with members and bank staff, and the perceived importance of center performance. [149]

Clients increased income

Treated members near transaction points did not increase non-Bank savings and saw the total household financial assets decline by nearly 30% while reporting no change in economic activities. Consequently, they increased reliance on informal loans.[150]

Summary of mobile banking impact

- Improving the rates of women's adoption of mobile banking can be achieved through female targeted training programs.[151]
- Gamification could lead to an increase in mobile banking transactions.[152]
- As many Financial Services for low income and rural populations are delivered in a group setting, digitization may disrupt the existing social architecture, leaving its overall effect uncertain. We see negative effects of digitizing group savings on deposits, savings balance, borrowing, welfare, and income. Much of these effects may be driven by weakened group cohesion and sensitivity to transaction fees and concentrated among members who lived near banking locations at baseline and had stronger connections to their microfinance groups. These findings provide a cautionary tale to those seeking to introduce mobile technology with the goal of increasing the usage of financial services.[153]

141 Pénicaud Scharwatt and Minischetti, "Reaching Half of the Market: Women and Mobile Money."
142 Koning, "Customer Empowerment through Gamification Case Study: Absa's Shesha Games."
143 Harigaya, "Effects of Digitization on Financial Behaviors."
144 Ibid.
145 Ibid.
146 Harigaya, "Effects of Digitization on Financial Behaviors."
147 Ibid,
148 Ibid.
149 Ibid.
150 Ibid.
151 Pénicaud Scharwatt and Minischetti, "Reaching Half of the Market: Women and Mobile Money."
152 Koning, "Customer Empowerment through Gamification Case Study: Absa's Shesha Games."
153 Harigaya, "Effects of Digitization on Financial Behaviors."

6 Implications for future research

Based on these findings, we have indicated several potential directions for the future use of research resources that will address the gaps in evidence and contribute to a more robust understanding of client effects. We have classified three types of evidence gaps:

1 **Foundational evidence:** Evidence that addresses the foundational questions of the effect of various Digital Finance products, i.e., Does *X* Digital Finance product contribute to improved outcomes for *X* clients?

2 **Evidence on optimal Digital Finance design and delivery:** Nuanced evidence on the design and delivery mechanisms of various Digital Finance products. Ideally, this is corroborated with foundational evidence, i.e., Does *X* Digital Finance with *X, Y* design and delivery mechanism contribute to higher adoption rates, greater outcomes for clients, and improved business models?

3 **Evidence on Digital Finance service bundling:** Evidence that enhances our understanding of the effect of product combinations or a suite of Digital Finance products, i.e., What combination of Digital Finance (and non-Digital Finance) products and services create greater outcomes for clients? Recommendations for further research for each of these categories are provided below.

Foundational evidence

Focus on Sophisticated Financial services: Digital savings, credit, and insurance products are under-evaluated for client impact. Digital products and services for savings, credit, and insurance are growing, yet there is almost no evidence on their effects on income and welfare of the client. Any impact study that examines the effect of these services delivered digitally would add to the industry's knowledge. Advanced insights on the effect of sophisticated financial services can be obtained through understanding their effects on different populations or user groups, for example, women, rural and urban populations, older users, or vulnerable populations, such as refugees, different economic activities, such as farming or running a small business.

> **Example question:**
> What is the effect of X digital savings or credit or insurance product [154] on X population? How did this effect occur?

Evidence on optimal Digital Finance product design and delivery

Digital traits: What sets digital apart from analog is the more nuanced ways in which digital insurance, credit, and savings can be designed and delivered. Currently, the focus on interesting design enhancements or delivery mechanisms that make Digital Finance unique is limited. For example, experimentation in gamification, chatbots, two-way *SMS*, smart interfaces, biometrics, pricing models, and others. Investing in studies that examine the *vanilla* Digital Finance product with *various toppings* in design and delivery would fill in the gaps, bringing greater benefits to both clients and business models. CGAPs framework of digital attributes is a useful structure to examine the effect of design and delivery mechanisms (as shown below). This type of research often focuses on improving product adoption, activity over time, and user satisfaction; thus, rapid A/B testing rather than *RCT*s would often be a more appropriate methodology when testing only the design and delivery mechanisms. Preferably, the effect on client level welfare outcomes would also consider both the Digital Finance product *and* the design and delivery mechanism.

154 Preferably, impact research should focus on the design and delivery mechanisms of these products.

Example questions:

What is the effect of:

- **Using** advanced **data analytics** on client transactional patterns to tailor service offerings or segment clients?
- Leveraging **social networks** within product design?
- **Developing smart and rich user interfaces appropriate for the target clients**?
- Integrating **customized two-way real-time communication** via SMS or chatbots?
- Allowing for **instant verification** using GPS, cameras, or biometric data to verify identity or location?
- Using embedded **GSM technology** to track movement and usage of movable assets?

Example questions:

Does *A, B, C, D, E, F* design and delivery approach increase product adoption and activity over time? That is, do they improve savings behaviors (savings products), risks taken (insurance), and repayment rates (credit) and among what populations?

Example questions:

Is the effect of Digital Finance products with enhanced design and delivery mechanisms on client outcomes greater compared to the effects of Digital Finance products without enhanced design and delivery mechanisms? For what populations?

Evidence on Digital Finance product bundling

Digital Finance bundles: What are the effects of using a combination of Digital Finance (savings, insurance, credit, and ePayments), as opposed to using only one, some, or no Digital Finance? Additionally, we are seeing that more providers offer Digital Finance products bundled with Digital Information Services (DIS), which contain relevant content for the target clients, for example, financial information, agricultural information, or business management. Bundling and unbundling requires significantly more complex studies and resources, but it could have far reaching implications on how we approach financial inclusion developmentally.

Example questions:

What is the combined effect of using a wide array of digital savings, credit, and insurance products on client outcomes? Which combination of products is most influential? For which populations?

Example questions:

Can combing Digital Finance with DIS enhance the effect of Digital Finance products? For which populations?

Other considerations for future impact research

Consider a focus on impact pathways, questioning not just *what* changed but *how* it changed: Digital Finance is not a homogeneous category. It is important to untangle the effect of each Digital Finance product and deepening our understanding of not only the changes in the lives of low income users that each of these products can catalyze, but also the ways in which the users experienced that change. This can result in a more nuanced understanding of how various products may contribute to various outcomes, allowing us to begin to form the impact pathways for each Digital Finance product based on emerging evidence. This will provide the sector with the capacity to delve into the details of the market and social conditions in which the Digital Finance product was or was not successful in catalyzing change.

Awareness of potential negative effects in research design: Research design that actively explores the unintended or negative consequences of digital saving, insurance, and especially credit products needs to be considered. For example, concerns about the design of digital credit solutions are growing not only in terms of high interest rates but also in terms of the growing number of clients who are being blacklisted by credit bureaus for outstanding loans. This information is crucial to inform better product design.

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