



Building Resilience through Financial Inclusion

A Review of Existing Evidence
and Knowledge Gaps

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Abstract

Low-income households around the world are particularly vulnerable to shocks, but also the least prepared when a shock hits. The effects of climate change, including floods, droughts, and other weather-related disasters, are adding another layer of risk for already vulnerable households. In this context, it is increasingly important that poor households build resilience—that they strengthen their ability to mitigate, cope, and recover from shocks and stresses without compromising their future welfare. Evidence suggests well-designed financial products and services can play a role in increasing low-income families' resilience by helping them be prepared for risk, reduce risk, increase investment in the face of risk, and respond when a shock occurs. Yet the role that financial products and services can play in increasing resilience, as well as the most effective design and delivery mechanisms toward that end, is not fully understood. This paper reviews the evidence on financial inclusion and resilience to inform policymakers on effective strategies and makes the call for more research on this timely and relevant topic.

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Key Lessons on Building Resilience through Financial Inclusion

Before a Shock			After a Shock
Investment in the face of risk Insurance can lead to more productive investments, and initial evidence on the impact of other financial tools on investment behavior is promising.	Risk reduction Lowering barriers to credit and introducing goal-based savings may reduce exposure to shocks by encouraging the adoption of risk-mitigating technology.	Risk preparedness Liquid accounts, savings groups, and behavioral nudges may enable households to build precautionary savings that lead to consumption smoothing after a shock.	Responding to shocks Lowering the costs of informal risk-sharing and social protection through digitization can help households affordably access funds when shocks occur.

Financial Inclusion and Resilience

While households of every income level need tools to help them manage risk, low-income households across the developing world are disproportionately affected by adverse events. These events range from “idiosyncratic” shocks, such as theft and health emergencies, which affect individuals, to “aggregate” shocks, such as climate-related events and broad shifts in the labor market, which affect large groups.

When an aggregate shock occurs, poor households are not only more likely to be affected, but also the least prepared. Due to low rates of savings, imperfect credit and insurance markets, and inefficient money transfer mechanisms, the poor tend to lack a financial cushion to soften their fall. In 2017, households in low- and middle-income countries were 27 percentage points less likely than their wealthier counterparts to report that they could come up with funds when an emergency occurred (Demirguc-Kunt et al. 2018).¹

As the effects of climate change intensify, building resilience—the ability to mitigate, cope, and recover from shocks and stresses without compromising future welfare—to weather and disaster risk has become even more essential to poverty reduction than ever. The World Bank estimates that, in the absence of natural disasters, the number of people living in poverty² would fall by 26 million within a year (Hallegatte et al. 2017). According to the Food and Agriculture Organization of the United Nations, changes in climate conditions will affect the way in which agricultural activities are conducted, resulting in an impact on food security (FAO 2016b). There is a large body of evidence suggesting that these impacts will be negative and will be amplified for more vulnerable populations (FAO 2016a).

Rigorous research has found that improved access to formal financial services can help people become more resilient. Resilient households adopt risk-reducing measures that help mitigate the catastrophic consequences of shocks; they demonstrate preparedness for future economic shocks; and they

are able to smooth consumption without resorting to costly coping strategies, such as taking on unsustainable levels of debt or selling productive assets.

Insurance, savings, credit, and digital payment products have all been found to increase resilience through various levers, often in the context of idiosyncratic or small-scale shocks. More evidence is needed, however, to understand effective ways to leverage financial inclusion for resilience as a policy goal and to incorporate financial tools into interventions that can help low-income households prepare for and manage unpredictable income streams and expenditure needs.

In this paper, we review existing evidence on how financial services can build economic resilience, identify areas where more research is needed, and make the call for more evidence on this timely topic. The remainder of this review is divided into four sections, representing different applications for financial services solutions to improve resilience before, during, and after an adverse event. Specifically, we explore evidence on the impact of financial services in:

- I. Increasing investment in the face of risk;
- II. Strategies for risk reduction;
- III. Facilitating risk preparedness; and
- IV. Responding when a shock hits.

This review focuses on evidence from developing countries, but many of the lessons may be relevant for financial services for low-income households in high-income countries. Unless otherwise specified, the evaluations included in this review are randomized control trials (RCTs).

¹ The 2017 Global Findex survey asked respondents whether it would be possible to come up with an amount equal to 1/20 of gross national income (GNI) per capita in local currency within the next month. It also asked what their main source of funding would be.

² Living on less than \$1.90 a day.

I. Increasing Investment in the Face of Risk

Poverty alone amplifies exposure to risk: any setback that hits could become a crisis. Low-income households without financial tools like savings accounts and insurance therefore tend to “play it safe” and only invest in low-risk, low-return activities, with negative effects on their income and wealth. According to one model, underinvestment due to perceived risk accounts for two-thirds of the negative impact on well-being from natural disasters (Elbers, Gunning, and Kinsey 2007).

Small-scale (“smallholder”) farming families are particularly vulnerable to climate and disease risk, and also account for the majority of households living in extreme poverty. The 2017 Global Findex found that about half of households that rely on agriculture as their main source of income reported experiencing a bad harvest or significant loss of livestock in the previous five years. The majority of these households bore the entirety of the loss on their own, with only a minority receiving any kind of compensation (World Bank 2018). Given such risks, smallholder farmer families often engage in low-yield, low-variability agriculture practices, with little investment in farm inputs, to avoid losses in case of a weather-related shock.

This section describes the evidence on to what extent financial products including insurance, savings, and digital payments can increase these households’ investments in the face of risk, and where further research is needed.

The Potential of Insurance for Greater Investment

Existing evidence from a variety of settings shows insurance products designed for low-income smallholder farmers have various positive impacts, including greater investments in farms and engagement in higher-return, riskier activities. For example:

- In India, farmers shifted to a riskier (less drought-resistant), but higher yield, variety of rice when they had access to insurance (Mobarak and Rosenzweig 2012).
- In China, Mali, and India, insurance led farmers to invest more in their farms and shift to farming more profitable crops (H. Cai et al. 2015; Cole, Giné, and Vickery 2017; Elabed and Carter 2014).
- In Ghana and Bangladesh, access to index insurance increased spending on productive inputs such as fertilizer (Karlan et al. 2014),



irrigation, and pest control (Hill et al. 2017).

- A natural experiment in China found that insured farmers also increased their demand for credit and reduce their need for precautionary savings (J. Cai 2016).

Despite the potential benefits of microinsurance, demand for these products remains low.

Previous reviews have pointed to both financial and non-financial factors that suppress take-up, such as basis risk (the imperfect correlation between the insurance payouts based on the weather index and actual losses faced by a farmer), lack of trust, lack of financial literacy, credit constraints, transaction costs, and behavioral biases (Brown, Zelenska, and Mobarak 2013; Carter et al. 2014; Cole 2015; J-PAL, CEGA, and ATAI 2016). The link between barriers to insurance and how they might impact investment decisions is relatively understudied, but financial literacy and appropriate product design appear to be key levers.

Interventions designed to increase customer understanding of and trust in insurance products may enhance these positive impacts. Evidence suggests that one way to address low insurance take-up may be to **change users’ perceptions of insurance**. For example:

- In India, financial education increased rainfall insurance adoption from 8 to 16 percent (Gaurav, Cole, and Tobacman 2011), and demand increased from 28 to 38 percent when an insurance educator was recommended by a trusted local agent (Cole et al. 2013).
- In Mali, researchers measured perceived risk reduction and found that the effects of insurance on the amount of land allocated to cash crops and total expenditures on seeds were magnified among farmers who felt insured (Elabed and Carter 2014).

Developing appropriate products for the needs and preferences of a specific customer segment—for example low-income users or women—may also improve product take-up and impacts on production. Different types of customers may feel threatened by different types of risks, suggesting a need for **more tailored products**. For example:

- One study from Senegal and Burkina Faso examined gender differences in risk management strategy, comparing demand for savings with demand for weather index insurance. Women had a stronger demand for emergency savings, while men had a much stronger demand for insurance. The researchers hypothesize that women may have perceived greater threats to their livelihoods from types of shocks that wouldn't be covered by a weather index product, such as an illness or injury (Delavallade et al. 2015).
- In other cases, risk may not come from catastrophic crop loss, but from changes to market prices. Researchers tested a more tailored insurance product in Ghana which bundled a credit product with an indemnity feature (i.e. half the principal was forgiven if the crop prices fell below a threshold) to account for this risk. In this case, product take-up was higher and farmers spent more on inputs, such as fertilizer (Karlan et al. 2011).

Looking Beyond Insurance

Self-insurance through savings can produce complementary effects on risk-taking and investment. There is emerging evidence that financial products other than insurance can have complementary impacts on the adoption of higher-return, but higher-risk income-generating strategies. Formal savings accounts, for instance, have been shown to encourage productive investments by providing a more secure means of storing money than informal savings methods, such as an investment in livestock.

In Kenya, for example, access to savings accounts had substantial, positive impacts on productive investments among female market vendors and led to higher incomes. This effect may result from the use of savings as self-insurance, as women in the treatment group were not forced to dip into their working capital in response to health shocks, which would have resulted in scaling back investment in their business (Dupas and Robinson 2013a).

In Nepal, women offered no-fee savings accounts were less risk-averse one year later than women not offered accounts. This suggests that the act of saving

may lead to a fundamental shift in risk preferences (Carvalho, Prina, and Sydnor 2013). Many questions remain around the impact of savings products as a self-insurance tool, and more research is needed on the levers that may lead formal savings products to impact the investment decisions of users.

Digital payments can enhance the impact of informal risk-sharing practices. Lowering the transaction costs of informal risk-sharing between friends and family members, on its own, may lead households to adopt higher-risk, higher-return income-earning strategies. In Kenya, a household panel study found that increased access to mobile money may have led households, and women in particular, to shift away from agricultural activities and into business. While more research is needed to better understand the mechanisms behind this shift, researchers hypothesize that access to mobile money allowed users to more easily share financial risks among friends and family, thus potentially insuring the possibility that the business was unsuccessful (Suri and Jack 2016).

Strengthening **informal risk-sharing may also reduce basis risk** and increase demand for formal insurance by providing support for small and frequent shocks, so that households rely on formal insurance coverage for larger, rarer shocks (Berhane et al. 2015; Dercon et al. 2014; Mobarak and Rosenzweig 2012). In addition:

- High-frequency financial diaries data from rural Kenya indicates that formal insurance doesn't crowd out informal risk-sharing, meaning that households who take up insurance will still rely on their social networks when faced with uncovered losses (Geng et al. 2018).
- Initial evidence from Burkina Faso indicates that insurers could leverage informal risk-sharing networks to increase coverage in rural areas by offering it to urban migrants who, without coverage, may need to support relatives in case of a shock (Kazianga and Wahhaj 2018).

However, more research is needed to explore a possible link between increased take-up of insurance due to informal networks and investment decisions.

Access to credit can make migration less risky. Sending a member of the family as a labor migrant to pursue better or different job opportunities is one potentially high-return income diversification strategy, but many households may hesitate to make this investment while having imperfect information about the potential rewards. An emerging area of research explores the constraints to labor migration, and the impact of removing these constraints on resilience.

In Bangladesh, a one-time cash or credit subsidy to cover the cost of migration for work during the lean agricultural season succeeded in increasing seasonal, domestic migration among rural households, leading to improvements in household consumption and food security. In addition, households that had been offered a one-time subsidy were more likely to migrate in subsequent lean seasons, even without the existence of an incentive. This research also found that an insurance product covering the migration-related losses induced just as many households to migrate as the conditional credit incentive (Bryan, Chowdhury, and Mobarak 2014).³

Open Questions

Taken together, this research suggests that financial products, and particularly insurance, can incentivize investment in high-risk, high-reward productive activities that households may otherwise shy away from due to unmanaged risk. These interventions could help lift families out of poverty in increasingly uncertain times, but many questions remain.

- **How can financial products nudge consumers towards truly profitable investments?**

More research is needed to understand whether the increased investments prompted by insurance take-up are profitable on average across both good and bad harvest years. What are the constraints (e.g. variations in price, supply chain reliability) to the profitability of increased investment? And what complementary interventions could be offered to help households avoid suboptimal investment decisions?

- **What targeted design innovations can increase the impact of products on different market segments, such as women?**

Research is needed to design and test products and strategies for different population segments, taking into account different risks they face as well as different perceptions of risks. For example, would the impacts be greater for women when including insurance coverage for health shocks? How can products be designed and marketed to account for gender-based differences in financial literacy and other gender-based barriers to accessing technology and the financial system?

- **Can better quality insurance products increase demand?** How can innovations in

product design improve the customer experience and increase demand? For example, what is the impact of more flexible payment and payout structures? Where are opportunities to bundle insurance with another product, such as savings or credit, and what impact does this have on insurance take-up, renewal, and related investment decisions? And finally, what impact will increased risk-taking behavior have on insurance providers, and how can the potential benefits be balanced with cost to keep access affordable (e.g. by bundling risk reduction practices with insurance, as in Lybbert and Carter 2015 and Ward and Makhija 2018)?

- **Can innovations in product design reduce basis risk?** What is the impact of innovations in data infrastructure (e.g. satellite remote sensing and picture-based monitoring of crop health, rainfall gauges, etc.) and fail-safe triggers that serve to improve the connection between insurance payouts and the true losses of policyholders? What is the impact of community-level index insurance, compared to the impact of individual policies, on demand and productive investments?

- **How can digital payments be leveraged to improve investment behavior?** Could linking savings, insurance, and credit to digital payments such as remittances or public benefits act as an on-ramp to increase demand? Could digital identities be used to market insurance products to remitting migrants or to direct subsidies to the extreme poor, lowering barriers to access for excluded populations?

II. Strategies for Risk Reduction

As the previous section highlights, insurance products and other strategies can help low-income households take potentially profitable risks like buying better seeds or leaving the village for temporary work. But how can policymakers reduce households' exposure to economic shocks in the first place?

Research suggests that facilitating investment in risk-mitigating technologies, such as drainage systems to avoid flooding, drought-resistant seeds, and preventive health products, can help stop a crisis before it starts (Brown, Zelenska, and Mobarak 2013; Emerick et al. 2016; Hallegatte et al. 2017). However, the demand for and subsequent take-up of these technologies remain low (Brown, Zelenska, and Mobarak 2013) due to barriers such as credit constraints, lack of information, high transaction costs, and behavioral biases.

³ While small-scale tests in Bangladesh showed important impact, an initial scale-up of this program in 2017 did not result in the same impact on migration or resilience, leading researchers to adjust the program's operating model for further testing in 2019 (for more information see Levy and Raman 2018).

Initial evidence indicates that innovations in credit and savings products have the potential to reduce these barriers (Hallegatte et al. 2017). Some products remove barriers to credit access resulting from rigid inflexible repayment schemes or capital and collateral requirements, while others use behavioral design to help people more effectively reach their savings goals for a specific purchase. This section explores the evidence and open questions on financial products that may reduce households' exposure to shocks by facilitating investments in risk-mitigating technologies.

Financing Risk-Mitigating Technology for the Most Vulnerable

Alternative credit arrangements, such as layaway plans, have been found to help finance risk-mitigating technology for those with limited access to credit. In Kenya, for example, researchers offered dairy farmers asset-collateralized loans, instead of requiring a sizeable initial deposit or guarantor. These loans increased the take-up of rainwater harvesting tanks from 2 percent to 42 percent and helped provide dairy farmers reliable and convenient access to water, improving their productivity. Lower deposit requirements increased repossession marginally, but not enough to offset the welfare benefits to borrowers (Jack et al. 2016).

Leveraging Behavioral Design to Increase Savings

Saving up for a large purchase can help low-income households to make investments in technology that protect them from future shocks. However, accumulating a large amount of savings is often difficult to accomplish for a variety of reasons.

Behavioral barriers to savings, such as present bias—prioritizing today's desires and needs over tomorrow's—pose challenges to maintaining regular savings and to resisting the temptation to tap into savings for another purpose. **Evidence shows that savings products that incorporate behavioral levers like commitment devices—voluntary, binding arrangements that people make to reach specific goals that may otherwise be difficult to achieve—can increase the likelihood that individuals are successful in meeting their savings goals** and can also nudge clients to make investments for a particular purpose.

When built into savings products, commitment devices can help address behavioral and social obstacles to saving. For example:

- In Malawi, farmers who were offered savings accounts with a commitment feature increased investment in agricultural inputs by 13 percent



and increased production by 21 percent (Brune et al. 2016).

- In Kenya, researchers offered households a savings product that incorporated a “soft” commitment mechanism: the pot of savings was labeled for health purposes. Apart from the label, there was no enforcement of the final use of the savings. Even so, the health savings label nudged households to increase their spending on preventative health products by up to 66 percent. Interestingly, a similar product incorporating a “hard” commitment device that limited withdrawals for an intended use was not effective for preventative health savings, likely because it kept participants from accessing needed funds in an emergency (Dupas and Robinson 2013b).

As always, designing savings products for women should take into account their specific needs and preferences. Savers with low levels of household bargaining power, often women, may have trouble protecting savings from the demands of friends and family members. Emerging evidence suggests that products that give women more control over their savings, for example through a hard commitment device that restricts access to funds until a goal is reached, can increase women's success at accumulating savings and later investing those savings in the durable goods that they choose. In the Philippines, offering a savings account with a hard commitment device led to increased expenditures on female-oriented durable goods such as sewing machines and kitchen appliances for married women with low bargaining power (Ashraf, Karlan, and Yin 2006, 2010).

Open Questions

More research is needed to understand the potential of financial services to facilitate household investments in risk-mitigating technology, as well as to test for impacts on resilience once they have adopted risk-mitigating technology.

- **How can credit products be better designed to help households mitigate risk?** Can innovations in borrowing requirements and credit scoring through digital finance and big data analytics increase investment in risk-mitigating technology? Must credit be combined with monetary incentives to ensure use of the new technology (e.g. subsidized insurance coverage conditional on adopting risk-mitigating technology as in Kramer and Ceballos's 2017 experiment in India) or can behavioral nudges and marketing generate similar effects?
- **How can policymakers provide support to the private sector to encourage investment in risk-mitigating technologies?** What is the impact of subsidized insurance or bridge loans that would allow lenders to protect clients in the face of an aggregate shock, for example by allowing loan deferral or forgiveness?
- **How can savings products be designed to encourage investment in risk-mitigating technology?** Could providers increase the take-up of certain technologies by creating products which explicitly nudge clients towards these investments, for example through labeling? What are the right technologies and for whom?
- **Finally, once low-income households gain access to credit or build sufficient savings for risk-mitigating investments, what is the ultimate impact of these investments on the household's experience of shocks?** Would the take-up and impact of products designed to finance risk-mitigation increase if bundled with insurance to protect investments against extreme shocks?

III. Facilitating Preparedness for Shocks

Households may take a number of measures to prepare for future income and expense volatility, including purchasing insurance, cultivating their social networks, and adopting mobile money technology to more easily receive transfers. For small and frequent shocks, financial services can encourage households to prepare by building precautionary savings, allowing them to self-insure and smooth consumption when a shock hits.

In 2017, savings was stated as one of the top three sources of emergency funds by people who reported they would be able to raise money if needed (Demirgüç-Kunt et al. 2018).⁴ This finding supports other evidence that low-income households use savings as a means of self-insurance, building up their savings prior to a shock and then using those

savings to smooth consumption after the shock. However, they tend to save more through informal means, such as assets like livestock, which may themselves be susceptible to shocks (Dercon 2002; Hallegatte et al. 2017), or cash stored informally, where it is more at risk of theft or reallocation to other social demands. Additionally, households face behavioral barriers that limit their ability to build up and keep savings (Karlan et al. 2014). This section will address the evidence on ways that financial products, particularly savings products, can help households be prepared for a shock.

Building Savings Cushions Before a Shock

Financial services can help people better manage risk with self-insurance, which in turn may help to smooth consumption in the face of shocks (El-Zoghbi et al. 2017). Accounts designed to increase liquidity and improve mental accounting encourage emergency savings in low-income households and, in turn, have positive effects on consumption smoothing and welfare.

Account liquidity and access to funds may be key to encouraging savings for emergencies, because funds are secure before a shock and easy to access when a shock hits. For example:

- In Nepal, no-fee accounts offered to women led to a smaller drop in income after a health shock compared to those without an account. The households were more resilient due to investments in nutrition (expenditures on meat and fish increased) and access to more effective (and more expensive) medical care that allowed household members to recover more quickly and miss fewer days of work (Prina 2015).
- Similarly, in Chile, individuals offered a free, liquid savings account reduced consumption cutbacks associated with a negative income shock by 43 percent (Kast and Pomeranz 2018).
- In Kenya, though usage was low, individuals offered free savings accounts were less likely to receive transfers and more likely to send them, without negative effects on household welfare, indicating that they may have been better able to self-insure compared to those who were not offered an account (Dupas, Keats, and Robinson 2017).

⁴ The other two stated in equal proportion were social networks and working.

However, in other evaluations of liquid savings accounts, usage was relatively low (Brune et al. 2016; Dupas et al. 2012; Dupas and Robinson 2013b; Schaner 2018). One possible reason for low usage is that household members with limited bargaining power, often women, prefer features that restrict access to and reduce the liquidity of savings in order to protect their resources and help them meet larger savings goals (Ashraf, Karlan, and Yin 2010; Brune et al. 2016; Dupas and Robinson 2013a; Schaner 2017). Trust in the financial institution, proximity of the banking branch, and fee structure also appear to limit usage of formal saving accounts (Karlan, Ratan, and Zinman 2014).

Labeling savings for emergencies can act as a soft commitment to build up savings for a specific purpose. Labels can nudge people to use their savings for the particular purpose of future consumption smoothing. For example:

- In rural Kenya, labeling savings for health emergencies and adding a soft commitment generated a significant increase in health savings over three years and decreased the likelihood that people would not be able to afford treatment for a health emergency by 39 percent (Dupas and Robinson 2013b).
- Also in Kenya, women offered a mobile savings account labeled for emergency savings and individual goals saved more, were less likely to engage in transactional sex as a risk-coping response to shocks, and experienced fewer symptoms of sexually transmitted infections (Jones & Gong, 2018).

The Role of Savings Groups

Savings groups, particularly those with flexible lending arrangements, can encourage emergency savings. There may be multiple mechanisms at play in how savings groups, such as village savings and loan associations (VSLAs), self-help groups, and rotating credit and savings associations (ROSCAs), lead to increased savings. One is that they create a socially-bound commitment to save. However, savings groups tend to be less liquid and flexible than other savings tools, potentially making them less well-suited to small, but common shocks.

While we know savings groups can help people save, evidence on the impact of savings groups on resilience and consumption smoothing is mixed. More evidence is needed to better understand and document the mechanisms through which savings groups may generate impact in the face of both aggregate and idiosyncratic shocks:

- In Mali and Malawi, access to savings groups increased food security, indicating that

households were able to smooth food consumption over the year (Beaman, Karlan, and Thuysbaert 2014; Ksoll et al. 2016).

- In Mali, researchers did not find that treatment changed the way households dealt with health shocks (Beaman, Karlan, and Thuysbaert 2014).
- An evaluation of VSLAs in Malawi, Uganda, and Ghana found weak evidence that the groups may influence risk management capabilities for households in the face of aggregate shocks, such as drought, but not idiosyncratic shocks, such as illness (Karlan et al. 2017). The authors of this report recommend replications of this work to confirm or challenge these findings.

Open Questions

These findings suggest that financial services can help households build their precautionary savings, allowing them to self-insure and smooth consumption, in turn making them better able to deal with a wide variety of shocks, including idiosyncratic shocks such as health emergencies. However, many questions surrounding the optimal design and delivery of these products remain.

- **How can products be designed to balance commitment mechanisms with the need to access funds quickly in an emergency?** Does increasing control over their savings with features that restrict access to and reduce liquidity of savings have an impact on households' economic resilience? How could mobile money be leveraged to offer low-cost savings with features that respond to user preferences or goals, as in Habyarimana and Jack (2018)?
- **How can savings groups be better designed to make them more responsive to shocks and respond to liquidity needs?**



When savings groups link members to payment services, credit, and insurance, are they able to respond to a wider range of shocks? Could groups themselves be insured by governments or financial institutions to support increased withdrawals in response to aggregate shocks? Finally, what is the impact of digitization on the design and delivery of savings groups, and how can digital finance improve outcomes in this space without weakening the social ties of members?

IV. Responding When a Shock Hits

When an adverse event occurs, low-income households without appropriate financial tools are often forced to engage in suboptimal coping practices such as cutting food consumption, reducing human capital investments, selling productive assets, or even engaging in risky or welfare-reducing behavior, such as transactional sex or child labor. These coping strategies have a detrimental impact on welfare and can reduce income in the long-run. This section covers evidence on the ways in which financial products, particularly digital payments, can enable households to access funds affordably when a shock occurs.

Person-to-Person Money Transfers

Digital financial services can enhance risk-sharing by lowering transaction costs and expanding the social network able to contribute, including across borders.

- In Kenya, a panel study found that households with access to the mobile money platform M-PESA received funds from a larger network of senders located further away and were able to absorb large negative income shocks (in this case caused by a drought), while non-users experienced a 7 percent reduction in consumption on average after the shock (Jack and Suri 2014).
- Similar results were found in Rwanda, where households were able to send money in the form of airtime credit following an earthquake (Blumenstock, Eagle, and Fafchamps 2016).

Reducing the cost of sending money can also significantly increase remittance flows.

Macroeconomic research has shown international remittances to be countercyclical and contribute to smoothing consumption during short-term fluctuations (World Bank 2015).

- In a study that randomly assigned discounts on remittance transaction fees for migrants from El Salvador and Guatemala, researchers found that a \$3 discount led migrants to send 20 percent

more remittances. Increases were due to more frequent remittances, not their average value, and continued for 20 weeks after the discount expired (Ambler, Aycinena, and Yang 2014).

- These findings are consistent with the large impacts of reduced prices on remittance flows found in El Salvador (Aycinena, Martinez, and Yang 2010).

This evidence indicates that a temporary remittance fee discount could enhance the ability of migrants to mobilize in response to domestic shocks, which initial evidence from the Philippines indicates they do already (Yang and Choi 2007).

Government Transfers

Digital transfers can also reduce the cost and time required to deliver social protection payments and make it easier for recipients to collect transfers (Aker et al. 2016; Blumenstock et al. 2015; Muralidharan, Niehaus, and Sukhtankar 2016). Transfers from social protection programs carried out by governments or nongovernmental organizations contribute significantly to smoothing consumption after an adverse shock, and these effects may be enhanced when digitized. In Niger, for example, household members who received a digital social welfare transfer after a drought experienced increased consumption, improved dietary diversity, depleted their non-durable assets at a slower rate, and produced a more diverse basket of agricultural goods, compared to households that received their money in cash. The researchers hypothesized that these results could be partly explained by time saved in receiving the transfers and increased control over spending decisions in the household on the part of women, who were the intended beneficiaries of these transfers (Aker et al. 2016).

Insurance Payouts

Insurance coverage can limit households' need to sell assets or cut meals when a shock occurs and, in the case of health shocks, encourage households to seek high-quality care. Smoothing consumption after a shock is in theory the primary objective of insurance, but most impact evaluations on insurance take this effect as a given. These impacts are difficult to study, because they can only be observed after the insured population experiences a shock. One study in Kenya found that weather index insurance for livestock losses due to drought helped households reduce their reliance on costly coping strategies, including selling assets and reducing consumption, after a shock (Janzen and Carter 2013). Using a regression discontinuity design in Mexico, researchers found that farmers who received payouts cultivated more land in the



next season and had increased income (De Janvry, Ramirez Ritchie, and Sadoulet 2016). Based on panel data in Kenya and India, these positive impacts of insurance payouts also seem to hold true for health shocks (Geng et al. 2018).

Consumer Credit

Microcredit lenders often prioritize loans for productive investments and may consider consumer credit to low-income households to be more risky or not contributing to economic development. However, consumer credit is often preferable to other more costly or welfare-reducing coping strategies, such as cutting meals and selling off assets, both of which harm households' future income-earning potential. A study from South Africa showed that access to consumer credit led to improvements food security, job retention, and income (Karlán and Zinman 2009). The authors hypothesize that these impacts were related to the use of the credit product to smooth consumption in the face of idiosyncratic shocks.

Open Questions

A number of research questions remain about how to reach the most vulnerable with financial products that improve resilience without leading to over-indebtedness, how to account for the particular needs of migrants, and how to combine these efforts with government and NGO relief work after a shock.

- **How can policymakers ensure that the potential benefits of digital financial services are evenly distributed?** Rather than being

charitable, senders in informal risk-sharing networks may expect to receive transfers themselves in the future, meaning that wealthier, well-connected individuals are most likely to benefit (Blumenstock, Eagle, and Fafchamps 2016; Geng et al. 2018). Mobile money take-up is also higher among those with social network support (Geng et al. 2018). How could government transfers or subsidized insurance be targeted toward areas with lower rates of mobile money utilization increase resilience among those without access to informal risk-sharing networks and digital financial services? What other interventions can improve take-up of mobile money so that the benefits of digital transfers are more evenly distributed?

- **How can financial products be tailored to meet the differing needs of economic migrants and the forcibly displaced?** Migrants crossing borders may over-remitt due to lack of access to financial services (Chin, Karkoviata, and Wilcox 2011). What is the impact of providing financial services for seasonal or temporary migrants and displaced people if they're likely to move on or return to their country of origin? How can financial services simultaneously address the needs of both migrant and host communities?
- **Are migrants over-taxed by low-cost remittances?** Does a reduction in transaction costs (e.g. through digitization) increase requests for transfers through social networks, overtaxing senders with requests and forcing them to

hide wealth or adopt welfare-reducing coping strategies, such as taking on additional work or selling assets? Does the resilience of the migrant remittance senders themselves decline as a result of increased demands on their money?

- **When is consumer credit the appropriate resilience strategy?** How can credit products be designed to help low-income households respond to small, frequent shocks? At what amount or for which segments do the potential welfare gains outweigh the cost? How can providers and policymakers balance potential benefits with consumer protection concerns, such as preventing over-indebtedness?
- **How can businesses and policymakers improve the effectiveness of bank and mobile money agents?** In one study, low-cost text messages which provided business management tips to mobile money agents led to improvements in agent cash flow (Acimovic et al. 2018). Could similar interventions improve agent and rural bank liquidity in the case of an aggregate shock, such as a natural disaster, where recipients of inbound transfers are cashing out? What other delivery mechanisms, regulatory initiatives, or technology innovations could help overcome limitations in the traditional mobile money agent model?
- **How can governments and relief organizations time the transition from life-saving aid to promoting future resilience?** For victims of shocks, how can practitioners and governments providing aid integrate interventions meant to promote future resilience, such as financial products and services, considering that there may be a period after a shock when populations are too vulnerable for financial inclusion interventions?

A Call to Action

Most existing research on financial inclusion and resilience is focused on interventions designed to improve the financial health of low-income households, making them better able to manage risk before a shock and recover after a shock occurs. Much of this work, however, examines the welfare impacts of these products in the absence of the conditions that they are meant to build resilience against, as researchers cannot anticipate the occurrence of a catastrophic or large-scale disaster as part of their research design. Moreover, many of the products reviewed in this brief were not specifically designed as part of a climate change response program, or as part of a regional resilience strategy, and there may be design and delivery innovations that could make them more effective for their intended use but



have not yet been evaluated. Resilience is a means, not an ends, to sustained poverty alleviation, and the studies examined here typically assess impacts within a year to a few years of a shock. To identify the product design features most appropriate to help households build economic resilience, it will be key to measure the long-term impacts of financial services and improved resilience on health, education, and income. This evidence will enable policymakers to make sound decisions on ways to promote resilience among vulnerable populations in a fast-changing world.

For these reasons, many questions remain and new innovations need to be designed and tested, and this review identifies several areas where future research is sorely needed. These include innovations to reduce the cost and increase take-up of insurance, innovative credit mechanisms to encourage investment in risk-mitigating technology, behavioral design to encourage savings (either for self-insurance or for investment), and digital tools that facilitate social networks and government response to shocks. Research is also needed on how financial services can complement other interventions, such as better meteorological services, improvements in risk-mitigating technology, social protection programs, basic infrastructure, and affordable health care. Testing these strategies will require strong private-public partnerships and collaboration between financial services providers, governments, donors, and academic researchers to encourage innovation and to scale-up promising solutions.

On the bright side, this existing research provides a foundation to build on—ideas to be modified and tested for contexts in which building resilience is a critical policy priority. Policymakers should therefore consider this evidence as part of the toolkit for helping vulnerable households become more resilient to climate change and continue exploring ways in which to effectively deploy them in pursuit of this goal.

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