

ENABLING DIGITAL DEVELOPMENT

Digital finance

Until a few years ago, agricultural productivity in Nigeria was declining, even though government spending had increased.¹ Since then, agriculture has become a driver of economic growth. One reason has been an innovative mobile wallet system initiated jointly by the public and private sectors and run by Cellulant, a mobile services company. Nigeria's smallholder farmers depend on subsidized fertilizer, but this crucial resource too often did not reach beneficiaries. The 2012 Growth Enhancement Support Scheme introduced mobile technology to transfer fertilizer subsidies directly to farmers, taking the government out of the business of procuring and distributing fertilizer. The support scheme now helps up to twice as many farmers, at one-sixth the cost. The transfer system relies on a database of more than 10.5 million farmers, who, as registered recipients of the subsidies, now have a better chance of gaining access to formal or regulated financial services. Based on this initial success, the system is expanding, aided by a digital identification system and biometric signatures, taking financial services far into Nigeria's rural hinterland.

This example and many similar experiences covered throughout this Report illustrate the large impact of the internet and related digital technologies on the financial sector.² Digital finance has promoted financial inclusion, providing access to financial services to many of the 80 percent of poor adults estimated to be excluded from the regulated financial sector.³ It has boosted efficiency, as the cost of financial transactions has dropped and speed and convenience have increased. And it has led to major innovations

in the financial sector, many of which have emerged in developing countries (box S2.1). The benefits pervade almost all areas discussed in this Report. Digital finance makes businesses more productive, allows individuals to take advantage of opportunities in the digital world, and helps streamline public sector service delivery.

Like all great opportunities, digital finance also comes with risks. What makes online financial systems easy to use for customers also makes them susceptible to cybercrime. The entry of nontraditional players poses new challenges for policy, regulation, and supervision. And the ease of transferring funds across the globe—often anonymously, using means such as cryptocurrencies—might increase illicit financial flows.

Benefits of digital finance

Digital finance promotes financial inclusion

More than 2 billion people have no access to any financial services. Overall, only about 59 percent of men and 50 percent of women in developing countries have an account at a regulated financial institution. Women, the poor, and small businesses often rely on informal financial services, even when they receive public transfers or remittances.

Digital payment systems help overcome barriers to accessing financial services. Mobile money schemes, in particular, allow people who own a phone but do not have a bank account to make and receive payments. In the right environment, these systems can take off and reach massive size rapidly (figure S2.1). Digital payments can reduce costs to recipients.⁴ For instance, farmers in Niger realized time savings for

WDR 2016 team based on Bossone (2015) and Tropina (2015).

Box S2.1 Innovations in digital payments

There are four major innovations in digital payments.

Wrappers create a digital interface with traditional payment systems such as credit cards or bank accounts. Many are offered by nontraditional providers, including internet intermediaries such as Google Wallet and Apple Pay.

Mobile money systems store money in the national currency as credit on smart cards or a system provider's books, and enable payments online or through mobile phones. A well-known example is M-Pesa, run by Safaricom. These systems can offer lower fees and easier use than traditional payment systems, even for those without a bank account.

Credits and local digital currencies are alternative units of account (not in national currency) designed to promote

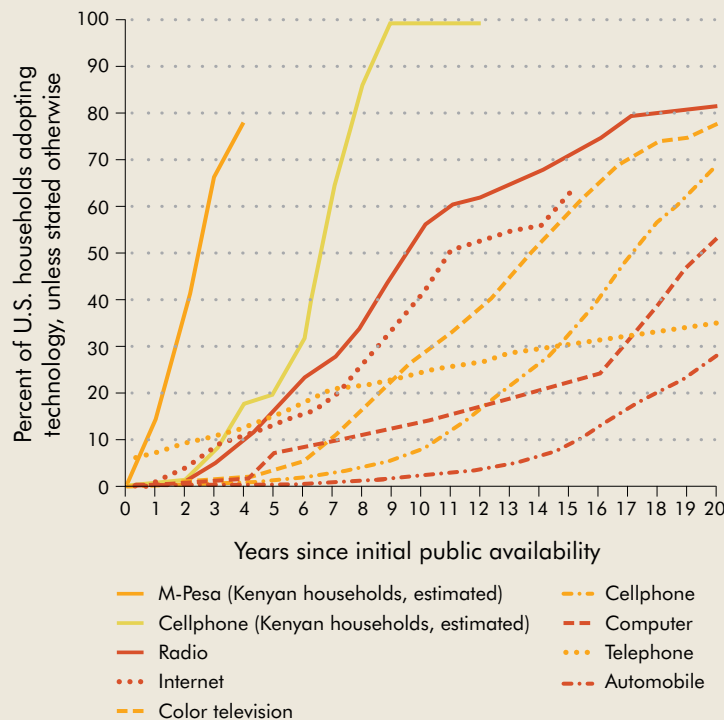
spending in a local economy or as a means of exchange in computer games.

Digital currencies are both a new decentralized payment scheme and a new currency. Such schemes record transactions in a publicly visible ledger. Most digital currencies, including Bitcoin, are cryptocurrencies because they use cryptographic techniques to ensure secure validation of transactions.

To get a sense of the magnitude of digital payment flows, consider this: In 2014, the volume of Bitcoin transactions worldwide was about US\$23 billion; for mobile payments on M-Pesa in Kenya, it was about US\$24 billion; for the online payment platform PayPal, it was US\$228 billion; and for the credit card issuer Visa, it was US\$4.7 trillion.

Sources: Bank of England 2014; <https://blockchain.info>; company reports.

Figure S2.1 Kenya's M-Pesa payment system reached 80 percent of households within four years



Source: Suri, Jack, and Stoker 2012. Adapted with permission from the National Academy of Sciences; further permission required for reuse.

Note: Shares of households in the United States, except for Kenyan M-Pesa and cellphone users.

SPOTLIGHT 2

each payment equivalent to an amount that would feed a family of five for a week. Digital payments increase control, since senders of remittances can have a greater influence on how recipients use the money, including for savings. Digital finance can increase the incentive to save, through automatic deposits, text reminders, or default options. Texted reminders increased savings in Bolivia, Peru, and the Philippines by up to 16 percent.⁵ Digital payments improve risk management by making it easier to receive support from social networks that can act as safety nets. M-Pesa users were better able to absorb income shocks compared to nonusers.⁶ Digital payments speed up delivery, which is especially important in case of emergencies such as natural disasters. And they increase security compared to traveling with large amounts of cash, as is commonly necessary in low- and middle-income countries.

Digital finance can increase women's economic participation. In part, this is because digital payments can more easily be concealed by the recipient than cash, at least temporarily, which helps shift economic decision making in favor of women. Access to savings instruments also increases female empowerment and the consumption and productive investment of female entrepreneurs. There is a significantly positive relationship between female labor force participation and female bank account ownership.⁷

Information asymmetries—when one party to a transaction knows much more than the other—are pervasive in the financial sector. In credit markets, especially those for informal enterprises and low-income borrowers, the lender usually has limited information about a potential borrower's ability to repay a loan, thus impeding lending. Digital technologies help estimate credit scores from digital footprints. Alifinance, a subsidiary of the Chinese e-commerce firm Alibaba that is now part of Ant Financial, provides loans to vendors on its e-commerce platform. Many vendors have small operations and face difficulties obtaining loans in the traditional financial system. Alifinance's credit scoring model is based on at least three months of a vendor's online activity and makes loan decisions automatically and almost instantly. Loans are Y 20,000 to Y 30,000 (US\$3,500 to US\$5,000), on average, with flexible repayment terms. Microlending elsewhere that serves small farmers or small businesses functions similarly, often using mobile phone payment records to assess credit risk. M-Shwari, operated by the Commercial Bank of Africa and Safaricom, is a bank account linked to Kenya's M-Pesa payment system. It pays interest on deposits and provides

short-term loans with approval often in a matter of seconds based on M-Pesa usage history. Between November 2012 and early 2015, the system issued 21 million loans to 2.8 million unique borrowers, with an average loan amount of US\$15.

Digital finance can increase efficiency

The internet reduces the cost of many financial transactions by allowing their unbundling into separate components that can be automated or provided by specialized entities. A retail payment consists of pre-transaction, authorization, clearing, settlement, and post-transaction, each one again involving several steps. Specialized providers can execute individual steps, yielding economies of scale that translate into savings. Such service providers are becoming more widespread in developing and emerging markets.

Governments can also lower the cost of financial transactions. Electronic payment cards reduced costs of social transfers in Brazil's conditional cash transfer program, Bolsa Familia, from almost 15 percent to under 3 percent of total payments.⁸ McKinsey estimated in 2010 that digital payments could save the government of India US\$22 billion per year.⁹ A large part of these savings comes from lower leakages and reduced fraud. Electronic payments create a clear digital record and can be traced, so the likelihood of funds not reaching the beneficiary or of duplicate payments or payments to "ghost" recipients who do not exist will be lower. Evidence from India also shows that using smart cards rather than cash for social security payments halved the incidence of demands for bribes.

Digital finance spurs financial innovation

The financial sector is transaction-intensive and has always been at the forefront of adopting new technology. Automation has led to a significant reduction in financial transaction costs. This has spawned innovations, such as automated credit scoring using advanced analytics and massive amounts of data. Automating processes allows new, so-called fin-tech firms to offer services often at lower costs than traditional providers, including money transfer across borders (Xoom, TransferWise) or short-term loans (Wonga, ZestFinance). Part of the Alibaba Group in China, Yu'E Bao—or "leftover treasure" in Mandarin—is a fixed-income investment fund into which customers can easily transfer balances from their Alipay digital payment accounts. Established in 2013, by the end of 2014, the fund had 185 million users and about US\$93 billion in assets. Peer-to-peer lending platforms operate without traditional financial intermediaries,

instead matching potential lenders and borrowers directly.

The emergence of digital currencies has been another innovation made possible by the internet. Bitcoin, the most well-known, was created in 2009. Its value in terms of national currencies has fluctuated widely, its acceptance as a means of exchange has been limited, and there have been widely publicized instances of fraud. But a recent analysis by the Bank of England suggests that the key innovation of such currencies is the distributed ledger that removes the need for accounting and settlement by intermediaries such as banks.¹⁰ This model could also work for other financial assets such as loans, stocks, or bonds, although it is unlikely to spread widely anytime soon.

Managing risks

The rapid development of whole new segments of finance has raised policy questions. How should these new areas of finance be regulated and supervised, for instance to ensure consumer protection? Do they pose significant risks to financial stability? And do they make it easier to commit financial fraud or illicit flows of funds?

One characteristic of digital finance has been the rise of nontraditional providers of financial services such as money transfers, savings, and lending. Some of these are new companies such as peer-to-peer lending firms like Kickstarter or LendingTree. Others are nonfinancial institutions setting up a finance arm (or “nonbank”), such as e-commerce sites like eBay (owner of PayPal) and Alibaba; internet intermediaries like Google; electronics and software developers like Apple; and telecom operators like Safaricom. This raises several concerns.

One concern is that traditional financial regulation does not always cover these companies or they are held to a different standard, such as reduced oversight, even though they can scale up quickly. These problems are somewhat similar to the “shadow banking problem” that preceded the global financial crisis, and regulators are exploring ways to shift from regulating entities to regulating activities. Traditional financial institutions, in contrast, use regulatory arguments to keep out innovative providers of digital financial services that could greatly benefit consumers and firms. This has obstructed the growth of online payment systems in Central America, for example. Light regulation fosters innovation. M-Pesa could not have grown as quickly had Kenya’s central bank erected strict regulatory hurdles.

Second, digital finance is bringing large numbers of people into the financial system for the first time. This requires strong consumer education and consumer protection, including promoting financial literacy and fraud prevention, dispute resolution mechanisms, and data privacy.

A third concern is that financial innovations could pose a systemic risk to a country’s banking sector, including credit, liquidity, operational, and consumer risk. Prudential regulation of digital finance reduces this risk, but may involve high compliance costs that raise barriers to entry, and thus to competition. Concerns about risks to the banking system were raised about Bitcoin, but analysis by the Bank of England, for instance, suggests that digital currencies play too small a role to threaten financial stability. A greater concern may be that financial innovations create distortions in financial markets that could have larger implications. For example, if automation and “big data” approaches make it much easier to issue consumer credit but not commercial credit, financial institutions might overallocate to the former, potentially creating a credit bubble and reducing credit availability for investments that increase productivity.

Finally, there are concerns about increased fraud in the financial system.¹¹ With the rise of electronic banking, cyberattacks on financial institutions and on other sectors processing electronic financial transactions have also increased. Massive theft of credit card information from retailers has highlighted the stakes involved. Larger financial institutions have the resources and know-how to continuously upgrade online and mobile security through tools such as encryption or strong authentication. In fact, banks have been at the forefront of developing secure transaction processes. But smaller and nonfinancial institutions may be more at risk. Apart from monetary losses, a large risk is also a loss of trust in digital financial systems that may hinder further innovation in the sector.

Besides fraud and theft, digital finance could facilitate financial flows for illegal or illicit purposes.¹² Such transfers could be money laundering (“cyberlaundering”), when illegally obtained funds are turned into seemingly legal assets through a process of deposit, layering, and integration with legitimate funds. They could represent payments for illegal goods or services such as drugs. Or they could be illicit financial flows—often from developing countries to capital markets in industrialized countries—that represent the proceeds from tax evasion, corruption, or bypassing of capital controls. Some flows may be to circumvent arbitrary regulations by unaccountable governments, but often they are the result of illegal activity that deprives a

Box S2.2 Technology can help unveil illicit money flows

Global communication networks have made it easier to move illicit money around the world and to shelter assets from domestic tax authorities. But recent high-profile cases also show how a combination of human intervention and technology increases the chances of detection. In each case, large datasets were leaked by insiders to tax officials or watchdog groups such as the International Consortium of Investigative Journalists (ICIJ). One case in 2014, Offshore Leaks, yielded 260 gigabytes of accounts data in offshore tax havens, including the British Virgin Islands and Cook Islands. Collaborating with media outlets, experts from Costa Rica, Germany, Malta, and the United Kingdom developed automated software tools for organizing and searching this massive dataset.

Sources: <http://www.icij.org>; press reports.

The largest number of addresses tied to these offshore accounts were from a number of large emerging economies. Besides Offshore Leaks, Swiss Leaks yielded data about secret bank accounts in Switzerland, and Lux Leaks documented strategies that international corporations use to avoid taxes in countries where they make profits, notably by channeling them through Luxembourg. While many clients are from developing countries, they get help from western accountants, and much of the money ends up in industrialized countries or their offshore territories. Increased transparency, thanks to technology's ability to sift through large leaked datasets, is encouraging reforms that will make it harder to hide assets in foreign jurisdictions.

country of financial resources that, in aggregate, are thought to exceed the value of development aid.¹³

The anonymity, speed, ease of transaction, and global reach of digital finance make illegal and illicit transfers easier, including through the ability to split large transactions into small tranches. Internet sites such as online casinos and digital currencies that offer a high degree of anonymity aid such activity. One study found that online casinos offered customers a choice of 235 payment options.¹⁴ And Bitcoin has been used to circumvent capital controls. Because these flows as well as cybercrime generally cross borders, it is not always clear which jurisdiction is responsible.

Although the internet might make illegal money transfers easier, it can also help address the problem. In contrast to cash, electronic transfers leave a trail that can aid law enforcement. Digital technologies could also help establish registries of beneficial ownership of financial and commercial holdings and transaction monitoring systems, a current priority of the G-20. This could reduce tax evasion and cyberlaundering—although the barriers to developing such directories tend to be due more to resistance by tax havens than to technical reasons, and reforms have mostly been prompted by high-profile disclosures (box S2.2). More generally, technology as a tool for tackling the problem of illicit financial flows can complement, but not substitute for, proper legal frameworks, international cooperation, and public-private collaboration.

As with international reporting obligations aimed at preventing financing of illegal activities or terrorism, a greater regulatory burden and reporting requirements can tax the resources of smaller countries, which may require assistance to comply.

Digital finance is developing rapidly, and constant changes will challenge the ability of regulators to catch up. Both too much and too little intervention by policy makers entails risks. Even in light of new types of financial crime online, however, the opportunities of digital finance for inclusion, efficiency, and innovation will likely outweigh the risks.

Notes

1. Case study from Grossman and Tarazi 2014.
2. See Bossone 2015.
3. World Bank 2014.
4. World Bank 2014.
5. World Bank 2014.
6. World Bank 2014.
7. Data from the World Bank Findex database, which covers 148 countries.
8. World Bank 2014.
9. McKinsey, as cited in World Bank 2014.
10. Bank of England 2014.
11. Chatain and others 2011.
12. Council of Europe 2012; Tropina 2015.
13. Tropina 2015.
14. Tropina 2015.

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