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Innovative financial technologies to support livelihoods and economic outcomes

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Question

What are key examples of poor people using technology / innovative financial instruments to improve their livelihoods or exploit economic opportunities? What are some of the main barriers to uptake?

Contents

1. Overview

Access to digital technologies, in particular mobile phones, internet connectivity and biometric authentication, allows for a wider range of financial services, such as online banking, mobile phone banking, and digital credit for the unbanked. Digital financial services can be more convenient and affordable than traditional banking services, enabling low-income and poor people in developing countries to save and borrow in the formal financial system, earn a financial return and smooth their consumption. This can contribute to improvements in livelihoods and other economic outcomes:

- **Poverty reduction**: A study, based on a survey of households across Kenya, finds that M-Pesa (a mobile transfer system) lifted 2 percent of households out of extreme poverty (Suri and Jack, 2016, p. 1288).
- **Agricultural payments**: It is easier to penetrate rural areas using mobile money. Digital financial services can provide more cost-effective and secure methods of financial transactions in the agricultural sector, particularly for rural smallholder farms.
- **Savings**: Mobile financial services increase the likelihood of saving and the amounts saved, particularly among the poor. There have been fewer successful findings in relation to savings, however, than in the cases of payments and credit.
- **Private investment**: Increases in cash flows and trade credit induced by mobile money, and reallocation of time from dealing with financial transactions to more productive activities, can lead to increased investment.
- **Weathering shocks**: Digital financial services can help people to handle income shocks by making it easier to collect money from friends and relatives.
- **Social networks**: Digital money transfers are rarely large enough to contribute to profit seeking and investment, but they strengthen maternal kinship ties and relationships among siblings and cousins.
- **Women's empowerment:** Digital financial services can give women greater financial independence and more equitable decision-making in households.

The existence of digital technology alone is not sufficient, however, to improve access to finance, and achieve improvements in livelihoods and economic opportunities. There are various challenges and barriers to uptake of digital financial services:

- **Regulations:** Differing approaches to regulation can either constrain or support the growth of digital financial services. Regulations are needed to safeguard consumers and to improve interoperability across digital financial service providers.
- **Infrastructure**: People will be less inclined to use digital payments if electricity outages, network outages or other technical problems undermine their usage.
- **Awareness and understanding**: Individuals with low income are more likely to have low levels of financial literacy and awareness of existing digital finance infrastructure.
- **Trust**: Distrust of digital finance by customers is often due to uncertainty and perceived risk in electronic financial transactions.
- **Demographics**: Women, poor households and those in rural areas often have lower financial literacy, ownership of mobile phones, and access to network infrastructure.

There is a growing body of literature on digital financial services, consisting primarily of peer-reviewed journal articles and donor reports. Much of the literature centres on Africa - particularly on Kenya, where mobile technology is widespread. There are various gaps, however, on the outcomes of such services (see Islam et al., 2016). While there is much literature, which asserts that digital financial services improve financial inclusion, there is little empirical evidence that establishes the links between digital finance and financial inclusion (Ozili, 2018). In addition, few studies have explored the relationship between mobile money use by firms, on the one hand, and private investment, firm profitability, and/or access to finance, on the other (Islam et al., 2016).

In this report, the terms ‘digital finance’, ‘digital financial services’, and ‘financial technology’ will be used interchangeably.

2. Digital financial services: Introduction

Mobile phones, the internet and other tools that collect, store, analyse and share information digitally have spread rapidly. According to a 2017 Gallup World Poll, 79 percent of adults in developing countries own mobile phones and 40 percent have access to both mobile phones and the internet (see Demirgüç-Kunt et al., 2017, p. 86). Access to both technologies allows for a wider range of financial services, such as online banking, mobile phone banking, digital credit via mobile phones for the unbanked, WhatsApp fundraising, and money pooling and circulation through M-Pesa (a low-fee mobile service that allows users to easily deposit, withdraw or transfer money) (Kusimba, 2018; Demirgüç-Kunt et al., 2017; Harelimana, 2017).

Weak infrastructure and under-developed banking sectors in many developing countries makes it time consuming for poor people to physically visit banks, in terms of travel costs and waiting in line (Islam et al., 2016). Digital financial services can eliminate such transaction costs and provide affordable, convenient and secure banking services to poor individuals in developing countries (Ozili, 2018; Demirgüç-Kunt et al., 2017; Islam et al., 2016). Mobile phones can enable the financially excluded and people in rural areas to access accounts where banking services are lacking (Demirgüç-Kunt et al., 2017; Ouma et al., 2017; Wyman, 2017). They put control and decision-making in the hands of users, who are able to process, store and transmit personalised financial data, and to transfer funds and make payments (Duncombe, 2014; Harelimana, 2017). In developing countries, 19 percent of adults (30 percent of account owners) reported making at least one direct payment using a mobile phone and/or the internet (Demirgüc-Kunt et al., 2017, p. 7). Mobile phones are used primarily for cash transfer, cash withdrawals and deposits (Ouma et al., 2017).

Mobile finance can be integrated with other digital technologies, such as smart cards, point-of-sale devices, ATMs and digital technology-based biometric identification cards (Demirgüç-Kunt et al., 2017). Biometrics data can verify customer identity for account opening and payment authorisation, which can lower barriers to account ownership (Demirgüç-Kunt et al., 2017; Wyman, 2017). Building upon mobile payments, mobile innovations can provide micro-insurance and facilitate social cash transfers (Duncombe, 2014).

3. Outcomes – improvements in livelihoods and economic opportunities

Inclusive digital financial systems enable poor people to save and borrow in the formal financial system, allowing them to build their account balances and assets, earn a financial return, smooth their consumption, and invest in entrepreneurial ventures (Ouma et al., 2017; Wyman, 2017). This can contribute to improvements in livelihoods, higher profits among micro-enterprises, and greater ability to deal with shocks (ibid; Islam et al., 2016). Digital financial systems can boost the gross domestic product of digitalised economies by providing individuals and firms with convenient access to a range of financial instruments (including credit facilities), increasing the volume of financial transactions and aggregate expenditure (Ozili, 2018).

Poverty reduction

M-Pesa is a mobile money transfer service that allows monetary value to be stored on a mobile phone and sent to other users via text messages. It has been adopted in the vast majority of households in Kenya. A study, based on a survey of households across Kenya, finds that M-Pesa increased per capita consumption levels and lifted 2 percent of households (194,000 households) out of extreme poverty (Suri and Jack, 2016, p. 1288). The impacts, which were more pronounced for female-headed households, were driven in large part by a higher level of savings and changes in allocations of consumption and labour (from agriculture to business) (ibid). Mobile money can facilitate these changes by: decreasing the costs of remittances; making payments easier and safer; boosting small-scale trade; increasing the return to savings and future consumption; allowing greater access to credit, potentially increasing productive investment; and facilitating risk sharing (Suri and Jack, 2016). Others argue instead that while more than three quarters of Kenyan adults subscribe to M-Pesa and usage levels are consistently high, evidence of its ultimate impact on the lives of users in terms of poverty alleviation is weak (Collins and Ng'weno, 2018).

Agricultural payments and public sector pay

Digital financial services can provide more cost-effective and secure methods of financial transactions in the agricultural sector, particularly for smallholder farms (Babcock, 2015). Digitising payments for the sale of agricultural products has increased account ownership: approximately 40 million adults in developing economies opened their first account in order to receive payments for the sale of agricultural products (Demirgüç-Kunt et al., 2017, p. 98).

In order to reduce costs, large commodity buyers are often willing to invest in the roll-out of mobile payments in rural areas, which reduces administrative costs and establishes a closer direct relationship with farmers. The *Musoni Core Banking System*, for example, integrates with M-Pesa and other mobile transfer systems, enabling all transactions to be carried out using mobile money, making it easier to penetrate rural areas (Babcock, 2015). It raises efficiency and reduces the costs of providing financial services in rural areas by enabling agri-suppliers and micro-finance institutions to easily manage their clients and loans. The Musoni App enables field officers to register clients, apply for loans and view portfolio and financial reports while travelling in rural areas (ibid). In turn, farmers get the benefits of access, convenience, security and their own financial identity (ibid).

SmartMoney, for example, is a third-party, mobile savings and payment system, operating in Tanzania and Uganda, that replaces cash throughout the entire value change with digital currency. Large agribusinesses can use the SmartMoney platform to transfer electronic crop payments in the SmartMoney wallets of intermediary buyers, who then purchase crops by transferring electronic crop income payments into the SmartMoney wallet of the farmer. They can spend the digital currency in the many SmartMoney shops and with other SmartMoney users, without incurring any transfer, deposit or withdrawal fees. This contributes to improving farmers' income and their general livelihoods (Babcock, 2015). Similarly, rice mobile finance (riMFin), operating in Ghana entails crop payments by the Global Agricultural Development Company (GADCO) into farmers' TigoCash wallets or, for farmers without a TigoCash wallet, via a voucher code that can be redeemed at a TigoCash agent. This has proven to be a time saving method, avoiding the need to queue at physical financial institutions, fill out documents and abide by particular opening hours (ibid).

Digitising payments of public sector wages and government transfers has also contributed to large increases in account ownership in some developing countries (Demirgüç-Kunt et al., 2017). Women and poorer adults may benefit disproportionately when governments digitise transfer payments. In Argentina, for example, almost a quarter of account owners in the poorest 40 per cent of households opened their first account to receive government transfers (ibid, p. 95).

Savings

Mobile financial services increase the likelihood of saving and the amounts saved, possibly due to the frequency and convenience of mobile phone transactions. Thus, expanding the scope for mobile phone financial services is a way of promoting savings mobilisation, particularly among the poor and low income earners who often have limited access to formal financial services (Ouma et al., 2017).

Ouma et al. (2017) examine the relationship between mobile phone money usage and savings mobilisation in Kenya, Uganda, Malawi and Zambia, relying on descriptive analysis and survey data on mobile phone-based financial services. Empirical findings from Kenya demonstrates that those who utilise mobile financial services (e.g. basic mobile phone savings stored in the phone and bank integrated mobile phone savings) are more likely to save than those who do not – and to save more (Ouma et al., 2017). The study also shows, across countries, that mobile phones are an important channel through which to increase savings, as they cut down transaction costs, reduce distances and increase convenience. Households also used mobile phones for payments and transfers (ibid).

There are limitations, however, to the impact of digital financial services on savings. Compared to payments and credit, there have been fewer successful findings in relation to savings (Wyman, 2017). This could be because formal savings tend to emerge later in the natural cycle of financial inclusion. It may also be because savings require a high trust threshold and digital methods may take time to foster trust (see sub-section on 'Trust' in the Challenges section). In addition, savings require low-cost mobilisation and servicing platforms. While joint mobile savings and credit products, such as M-Pesa and M-Shwari, have emerged, few people use these accounts on a regular basis (ibid).

Innovative approaches, such as the idea of goal-setting, can provide incentives for savings. In Kenya, for example, Equitel's mobile phone plan offers a system of 'pockets', which enable clients to set dates and amounts for putting money aside as goals. This kind of 'virtual savings

group' can be easier to relate to for customers with irregular incomes who would otherwise use informal savings channels. In Colombia, a similar approach (Banco Davidenda "bolsillios") increased average balances by 30 percent compared to a peer group not using such pockets (Wyman, 2017, p. 46).

Private investment and profitability

The reduction of transaction costs and simplified transfers through mobile money improves the liquidity of firms as cash can flow digitally at a faster rate. It is plausible that sufficient increases in cash flows induced by mobile money, and reallocation of time from dealing with financial transactions to more productive activities such as pursuit of growth opportunities, could lead to increased investment. Increases in trade credit and other external sources of financing, facilitated by mobile money, could also raise investment (Islam et al., 2016). Umati Capital (UCAP) is a non-bank financial intermediary in Africa that leverages technology to provide access to working capital to small and medium enterprises who supply to larger entities. In Kenya, reliance on technology, such as mobile applications throughout each stage of the value chain to capture data, has enabled faster lending decisions (Babcock, 2015).

There is empirical support that reduction in transition costs and improved cash flows can improve liquidity. There is, however, generally limited evidence linking this to investment (Islam et al., 2016). A study on the relationship between the use of mobile money (payments to suppliers and employees, from customers and for utility bills) and private investment in Kenya, Tanzania and Uganda, relying on firm-level data, finds that such usage results in a 16 percent increase in the likelihood of investing (Ibid, p. 11).

A study of the effects of integration of computerised systems and digital finance services in Rwanda finds that such services improve customer satisfaction and profitability, in part by simplifying transactions (Harelimana, 2017).

Weathering shocks

Digital financial services can help people to manage financial risk and handle income shocks, stemming from unforeseen emergencies (e.g. illness, loss of employment, livestock death, and harvest or business failure). It does this by promoting financial inclusion and making it easier to collect money from distant friends and relatives (Olizi, 2018; Demirgüç-Kunt et al., 2017).

A study on the impact of reduced transaction costs of mobile money on risk sharing in Kenya, relying on M-Pesa user data, finds that users were able to fully absorb large negative income shocks without any reduction in household consumption. In contrast, household consumption of food and other items for households without access to M-Pesa fell by 7 percent on average in response to a major shock (Jack and Suri, 2014, p. 183). M-Pesa users had access to higher levels of remittances from a wider network of sources from farther distances, easily transmitted through SMS. Prior to M-Pesa, they used to be delivered via hand or informally through friends or bus drivers – a costly method, subject to delays and losses (Jack and Suri, 2014).

Financial technology providers have also been shown to have better ability to provide instant emergency funds or loans in small amounts to individuals with low and poor incomes compared to banks and other lending institutions. This is because conventional bank or lending institution must go through the credit risk assessment processes which may be too lengthy for individuals that need instant emergency funds (Olizi, 2018). The provision of micro-insurance, enabled

through integration of digital financial services and reduction in transaction costs, can also be used to protect against income shocks, such as price variability and health risks (Duncombe, 2014). Informal financial groups, facilitated through digital financial services, can assist in times of crisis through their welfare functions and increased access to liquidity (Johnson, 2016).

Social networks

While there are few studies that explore the links between digital finance and financial inclusion (Ozili, 2018), Collins and Ng'weno (2018) emphasise that there are other important impacts upon which to focus, in particular strengthening of social networks.

Research on M-Pesa, examining the interplay between social networks and mobile money remittances in Western Kenya, finds that digital money transfers follow and reinforce pre-existing forms of emotional support and social relationships (Kusimba et al., 2015). Relatives provide reciprocal small and frequent digital money transfers, through mobile phone text messaging, without need of internet or a bank account. These transfers contribute to household and emergency needs, transport, farming or work, ceremonies and funerals, school fees, medical bills and/or migration. Money gifts are rarely large enough to contribute to profit seeking and investment, but they strengthens maternal kinship ties and relationships among siblings and cousins, connecting them to new circulations of money (Kusimba et al., 2016; Kusimba et al., 2015). Such money remittances can, however, increase burdens and social pressure to recirculate e-money gifts (Kusimba et al., 2016).

Another study on the use of financial services among low-income people in Kenya, based on household surveys, finds that mobile money transfers are a way to move money within interpersonal networks of immediate and extended family and friends (Johnson, 2016). While the majority of mobile money transfers were gifts, there were also reported cases of borrowing and lending among relatives and friends, all operating within relationships of entrustment, obligation and need (ibid). Financial groups and mobile money transfers in such circumstances operate within social relations of equality, in contrast to hierarchical and uneven power relations of traditional banks (ibid). Without access to borrowing, savings in financial institutions are largely a one way exchange that does not resonate with the nature of friendship and mutually supportive relationships, facilitated by reciprocal digital transfers (Johnson and Krijtenburg, 2018).

Women's empowerment

Digital finance has the potential to accelerate women's access to financial services. In India, for example, Demirgüc-Kunt et al. (2017, p. 25) remark that three years prior, men were 20 percentage points more likely than women to have a bank account. However, the gender gap has since shrunk to 6 percentage points due to the use of biometric identification cards, introduced by the government in its push to increase account ownership.

In Kenya, researchers believe that mobile money has the potential to give women greater financial independence as they are more likely to be able to manage and keep their own income through this technology, rather than with cash which often gets used by the whole household (Siri, cited in Matheson, 2016). Women's greater access to digital financial services and monetary values can, in turn, facilitate growth in women's empowerment and more equitable decision-making in households (see Kusimba, 2018).

Further, the study on M-Pesa in Kenya, based on a survey of households across Kenya, finds that mobile-money services have helped an estimated 185,000 women move from farming to business occupations (Suri and Jack, 2016, p. 1289). The easier provision and receipt of micro-credit affords women more control and direct access to remittances. This, in turn, has supported them in reducing their reliance on multiple part-time occupations, including working in subsistence agriculture, and increasing their business ownership (Suri and Jack, 2016).

4. Challenges and barriers to uptake

The existence of digital technology alone is not sufficient to improve access to finance and increase financial inclusion (Ozili, 2018; Demirgüç-Kunt et al., 2017). In order to ensure that people access and benefit from digital financial services, it is necessary to have appropriate regulations and consumer protections, good physical infrastructure, awareness of and trust in digital channels, among other factors. It is also important to tailor such services to the needs of disadvantaged groups such as women, poor people, and first-time users of financial services, who may have low literacy and numeracy skills (ibid). Lack of attention to these factors and requirements can undermine the uptake of digital financial services.

Regulations

Governments need to ensure that appropriate regulations and consumer protections are in place to safeguard people from fraud and abuse, particularly for women and/or low-income people, who are most likely to lack experience with financial services (Demirgüç-Kunt et al., 2017). Differing approaches to regulation can either constrain or support the growth of digital financial services. In Cambodia, for example, a single digital finance service provider covers 80 percent of the market due to high barriers to entry. It is difficult to enter the market due to the need to find a partner bank that must also follow a set of compliance procedures established by the authorities (Hanley et al., 2016). In contrast, in the Philippines, less rigid regulations and lower barriers to entry have allowed for a much greater number of banks offering e-banking facilities and more e-money issues, including rural banks that have been able to develop linkages with different partners (ibid).

Even with regulations that allow for growth, however, the business environment can still constrain the development of digital financial services. Despite the proliferation of electronic services in the Philippines, very few financial transactions are made electronically due to limited interoperability of domestic payment systems (Demirgüç-Kunt et al., 2017). Major payment providers have their own ecosystems, which makes it impossible for smaller institutions to participate. Hanley et al. (2016) suggest that financial regulators should consider policies to allow potential digital finance service providers to enter the market without being attached to a bank. Lack of interoperability across digital financial service providers can also deter user uptake due to confusion with each institution and provider having its own rules and menu structures (Ephraim et al., 2017).

Some countries in Asia, such as China and India, have been successful at creating the environment for collaboration and integration of financial technology providers and the banking sector. In Africa, however, there has in the past been divisions between the two, with financial technology innovations, often deployed by mobile network operators, separated from and often in direct competition with banks (IFC, 2017). There has since been a move toward integrated services, with the success of M-Shwari, M-Pesa and other digital financial services that allow users to perform traditional banking services on their mobile phones. M-Pesa has been a

tremendous success in Kenya, with vast uptake, in contrast with South Africa, where it has failed to launch, in part due to stricter digital wallet regulations (alongside an inadequate distribution network and low mobile network subscription rates) (ibid).

Digital finance also necessitates regulations to protect consumers in a rapidly changing environment and from risks related to data governance. Addressing these issues, relating to how data is accessed, used, stored, and shared, requires coordination between regulators (Wyman, 2017).

Infrastructure

According to the 2017 Gallup World Poll, while the vast majority (79 percent) of adults in developing countries own mobile phones, less than half (40 percent) have access to both mobile phones and the internet (see Demirgüç-Kunt et al., 2017, p. 86). In order to provide and encourage use of digital financial services, it is essential to have the necessary physical infrastructure, in particular reliable electricity, mobile networks and internet connectivity (Demirgüç-Kunt et al., 2017). People will be less inclined to use digital payments, for example, if network outages or other technical problems undermine their reliability (ibid).

Lack of good-quality and affordable digital connectivity is often due to in part to a deficient regulatory framework (Ozili, 2018). It undermines the ability of users to have access to digital financial services from any location and at all times. It also excludes individuals and firms that do not have internet connectivity from participating in these services (ibid).

It is also essential to have the necessary financial infrastructure in order to promote uptake of digital financial services and financial inclusion. This involves an adequate payments system and a physical network to deliver payments to both urban and rural economies (Demirgüç-Kunt et al., 2017).

Awareness and understanding

The uptake of digital financial services requires greater financial awareness and literacy (Hunter et al., 2016). Individuals with low income, who are more likely to have low levels of financial literacy and awareness of existing digital finance infrastructure, will thus be less likely to utilise digital financial platforms (Ozili, 2018).

Lack of interoperability across financial service providers can further undermine the ability of all potential users to understand and figure out how to use digital financial technologies. This will deter its use, in contrast to cash, which is considered to be a consistent monetary instrument (Ephraim, 2016).

Trust

Insufficient trust in digital finance by customers undermines uptake of such services, account ownership and the possibility of improving financial inclusion (Ozili, 2018; Demirgüç-Kunt et al., 2017). This problem is greater in countries that lack strong consumer protection institutions and frameworks (ibid).

Distrust can be caused by high degree of uncertainty and perceived risk in electronic financial transactions. Users need safety and security in mobile banking, such as privacy of financial information in order to rely on digital finance (Ahmad et al., 2016). Digital data security breaches,

which can be common, can lower customers' trust in digital finance platforms and increase their perception of risk (Ozili, 2018; Ahmad et al., 2016). A study on mobile banking customers in Pakistan, based on survey data, finds that trust and confidence in financial transactions through mobile depends on risk perception (Ahmad et al., 2016). Users also require reliability in order to adopt digital finance, which as noted above can be undermined by infrastructure problems.

Demographics

Gender

Gender gaps in technology access, whereby women are less likely than men to own a mobile phone, also translates into differences in access to digital financial services. The gaps can vary across countries. In Pakistan, for example, men are more than twice as likely as women to own a mobile phone; whereas there is no appreciable gap in other developing economies, such as Brazil, China, Colombia, Indonesia, and Turkey (Demirgüç-Kunt et al., 2017). Similarly, among the unbanked in Sub-Saharan Africa, 54 percent of men have a mobile phone in contrast to 43 percent of women. Yet in several economies in the region, including Mozambique and Senegal, unbanked women are about as likely as their male counterparts to own a mobile phone; and in other economies, such as Botswana and Zimbabwe, unbanked women are more likely than unbanked men to have a mobile phone (Demirgüc-Kunt et al., 2017, p. 93). In addition to mobile phone gaps, women also often have lower levels of financial literacy in various contexts, which can further undermine their ability to take advantage of digital financial service offerings (Wyman, 2017).

In countries where women have high ownership of mobile phones, such as in Kenya, the spread of mobile money accounts can create new opportunities to better serve women and increase their financial inclusion (see sub-section of 'Women's empowerment' above).

Rural-urban

Urban populations continue to benefit from much broader access to finance than rural communities (Demirgüc-Kunt et al., 2017). Mobile money has spread faster in urban centres due to high population densities that make the economics work for agents, mobile financial service providers and users. In contrast, lower population densities in rural areas require greater efforts to design viable business models (Babock, 2015).

Babcock (2015) finds that barriers to the implementation of digital crop income payment schemes in rural areas include: illiteracy, financial illiteracy, digital illiteracy and lack of trust. Smallholders have long been excluded from the formal economy as they tend to be illiterate and distrustful of banks. Illiteracy, financial illiteracy and lack of trust limit the impact of conventional marketing and advertising to promote mobile phone adoption. Building trust involves promoting financial literacy by fostering a greater understanding among farmers about the features and benefits of mobile finance (ibid).

Rich-poor

Digital platforms are more likely to be used by households with greater income and wealth, in urban areas (Ozili, 2018). There is a gap in mobile phone ownership and internet connectivity between richer and poorer adults (Ozili, 2018; Demirgüc-Kunt et al., 2017). Forty-eight percent of adults in the richest 60 percent of households within developing economies have these technologies, in contrast to 28 percent of those in the poorest 40 percent. In Kenya the gap is

nearly twice as large, at 39 percentage points; in Colombia it is 29 percentage points (Demirgüc-Kunt et al., 2017, p. 87).

Individuals with relatively high income in urban areas have greater incentive to participate in the digital financial system since the fees charged for transactions are negligible to them, in contrast to poor individuals in rural areas, for whom fees may be substantial (Ozili, 2018). Even if the poor are included in the digital finance system, their uptake may be limited as it may be cheaper for them to walk into their banks or to the shop to purchase small ticket items than to use online digital finance platforms (ibid).

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About this report

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