INTRODUCTION

The last two decades have seen financial inclusion becoming firmly established as the primary international objective for developing countries’ financial sectors (Lensink et al., 2022). The shift in focus from financial development, which captures the overall relative size of the financial sector, to financial inclusion, which focuses instead on breadth in terms
of inclusivity of financial sector access and use, is perhaps one of the most notable examples of a successful move away from conventional macroeconomic aggregates to more socially nuanced indicators. The reasons for the high priority assigned to developing countries’ financial inclusion by international organizations and policymakers are manyfold and will later be briefly discussed. At this stage, financial inclusion is identified as a key enabler for seven of the seventeen Sustainable Development Goals (World Bank, 2018) and has long been considered as a necessary condition for optimal population participation in social and economic life (Anderloni et al., 2008). Most importantly, there are well-established causal links between the financial inclusion of women and female economic and empowerment outcomes (Duvendack & Mader, 2020; Hansen et al., 2021; Pitt et al., 2006), which further underscore the social necessity of increasing financial inclusion, particularly with a gendered focus.

The fintech revolution of the early twenty-first century is rapidly emerging as a major influence on developing a country’s financial sectors and has widespread implications for the crucial development goal of increased financial inclusion. Fintech evolves somewhat differently in developing countries than in advanced economies, but the impacts of this evolution remain highly relevant. In their discussion of the different eras and phases of fintech, Arner et al. (2015) note that while the twenty-first-century fintech revolution in the developed world has seen financial technologies becoming increasingly more advanced and complex, developing countries’ financial innovations are inherently more low-fi and focus on navigating and surmounting the obstacles and infrastructural inadequacies which have acted as breaks on more traditional financial service providers and facilities. For example, rather than designing complex apps that presuppose widespread smartphone ownership and digital literacy, fintech innovators in the developing world focus on providing new financial products and services specifically in ways that circumvent the need for these preconditions. The vastly successful takeoff of Mobile Money services, particularly in Africa, which are purposefully designed to require only the most basic cell phones, regular 2G signal coverage, and a highly localized system of agents is the prime example of this (Allen et al., 2014; Hinson et al., 2019; Suri & Jack, 2016). What Mobile Money

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lacks in technological sophistication is more than compensated by its extraordinarily rapid adoption in many countries.

In Lensink et al. (2022), we argued that understanding the implications and impacts that different forms of fintech have both for and through financial inclusion on social and economic outcomes represents one of the most exciting and important research frontiers in the field of development finance. In this chapter, we further elaborate on this point. After briefly acquainting the reader with the relevant concepts and indicators of financial inclusion and providing an overview of the current state of fintech in the developing world along with some fintech definitions, we expand the empirical discussion of Lensink et al. (2022) into a comparison of the penetration of key fintech products and services between different developing regions. These products and services range from deliberately low-fi innovations such as Mobile Money and simple peer-to-peer platforms to frontier technologies such as crowdfunding apps, RegTechs, cryptocurrencies, and blockchain. We then review the main findings of the literature thus far regarding the impacts of fintech—and particularly, Mobile Money—on financial inclusion and development outcomes. Afterward, we discuss the risks associated with the rapid shift in the financial sector landscape that the fintech revolution implies and the accompanying regulatory implications. Finally, we conclude by proposing two alternative future scenarios for the long-term implications of fintech on developing countries’ financial inclusion. The first is that, by actually being ahead of the curve in the adoption and proliferation of many new financial technologies, developing countries may find that the fintech revolution acts as an equalizer by which the constraints of physical resources and infrastructure are relieved, and populations face rapidly expanding and more inclusive financial access. The second more somber scenario is that, as fintechs in advanced countries become ever more complicated and digital infrastructure and literacy in the developing world continues to lag, the fintech revolution may only serve to create further forms of division between and within country’s financial exclusion as swathes of the world population are shut out of these new innovations.
What Is Financial Inclusion, and How Can Fintech Impact It?

A useful working definition of financial inclusion (FI) is that “[financial inclusion involves] broadening access, availability, and enhancing the usage of formal financial services by all segments of the population” (Sarma, 2008). As FI is a multifaceted concept, preferred definitions may vary, but this definition concisely captures its essence. The key elements of this definition are first and foremost that financial inclusion involves increasing the levels of financial sector access and usage for individuals. Furthermore, this should be independent of population segmentation, such that different ethnic, social, gender, geographic, age, etc., groups enjoy equal opportunities to access and make use of financial services within developing countries. Finally, we are talking about formal financial services, in that a key element of financial inclusion is supporting poorer and more marginalized individuals to move away from reliance on informal and perhaps predatory financial service arrangements.\(^1\) Therefore, to understand the financial inclusion concept clearly, it can also be useful to turn it around: if financial exclusion is the inability of individuals in developing countries to access and use formal financial services due to a lack of available or affordable products in their area, lower levels of financial literacy, discrimination, mistrust, or some other reason, the goal of financial inclusion is to bring these individuals into the financial system by overcoming these obstacles. Therefore, financial inclusion differs from the earlier concept of financial development, where financial sectors are evaluated according to their size (Hannig & Jansen, 2010; Lensink et al., 2022), such as the relative volume of loans outstanding or deposits on

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\(^1\) To the extent that there are also some positive aspects of informal finance, such as the leveraging of local knowledge to reduce collateral requirements (Manig, 1990) or the social interaction gains from participating in savings clubs (Anderson & Baland, 2002), financial inclusion interventions can also seek to incorporate these into formal financial products and services so as to improve their appeal and by extension their breadth of usage.
account, and instead evaluates financial sectors according to their degree of inclusivity at the individual level.

We measure levels of financial inclusion according to the shares of individuals, preferably stratified by social groups, who have access to and make use of formal financial products and services (Allen et al., 2014; Demirgüç-Kunt & Klapper, 2013; Demirgüç-Kunt et al., 2017, 2018). These latter references refer to the Global Findex Database, which since 2011 has provided triennial survey-based indicators of the population share of individuals who access and use various forms of financial services and transactions and which forms the ‘gold standard’ of financial inclusion data (Lensink et al., 2022). As such, it will become immediately apparent that fintech revolution has the potential to boost levels of financial inclusion in three different ways:

1. By utilizing technological solutions to reduce frictions in access to or use of existing financial products and services, such as reducing fixed costs, overcoming infrastructure constraints, etc., so that those who wish to become financially included but face barriers now see those barriers lowered.
2. By allowing existing financial service providers to adapt their financial products and services in order to make them more appealing to individuals who had thus far chosen not to make use of them.
3. By developing new financial products and services which act as substitutes for those already in existence but have greater scope for reaching those who remain financially excluded.

The first two points, if successful, would therefore lead to observable rises in conventional financial inclusion indicators such as the share of

2 The key difference being that financial development concepts tell us nothing about the extent to which financial sector usage is concentrated. For example, small numbers of urban elites could own large deposit holdings, and access voluminous credit, in a financial sector which therefore appears large but in fact is completely closed to most people and has little impact on general living standards or poverty reduction. For a full overview of the shortcomings of the financial development concept and the academic and policy shift in focus toward financial inclusion, see Lensink et al. (2022).


4 Given the context of this book, we deem it superfluous to define ‘fintech’ or ‘the fintech revolution’ here, although of course we will later make clear the prevalent forms fintech takes in the developing world.
adults with a bank account or the share of adults currently holding credit. However, the latter point requires new indicators, such as the share of individuals accessing these new products and services, which will lead to debates over the degree of substitutability between the new services and the old ones. Some of these new indicators have already been incorporated into later rounds of Findex Surveys as individuals in developing countries are asked about their financial sector engagement in a manner which is then easily aggregated into national level variables.

**Predominant Fintechs in Developing Countries**

As indicated in our introduction, the fintech revolution can be usefully deconstructed into two components—that which is taking place in advanced economies, and that in the developing world. This broadly matches the split between Arner et al.’s (2015) ‘FinTech 3.0’ and ‘3.5’. In general, both of these represent elements of an era during which fintech has become detached from conventional banks and financial service providers, taking advantage of technological innovation in tandem with the reputational blows to the existing system caused by the Global Financial Crisis of 2008 and its aftermath in order to overcome skepticism of new service alternatives by individuals and governments (Chamley et al., 2012; Philippon, 2016). However, the two elements of this split take place in very different institutional and infrastructural landscapes.

The predominant fintech innovations which characterize the ongoing fintech revolution in the developed world are usefully surveyed by Gomber et al. (2018) and will be familiar to most readers of this book. They subdivide these innovations into four basic categories: operations management, payments and transfer innovations, lending and deposit innovations, and investment innovations. We do not discuss operations management as it does not really relate to financial inclusion, but of the latter three, there is clear relevance to developing country contexts. Payment and transfer innovations, and lending and deposit innovations clearly relate directly to established financial inclusion concepts and metrics. Nevertheless, the major examples Gomber et al. (2018) provide for each category vary in terms of relevance for developing countries at the present time. Cryptocurrency and blockchain may have a future role to play in developing countries, particularly as they relate to cross-border transactions. However, other than in outliers such as El Salvador, there
is little penetration thus far. Ndemo (2022) demonstrates that cryptocurrency markets are much smaller in the developing regions of Africa, the Middle East, and Latin America than that of North America and Western Europe; although East Asian and South Asian markets are less far behind, Ndemo argues that the rate of market growth in Africa is rapid. It is difficult to imagine how investment innovations such as robo-advisory and online stock-market portfolio suites are especially relevant to developing countries’ financial inclusion at the present time. However, peer-to-peer lending and crowdfunding platforms for capital investments may be, and such platforms have already made some headway in developing countries with regard to investments in agricultural equipment (Hinson et al., 2019). Nevertheless, as Cozzens and Thakur (2014) repeatedly illustrate, most of such innovations originate in and are designed for developed countries as developing countries are recipients of exogenous technology and are left to adopt and adapt them if they can.

The other aspect of the fintech revolution which relates more directly to developing countries is inherently different. Rather than the somewhat complex innovations discussed above, which place high demands both on infrastructure and human capital, some fintechs evolve for very different reasons. Traditional supply-side constraints on financial inclusion in developing countries include high fixed costs of retail nodes such as banks and ATMs (Mas, 2011; Ouma et al., 2017), shortages of educated financial sector workers (Allen et al., 2021), unreliable infrastructure (Ogawa et al., 2021), and informational constraints (Karlan & Zinman, 2009). Demand-side constraints include lack of financial literacy, lack of trust in financial institutions and contracts, and low levels of income and wealth (Lensink et al., 2022). Naturally, these constraints are equally relevant for new fintechs as for conventional financial sector services, and thus overcoming these constraints is a necessary condition for any fintech to take off in developing countries at scale. Therefore, the fintech revolution as it pertains to developing countries is largely concerned with circumnavigating these constraints. Mobile Money, which is discussed in greater depth in the next section, is the flagship innovation of developing countries’ fintech thus far.

**Constraints on Fintech in Developing Countries**

Inadequate digital infrastructure has proven to be a major binding constraint on the international proliferation of fintech (Diniz et al., 2012).
In an econometric study of the relevance of information and communications technology (ICT) infrastructure for fintech in Nigeria, Morakinyo et al. (2019) find that the probability of adopting fintech crucially depends on the proximity to network infrastructure. In most Sub-Saharan African countries, distances to appropriate networks are vast. Moreover, the electrical and communications infrastructure provides limited and unreliable access to broadband Internet connections (Yermack, 2018). This is especially the case in rural areas where the infrastructure is not fintech-enabling. Clearly, as long as the necessary information infrastructure, including a reliable low-cost electricity grid and mobile networks, is not available, the diffusion of fintech will not take place.

To promote adequate ICT infrastructure, it seems indispensable that African policymakers create a supportive regulatory framework or ease regulatory bottlenecks at the very least. However, we know surprisingly little about the optimal regulatory framework to promote fintech. African governments have mostly taken a hands-off approach regarding fintech regulations. In Kenya and South Africa, the two most successful fintech adopting countries in Africa, a specific fintech legal framework does not exist, and governments tried to address various issues as they emerge (Didenko, 2018). Major fintech crises did not occur in these countries, which suggests that the legal framework is somehow properly used. Yet, it is unclear whether future regulatory responses will be appropriate and how other African countries will respond. Therefore, an in-depth analysis of the appropriate regulatory frameworks and legal systems which best promotes fintechs generally is of utmost importance. Importantly, Yermack (2018) finds that the adoption of fintech in African countries is much higher in countries with a common law system than in countries with a civil law system. This is probably because common law protects better against risk (i.e., better investor protection) and ensures lower costs of capital than civil law, which incentivizes risky investments in fintech. The regulatory implications of fintech for developing countries will be discussed in greater detail in section “Risks and Regulatory Implications of the Fintech Revolution in Developing Countries”.

**MOBILE MONEY ADOPTION: A REGIONAL COMPARISON**

Consider the following stylized example: A middle-aged man named Ngugi, using his simple analog phone in Nairobi, Kenya, has just transferred money to his 80-year-old mother and his older brother in the village of Kilingili,
about 237 km away. Floods in Kilingili have done considerable damage to the family farm, so the money from Ngugi’s job in the city is welcomed. There is no cable-internet in Kilingili, and Ngugi’s mother does not have a cellphone, but these things do not matter—she goes to collect the money from Mr Hasan at the grocery kiosk, who also earns small commissions as a Mobile Money agent using his analog phone on the side. At the same time, Delali, a 28-year-old woman in Kpoeta, Ghana, has just been notified by SMS that her Mobile Money account has reached her savings goal of 150 cedis, after she chose to deposit 10 cedis per week for the last few months. This goal, together with her credit score from Mobile Money transactions, qualifies her for an instant microloan of 300 cedis. She uses this money to buy a portable high-capacity rice-milling machine and expand her rice production business. Welcome to the world of Mobile Money.

**Introduction to Mobile Money**

Mobile Money is the use of the cellular network and mobile phone handsets as infrastructure for financial sector transactions. Donovan (2012) defines Mobile Money as the provision of financial services through a mobile device. Internationally, the real pioneer in the Mobile Money market was M-Pesa, which first emerged in Kenya. This innovation was initially designed by Safaricom, a mobile network operator (MNO), to allow users to deposit and transfer small amounts of money via SMS using their cellphones. M-Pesa was launched in 2007 and piggybacked on the network of MNO agents scattered all over Kenya, including in small villages and isolated areas, from which SIM-cards and airtime could be purchased or transferred in very small units. Safaricom took advantage of this wide and already well-established agent network and the wider accessibility of mobile phones to offer a faster and cheaper means of remitting money across long distances. This immediately solved the problem of the huge transfer costs associated with money transfers through banks, and the risk of theft or loss in the case of cash transfers by the poor along physical transport links. The network of mobile agents was part of the key infrastructure in delivering fast payment services at an affordable rate and is also a large part of the reason why Mobile Money achieved scale so quickly. As noted in Mas and Radcliffe (2011) and Lensink et al. (2022), Mobile Money agents act as the ‘retail arm’ of the Mobile Money system, and customers or Mobile Money users only need access to a cell phone and small cash float to start transacting.
Mas and Radcliffe (2011) provide a detailed overview of precisely how Mobile Money strategically overcomes the supply- and demand-side constraints on developing country fintech proliferation discussed in the previous section. First, as with M-Pesa and Safaricom, Mobile Money piggybacks on existing infrastructure. This means that it always ensures that network requirements are already in place. This includes ensuring all operations can be performed on the existing 2G cell phone network, and initially locating agents and outlets in existing consumer focal points such as village convenience stores and kiosks. The agent’s system also overcomes human capital constraints as it negates the need for qualified financial service staff. Second, the high fixed costs of conventional banking and even microfinance retail nodes are converted into variable costs, as Mobile Money agents are employed as contractors working on commission for the transactions, they facilitate or are existing shopkeepers merely adding another product or service to the array of things they already sell. Third, the business model of Mobile Money centers around profiting from volume of transactions rather than volume of deposits. That is, profits are made more from commissions rather than lending out deposit holdings or from collecting account ownership fees. This means that even customers with no meaningful funds on deposit are still of value so long as they perform transactions, and that Mobile Money accounts themselves can be offered for free. Finally, Mobile Money focuses on the products and services for which traditionally financially excluded individuals have the most pressing need—that is, secure savings and instantaneous transfer facilities, rather than more complex insurance and savings products, although these are also offered in more recent permutations of Mobile Money (Hinson et al., 2019). These features serve to illustrate the adaptability of successful developing country fintech, and to indicate the approaches other innovators can take if they wish to gain footing at scale in the Global South.

**Empirical Overview of Mobile Money Penetration**

In Chapter 6 of Lensink et al. (2022), we provided an empirical overview of the preponderance of Mobile Money in Sub-Saharan Africa as of 2017, demonstrating that the African continent really is the world leader in terms of Mobile Money adoption and penetration, albeit with highly heterogeneous experiences across the continent. We now extend this overview to the other developing regions and a broader set of Mobile
Money indicators, also updated with the recently released 2021 data. However, the 2021 Findex data comes with a large caveat. As a result of COVID-19, fewer countries were sampled than in the 2017 round, and it appears that the omitted countries were often at the lower end of the development spectrum. Table 12.2, which shows the shares of non-high-income countries in each region which passed certain Mobile Money adoption thresholds, demonstrates the reduction in sample size in some of the regions. It may therefore be that seeming improvements in the degree of Mobile Money proliferation between 2017 and 2021 are in fact a result of some lower penetration countries dropping out of the sample, and readers may therefore prefer to focus on the 2017 data as an older but more complete overview. While so often in development economics, the discussion focuses on how Sub-Saharan Africa can ‘catch-up’ to other regions, in the case of Mobile Money, the story is reversed—it is Sub-Saharan Africa, or at least large swathes of it, which have set the standard for other developing regions to replicate. This again serves to illustrate how carefully designed fintechs can fundamentally uproot conventional development disparities.

When empirically analyzing financial inclusion across any dimension, decisions must be made over the selection of appropriate indicators. The difficulty is that there are several different measures of, for example, the scale of adoption of Mobile Money at the individual-user level and attempts to rank countries or regions on the basis of financial inclusion may depend heavily on the selection of indicators. Attempts have been made to construct FI indices by combining multiple variables into a single univariate index (Sarma, 2008), but while there remains no consensus over which variables should be included and how they should be weighted, it remains preferable to examine individual financial inclusion variables. In Lensink et al. (2022), we focused on the share of adult individuals with a Mobile Money account and the share of total domestic remittances received via a mobile phone. Now, however, we defer to the Mobile Money usage measures of Khera et al. (2021) in a recent International Monetary Fund (IMF) report: share of adults (age 15+) with

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5 Khera et al. (2021) also propose some ‘supply-side’ access measures of Mobile Money penetration, such as number of agents per capita, however for reasons of concision, we do not focus on these as they are less relevant to the discussion of financial inclusion at the individual level.
a Mobile Money account, share of adults who receive salary via a cellphone, and share of adults who use the cellphones to pay utility bills. Via this selection of the most common regular incoming and outgoing transactions which individuals make, we gain a broader impression of how and where Mobile Money has made the greatest inroads in terms of people’s daily financial lives.

Table 12.1 presents an overview of the depth of Mobile Money penetration in the major developing regions from the most recent rounds of Findex data in 2017 and 2021 along the three indicators favored by Khera et al. (2021) and listed in the above paragraph. In the case of the latter two indicators, we restrict the denominator to the shares of adults who receive some form of wages, and who pay utility bills, respectively. High-income countries are excluded according to World Bank income classifications. Most questions regarding Mobile Money usage were not included in the earlier rounds of Findex data, hence we do not have data from the 2011 and 2014 Findex reports. However, as the earliest Mobile Money services in Kenya were launched in 2007, all of this data grew from 0% in the ten or fewer years preceding 2017. The right-hand side of Table 12.1 shows the country in each region with the highest value for each indicator in each sample year. The countries with the lowest values for each indicator have shares close to 0% in all cases.

Focusing particularly on the more complete 2017 sample, the aforementioned positive gap between Sub-Saharan Africa and the other developing regions is clearly observable in the upper panel of Table 12.1, although in the usage measures of the middle and lower panels, it can be seen that East Asia and Pacific (EAP) is also an early and heavier adopter alongside SSA. This relates to the previously discussed latent demand in Sub-Saharan Africa for fast and secure methods of transfer between individuals rather than between individuals and large companies such as employers and utility providers (Mas & Radcliffe, 2011). Also note that using a mobile phone to receive wages can involve using conventional banking apps in addition to specific Mobile Money accounts, which likely explains the low Mobile Money account ownership but relatively high cellphone usage among wage recipients in EAP. Unsurprisingly, given its pioneer status, Kenya leads not only Sub-Saharan Africa, but the world across all three indicators. Iran was the lead country in the Middle East and North Africa (MENA), China and Mongolia led EAP, Bangladesh and Pakistan led South Asia (SA), and there were no consistent leaders across indicators in Europe and Central Asia (ECA) and Latin America.
Table 12.1 Aggregate mobile money penetration in 2017 and 2021* in the developing world

Men and women

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2021*</th>
<th>2017</th>
<th>2021*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Share of 15+ Individuals who have a Mobile Money Account</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>1%</td>
<td>6%</td>
<td>22%</td>
<td>60%</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>3%</td>
<td>17%</td>
<td>16%</td>
<td>33%</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>5%</td>
<td>23%</td>
<td>29%</td>
<td>38%</td>
</tr>
<tr>
<td>The Middle East and North Africa</td>
<td>6%</td>
<td>6%</td>
<td>26%</td>
<td>12%</td>
</tr>
<tr>
<td>South Asia</td>
<td>4%</td>
<td>12%</td>
<td>21%</td>
<td>29%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>21%</td>
<td>33%</td>
<td>73%</td>
<td>69%</td>
</tr>
<tr>
<td><strong>Share of 15+ wage receiving Individuals who received salary through a cellphone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>24%</td>
<td>3%</td>
<td>33%</td>
<td>61%</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>6%</td>
<td>17%</td>
<td>17%</td>
<td>29%</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>2%</td>
<td>18%</td>
<td>12%</td>
<td>38%</td>
</tr>
<tr>
<td>The Middle East and North Africa</td>
<td>2%</td>
<td>2%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>South Asia</td>
<td>3%</td>
<td>11%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>19%</td>
<td>32%</td>
<td>33%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Share of 15+ bill paying Individuals who pay utility bills via a cellphone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>19%</td>
<td>5%</td>
<td>25%</td>
<td>62%</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>10%</td>
<td>41%</td>
<td>23%</td>
<td>68%</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>5%</td>
<td>31%</td>
<td>17%</td>
<td>52%</td>
</tr>
<tr>
<td>The Middle East and North Africa</td>
<td>11%</td>
<td>16%</td>
<td>43%</td>
<td>80%</td>
</tr>
<tr>
<td>South Asia</td>
<td>4%</td>
<td>15%</td>
<td>11%</td>
<td>28%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>23%</td>
<td>37%</td>
<td>82%</td>
<td>84%</td>
</tr>
</tbody>
</table>

Notes: Upper Table shows the aggregate share of individuals with a Mobile Money account, Middle Table shows the aggregate share of individuals who receive wages via a mobile phone, Lower Table shows the aggregate share of individuals who pay utility bills via a mobile phone. Left-hand side shows the data for each of the developing regions of the world according to the World Bank regional classifications, Right-hand side shows the data for the highest performing country in each region for each indicator. High-income countries and individuals under 15 years old are excluded. Data comes from the World Bank Global Findex Database utilizing the regional aggregates as provided (Demirgüç-Kunt et al., 2018, 2022). *2021 data aggregates omit some countries as compared to the 2017 data as some countries were unable to be surveyed during the Covid period; as omitted countries are likely systematically lower in terms of level of development, direct comparisons between the two sample years should be treated with caution.
### Table 12.2  Intra-regional Intensity of Mobile Money Penetration in 2017 and 2021* in the Developing World

<table>
<thead>
<tr>
<th>Countries</th>
<th>2017</th>
<th>2021*</th>
<th>2017</th>
<th>2021*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Share of countries where the share of adults who have a Mobile Money Account is &gt; 20%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>10%</td>
<td>50%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>(1/10)</td>
<td>(5/10)</td>
<td></td>
<td>(1/10)</td>
<td>(0/10)</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>0%</td>
<td>6%</td>
<td>17%</td>
<td>14%</td>
</tr>
<tr>
<td>(0/22)</td>
<td>(1/18)</td>
<td></td>
<td>(1/6)</td>
<td>(1/7)</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>6%</td>
<td>38%</td>
<td>51%</td>
<td>85%</td>
</tr>
<tr>
<td>(1/17)</td>
<td>(6/16)</td>
<td></td>
<td>(18/35)</td>
<td>(22/26)</td>
</tr>
</tbody>
</table>

| **Share of countries where the share of wage earners who received salary through a cellphone is > 20%** |      |       |      |       |
| East Asia and Pacific            | 20%  | 70%   | 10%  | 0%    |
| (2/10)                           | (7/10)|       | (1/10)| (0/10)|
| Europe and Central Asia          | 5%   | 11%   | 0%   | 0%    |
| (1/22)                           | (2/18)|       | (0/6) | (0/7) |
| Latin America and the Caribbean  | 0%   | 13%   | 51%  | 81%   |
| (0/17)                           | (2/16)|       | (18/35)| (21/26)|

| **Share of countries where the share of bill-payers who pay utility bills via a cellphone is >20%** |      |       |      |       |
| East Asia and Pacific            | 20%  | 30%   | 0%   | 10%   |
| (2/10)                           | (3/10)|       | (0/10)| (1/10)|
| Europe and Central Asia          | 0%   | 61%   | 0%   | 14%   |
| (0/22)                           | (11/18)|       | (0/6) | (1/7) |
| Latin America and the Caribbean  | 0%   | 38%   | 43%  | 73%   |
| (0/17)                           | (6/16)|       | (15/35)| (19/26)|

**Notes** Upper Table shows the share of countries in each developing region where the proportion of adults with a Mobile Money account is greater than 20%, Middle Table shows the share of countries in each developing region where the aggregate share of individuals who receive wages via a mobile phone is greater than 20%, Lower Table shows the share of countries in each developing region where the aggregate share of individuals who pay utility bills via a mobile phone is greater than 20%. Regions are according to the World Bank regional classifications. High-income countries and individuals under 15 years old are excluded. Data comes from the World Bank Global Findex Database utilizing the regional aggregates as provided (Demirgüç-Kunt et al., 2018, 2022). *2021 data aggregates omit some countries as compared to the 2017 data as some countries were unable to be surveyed during the COVID period; as omitted countries are likely systematically lower in terms of level of development, direct comparisons between the two sample years should be treated with caution.
and the Caribbean (LAC), likely due in part to generally low levels of Mobile Money penetration and adoption across these regions.

Focusing on the reduced sample with 2021 data, rapid growth can be observed in some regions; we of course repeat the caveat that this may in part be due to some countries with lower levels of Mobile Money penetration dropping out of the sample. Nevertheless, rapid growth in Latin America across all three indicators, and to a slightly lesser extent in Europe and Central Asia, suggests that other parts of the developing world are beginning to take Mobile Money more seriously and to seek to catch-up with Sub-Saharan Africa. The very rapid growth of Mobile Money in Thailand appears to be a particularly interesting case; moving from just 8% of adults with an account in 2017 (not shown in the table) to 60% in 2021, Thailand has seen a surge almost as deep and rapid as Kenya and the other African leaders achieved a few years earlier. Explaining this rapid rise will be an interesting case study for future research; a speculative explanation might be that particularly severe COVID-19 restrictions in some East Asian countries acted as a catalyst for people to find simple digital alternatives to cash and physical transactions. Mongolia, which was already a regional leader in 2017, has also seen rapid growth in the years since then. Turning to Europe and Central Asia, the rapid rise of Mobile Money penetration in Russia cannot be ignored, although this data was collected prior to the invasion of Ukraine and the situation may therefore have changed. South Asia and the Middle East and North Africa still remain very nascent in terms of Mobile Money adoption. In summary, the 2021 data seems to suggest that Mobile Money is beginning to take off in some but not in all developing regions outside of the lead region, Sub-Saharan Africa, albeit with the caveat of a smaller sample of countries and the exogenous shock of the COVID-19 pandemic and accompanying restrictions in many parts of the world.

Looking solely at the lead countries in each region, however, gives little insight into how evenly Mobile Money penetration is dispersed within each region. Table 12.2 shows the share of countries in each region with values for each indicator above 20% in 2017 and 2021, and the total number of countries in each region which exceed this threshold. The changes in the denominators of these shares illustrate how many countries are missing from each region in the COVID-19 impacted 2021 survey. The 20% cut-off point is chosen arbitrarily, but is comparable to what would generally be considered a ‘very low’ level of financial inclusion for more conventional banking products (Lensink et al., 2022). As can be
seen across all indicators, in 2017 the share of countries and number of countries with a sizable magnitude of Mobile Money penetration was very small in all regions except Sub-Saharan Africa. This discovery suggested three alternative possibilities regarding the future of Mobile Money in the non-African developing regions: either, (a) other regions lag behind Sub-Saharan Africa and can replicate the SSA experience of diffusion of Mobile Money penetration from the lead country if given more time, (b) other regions face constraints on the diffusion of Mobile Money adoption which are not present in SSA, such as cultural resistance or regulatory barriers, or (c) other regions have less need or demand for Mobile Money services than SSA, perhaps because more conventional forms of finance are more developed, and therefore could rapidly adopt Mobile Money but collectively choose not to.

The 2021 data may provide some limited indication as to which of these prognoses are more plausible, although in truth situation is likely to vary between regions and over time. The fact that two other developing regions—East Asia and Pacific and Latin America and the Caribbean—have seen a sizable increase in the share of countries with a ‘larger’ Mobile Money share between 2017 and 2021 is suggestive of catch-up potential at least in these regions, albeit with Sub-Saharan Africa still far out in front. Conversely, the failure of takeoff in both the Middle East and North Africa and South Asia indicates that the future of Mobile Money is by no means a settled question across the developing world. The next round of Findex should tell us more about the long-term trends in Mobile Money adoption and other digital financial services when divorced from COVID-19 distortions and the reduced sample size; meanwhile, researchers will doubtless continue to explore the reasons why Mobile Money expands with depth and speed in some countries and regions while remaining nascent in others.

**Evolution and Impacts of Mobile Money**

Even across its relatively short lifespan, Mobile Money has evolved from simple payment and transfer services to other more complex financial products (Hinson et al., 2019). M-Pesa, the aforementioned Mobile Money pioneer, has grown to include the whole suite of financial services from savings and deposits to credit, insurance, and investments. On the basis of past experience, where M-Pesa goes, others will follow. Mobile Money also offers other points of appeal to developing country
consumers. Ndung’u (2021) summarizes Mobile Money benefits in the case of Kenya. According to Ndung’u, Mobile Money has created an electronic retail payment system, enhanced financial inclusion, created new and sustainable business models, and improved government e-services and tax collection. Thankor (2020) also confirms that Mobile Money has had a positive impact on widening access to electronic payment systems.

Does Mobile Money indeed lead to enhanced financial inclusion? The answer may not be quite as obvious as it may first appear. While Mobile Money accounts function broadly as de facto bank accounts, they only have meaningful impacts on financial inclusion if they proliferate among individuals who do not already have other forms of financial access. With Mobile Money, access to financial services is often available at a lower and more affordable cost than the same services offered by alternative providers due to the lower infrastructure costs (Maurer, 2012), which can render it appealing to previously unbanked individuals. As a result of the reduced setup and transaction costs associated with Mobile Money in financial transactions, Mobile Money can increase access to credit many of the small and informal firms which characterize much of the developing country manufacturing and services sectors (McMillan & Zeufack, 2022). In a study of enterprises in East Africa, Gosvai (2018) shows that firms which have adopted Mobile Money are more likely to access credit and therefore become financially included along the credit dimension. Lensink et al. (2022), however, document a high correlation between shares of individuals with Mobile Money accounts and conventional bank accounts in SSA, but it remains unclear whether this implies that the same individuals are commonly holding both, or that there are necessary country-level preconditions for the takeoff of both which then nevertheless attract differing clientele.

In terms of the wider societal and economic impacts of Mobile Money, or to be more precise, of financial inclusion via the channel of Mobile Money, the nascent literature is already giving cause for optimism. For example, it has been argued that Mobile Money significantly reduces economic distortions due to theft and expropriation when compared with cash transactions (Donovan, 2012; Kumar & Dutta, 2015). Furthermore, Mobile Money allows for risk-sharing between families and associates across wide geographic areas. If extended family members are dispersed

6 Professor Njuguna Ndung’u was the Governor of the Central Bank of Kenya and under whose term M-Pesa was launched in 2007.
across different towns and regions, an emergency or exogenous shock befalling one arm of the family can easily and swiftly be mitigated by a flow of domestic remittances via Mobile Money from the other family members. Maybe some months later, those who sent money will themselves experience an emergency and become the receiving parties—this is the essence of intra-familial risk-sharing, for which swift, safe, and geographically diffuse transfers are a necessary condition.

Key studies by Jack and Suri (2011, 2014) show how Mobile Money plays a useful role in risk management by households when faced with exogenous shocks in Kenya. They find that households with Mobile Money accounts are more adept in managing idiosyncratic shocks such as unexpected job losses, harvest, or livestock failures than those without Mobile Money. The same authors in Suri and Jack (2016) demonstrate that Mobile Money access increased household consumption generally, especially among female-headed households, and reduced the incidence of extreme poverty. This is in large part due to the positive effect of Mobile Money access on the ability to smooth consumption over time. These authors demonstrate how fintechs can work through financial inclusion to have major economic impacts. Donovan (2012) reiterates this point and states that, unlike household assets which are ‘lumpy’ and difficult to swiftly liquidate in the face of shocks, Mobile Money balances can be withdrawn as cash almost instantaneously. Riley (2018) provides evidence that Mobile Money plays an instrumental role in inter-location risk-sharing, such that in the event of covariate shocks, households with Mobile Money do not suffer consumption losses to the extent of those without Mobile Money. Other studies with similar conclusions on risk-sharing benefits also include Blumenstock et al. (2016), Aron (2018), and Okello et al. (2018). The aforementioned study of Gosavi (2018) shows that not only do firms that have Mobile Money accounts become more financially included in terms of credit access and utilization, they also experience productivity gains.

The evidence of Mobile Money impacts on societal, as opposed to individual, welfare is more varied. Blumenstock et al. (2015), Munyegera and Matsumoto (2014), and Natile (2020) demonstrated the existence of social welfare gains from Mobile Money access via improved access to and price of health services, energy, and sanitation. However, much of this evidence is less econometrically robust than the individual-level studies in terms of dealing with endogeneity biases (Aron, 2018). Positive impacts
of Mobile Money on agricultural markets and outcomes have been documented by Kirui et al. (2013) and Hinson et al. (2019), the latter of which also touches upon other agri-business fintechs. While early evidence on the impact of Mobile Money on financial inclusion, and through financial inclusion into tangible societal and economic outcomes, is positive, the recency and novelty of Mobile Money means that the body of quality empirical research into impact is lacking. In particular, much of the key research into Mobile Money impact has taken place in Kenya due to the pioneer status of this country in terms of Mobile Money proliferation. It remains to be seen whether these findings will generalize when tested in other countries and contexts.

**Cryptocurrency and Blockchain: Next Frontier, or a Bridge Too Far?**

For many people, the first financial innovations which come to mind when speaking of ‘the fintech revolution’ are cryptocurrencies and blockchain. Dominant features of both the media and increasingly academic conversation around fintech, cryptocurrencies, and their accompanying facilitatory technology encapsulate everything which is exciting and revelatory about fintech in the twenty-first century for some, while others remain skeptical as to their potential, longevity, or even their inherent value.

It is difficult to decide at what length we should discuss cryptocurrencies and blockchain here. It is the case that cryptocurrencies and blockchain are considered key features of the fintech revolution in the developed world (Fernandez-Vazquez et al., 2019), are starting to play a larger role in a small number of specific developing countries such as El Salvador (Zagorsky, 2021) and Nigeria, and have been proposed as having significant potential for development through means of reduced cost remittances and fraud reduction (Kshetri & Voas, 2018), and as an alternative store of value in countries with poor inflationary records. However, these technologies remain very much in the realm of ‘developed country fintechs’ in Arner et al.’s (2015) classification. Additionally, as was discussed in section “Fintech and Financial Inclusion in the Developing World”, penetration into developing country markets remains slight, as does cryptocurrency investment in or innovation from developing countries (Ndemo, 2022). Figure 12.1 shows the share of the total global cryptocurrency value received which flowed to each world region in the year until June 2021, adjusted for purchasing power parity (PPP). The
data is from Chainanalysis, a private company which compiles blockchain analytics. We must note that the regions do not precisely match the World Bank classifications discussed earlier. From Fig. 12.1, it can be seen that, even with the PPP adjustment which adds additional weight to the less developed countries, the majority of global cryptocurrency value received flows to Europe and North America. Despite each containing the hugely populous countries of China and India respectively, the regions of East Asia, and Central and South Asia each received only 14% of the global flows of cryptocurrency flows in the most recent year. In contrast, Latin America, the Middle East, and Africa all have shares in the single digits. Additionally, there is currently very little quality empirical research into the effects of cryptocurrencies and blockchain on developing country outcomes. This includes the potential impact they have on financial inclusion. Thus, so much of what can be said about their potential impact on FI, and through FI, remains speculative.

Fig. 12.1  Share of cryptocurrency global value received by world region, PPP adjusted (Note Figure shows the share of the total cryptocurrency value received by each developing region of the global total. Data from Chainanalysis [2021])
In order for cryptocurrencies and other innovations based on blockchain to facilitate financial inclusion, it would be necessary not only for them to take off in developing countries at scale, but also to appeal to financially excluded individuals. This could happen in one of two ways—either via a relaxation of the constraints on access which prevent those who are financially excluded from adopting other forms of financial product, or by providing such a strong incentive to the unbanked to begin using cryptocurrencies and the accompanying accounts and digital wallets to overcome these constraints for themselves. The former path seems less probable with cryptocurrencies in their current form. If anything, cryptocurrency platforms originating from developed countries are likely to be more onerous in terms of human capital requirements, more dependent on digital infrastructure, and more prone to trust concerns than conventional banking services. Nevertheless, just as Mobile Money proved a great success in many developing countries due to tailoring to their needs and constraints, there might be potential for cryptocurrency platforms originating from developing countries to do the same, if such innovations can be encouraged. The latter path, however, may prove more fruitful in the short run. If cryptocurrency becomes a major global channel for the flow of international remittances (Scott, 2016), and more developing countries’ citizens may be incentivized to participate and become financially included in order to receive funds from abroad, especially if their international relatives assist them with the technical aspects. Similarly, if cryptocurrencies allow for the bypassing of foreign exchange controls, this may yield an incentive to join the financial system in countries with unstable currencies, although again this is more likely for wealthier, already banked citizens. For definitions, risks and a wider discussion of cryptocurrencies, blockchain, financial inclusion, and development, the interested reader can refer to Chapter 6 of Lensink et al. (2022). However, as the technology is nascent in developing countries, so is the empirical literature. The key research required in order to properly understand the potential for fintech to influence developing country’s financial inclusion, economic, and welfare outcomes remains to be done.

Risks and Regulatory Implications of the Fintech Revolution in Developing Countries

New technologies almost always come with new risks and developing countries’ fintechs are no exception. The main types of risk can be divided
into two groups. The first group relates to security and privacy challenges, as well as the associated risks that fintech users may face. The second group relates to technical and technological risks contained within fintechs which may have an impact beyond individual users, to banks, financial institutions, and the financial system as a whole. It should be noted that both types of risk may be exacerbated in the developing countries’ context where the trust levels of individuals (Mattes & Moreno, 2018) and the stability of financial systems (Montiel & Servén, 2006) may be weaker than in the developed world.

In fintech, as with all digital systems, security and data privacy are of paramount concern. For fintech applications, critical information may be stored on mobile devices that are prone to loss or theft. Security of mobile devices can also be compromised through mobile payment applications. It should be noted that citizens of developing countries may have lower levels of financial or general literacy, leading to a greater likelihood of forgetting or writing down key passwords or PINs, and an inability to follow complex security protocols. As a result, fintech companies need to develop appropriate measures to protect sensitive consumer data from unauthorized access and to help users to protect themselves. Jagtiani and Lemieux (2018) note that novel fintechs tend to use some data sources which are more prone to error and thus could potentially create further risks to consumers. Such technical and technological failure can also generate other risks for the poor, who may not be well-placed to act swiftly to report faults, follow-up technical errors, etc.

From the bank and financial system perspective, the Bank for International Settlements (BIS) (2018) identifies potential systemic risk arising from increased network-interconnectedness of Mobile Money operations, cellular networks, MNOs, and banks. Just like in the O-Ring Theory of Economic Development (Kremer, 1993), failure of the weakest part of the network can lead to failure of the entire system. As with all digital systems, there is a risk of technical failure. This is not only a burden for fintech providers but also for larger firms or institutions which connect with fintech, as they inherit the need also to manage and mitigate technical failures.

These identified risks pose substantial regulation challenges to regulatory authorities. Unlike traditional banking models, which while embracing digital technologies are often backed with physical paper records, most fintechs are entirely virtual. Furthermore, the rapid evolution of technological innovation in current fintechs means that there is
a constant lag between regulation and the innovation of the industry. This gap makes it difficult for regulators to appropriately come up with regulatory policies that can cope with the rapid growth in fintech innovations. Perhaps ironically however, Arner et al. (2015) note that the instability and stunted growth of conventional financial institutions may in fact render developing country policymakers more adaptable to the regulatory challenges posed by new fintechs. While developed countries may feel the need to protect established financial sector players and restrict new technologies, developing countries may embrace the chance to try something new in the face of persistent failures of the conventional systems. This may in part explain why SSA is such a world leader in Mobile Money adoption, as detailed in the previous section.

BIS (2018) identifies 10 implications of fintech development which form a useful bedrock for thinking through appropriate regulatory frameworks. As these implications are lengthy, we will not lay them out here, but they draw attention fundamentally to the unpredictability of fintech challenges, the preponderance of new and unlicensed entrants in fintech markets, and the potential of fintechs to change the nature of existing financial sector actors. Bains et al. (2022) discuss two main approaches to regulating a financial sector with rapidly evolving innovation: the entity-based approach and the activity-based approach. Then, they propose a third hybrid approach. The entity-based approach follows a traditional focus on regulation of licensed firms engaged in regulated financial services, which is good for adapting to new innovations but somewhat rigid in terms of catering to new market entrants. The activity-based approach, by contrast, is not restricted to licensed firms but instead focuses on regulating specific activities which any firms may then conduct, provided they adhere to these rules. This is more conducive to new entrants and competition but makes regulation much more difficult to channel and enforce. For this reason, Bains, Sugimoto, and Wilson propose a hybrid model which has two layers of regulation—one based on entities and the other based on activities, which have a smoother path for new firms to become licensed entities.

Amstad (2019) takes the alternative view that fintech firms can be seen as similar to banks as they provide similar services and if classified as such, they therefore fit within existing regulation. It then follows that where fintechs do innovate entirely new services, these should be ignored and kept unregulated as the current industry and technology is
still in an infantile stage of development and growth, a “wait-and-see”-style approach. This was largely the approach taken in Kenya, the Mobile Money pioneer. Ndung’u (2021) states that in the absence of regulatory guidelines prior to the launch of M-Pesa, regulatory authorities in Kenya gave a letter of no objection to Safaricom and adopted what it called a “watch and learn” position to assess the innovation and its effects and before providing appropriate regulation. Tanzania, another successful case in Mobile Money, also adopted a similar position dubbed as “test and learn”. This is further evidence of how, contrary to past experiences, developing countries are often proving to be more flexible in the case of fintech regulation than their developed world counterparts.

In lieu of these frameworks, specific regulatory models have been proposed as means to structure fintech regulation more effectively. Three main models have been outlined: innovation offices, regulatory sandboxes, and RegTechs. Innovation offices within governments have traditionally existed in most developed countries as units or divisions of conventional regulatory authorities tasked with adapting to the challenges of new innovations (UNSGSA, 2019). The quality of resources and the support provided by regulatory authorities to innovation offices is key to their success and are inputs which may prove lacking in developing country contexts.

In the second alternative, regulatory sandboxes are structured live environments which are used to roll out and test innovations as they emerge. Sandboxes can be structured as product testing sandboxes or policy testing sandboxes (UNSGSA, 2019). Product testing sandboxes exist when new products or services are piloted under official observation and at small scale before formal registration or licensing. Policy testing sandboxes use the sandbox environment to assess effectiveness of regulations with regard to innovations, thereby allowing regulators to come up with appropriate regulatory frameworks in a reactive manner. The two approaches need not be mutually exclusive since product testing sandboxes implicitly test the appropriateness of existing regulatory policies. A multi-jurisdictional sandbox has also been proposed to address cross-border regulatory issues and promote the harmonization of regulatory jurisdictions across borders (UNSGSA, 2019). This could prove particularly useful for cross-border payments and transfers using novel fintechs.

Finally, RegTechs are technology-enabled regulatory instruments which are designed to assist regulators in effective regulation of the
fintech environment (Mueller & Murphy, 2018). RegTechs act algorithmically to monitor the compliance of fintechs as well as to identify potential regulatory gaps. However, these are probably of less relevance to the more ‘low-fi’ fintechs which form the backbone of the fintech revolution in developing countries.

**Conclusion and Prognoses for Internationally Inclusive Fintech**

The potential for fintechs in general and mobile financial technologies in particular to promote financial inclusion and to contribute to the UN Sustainable Development Goals seem close to undisputable. The success stories of Mobile Money services, such as M-Pesa in Kenya, has shaped the view that fintech, and especially branchless ICT innovations, will be able to raise living standards in poor rural areas in African economies and other developing countries, and help to induce a process of inclusive growth. Nevertheless, aside from Mobile Money, the diffusion of more advanced fintechs over the developing world has tended to lag behind developed regions, with these countries lacking both the digital infrastructure and the population buy-in necessary for such technologies to achieve any kind of scale. For example, in the period 2010–2014, only 0.33% of worldwide investments in fintech took place in Africa (U.S. ITA, 2016), with similarly low levels of investment occurring in several other developing regions. If developing countries have few options other than to ‘catch’ fintechs as they fall from the developed world, they will end up with products and services which are not tailored to the needs of their populations and the constraints of their infrastructure.

It should be noted that even if fintech does start to diffuse worldwide, it will only be successful in promoting inclusive growth if it meets the needs of broad numbers of disadvantaged groups, including smallholders, who often are first-time users of fintech and may have low literacy and numeracy skills (Demirgüç-Kunt et al., 2018). It is to be expected that richer, higher income, and more literate individuals in urban sectors of developing countries may benefit most from advanced fintech, with the concomitant risk of exacerbating internal inequality within often already unequal and elite-dominated societies. This especially holds for digital finance, as digital platforms are more likely to be used by richer households and households in urban areas (Beck & Brown, 2011). If fintechs
diffuse to developing countries without much alteration from their developed country precursors, they may even negatively affect the poor. If providers decide to focus less on impoverished and uneducated communities, or discontinue provisions of specific fintech services in high-risk rural areas (Ozili, 2018), it will lead to more inequality. This could also lead to further financial exclusion of certain groups. Thus, to give fintech the best possible chance of playing a transformative role and creating possibilities for improving living standards across society, policies need to be developed to ensure that poor and rural smallholders are not shut out. The most natural starting place for policy would be encouraging and fostering local fintech development and innovation, instead of an intensive focus on how to co-opt fintechs from abroad.

On the basis of the nascent literature on fintech and financial inclusion, alongside our conclusions and our speculations, we propose that there are two potential dichotomous routes in which the relationship between fintech and FI may be expected to evolve in the developing world. First, the optimistic prognostication is that developing countries can get ahead of the curve in the adoption and proliferation of many new financial technologies which are specifically tailored to their needs, with resulting benefits not only for the financial inclusion of their citizens and higher-order economic outcomes, but also for closing the gap between their financial sectors and those of the developing world. The basis for this possibility is the observed takeoff of Mobile Money and other low-fi fintechs in Sub-Saharan Africa, whereby this poorest region of the world has most rapidly and widely embraced a new and transformative financial technology. There is also the possibility that the failure of legacy banking and financial institutions to widely include citizens and provide stable financial sectors will render developing country policymakers more open to new technologies, making them more supportive in terms of regulation. Secondly, the alternative future is more pessimistic but equally plausible. As advanced countries’ fintechs become ever more complicated, if there is no concerted effort to tailor these to developing country populations or to develop locally targeted alternatives, the digital infrastructure and human capital demands of fintech could increase much more rapidly than the developing world is able to supply, resulting in large swathes of the global population being shut out of fintechs entirely, which will create new forms of intra- and international financial exclusion. Determining which of these prognostications is more likely depends
strongly on whether developing countries become passive absorbers or active innovators of fintech in the forthcoming years.

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