



United Nations  
Office for South-South Cooperation

# South-South Ideas

**South-South Cooperation  
and Financial Technology  
in a Globally-inclusive  
Economic Architecture**

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**February 2021**

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# Executive Summary

This paper examines how recent advances in computing and telecommunications technologies are promoting financial inclusion in the Global South by dramatically transforming the way the financial industry operates. The emergence of financial technology (FinTech) companies based in the Global South and their roles in promoting financial inclusion in their respective regions is discussed. A key emphasis of the paper is internationalization of Southern-based FinTech companies and evolving South-South Cooperation in the FinTech arena.

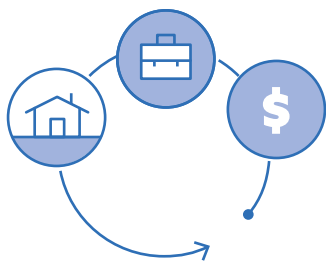
Special consideration is given to the use of Big Data in assessing, evaluating and refining the creditworthiness of potential borrowers as a crucial mechanism underlying this transformation. Various categories of personal financial and non-financial information being used by Big Data companies as proxy measures for a potential borrower's identity, ability to repay and willingness to repay are explored. The paper hopes to advance the understanding of how artificial intelligence (AI) applications have transformed the financial industry landscape.

Another theme of the paper is the potential role of blockchain-based financial technologies and cryptocurrencies to improve access to and affordability of financial services for low-income people and small businesses. The argument is made that blockchain has the technical potential to serve the needs of unbanked and under-banked populations.

# Introduction

According to the World Bank's Global Findex database, about 1.7 billion adults were unbanked in 2017, which means that they lacked an account with a formal financial institution or a mobile money provider (Demirguc-Kunt et al., 2017). Most of the unbanked population is in the Global South. In South Sudan, for instance, only nine percent of adults had a bank account. Likewise, according to the International Finance Corporation, over 200 million small-and-medium enterprises in the Global South lack access to financial services.

Addressing the above issues by promoting financial inclusion is essential to improve the living standards, overall quality of life and well-being of disadvantaged groups in the Global South. Financial inclusion involves ensuring access for individuals and enterprises to useful financial products and services to meet their needs at affordable rates (worldbank.org, 2018). Having financial access is an important prerequisite for day-to-day living as well as for planning long-term goals and attending to emergencies (worldbank.org, 2018).



Financial inclusion involves ensuring access for individuals and enterprises to useful financial products and services to meet their needs at affordable rates.

An encouraging trend is that the financial landscape in the Global South has undergone a rapid transformation over the past few years. Financial technology (FinTech)<sup>1</sup> has emerged as a major force that has shaped this landscape. FinTech solutions have been successful in promoting financial inclusion in some Global South economies. For instance, China's success regarding financial inclusion can be attributed to the country's FinTech companies. Following the success in their home country, Chinese FinTech companies have been attempting to replicate their business models in other Global South economies, such as those in Southeast Asian markets (Kshetri, 2020b). Likewise, in sub-Saharan Africa economies, mobile money has been a key driving factor to expand financial inclusion. For instance, the proportion of the adult population with a mobile money account in the region was 21 percent in 2017, which was an almost 100 percent increase from the 2014 level. By 2017, all of the world's eight economies in which at least 20 percent of the adult population used only mobile money accounts were in the Africa region—Burkina Faso, Côte d'Ivoire, Gabon, Kenya, Senegal, Uganda, United Republic of Tanzania, and Zimbabwe (Felsenthal and Hahn, 2018).

<sup>1</sup> FinTech is used to refer to a computer programme or other technology that aims to improve and support the delivery and use of banking and financial services. Some examples include mobile money or contactless payments, nontraditional credit scoring models based on information from consumer social media behaviour, cryptocurrencies and artificial intelligence—such as enabled chatbots used by financial institutions to help customers (Kshetri, 2020b).





A look at some successful markets, such as China and Kenya, indicates that a favourable regulatory environment has been a key trigger of mobile money-related innovations in these markets.

What is even more striking is that mobile money-related innovations driving financial inclusion in Southern economies have mainly originated in the Global South. A look at some successful markets, such as China and Kenya, indicates that a favourable regulatory environment has been a key trigger of mobile money-related innovations in these markets (Kshetri, 2020b; Kshetri and Acharya, 2012). For instance, the main source of success of Chinese FinTech firms, at least in the initial phase, can be attributed to a FinTech-friendly regulatory environment rather than breakthrough technologies and innovations (Kshetri, 2020b). Likewise, when the mobile phone-based money transfer service M-Pesa was launched in Kenya in 2007 by Vodafone for Safaricom and Vodacom in 2007, no clear regulatory guidelines for mobile payment existed in the country. M-Pesa exploited the loophole and operated without a banking license (Kshetri and Acharya, 2012). Now, M-Pesa has over 20 million active users in Kenya (Harrisberg, 2020). The country is now reported to have approximately 50 mobile lending apps (Weitzberg, 2019).

Demand-related factors, such as the need for lower-cost solutions and ethnic and cultural connections, have stimulated the growth of Global South FinTech solutions into other Global South markets. Geographic proximity as well as ethnic and cultural connections between China and Southeast Asia have facilitated Chinese FinTech company operations in that region. Southeast Asia has more than 30 million people of Chinese origin, making it the region with the world's largest ethnic Chinese population outside of China (KrAsia, 2018). By early 2020, M-Pesa had 37 million users in seven African countries—Democratic Republic of the Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique and United Republic of Tanzania (Vodafone, 2020).

Thus, Southern-originated innovations have been a vital force shaping a globally-inclusive economic architecture. South-South Cooperation has an important role to play in transferring and promoting Southern-originated innovations that shape inclusive financial and economic environments into other Global South economies.

Southern-based firms have also introduced more sophisticated financial innovations. These innovations are based on technologies such as Big Data,<sup>2</sup> cloud computing,<sup>3</sup> artificial intelligence (AI)<sup>4</sup> and blockchain.<sup>5</sup> According to the International Data Corporation, approximately 80 percent of Chinese banks will rely on the cloud to acquire and integrate FinTech solutions (Faridi, 2020). As an example, in 2015, Ant Financial Services Group, the financial affiliate of Alibaba Group Holding, launched an Internet bank called MYbank. MYbank analyzes more than 3,000 variables, such as social media activities, court reports, default on debts, late returns of rented cars and transactions on Alipay online payment service, and by mid-2019 had provided loans amounting to US\$290 billion to about 16 million small companies (aljazeera.com, 2019). Alibaba has noted that it can provide the loans at significantly lower costs

2 Gartner defines Big Data as “high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making.”

3 Cloud computing involves hosting applications on servers and delivering software and services via the Internet. Users can access computing power and resources on the cloud and pay for services based on usage. Services offered include the use of software, platforms and infrastructures.

4 AI entails simulating human intelligence by machines. The key processes involved are learning (acquiring information and understanding the rules for using the information), reasoning (applying the rules to reach conclusions) and self-correction.

5 Blockchain can be viewed as a decentralized ledger that maintains records of a transaction simultaneously on multiple computers.



because it uses its own technologies instead of expensive foreign software and it has no physical branches (Zhang and Woo, 2018). The costs associated with approving a small business loan is reported to be 2 yuan (\$0.32), compared to more than 2,000 yuan (\$318) at a traditional bank (Zhang and Woo, 2018).

FinTech companies in the Global South have also shown an increased utilization of so-called Fourth Industrial Revolution (4IR) technologies,<sup>6</sup> such as AI, big data and blockchain. By utilizing these technologies, these firms have developed capabilities to explore factors that have not previously been thought of or regarded as important determinants of the likelihood that customers will repay a loan (Delgado, 2016). For instance, Myanmar-based microfinance institution Maha Agriculture started combining harvesting data based on weather monitoring with its credit-scoring model, which is expected to improve predictive capabilities and increase its borrowers (Bary, 2018).



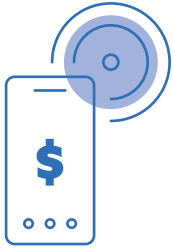
A large proportion of the world's most innovative FinTech companies, based on criteria such as innovation, size, ability to raise capital and reach, are based in the Global South.

A further encouraging development is that a large proportion of the world's most innovative FinTech companies, based on criteria such as innovation, size, ability to raise capital and reach, are based in the Global South (Mostowyk, 2018). In the 2018 FinTech 100 report released by KPMG and FinTech investment firm H2 Ventures, eleven of the best FinTech innovators were from China, including Ant Financial Services Group, the financial affiliate of Alibaba Group Holding (ranked #1), JD Finance (ranked #2) and Du Xiaoman Financial, owned by the search engine Baidu (ranked #4). (Mostowyk, 2018).

The FinTech sector is gaining traction as a venture capital magnet in some Southern economies. The global FinTech sector attracted venture capital funding of over \$ 13 billion in 2016 (Cleary et al., 2018). According to the Latin America Venture Capital Association, startups in the FinTech sector received more investment in 2015 than any other sector (Kshetri, 2019a). Venture capital firms normally provide capital to immature capital-intensive companies that have high growth potential. They are finding FinTech to be a sector with such startup companies. In Latin America, FinTech accounted for about 30 percent of IT sector investment in 2015 (Lustig, 2017). The Latin America Venture Capital Association's study also found that the region's FinTech industry attracted \$186 million in venture capital in 2016 (Mergermarket, 2017), representing about 37 percent of the region's total venture capital investment that year (Azevedo, 2018). As an example of the trend to invest in FinTech, NXTP Ventures, which provides venture capital funding to early-stage technology companies in Latin America (Arrieta et al., 2011), invests in more than ten industries, including agricultural technology and logistics, but the FinTech sector accounts for the highest share of its investment or about a quarter of the company's total investment (Ormerod, 2020).

The benefits of financial technologies have been especially pronounced during the recent COVID-19 pandemic. For instance, in China, local governments distributed free digital coupons on mobile payment platforms, such as Alipay and WeChat Pay. In March 2020, Jiaying city in Zhejiang Province announced a plan to distribute digital coupons worth \$28.2 million to the public, of which \$21 million could be redeemed through WeChat Pay. These measures were taken to help stimulate domestic consumption at a time when economic activities were negatively impacted by the pandemic (Zhang, 2020). Zhejiang Province's capital city, Hangzhou, also announced

<sup>6</sup> Fourth Industrial Revolution (4IR) technologies represent a convergence of major technological innovations described earlier (Schwab, 2016). This is considered the fourth phase of the industrial era, with the first phase having started in the eighteenth century.



In China, local governments distributed free digital coupons on mobile payment platforms to help stimulate domestic consumption at a time when economic activities were negatively impacted by the pandemic.

plans to distribute coupons worth \$237 million via Alipay to its more than six million local offline merchants. The coupons can be used to pay for items online or offline (Zhang, 2020).

A study conducted by the global management company McKinsey & Company found that widespread adoption and use of digital finance in Southern economies could increase the region's GDP by \$3.7 trillion or six percent by 2025 (mckinsey.com, 2016). For instance, digital finance increases access for unbanked people and enterprises to finance and allows them to engage in entrepreneurial activities. Digital finance is also likely to reduce public spending leakage and increase tax collection (mckinsey.com, 2016). Observers have noted that it is in the interest of regulators and central banks to consider FinTech as a leapfrogging opportunity that can promote inclusive economic growth (Sy et al., 2019). In some Southern economies, policy frameworks have moved along this direction. For instance, factors such as strong competition and friendly regulations have been among the key factors driving the growth of FinTech firms in Global South economies like China (Kshetri, 2020b; mckinsey.com, 2016) and some countries in Africa, such as Kenya and the United Republic of Tanzania (africalegalnetwork.com, 2020; Kshetri and Acharya, 2012; Synced 2018). Likewise, in 2019, India allowed FinTech startups, banks and financial institutions to establish a regulatory sandbox<sup>7</sup> for live testing in areas such as retail payments, digital Know Your Customer and wealth management (The Economic Times, 2019). A regulatory sandbox allows Fintech startups to operate under a temporary license for a certain period without complying with all the regulatory requirements at once. This allowed new Fintech companies to test innovative solutions serving only a small number of customers.

In light of the above discussion, the primary objective of this paper is to examine the role of FinTechs in promoting an inclusive economic architecture in Global South economies. South-South cooperation in the FinTech arena is also focused upon, especially its role in expanding FinTech in the Global South to promote financial inclusion to the unbanked population.

The paper is structured as follows. The role of 4IR technologies in promoting financial inclusion in Global South economies is analyzed; this is related to various Sustainable Development Goals. Next, a review is conducted of some Global South-based FinTech companies and their entry into other Global South economies. This is followed by a section on new forms of South-South cooperation in the FinTech sector. Then, opportunities and challenges for digital transformations in Global South economies are discussed. The final section provides concluding remarks.

7 <https://www.cgap.org/topics/collections/regulatory-sandboxes-financial-innovation>.

# 1. The Role of 4IR Technologies

In this section, the role of three main 4IR technologies in promoting financial inclusion in Global South economies is discussed.

## 1.1. Big Data

### 1.1.1. What is Big Data?

Technology research and advisory company Gartner has defined Big Data in terms of three Vs: volume, velocity and variety. Examples related to FinTech used in Global South economies help illustrate these three Vs.

#### Volume



**Volume:** The software-as-a-service company Lenndo, which operates in Colombia, India and several other Global South economies, uses social media and smartphone records to build credit worthiness and help users gain access to financial services. Potential borrowers give Lenndo access to all of their social media activities from Twitter, Facebook, LinkedIn, Google, Yahoo and Hotmail. A typical Lenndo credit application has over 12,000 data points, which can be used to assess creditworthiness (aws.amazon.com, 2015).

#### Velocity



**Velocity:** Some data is time-sensitive and needs to be stored, processed and analyzed quickly. The creation of high velocity data has helped increase access to financial services. For instance, Kenya-based mobile payment solution and service provider MobiPay's cloud-mobile platform Agrilife connects farmers with value chain partners, such as dairy processors who purchase milk, credit appraisers and local input/agro-dealers. Agrilife provides 'near-real-time information' on farmers' ability to pay for services (capacity.org, 2013). Instead of relying on household surveys, farmers' needs are assessed by digital platforms, which leads to faster decision-making in an objective manner. For instance, based on the milk sold to a dairy processor, a farmer receives an SMS short code that can be used to access credit to purchase inputs. The transaction's 'weight details' are also transferred to the platform, which minimizes data discrepancies (cta.int, 2014) because Bluetooth-enabled digital scales directly send the data to the information system rather than being provided by humans (cta.int, 2014). Digitization therefore minimizes the governing or transaction costs that are associated with what Williamson (1979, 1985) refers to as opportunistic behaviour and uncertainty.

#### Variety



**Variety:** Structured data, that can be organized in an assigned format to be used by a database management system, as well as unstructured data, which is unformatted and lacks a predefined standard structure, are being combined to make lending decisions. For instance, a technology developed by the Brazilian company Cignifi can recognize patterns in consumer phone calls, text messages and data usage that are used to predict lifestyle and credit risk profile. In 2011, Cignifi analyzed three million cell phone users in Brazil to produce behaviour-based scores.

Cignifi claims to find many variables associated with credit risk. For instance, users that make many short calls in the early morning are considered to have bad credit risks. The company also looks at the length of calls and the location from which the user makes the calls. Likewise, users that top up their SIM cards regularly are likely to be less risky borrowers (Kirsner, 2012).

### 1.1.2. Big Data as a proxy for creditworthiness

Analysts have suggested the importance of paying greater attention to three categories of data that can potentially be used as reliable proxies for creditworthiness of low-income people and microenterprises: verifying identity, assessing the ability to repay and assessing the willingness to repay (Baer et al., 2013).

## Identity



**Identity:** Identity-related information helps ensure that the statements or facts about a potential borrower are the same as what has been provided or described by the borrower. Such information helps reduce potential fraud. Various approaches and data sources are used to evaluate identity. A South African mobile payments provider was reported to be piloting the use of location data as a low-cost mechanism to validate self-reported addresses. To do so, it looks at the user's cellphone's nightly location patterns (Ehrbeck, 2015). Some FinTechs use data from government agencies, allowing the company to quickly confirm the validity and authenticity of a potential borrower's identification. Tencent's WeBank verifies a person's identity using data from the Chinese Ministry of Public Security.

## Ability to repay



**Ability to repay:** To determine the ability to repay a loan, possession of means needs to be assessed. For instance, it is suggested that individuals living in rural areas who top up their cellphones on the same day every week and who pass by more than two mobile-phone masts during the week are likely to have more reliable financial habits than those who top up irregularly and do not travel (Economist.com, 2014). Prior research in geography indicates that one reason why highly mobile people move is related to the search for better economic opportunities. Such people often leave places that have unsatisfactory employment opportunities and move toward places where opportunities are better (Lonsdale and Archer, 1997). FinTech companies in the United States, LendUp<sup>8</sup> and Moven,<sup>9</sup> consider the number of social media friends a borrower has as a proxy for the ability to pay (Jeffries, 2014).

Ecuador's FinTech Kullki provides loans to consumers without prior credit history. Its credit ranking system uses the KSOCIAL score that involves data mining from the borrower's mobile devices. Information analyzed include how people organize their lives. For instance, those that organize most of their contacts by both first and last names are viewed as more creditworthy (Cheney, 2016). Also, attention to detail, such as grammar and punctuation in text messages, is taken into account (Cheney, 2016). The assumption is that a borrower's ability to pay is tightly linked to the digital footprints generated by their virtual presence (Atkins, 2019).

8 LendUp provides payday and installment loans, financial education, credit reporting as well as gamification to promote responsible lending behaviour.

9 Moven is a mobile payments service provider. Moven's tools can also track users' financial wellness.

# Willingness to repay



**Willingness to repay:** The willingness to pay is different from the ability to pay. For instance, paying a loan may disrupt usual household consumption patterns or deplete assets, putting the borrower at risk of poverty (Russell, 1996). Possession of means thus may not be a sufficient condition to pay a loan. It is also important to assess whether the borrower has a strong disposition or inclination towards paying down debt. Past credit history and payment behaviour of borrowers are used to assess the willingness to repay. Credit history-related information, such as a review of utility, rent, telephone, insurance and medical bill payments, provide valuable information. Since such information is not available for most borrowers in Global South countries, FinTech companies have developed alternative approaches. For instance, the German company Monedo considers consumers who spend time online gambling as credit risks. Potential borrowers who have friends that have already repaid a loan are viewed as less risky (Vasagar, 2016).

## 1.2. Artificial Intelligence



AI is transforming the consumer financial services market, as well as consumer interaction with the financial services ecosystem.

Artificial Intelligence (AI) is rapidly developing and ushering in political, economic and social transformation in Global South economies (Financial Center for South-South Cooperation, 2020). AI-based solutions are likely to emerge as game-changers with important implications for expanding financial access to low-income people and small businesses. This is because traditional banks are unwilling or reluctant to serve small-scale borrowers due to high transaction costs and inefficient processes associated with making small loans to these borrowers (Kshetri, 2019a).

AI is transforming the consumer financial services market, as well as consumer interaction with the financial services ecosystem. This shift has been driven by maturing AI algorithms, growing AI investment, increasing competition and rapid changes in consumer preferences for digital financial products facilitated by AI.

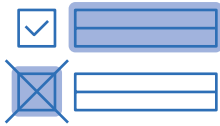
As more and more FinTech companies and banks are minimizing physical branches, AI-based digital personal lending has expanded in the Global South. Credit scores that are calculated by machine-learning algorithms are expected to improve the ability of financial institutions to score credit-poor consumers, which is likely to expand financial inclusion.

Unsurprisingly, a large number of FinTech companies have started experimenting with AI. In many Global South economies, banks and financial institutions have made progress in the use of AI in operational processes. For instance, chatbots are being used for front office operations; AI is being deployed in Know Your Customer/anti-money laundering for middle office functions; and AI is used to manage risk underwriting for the back office (Decosmo, 2019). The use of AI for higher-level functions, such as biometrics and voice assistants, has been rare (Decosmo, 2019). Of special interest to this study is AI's role in promoting financial inclusion. In Table 1, some well-known Global South-based financial companies that have utilized AI are listed and described.

### 1.2.1. The benefits of using AI in financial technology

The implementation of AI in a financial company can bring a number of benefits. First, AI-based systems provide a faster response, resulting in higher customer satisfaction. The United Bank for Africa in Nigeria has a banking chatbot called Leo that helps customers with a number of transactions, such as transferring money, paying bills, buying airtime and checking account balances (mTransfersHQ, 2018). Customers can chat with Leo on WhatsApp, Facebook messenger and apple business chat and the chatbot responds immediately. Mexico's Konfio makes loan disbursements in about 24 hours to small and midsize companies, compared to months taken by traditional banks. Konfio's interest rates are half of those charged by traditional banks. Its delinquency rate was 4.8 percent in 2018, compared with 5.4 percent for the banking industry (Lucchesi, 2019). Konfio utilizes alternative data sources, AI and data science in its lending decisions. Borrowers can complete the application process in about eight minutes. Konfio loans average \$12,000, compared to \$40,000 for traditional banks in Mexico (PYMNTS, 2019b). Companies such as Konfio use systems with enormous processing power, which allows them to handle large amounts of data in a short time.

Another benefit of AI-based systems is reduction in risky and fraudulent transactions. AI algorithms can analyze risk cases and flag them. AI-based systems can also address problems related to the high cost of due diligence, which has been a serious concern in many Global South economies. For instance, due primarily to fraud, bad loans account for about 20 percent of bank loans in India (Suberg, 2017) and loan fraud in the country amounts to about \$2 billion annually, resulting in high interest rates due to low trust (Pitti, 2018). Fraud detection systems can analyze customer behaviour and other information to trigger a cybersecurity mechanism when anomalous activities occur. China's Ant Financial, as an example, uses deep-learning technology to detect fraud (Perez and Soo, 2017; Zoo, 2019). The company's losses related to fraud are one in one million, which is extremely low (Perez and Soo, 2017). Banks also employ AI to prevent money laundering. Machines can recognize suspicious activities and cut the costs of investigations into transactions involving money laundering.



Reduction in risky and fraudulent transactions. AI algorithms can analyze risk cases and flag them.

AI can drastically reduce the operating costs for financial institutions, since machines perform most of the work that human agents otherwise would need to perform. For instance, Ant Financial's AI-based customer service chatbot handles two to three million queries per day. By using complex and sophisticated rules compared to those in traditional credit scoring systems, AI provides a more accurate assessment of a borrower faster than human agents and at a lower cost.

Similarly, South Africa's TymeBank which describes itself as a "fully digital bank" utilizes AI to interact with its customers online and via kiosks. There are no human beings providing services at call centers and branches. The bank has been able to serve consumers at a low cost (Noonan 2019). For instance, TymeBank's card replacement charge is R40 compared to FNB's R110 and Standard Bank's R55 (businesstech, 2019). To verify a customer's identity at a kiosk, TymeBank's system is linked with the database of the Department of Home Affairs to capture biometric data. The service was started in November 2018 and had 670,000 customers by August 2019 (Malinga, 2019). TymeBank has 250 employees, compared to about 50,000 employees in the average South African bank. TymeBank's financial education app,



TymeCoach, helps users make better financial decisions. The app's AI-based chatbot answers financial management-related questions. It also provides customers with their credit report information (Malinga, 2019).

Alibaba has been using AI-powered chatbots on the company's e-commerce site Taobao. In 2017, its customer service chatbot Alime Shop Assistant handled more than 93 percent of customer queries. The company estimated that to traditionally handle this amount of queries, 83,000 human customer service agents would have been needed (Britt, 2018).

### 1.2.2. Activities of AI-based systems in Global South-based institutions

#### Investment strategy recommendations and regulatory and other compliances

Some FinTech companies provide investment strategy recommendations using AI. One such example is Indonesia's Halofina, which describes itself as a goal-based robo-advisor platform. Halofina allows customers to manage personal finance based on their goals. Its users can invest directly from the mobile app (Fintechnews Indonesia, 2020).

AI-based tools can help comply with regulatory and other requirements. In 2015, Malaysia's BIMB Investment Management Bhd partnered with UK-based Arabesque Asset Management Holding Ltd to launch an AI-based multi-currency global equity fund. The fund complies with Shariah law as well as fulfills environmental, social and governance requirements. It uses AI in the entire investment process (Yun, 2020).

#### Fraud reduction

AI can be used to reduce engagement in fraudulent activities by a wide range of players in the banking and financial industry and market. Some FinTech companies have developed solutions for specific Global South markets. For instance, PagShield is an AI-based antifraud tool, specifically designed for the Brazilian market. PagShield checks the address provided by a potential borrower using their IP's geo-location. The system analyzes customer browsing patterns on websites. To do so, it considers factors such as the device fingerprint, IP geo-location, proxy detection and velocity checks. PagShield also uses a social graph, which involves looking at a consumer's relationships and interactions with others (pagbrasil.com, 2020). An additional feature used for fraud detection involves measuring the round-trip time between PagShield and a customer's browser to determine whether a proxy or VPN is being used by a fraudster (Condon, 2018). The algorithm automatically makes adaptations for each e-commerce business, allowing it to identify anomalous behaviour on a user's website.

Merchants may also engage in fraudulent activities, such as not fulfilling their promise of delivering the goods after receiving payment. AI can analyze the authenticity of Know Your Customer documents with computer vision and pattern-matching algorithms. AI can also look at the merchant's online behaviour on social media and other sources (Sharma, 2019).



## Collections

AI and machine learning are effective for collections. They provide insights into the effectiveness of various approaches depending on given customer profiles. Machine learning algorithms help determine which customers to wait on when they do not pay on time (Columbus, 2019). Chilean FinTech startup Colektia utilizes AI to improve businesses' collection processes. Colektia looks at operations and then recommends strategies that can be used to improve the collection process. It also offers a chatbot to increase efficiency. Colektia's system reportedly reduces human intervention by up to 90 percent (Salazar, 2019). As of March 2020, Colektia had 15 financial companies as its customers in multiple Latin American countries, including Chile, Colombia, Mexico and Paraguay (López, 2020b).

## Risk assessment

AI and machine learning are predicted to be used more and more often to manage lending risks in market segments that have little or no information about credit history. AI and machine learning are finding wider applications in Southern economies.

Indonesia's Person-To-Person (P2P) lender Crowdo uses AI to assess risk. Lenders are provided with detailed information about borrowers' businesses. The system also looks at businesses' risk exposure to catastrophic events, such as pandemics. For instance, during COVID-19, hotels and restaurants were classified as high risk. As of March 2020, Crowdo had funded 5,000 projects in Indonesia. Its non-performing loan ratio was reported to be 1.89 percent (Eloksari, 2020), below Indonesia's gross non-performing loan ratio of 2.5 percent in 2019 (Olavia, 2020).

The Brazilian FinTech REBEL likewise combines AI, Big Data and machine learning to analyze risk (Atkins, 2019). REBEL offers unsecured credit of up to 50,000 reals (about \$8,700.) for up to 24 months, targeting middle class clients. The interest rate is as low as 2.9 percent per month. REBEL offers consumers free access to its REBEL Score, which explains the consumer's credit profile and explains steps that can be taken to improve financial health (TechStartups, 2019).

Guadalajara-based Kueski uses machine learning to conduct risk assessment of potential borrowers that lack credit history and do not have collateral. Clients are offered a personalized loan without an in-person meeting. Kueski also uses AI for fraud reduction. It does so by identifying unusual patterns from potential borrowers who are applying for a loan. Kueski uses information submitted by the user as well as data collected from other sources (López, 2020a).

As a final example, Nigeria's Migo employs machine learning to make lending decisions for middle and low-income consumers. Migo's partner banks also use its technology to reduce risks (Idris, 2020). Potential borrowers provide personal information when they apply for a loan. Based on the information, the loan amount varies from N500 to N500,000 (\$1.30 to \$1,300). The company normally starts with a small loan. Borrowers are eligible for larger amounts after trust is built. For instance, borrowers who pay loans on time are then viewed as more trustworthy (Migo, 2020). Migo's application programming interface (API) is plugged in by its partners, such as banks, telecommunications operators and merchants. By 2019, over three million loans had been offered to more than one million customers in Nigeria (Olowogboyega, 2019b).

### Improving financial and operational performance of borrowers

AI is being used to improve financial and operational performance of borrowers and help them succeed. Konfio has recognized the need to offer more than just lending to small-and-medium enterprises. Konfio also provides its one million clients with technology that offers insights to customers and helps them organize data (Hinchliffe, 2019).

Likewise, the Brazilian FinTech Olivia offers a free app that, after the user gives consent, connects to the user's bank account and monitors their transactions and spending behaviour. Olivia's algorithm uses the information collected to provide personalized recommendations to improve spending behaviour (López, 2020c). As of January 2020, customers of a number of banks, including Itaú, Banco do Brasil, Caixa Econômica Federal and Nubank, were connected to the platform (LAventure capitalA, 2020). In the US, Olivia's AI-based system was trained with data from 18,000 financial institutions using information related to profiles, consumption habits and financial transactions (Mari, 2019).

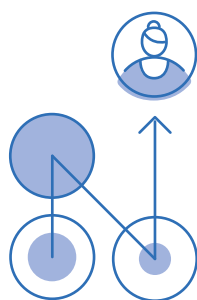
**Table 1:** Some well-known Global South-based financial companies that have utilized AI

Company	Country	Use of AI	Outcome
<b>UBA</b>	<b>Nigeria</b>	A banking chatbot Leo helps customers transfer money, pay bills, buy airtime, check account balances and other functions (mTransfersHQ, 2018).	Available 24 hours a day and faster than human agents.
<b>Ant Financial</b>	<b>China</b>	An AI-based customer service chatbot handles two to three million queries per day. Deep-learning technology is used to detect fraud (Kshetri, 2020b)	Losses related to fraud are one in one million. Outperformed human agents in customer satisfaction.
<b>Safaricom</b>	<b>Kenya</b>	Provides services such as managing subscriptions, canceling SMS services, reversal of money sent to a wrong recipient, airtime top ups and checking M-Pesa and airtime balances (Ombogo, 2019). Chatbot assistant is called Zuri.	To reverse pay, an M-Pesa user no longer needs to contact a customer service team, which takes a long time.

### 1.3. Blockchain

Blockchain's key features can make FinTech products based on this technology and cryptocurrencies attractive to Southern economies (Kshetri, 2017)). It is argued that blockchain can enhance efficiency of some types of payment systems in the Global South. The decentralized nature of the network means that all operations are accessible to all relevant members of the network. Processes such as ordering, settlement and payments are implemented on a (near) real time basis.

#### 1.3.1. Blockchain and financial inclusion



A notable feature of these solutions is the ability to aggregate information from many sources to build economic history.

Some FinTech companies and cryptocurrencies<sup>10</sup> aim to capitalize on blockchain-led decentralization and disintermediation to directly connect borrowers with lenders. Doing this, the costs of financial services can be reduced. Another notable feature of these solutions is the ability to aggregate information from many sources to build economic history. This aspect is especially important for Global South economies because most of them lack reliable credit information on most people and companies, which is needed to minimize bank lending risks. Limited credit information can be attributed to the fact that Global South economies either lack a national credit bureau or have a poorly functioning one. For this reason, reliable credit information is not being collected and distributed to increase transparency and minimize bank lending risks (Kshetri, 2019a). In China, only 20 percent of the adult population has a credit score (Lohr, 2015). Sierra Leone has one credit bureau with information on only 2,000 of the country's seven million people (Hudli, 2018). To overcome this challenge, theoretically, borrowers can show blockchain-based credit information to lenders and receive loans more easily (Stanley, 2017).

The US-based blockchain company BanQu utilizes blockchain to establish economic identities and proof of record (which it calls 'economic passports') for unbanked persons (Stanley, 2017). A blockchain-based verifiable digital identity is expected to help disadvantaged groups establish ownership, business assets and production values and help them engage in economic transactions. It aggregates information from a number of sources, such as those related to financial history, land records, trust networks documenting trust-relationships with others, business registrations, vaccination records and remittance income. ID-related information sources include selfies, biometrics and key physical attributes. Blockchain's decentralized, secure ledger also provides Know Your Customer and other information to partners that can potentially offer products and services to these disadvantaged individuals (White, 2018).

Another problem that blockchain might address is related to the lack of formal identity documents. Potential borrowers in many Global South economies cannot prove who they are, which is among the main reasons why many low-income people lack access to financial services. According to the World Bank's ID4D database, one billion people lack any form of identification. An additional 3.4 billion people have some type of identification, but lack the ability to use it in the digital world (White et al., 2019).

10 Cryptocurrencies differ in terms of anonymity and privacy. For instance, compared to bitcoin, Monero, Dash and Z-Cash perform better in anonymity and privacy. These have built-in anonymity features. Monero is arguably the most anonymous cryptocurrency (Kshetri, 2018).

Sierra Leone addressed the above problem by launching in August 2019 a blockchain-based National Digital Identity Platform developed by Kiva (Inveen, 2019). Kiva worked with the United Nations Capital Development Fund and the United Nations Development Programme to develop the platform. Kiva's blockchain protocol aims to address two major barriers that hinders low-income people's access to financial services: formal identification and verifiable credit history (Cheney, 2019).

### 1.3.2. Blockchain and international remittances

Blockchain is bringing a fundamental transformation to the way the international remittance market is functioning. As an example, Ripple's On-Demand Liquidity<sup>11</sup> leverages XRP (the payment network's cryptocurrency) to send money faster at a lower fee. Some users of RippleNet in Global South economies include Vietnam's [TPBank](#), Pakistan's Faysal Bank (Ledger Insights, 2019), The National Bank of Egypt (Huillet, 2020a) and Thailand's Siam Commercial Bank (Ripple, 2020a). The Siam Commercial Bank has teamed up with the digital money transfer service provider Azimo to use RippleNet. Using non-blockchain solutions, sending remittances from Europe to Thailand takes more than one business day to settle. With the RippleNet, Siam Commercial Bank clears Pounds and Euros into Thai Baht in less than a minute (Ripple, 2020a). Using On-Demand Liquidity, banks can avoid pre-funding<sup>12</sup> and thus settle remittances quickly (Ripple, 2020b). On-Demand Liquidity is especially attractive to payment companies and non-banking institutions that are required to open overseas accounts to pre-fund their transfers. Many such institutions face difficulties opening overseas bank accounts due to concerns related to money laundering (Ledger Insights, 2019).

In November 2019, Thailand's Siam Commercial Bank announced that it launched AI-based Robo-Advisor to manage investment portfolios. The Robo-Advisor helps investors make decisions based on market conditions and their preference for risk taking. Consumers can start using the service with just \$100 in initial investment. By 2019, the bank had invested \$1.3 billion on artificial intelligence, digital platforms and other technology in a four-year capital spending programme (Nguyen, 2019). Siam Commercial Bank expected that the new system would result in 100,000 new accounts by 2020 (Faridi, 2019).

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11 The technology company Ripple Labs launched Ripple as a real-time settlement system, currency exchange and remittance network.

12 Prefunding involves taking money from the sender and 'pushing' the money to a beneficiary partner bank or a beneficiary money transfer operator (Khan, 2020).

## 2. Some Global South-Based FinTech Companies and Their Entry Into Other Global South Economies

In Table 2, some notable examples are shown of Global South-based FinTech companies that have operated extensively outside their home markets. These companies replicated their home market successes in other Global South economies. A key attractiveness factor is that Global South markets have comparable economic bases and similar economic conditions, providing a favourable climate for Global South-based FinTech firms to succeed in other Global South markets (Kshetri, 2020b).

Especially impressive are Chinese FinTech companies, which, following successes in promoting financial inclusion in their home country, have expanded in South East Asian markets and other Southern economies (Kshetri, 2020b). Likewise, Nigerian FinTech companies have been active in other Global South economies (Table 2). For instance, in 2019, the Nigerian FinTech company Migo, which uses a cloud-based platform to make it possible for customers to use loans, buy things and withdraw cash without cards, entered into Brazil (Onukwue, 2019).

Additionally, Global South-based companies have invested in the FinTech sector of other Global South economies. In November 2019, \$360 million was invested in Nigeria-focused payment ventures (Bright, 2019). \$170 million of this funding came from Chinese investors. Some venture capital investors in the Nigerian FinTech sector include China's Qingliu Capital, Jiuhe Venture Capital and Shaka Ventures and United Kingdom-based TLcom Capital Partners ([africanbusinesscentral.com](http://africanbusinesscentral.com), 2020).

Two observations from these statistics are of interest. First, FinTech Southern economies, such as Nigeria's, are an attractive sector for foreign venture capital investment. Second, the leaner cost structures of Chinese firms play a pivotal role in developing value-creating strategies in the African context (Kshetri, 2013).

For Global South economies, a main benefit that Global South-based FinTech companies offer is low transaction costs. For instance, the average mobile transaction conducted via Kenya's mobile phone-based money transfer, financing and microfinancing service M-Pesa is about a hundredth of the average check transaction and half of the average ATM transaction of a traditional bank (Jack and Suri, 2010). It is estimated that each M-Pesa transaction would require two to three hours and costs \$3 if it were processed through traditional financial channels (Schwartz, 2014).

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## 2.1. Alipay

Alipay is owned by Ant Group, formerly known as Ant Financial, which is an affiliate of the Chinese e-commerce giant Alibaba. It is worth noting that Alibaba was among the first Global South-based companies to launch FinTech products. In 2007, Alibaba launched AliLoan, which was backed by the China Construction Bank. AliLoan utilizes an automated system to provide micro-loans to online vendors. Sesame Credit was launched by Ant Group in 2015 to provide credit ratings of consumers and small businesses. Sesame mainly utilizes data from Alibaba's huge online ecosystem. It also makes use of data collected from Alibaba's various partners, as well as the online and offline history of transactions.

In April 2016, the Southeast Asian e-commerce company Lazada was acquired by Alibaba. Following the acquisition, Lazada's payment platform helloPay was rebranded as Alipay in Indonesia, Malaysia, the Philippines, Singapore and Thailand (Perez, 2017). By January 2019, Alipay and its global partners served over one billion users (fastcompany.com, 2019) in 42 countries (Wu, 2018), especially in South East Asia. Alipay was used by 68 percent Chinese online shoppers (He, 2019). In September 2019, Lazada reported that it had become the top e-commerce platform in Southeast Asia, with more than 50 million active buyers annually.

Ant Group's goal is to be like Visa or MasterCard in South East Asian markets. In Malaysia, Alipay also created a joint venture with the local bank CIMB's subsidiary for e-payment systems for micro payment Touch'N'Go to launch a new mobile e-wallet platform. The new platform can be used for payments and other financial services in Malaysia. Touch'N'Go customers can use the new e-wallet for e-commerce and other services. Alipay users can engage in cashless transactions outside China (Eusoff, 2017).

Ant Group has also invested in several South East Asian mobile money providers, such as Thailand's True Money, that provides e-payment services in Southeast Asia, and the Philippines' Mynt, a FinTech startup launched by Globe Telecom (Freischlad, 2018). In Indonesia, Ant Financial entered into a strategic partnership with Emtek Group in April 2017. Unlike True Money and Mynt, Emtek did not have its own mobile wallet. Ant Group I and Emtek launched the e-wallet Dana (meaning 'fund' in Bahasa Indonesia), which is also referred to as the Indonesian Alipay. In the beginning, Dana provided financial services for the Indonesian users of mobile instant messenger and videotelephony application BlackBerry Messenger. Dana's future plans included allowing credits to be used for diverse services, such as paying utility bills and health insurance, which are provided by other mobile wallets in Indonesia, such as Go-Jek's Go-Pay and Grab's Ovo (Freischlad, 2018). By increasing access of individuals and enterprises to useful financial products and services financial inclusion is promoted.

In December 2019, Ant Group I made a strategic investment in Vietnam's eWallet startup eMonkey (PYMNTS, 2019a). Since eMonkey has operating licenses from the State Bank of Vietnam, the deal allows Ant Financial to enter the Vietnamese payment market (Keyes, 2019). Southeast Asia's digital payments market, in which both the payer and payee use digital modes to send and receive money, is huge and rapidly growing. The gross transaction volume was \$600 billion in 2019, and is estimated to increase to \$1.1 trillion by 2025. Likewise, the e-wallets accounted for \$22 billion in 2019, and that amount is predicted to increase to \$114 billion in 2025 (Davis et al., 2019). Ant Group can benefit from this rapidly growing market and has the

potential to promote financial inclusion in Southeast Asia by replicating its success in the home market.

The African financial services provider Ecobank teamed up with Ant Financial's Alipay to allow international remittances between the two company's users. Instant transfers will also be possible between users of Ecobank and Alipay's partner services (Donkin, 2020). By increasing remittances more families will have access to useful finances, which is another measure that can promote financial inclusion.

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## 2.2. Flutterwave

Flutterwave is a Nigerian provider of commercial financing and mobile payment services. Flutterwave's application programming interface integrates different payment systems and methods. The goal is to make it easy to process payments for banks and merchants in Africa (Jackson, 2019). As of February 2020, the payment platform had processed more than 100 million transactions valued at over \$5.4 billion (Aina, 2020). As of December 2019, Flutterwave served over 60,000 merchants in six African countries and the United Kingdom (Onaleye, 2019). Its clients included Arik Air, Uber and Wakanow (Techcabal, 2019). As of December 2019, Flutterwave supported over 150 currencies and facilitated payment services from over 68 gateways, such as AliPay, MasterCard, PayPal and Visa (Olowogboyega, 2019a). Flutterwave operates in African economies including Ghana, Kenya, Nigeria, Rwanda, South Africa and Uganda, (Aina, 2020). It plans to enter Cameroon, Egypt, Ethiopia and Morocco as well as Asian economies, such as China and India (Kene-Okafor, 2019).

In March 2020, Flutterwave teamed up with Nigeria-based FinTech Paga to allow Paga users to access products from merchants using Flutterwave. Paga's over 14 million customers can make payments directly from their wallets to merchants such as airlines, hotels, ticketing companies, media outfits and fashion retailers (The Paypers, 2020). Increasing Paga users' access to useful financial services has promoted financial inclusion.

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## 2.3. M-Pesa

Originating in Africa, M-Pesa is considered among the most disruptive innovations in micropayment and mobile-banking. M-Pesa allows consumers to make person-to-person transfers, receive mobile phone credits, pay school fees and electricity bills and save money. M-Pesa customers can pay off or collect on their loans with a text message. Since only 43 percent of the adult population in sub-Saharan Africa has a bank account (<https://globalfindex.worldbank.org/>), this feature makes the innovation ideal for African economies. Another reason for its suitability in Africa is the increasing pervasiveness of mobile phones. According to the International Telecommunication Union, as of 2019, the continent's mobile-cellular telephone subscription rate was 80.1 per 100 people. As mentioned above, by early 2020, there were 37 million users in seven African countries. (vodafone.com, 2020).

It is reported that Safaricom is considering adopting blockchain for remittance. Blockchain is expected to expand the M-Pesa service outside of Kenya (CryptoGuru, 2020).



## 2.4. WeChat Pay

Tencent's WeChat Pay, another Chinese FinTech firm launched in 2013, exceeded Alipay in userbase by 2014 (Luk, 2017). By 2014, over 100 million user bank cards had been linked with WeChat Pay (Yining, 2015). By mid-2019, WeChat Pay supported over 18 currencies in 49 countries (Medici, 2019) for over 900 million users (Rapoza, 2019). WeChat Pay's success can be attributed to WeChat's huge userbase. It had over 1.1 billion active users as of early 2020 (Liao, 2020). By promoting WeChat user access to financial services, WeChat Pay is promoting financial inclusion.

**Table 2:** Some examples of Global South-based financial technology companies

Company	Country	Internationalization status
Alipay	China	January 2019: Alipay and its global partners served over one billion users in 42 countries (fastcompany.com, 2019; Wu, 2018).
Flutterwave	Nigeria	Operates in African economies, including Ghana, Kenya, Nigeria, Rwanda, South Africa and Uganda. Plans to enter Cameroon, Egypt, Ethiopia and Morocco, as well as Asian economies, such as China and India. As of February 2020: processed more than 100 million transactions valued at over \$5.4 billion (Aina, 2020).
M-Pesa	Kenya	2020: 37 million users in seven countries (Democratic Republic of the Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique, United Republic of Tanzania) (vodafone.com, 2020).
WeChat Pay	China	Mid-2019: supported over 18 currencies in 49 countries for over 900 million users. It capitalizes on WeChat's huge userbase of 1.1 billion active users (Medici 2019; Liao, 2020).

### 3. New Forms of South-South Cooperation

Global South-based FinTech firms' globalization ambition has contributed to the development of new forms of South-South cooperation in the FinTech arena. Firms based in some Global South economies demonstrate several unique advantages that are important when competing in other Global South economies. For instance, Chinese firms arguably have lean cost structures, an important factor for developing value-creating strategies in most Global South economies, such as those in Africa (Kshetri, 2013).



Firms based in some Global South economies, such as China, are in a position to reconfigure their resources to operate in Africa and other Southern economies.

Firms based in some Global South economies, such as China, are in a position to reconfigure their resources to operate in Africa and other Southern economies. They can easily adapt the business models used in their domestic markets (*Harvard Business Review*, 2009). As noted earlier, India has allowed FinTech startups, banks and financial institutions to establish regulatory sandbox for live testing in diverse areas (*The Economic Times*, 2019). Given India's higher level of technological capabilities compared to many other Global South economies, if successful FinTech firms emerge from this initiative, they will have the potential to be successful in other Global South economies. Prior research has indicated that Indian firms' capability to deliver value for money in the domestic market has been an important source of their competitive advantage to operate in other Global South economies, such as those in Africa (Kumar, 2008).

An encouraging trend is that many FinTech firms based in several Global South economies grant access to each other's networks. For instance, Safaricom and Ant Financial teamed up to offer the M-Pesa wallet to use as a payment option on Alibaba's online shopping portal Aliexpress.com (Wolfe and Fitzgerald, 2019). Likewise, Alibaba has partnered with Flutterwave to provide Alipay as a digital payment option for African merchants (Bright, 2019).

A further encouraging development is the dramatic reduction in costs and increase in efficiency of South-South trade, thanks to recent developments in blockchain-based FinTechs and cryptocurrencies. Crypto-denominated international commerce has become increasingly common in South-South trades (Kshetri, 2021; Orcutt, 2020). Small businesses in Global South economies have reported that speed and efficiency can be greatly improved by making payments in cryptocurrencies rather than in major international currencies, such as the US dollar and Euro. A Nigerian vendor of handsets and accessories, who sources his products from China and the United Arab Emirates, reported that his Chinese suppliers prefer payments in cryptocurrencies. He started paying with cryptocurrencies and his profits increased. This is mainly because he did not have to buy US dollars using the Nigerian naira or pay expensive fees to money-transfer agencies (Kshetri, 2021; Orcutt, 2020).

Due to such practical issues, Bitcoin use has been reported to grow in developing economies, such as those in Africa. According to US blockchain research firm Chainalysis, monthly cryptocurrency transfers of under \$10,000, which are typically made by individuals and small businesses, to and from Africa increased by more than 55 percent between June 2019 and June 2020 to reach \$316 million (Akwagyiram and Wilson, 2020).



A further encouraging development is the dramatic reduction in costs and increase in efficiency of South-South trade, thanks to recent developments in blockchain-based FinTechs and cryptocurrencies.

Chainalysis also found a similar pattern in Latin America. From June 2019 to June 2020, Latin America sent \$25 billion worth of cryptocurrency and received \$24 billion (Orcutt, 2020). The Chainalysis data showed that East Asia was Latin America's significant counterparty (Chainalysis, 2020). The blockchain research firm's interviews with Latin America-based cryptocurrency operators indicated that many of the payments were commercial transactions between East Asia-based exporters and Latin American importers. A Paraguay-based cryptocurrency exchange explained that businesses in Paraguay import significant amounts of goods from China. Some of them are then exported to other countries, such as Brazil. Many of the importers make payments using Bitcoin because of the speed and ease with which they can settle the payments. Due to concerns related to money laundering, banks in Paraguay are reluctant to do businesses with most companies. The banking application process is complex, which requires many supporting documents and takes a long time. Moreover, even if a business's application to make a payment in international currencies is approved, wire transfers are costly. Moreover, by making payments in cryptocurrencies, they avoid import taxes (Chainalysis, 2020).

This new form of South-South cooperation is expected to further strengthen South-South trade and investment links. China-Africa trade in 2019 was \$208 billion (Nyabiage, 2020). Alibaba-Flutterwave integration is expected to facilitate payment activities associated with this huge and rapidly growing China-Africa trade (Bright, 2019).

# 4. Opportunities and Challenges for FinTechs in Global South Economies

Initiatives to use FinTech to expand financial inclusion in Global South economies provide a range of opportunities and challenges. In this section, favorable circumstances that increase the chances of success FinTech initiatives in Global South economies and the obstacles they face are examined.

## 4.1. Opportunities

### 300 million

New subscribers in sub-Saharan Africa will access the mobile Internet and 690 million smartphones will be active by 2025.

From the above discussion it is clear that a number of opportunities exist to use FinTechs to expand financial inclusion in the Global South. Many encouraging developments are being achieved in the area of digital connectivity. According to the trade body Global SouthM Association, about 300 million new subscribers in sub-Saharan Africa will access the mobile Internet and 690 million smartphones will be active by 2025 (Radcliffe, 2018). This will be a significant uptick in smart phone usage: feature phones (earlier-generation phones) accounted for 60 percent of phones sold in Africa in 2017 (Ekwealor, 2019). In 2018, only a third of mobile users in sub-Saharan Africa, 250 million, had a smartphone (Radcliffe, 2018). The Global SouthM Association has predicted that mobile broadband connections in sub-Saharan Africa economies will increase to 87 percent of total connections in 2025 compared to 38 percent in 2018. 3G is expected to account for 60 percent of all mobile connections in the region by 2025. In South Asia, 3G mobile Internet infrastructures had 88 percent coverage in 2018 (gsma.com, 2019). Likewise, by the end of 2018, 3G and 4G accounted for 75 percent of cellular subscribers in Latin America (Lu, 2019). These developments provide important opportunities in the medium to long term to use FinTech to expand financial inclusion.

At the same time, a number of high-profile FinTech solutions are being created in Southern economies. As noted above, in the 2018 FinTech 100 report released by KPMG and FinTech investment firm H2 Ventures, China accounted for 11 of the best FinTech innovators. Among other Global South economies, three of the best FinTech innovators each originated from Brazil and India and two from Indonesia. Several other Global South economies, including Argentina, Barbados, Colombia, Jordan, Mexico, Myanmar and Vietnam, had one best FinTech innovator (Mostowyk, 2018). These FinTech companies are in a position to transform the financial and economic landscape in Southern economies.

Interestingly, in the context of the COVID-19 pandemic, FinTech companies have made their digital offerings more attractive and affordable. In Kenya, mobile money has acted as a public health tool. Kenya's President Uhuru Kenyatta asked consumers and

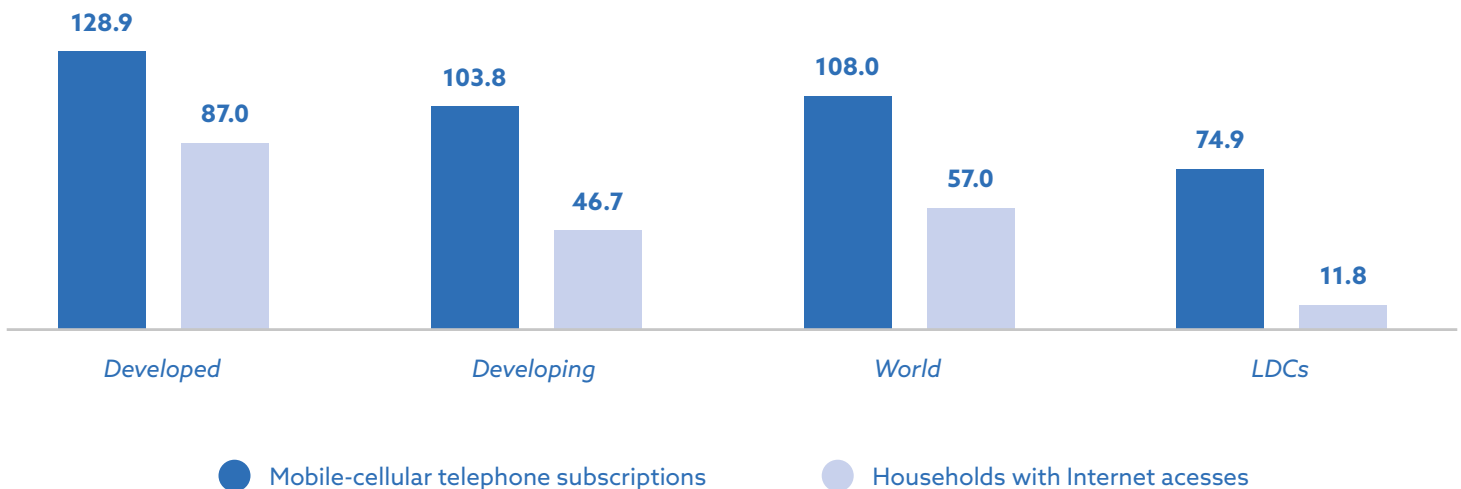


Interestingly, in the context of the COVID-19 pandemic, FinTech companies have made their digital offerings more attractive and affordable. In Kenya, mobile money has acted as a public health tool.

businesses to use digital payments to fight COVID-19 (Bright, 2020a). At the request of the Central Bank and the President, Safaricom offered a partial fee waiver on M-Pesa transactions. Such an offering was expected to reduce the physical exchange of currency. Consumers did not need to pay fees for person-to-person transactions of less than 1,000 Kenyan Shillings (\$10) for three months (Bright, 2020b). Ghana's central bank required mobile money providers to waive fees on transactions of GH 100 (about \$18) (Bright, 2020b). Likewise, Nigeria's Paga made fee adjustments, which allowed merchants to accept payments from Paga customers for free. Mobile operators in other African economies, such as Uganda and Cameroon, also waived costs to transfer money on their mobile platforms (Africanews, 2020). The goal was to help slow the spread of COVID-19 by reducing cash handling (Bright, 2020b). It was reported that some stores in Nigeria stopped accepting cash due to COVID-19 (Adesina, 2020).

Finally, in some Global South countries, FinTech-friendly regulations have driven the growth of the sector. For instance, FinTech companies arguably face little or no barriers to market entry in Kenya (Collins, 2020). Likewise, a main reason why FinTech is growing rapidly in the United Republic of Tanzania is that Tanzanian regulators have actively encouraged FinTech innovation (africalegalnetwork.com, 2020). Even more encouraging, regulatory obstacles have been mitigated during the COVID-19 pandemic. For instance, the Bank of Ghana removed Know Your Customer requirements which sometimes act as a constraint in the use of mobile money and citizens can use existing mobile phone registrations to open accounts with the major digital payment providers (Bright, 2020b). Other Global South economies can draw lessons from successful experiences of economies, such as Ghana and the United Republic of Tanzania, to make regulations more friendly to stimulate the diffusion of FinTech products.

**Figure 1:** Penetration rates of mobile-cellular telephones and the Internet (per 100 people, 2019)



Data source: International Telecommunications Union (2020); [www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx](http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx).

## 4.2. Challenges

Global South economies encounter a number of challenges in their efforts to expand financial inclusion using FinTech products. In many Global South economies, digitization initiatives are hindered by the lack of connectivity and cost. For instance, in 2019, a high-usage mobile broadband bundle (140 minutes of voice, 70 SMS and 1.5 GB of data) cost \$31 purchasing power parity (PPP) in developed countries compared to \$45 PPP in Least Developed Countries. Likewise, the average price of a low-usage bundle (70 minutes of voice, 20 SMS and 500 MB of data) was about \$25 PPP and differences between developed countries, developing countries and least developed countries are insignificant (ITU, 2019). A more severe challenge is that a large proportion of the population in many Global South economies lacks access to any digital technologies. For instance, in least developed countries (Figure 1), more than 25 percent of the population does not have cellphones and more than 88 percent lacks Internet access. For populations that lack any digital footprint, initiatives of FinTech companies are difficult to implement.



In many Global South economies, digitization initiatives are hindered by the lack of connectivity and cost, Low financial literacy and lack economies of scale.

Another challenge is that FinTech regulations in most Global South economies are developing at a slow pace. Regulations normally develop more slowly compared to the rate of technological development. With the rapid development of FinTech technologies, new types of risks, such as misuse of personal information, are emerging, which are not well understood. Such risks are not covered by existing regulations (Sy et al., 2019). Many consumers who have received credits from FinTech companies feel that they are victimized by misuse and abuse of personal data and information (Kshetri, 2016; 2020b). For instance, in a China Youth Daily poll, 76 percent of respondents believed there was such abuse (Wantchinatimes.com, 2015). Online credit services allegedly abuse personal data to collect debts. One such example is Alibaba's Ant Check Later which allows users to delay payments and pay in installments. An online user reported that he was contacted by Ant Check Later for information about his friend who owed money to the payment service. Ant Financial Services reportedly said that the practice of contacting a borrower's friends or relatives to help with collecting debts is common in the financial sector. FinTech companies in Kenya are also reported to use 'societal shaming' for debt collection (Olowogboyega, 2019a). FinTech companies in Kenya and some other Global South economies face little regulatory scrutiny (Collins, 2020).

Low financial literacy has been a key challenge in some Global South economies (Ndulu and Qhotsokoane, 2020). Some borrowers lack an understanding of the consequences of not paying their loans on time. For instance, during 2014-2017, 2.7 million Kenyans were blacklisted by the country's Credit Reference Bureaus (Mustafa et al., 2017). 400,000 of them had defaulted on loans that were less than \$2 (Weitzberg, 2019). It is argued that FinTech companies have created 'credit bubbles' among poor and vulnerable groups (Collins, 2020). That is, credits are extended to these groups based on less stringent lending standards and without an expectation of a profitable use of the credit by the borrower.

Most Global South-based FinTech innovations lack economies of scale. This is because most Global South economies are small and market fragmentation hinders their entry into other Global South economies. For instance, M-Pesa faced difficulty replicating its home market success story in South Africa. A primary factor was that South Africa has stricter digital wallet regulations (Alexander et al., 2017). M-Pesa also faced barriers in Afghanistan (Accion International, 2014). Whereas Safaricom

had a near monopoly position in Kenya, four major mobile providers compete in the Afghanistan mobile market. This means that if a mobile money user opens an account with a provider, the user may not be able to send money to users that have accounts in other mobile network providers. A further challenge is that people in Afghanistan have a lack of trust in the banking system in general (Accion International, 2014).

Additionally, Global South economies face shortages of manpower to develop FinTech solutions locally. In an international survey conducted in October 2019 by IBM, among 4,514 senior business decision-makers in China, Europe and North America, 37 percent of respondents reported that limited AI expertise and knowledge hindered successful AI adoption (Bnamericas, 2020). It is worth noting that the lack of expertise in AI and other technologies is a more severe challenge in most Global South economies. For instance, out of India's two million software developers, only 5,000 were estimated to have blockchain skills (Agarwal, 2018).

Another challenge for Global South Fintech companies is that in many cases their datasets originate from sources that are unrelated to financial services, such as social media (Kshetri, 2020a). Big Data analytics used to predict potential borrower creditworthiness rely on correlations rather than causations. It is not easy to determine which correlations shown by Big Data tools are random and which ones may reflect responsible financial and consumption decisions (Zetsche et al., 2018).



A final challenge in Global South economies in general is the lack of skills among Internet users to protect themselves from rapidly rising cyber-threats.

For some of the solutions discussed above, such as blockchain-based FinTech companies and cryptocurrencies, complexity makes them difficult to grasp and use, especially for those who lack technological and other necessary skills. For instance, some estimates suggest that half of the populations of developing countries cannot speak an official language of their own country (Kenny, 2003). A key challenge is related to information flow. Studies conducted in the agriculture and food and beverage industry have indicated that farmers receive information from relatively restricted channels and that they learn about new technologies from very few sources. Moreover, information they receive is not perfect (Udry and Conley, 2001). All this leads to slow learning of new technologies outside of major urban areas and use of new technologies is often limited to specific groups and networks (Vann den and Derco, 2001). The challenges related to poor information flow are even more pronounced for blockchain applications due their high degree of complexity.

A final challenge in Global South economies in general is the lack of skills among Internet users to protect themselves from rapidly rising cyber-threats. A large proportion of Internet uses in Africa and other Global South economies are inexperienced and not technically savvy (Kshetri, 2019b). Practitioners in the field have observed that individuals in Africa handwrite their debit card PIN number on the card itself to make sure that they do not forget it (Stanley, 2017).



# 5. Conclusion

Global South-based FinTech companies are utilizing digital technologies to assess, evaluate and refine the creditworthiness of potential borrowers in new and innovative ways. They have been able to reduce transaction costs using these innovations. In addition, these companies are utilizing new sources of data on borrowers that traditional financial institutions did not use. All these factors have led to improved access to financial services for disadvantaged groups, such as small-and-medium enterprises and low-income households.

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The discussion in this paper illustrates how AI can drastically reduce operating and other costs, which in turn can increase the efficiency of processes and lead to lower transaction costs for providing small loans. Global South-based FinTech companies are exporting their successful strategies into other Global South markets. A key attractiveness factor is that many Global South markets have a comparable economic base and similar economic conditions. In many cases, geographic proximity as well as ethnic and cultural connections between Global South economies are also major facilitators that help Global South-based FinTech companies succeed in other Global South economies.

Experience has shown that while FinTech companies may be successful in their original countries, their models may not be transferable to other developing countries. For instance, companies such as Alibaba have developed their own technologies, however, FinTech companies in most developing countries may lack the capability to do so.

The degree and level of internationalization of FinTech can be further enhanced and improved. Global South economies should create even more favourable environments for Global South-based FinTech firms to enter and operate in their economies. The availability of large data centres, such as cloud centres, can help attract FinTech firms. Supporting other supply side factors, such as app developers and service providers, can also attract foreign FinTech firms. In addition to the various capacity-building measures, harmonization and standardization of regulatory frameworks in the FinTech arena is another area in which Global South economies can work together.

Measures should be taken to increase borrower success probabilities with the loans provided by FinTech firms. As an example, these firms could team up with host country governments to design awareness and education programmes. 'Ggamified' financial education videos could be created to improve individual use of credit cards and other financial products. Customers might also be given the opportunity to improve their credit status by watching short videos and passing corresponding tests (Faz and Noor, 2014).

It would behoove Global South governments to team up with FinTech companies to launch awareness and education campaigns that can accelerate the diffusion of digital payment systems. Special focus should be placed in the area of cybersecurity. Efforts should also be directed toward collecting and identifying data that more accurately reflect low-income peoples' and small firms' creditworthiness. More importantly policy makers should focus on developing nurturing environments for local fintech startups that can utilize these data and information to promote financial inclusiveness and further develop the fintech ecosystem.

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