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Digital Financial Inclusion: Policies and Business Models

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ABSTRACT

Improved access to formal financial services boosts economic development, decreases inequality, and benefits people at the bottom of the pyramid, more specifically small and marginal farmers, micro and small enterprises, women, and other excluded segments of the population. The digital disruptions and emergence of innovative business models in the banking and financial sector are enabling factors for deepening of digital financial inclusion (DFI). The governments, central banks, commercial banks, fintech companies, and other private and public enterprises are contributing to the digital financial services (DFS) ecosystem through innovative payment infrastructure, low-cost digital products and services, unique delivery models, regulation, and so on. The paper analyses global policy on DFI, innovative business models, progress and achievement of DFI across BRICS countries, and innovative DFI models in India. The paper concludes with DFI lessons to India from global/BRICS countries and the way forward for DFI.

Keywords: : Digital financial services, financial inclusion, digital technologies, business model, regulation, banks and financial institutions, payment system, Fintech, BRICS, India.

JEL Classification Number: E44, F65, G18, G21, O16, O50

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1. Introduction

Worldwide, approximately a quarter of adults do not have access to a minimum banking services (Demirgüç-Kunt et al., 2018) due to absence of access, high cost of services, faith in financial institutions, and hardships in procuring identification records (Senyo et al., 2020). Financial inclusion (FI) enables the population to build capability to save, borrow and exchange money, which in turns helps to fight against poverty. Further, the access to financial services greatly improves the opportunity for the people with boost in their quality of life (Demirgüç-Kunt et al., 2018). FI is defined as where *“individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way”* (World Bank, 2018), is central to lessening poverty (Demirgüç-Kunt et al., 2018).

In the last 15 years, there has been a thrust to study *“how banks can translate the potential of mobile phones into greater financial access for poor people”* (CGAP, 2008: 1). This has moved from the role of banks, to include a broader network of technology, entrepreneurial and start-up financial technology firms, which is known as “Fintech firms” that offer innovative Digital Financial Services (DFS) as substitutes to traditional banking services. Fintech pronounces the application of technology to offer new and enhanced financial services (Gomber et al., 2018). In developing countries, mobile money, a Fintech innovation that facilitates financial transactions without a bank account, is bettering FI (Senyo & Osabutey, 2020) and impacting the life’s of millions.

Mobile money schemes, such as M-Pesa in Kenya (Oborn et al., 2019), have decreased the number of households in poverty. Other solutions, such as Oi Paggo in Brazil and TCASH in Indonesia (Iman, 2018), exhibit how contextually appropriate solutions give customers newer, low-cost, easier, faster and more effective ways of storing and moving value. Complex associations between “old” organisations such as banks and “new” organisations such as telecommunication companies (telcos) and FinTech firms (Gozman et al., 2018) are required to co-create these pioneering services for the last mile with an affordable cost.

Still, these instances have proven hard to reproduce in other developing countries and many individuals remain financially excluded (Demirgüç-Kunt et al., 2018). Notwithstanding the rising research on Fintech, and precisely in mobile money, the bulk of the studies emphasize on individual adoption concerns such as experiences, drivers and impediments (Senyo & Osabutey, 2020), users’ opinion and cultural hurdles (Bongomin et al., 2019). Studies at the organisational level tend to observe FinTech companies as a sensation (Gozman et al., 2018; Leong et al., 2017; Oshodin et al., 2019) or how banks react to disruption by Fintech companies (Gomber et al., 2018), rather than how these players resolve the reasons behind financial exclusion.

Numerous international financial institutions have created several systems to assess FI. An extensively used data portal to build these systems is the G20 FI Indicators developed by the GPMI (Global Partnership for FI) and powered by the World Bank’s Data-Group. These indicators measure the access and use of quality of financial services within

the country and across countries. In 2016, the portal added fresh indicators to measure the usage of digital payments and access to digital infrastructure. Digital Financial Inclusion (DFI) allow individuals to improve access to financial services and expand economic progress in underserved market economies. Some studies demonstrate that the FI and economic development in a nation have a noteworthy covariant relationship and found that the dearth of an inclusive financial system would lead to income inequality and sluggish economic growth (Anand S., et al., 2012; Beck T., et al., 2007; Sarma and Pais 2011). Galor et al., (1993) and Honohan (2004) believe that the progress of FI means that all members in the economic system have easy access to formal financial services, such as bank deposits, credit, and insurance (Galor & Zeira,1993; Honohan P., 2004). Dahlman et al., (2016) indicate that the digital economy promotes growth and productivity and backs inclusive development. The studies by Myovella et al., (2020) substantiated that digitalization positively contributed for the economic growth of Sub Saharan Africa (SSA) and OECD (Organization for Economic Co-operation and Development) countries. These studies, indicated the need and relevance of digital inclusive finance that is a blend of digital technology and inclusive finance for the betterment of vulnerable sections of the population.

Notwithstanding several policy initiatives taken by the Government of India (GoI) to reach the last mile, FI remains elusive for the ordinary man. While policy initiatives combined with reforms such as demonetisation (2016) and goods and services tax (GST; 2018) facilitated to boost the use of digital solutions, the COVID-19 pandemic has augmented the acceptance of digital financial solutions covering various social segments. Digital technologies have increased growth, extended opportunities, and enriched service delivery, still their collective effect has fallen short and is unequally spread (World Bank, 2016). To factor this, the Group of Twenty (G-20) nations and the World Bank championed eight high-level principles to accomplish DFI (GPFI, 2016).The GoI has been making determined endeavors to develop its digital infrastructure and allow access to financial services through the Unique Identity-Aadhaar and the Digital India Programme through which to provide public services through digital channels and to link rural areas with high speed internet. Another sweeping move towards digitisation is the move towards government-to-person (G2P) payments or direct benefit transfers (DBTs) (GPFI, 2017).

The rest of the paper is organized as follows: the second section presents the review of literature on the need, benefits, and measurements of FI, evolving digital ecosystem, regulation, and risk management in FI. The third section of the paper discusses on global DFI eco-system and reviews some selected DFI business models of selected countries. The section on BRICS country's performance on DFI and learnings are elaborated in section four. Section five in the paper deliberates on India's FI progress, policy, and evolving business model. The last section of the paper deals with the conclusion and future of DFI in India.

2. Literature Review

2.1 Need for FI

Recent years there have seen substantial attention towards FI. This is due to the need to confront poverty with an access to formal financial services, which guarantees the economic development of countries. In 2017, about 1.7 billion adults, which is around

31 percent of the world's adult population in the globe, did not have access to financial services (World Bank Group, 2018).

Yet, dearth of use does not inevitably mean lack of access. Some people may have access to financial services at an affordable prices, but they decide not to use them for religious and other reasons, while other people's access may be constrained by high costs for these services or due to regulatory hurdles or to meet higher levels of compliances. And so, the main issue is the degree to which lack of inclusion stems from the dearth of demand or the presence of obstacles that stop individuals and businesses from accessing financial services (World Bank Group, 2014). Thus, for a genuine consumer access to financial services the timely availability of consumer-friendly, comfortable and reasonably priced financial service is considered (Demirgüç-Kunt et al., 2017).

2.2 FI Benefits

Hannig and Jansen (2010) studied regional trends on FI and reached at positive findings about taking the FI measures in nations where 25 percent of families receive incomes equal to or below USD 2 per day. Jin (2017) obtained results on the influence of FI on wealth creation, decreasing poverty, and bettering social protection for citizens. As stated by Sarma and Pais (2011), the condition in the banking sector does not have a clear influence on financial affordability, unlike the ownership structure. But, Han and Melecky (2013) highlight the positive effect of measures to increase access to bank deposits as a traditional savings service on financial stability. Morgan and Pontines (2014) pronounced channels for increasing financial services availability, recognized the positive effects of increased inclusion, and focused on the deficiencies related to regulation and control. FI prospects of the population are determined by the contemporary trends of innovative development of the financial sector (Allen, 2012) under propagation of remote financial services, use of digital and mobile money and innovative systems. Financial innovation makes it possible to produce new products and services, develop effective data processing and storage models, aid to expand customer reach, decrease cost, and improve financial services delivery.

2.3 FI Measurement Metrics

FI is measured through the lens of consumer (individual and small business) access to formal financial services and is based on the absence of all kinds of impediments and hurdles (price and non-price) for their timely and complete receipt (Naumenkova, 2015). FI is evaluated on the basis of quantitative and qualitative indicators of access, quality, usage and impact. The access is measured through the accessibility of service infrastructure such as financial institutions, their branches and offices, technical amenities, agent network, means for remote access to services like internet, mobile communication, etc. The quality of financial services for consumers is gauged in terms of price affordability, uninterrupted services, effective consumer protection system, etc. The usage is measured through depth of financial services used by the consumer and their knowledge/literacy on available financial services, the impact of financial services on quality of life, etc. For a more thorough analysis of the impact factors and precise variances of various financial services across the countries Honohan (2008), Park and Mercado (2018) have developed a FI index.

2.4 DFI Ecosystem and Business Models

Fintech revolution opens new prospects for FI (Demirgüç-Kunt et al., 2018). This applies precisely to the use of digital money, mobile accounts (Sarma & Pais, 2011), and the issuance of biometric smart cards (Karthik et al., 2016). Changes in the payment system in the present environment and the likelihood of its usage for FI are covered in the WBG (World Bank Group) and BIS (Bank for International Settlements) joint document (World Bank Group, 2016). Klapper and Singer (2017) emphasized the benefits and challenges of implementing digital payments by public establishments to residents in the government-to-person (G2P) system. Gabor and Brooks (2017) studied the establishment of Fintech philanthropy development complexes that combine behavioural economics with forecasting algorithms via realizing the “Know Thy (Irrational) Customer” idea to hasten access to finance. Fintech innovations, such as mobile money, operate in an ecosystem of diverse players that compete and collaborate to achieve a common goal (Lagna & Ravishankar, 2021; Lee & Shin, 2018; Muthukannan et al., 2020). Innovation in digital eco-systems usually have one, or several, principal entities that help to define boundaries and coordinate between independent institutions (Jacobides et al., 2018; Senyo et al., 2019). Jacobides et al. (2018) suggest that innovation in ecosystems have multifaceted non-generic complementarities which are the unique competences of players and are not unilaterally hierarchically controlled.

New and old actors in DFS combine to offer unique capabilities in a Fintech ecosystem that contribute to innovation and complement one another (Lagna & Ravishankar, 2021; Lee & Shin, 2018; Muthukannan et al., 2020). Lee and Shin (2018) identify five interacting players in the Fintech eco-system – technology developers such as big data analytics, cloud computing, blockchain and social media developers creating digital solutions; FinTech firms, offering technology facilitated payments, wealth management, lending, crowdfunding, capital market and insurance services; government actors including financial regulators and legislature creating a steady regulatory environment; traditional financial institutions such as large commercial banks acting as the reliable custodians of money; and financial customers, who use and benefit from the services.

Established financial sector incumbents and institutions are challenged by Fintech-driven business models in relationships, governance mechanisms, products, services and markets (Gozman et al., 2018). Incumbent financial institutions react to protect their interests by revamping their processes, products and business models (Drummer et al., 2017). As many incumbents are restricted by legacy technologies and struggle to compete with the nimbleness of Fintech firms, they must work in partnership with them to access new technical capabilities or new markets and customers (Drummer et al., 2017).

Fintech firms, consecutively, rely on banks to access regulated markets and financial know-how and capital (Senyo & Karanasios, 2020). These synergetic relationships help to beat challenges of delivering services to the unbanked, such as the high levels of investment amidst long payback times, challenges of scaling-up, scarce financial infrastructure to allow interoperability between services and a balanced regulatory framework that attracts investments from banks and other actors. The relationship between the new and old actors not only defines the limits of activity (Jacobides et al., 2018), but also outlines the direction of FI (Leong et al., 2017).

DFS are facilitating entirely new business models that bring added services to the poor. Large e-commerce platforms and telecom operators have leveraged the capability

of DFS to aid payments to offer services such as ‘pay-as-you-go’ solar energy, insurance and lending. For instance, Ant Financial’s “310” loans need three minutes to apply, one second to approve and zero human communication. Platform based models for trading supply-chain invoices have facilitated MSMEs to leverage their receivables to access working capital. Elementary digital insurance products have arisen in Africa and South-Asia (Ceyla et al., 2020).

2.5 DFI Regulation

Recently in the field of remote financial services, there exist convergence and amalgamation of national models. This encourages the introduction of standard methods to the regulation of the financial sector and safeguarding the rights of financial services customers (Mishchenko et al., 2018). Besides, there is a blend of different forms of agency and remote servicing (World Bank Group, 2016). While many countries have begun to report on the basic facilitators for DFS to sustainably reach scale, DFS requires a more strong set of enabling elements to be in place to guarantee financial integrity, stability and competition. These policy enablers can be divided into three groups: favourable legal and regulatory frameworks; supporting financial and digital infrastructure; and supplementary government support systems.

Addressing these three areas requires policymakers to look at a wide range of grave issues which include: how to enable elementary digital connectivity and mobile-phone penetration; whether and how to authorize non-banks to have access to national payment infrastructure and to issue electronic money; how to enable and regulate extensive ‘agent networks’ that meet the need for the cashing-in and cashing-out of digital accounts because most countries remain cash based; implementing digital and biometric ID systems; how to enable access to government data platforms; how to ensure competition for DFS, considering leading platforms which engage in DFS; and how to regulate new actors that offer financial services (Ceyla et al., 2020).

2.6 Risk Management in DFI

Zimmerman and Baur (2016) pronounced managing the risks arising in the process of DFS; specifically, risk management in the area of mobile money and mobile accounts was explored by Jack and Suri (2014). Policymakers need to consider the risks posed by DFS and address them consequently. While the benefits of financial services for the poor are well recognized, they bring in risks to users and to the wider financial system. For users, data privacy anxieties arise from the data trails created by DFS which can expose them to unapproved disclosure, exploitation of personal data, and bias. Imbalanced access to technology and the ‘digital divide’ can exclude the poor, particularly women, from DFS.

Reaching large numbers of previously unserved individuals with DFS possibly exposes them to predatory lending and over-indebtedness. For the wider financial system, DFS presents cyber-security and operational risks from activities, such as hacking. Financial integrity could be endangered by use of crypto-assets, pre-paid cards and other tools that may enable individuals to evade Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) controls. DFS also pose challenges to competition authorities as large platforms leverage economies of scale and scope to increase concentration and dictate the provision of DFS. Finally, risks at the level of individual institution or infrastructure could spread over to the broader economy and pose macro-financial risks (Ceyla et al., 2020).

3. DFI Global Experience: Policy, Business Models and Impact

Over the last decade, 1.2 billion previously unbanked adults gained access to financial services, and the unbanked population fell by 35 percent, primarily boosted by the increase in mobile money accounts (World Bank, 2018), which indicates the potential of DFS in FI. In this section, ten DFI models from Africa, Asia, North and South America have been analysed with the aim of studying their business models, technologies deployed and policies that would help in advancement of DFS to the financially excluded and underserved populations in a considerable manner.

3.1 Innovative global DFI Models

Every Fintech has a unique business model that has been built to serve the financial needs of the target population of a certain country or geographical region. The business model and the products/services offered become relevant to the country because they help in addressing the specific problems faced by them. For instance, “Cropital” in Philippines, is aimed towards farmers and it becomes significant as 23 percent of the workforce of the country is engaged in farming activity. Similarly, the business model of each of these selected DFI models in this paper (Table 1) has made a noteworthy impact on its target population. Relevant aspects of these selected cases can be used to develop innovative models and policy frameworks for other countries to foster DFI to a significant scale with sustainable impact.

3.2 Emerging Technologies and Business Models

The world is now focusing on building fintech services like e-wallets or mobile-based consumer loans that help reach customers directly. But technology at the back end is undergoing massive transformations as well. Innovations that help banks and financial institutions evolve existing services or products enhance FI. In this backdrop, the B2C (business-to-consumer) and B2B (business-to-business) models are pivotal for such innovations.

The introduction of technology into financial services has evolved payment services, especially in reducing the cost of remittances and transactions and lessening merchant acquisition costs. Super apps and e-wallets are low-priced and user-friendly thereby helping payment companies acquire large customer bases. Smallholder farmers (farmers who own or/and cultivate less than 2.0 hectare of land) living in remote areas have poor and inadequate physical and financial infrastructure. Funders often consider this segment as high risk and costly to serve. Therefore, fintech companies working in this segment focus on assessing the risk more efficiently and reducing the cost. They employ machine learning and satellite imagery to analyze the farms and farming practices. Fintech companies like Crowde enable farmers to raise working capital through a crowdfunding platform that has a profit-sharing scheme. They calculate a customer’s credit score by assessing the type of crops and by their community connections. They also use GPS tracking in the creditworthiness assessment process and ultimately help their customers connect with potential buyers of their crops (Murthy & Faz, 2021).

Disparities in mobile phone ownership and literacy levels act as hindrances for the inclusion of women. Lack of ID/property rights and strict regulatory requirements make it difficult to accelerate FI of women. Therefore, fintech business models use alternative

techniques such as digital footprints and alternate credit scoring to deploy financial services (Sahay et al., 2020).

The use of new and forefront technologies plays a pivotal role in promoting FI and addresses some major concerns of financial exclusion such as inadequate education, lack of/no credit history, unavailability of valid identification, and geographic challenges. On analyzing ten fintech models from across the globe, it is seen that the use of emerging technologies has helped create a greater impact in terms of improving the well-being of disadvantaged groups.

Of the emerging technologies, Artificial intelligence (AI) and Machine learning (ML) are creating a new revolution with their rapid development and expanding reach, especially in developing countries. AI, ML, and crowdfunding technologies are helping customers, mainly entrepreneurs and SMEs, get better access to credit. Access to credit is crucial in FI as traditional banking institutions are often reluctant to extend credit to such borrowers due to a lack of data on credit history. ML algorithms help with credit scoring using alternate transactional data and thus, enable financial institutions to lend to credit-poor customers.

Crowdfunding technologies have also emerged as an efficient way of providing better access to finance. Fintech firms such as Crowde and Cropital have helped raise funds for MSMEs and farmers by employing crowdfunding technology. Digital Crowdfunding enables customers, who are excluded from traditional financial services, to raise capital through a digital platform thus expanding the investor base.

Financially excluded customers, MSMEs, and entrepreneurs now have improved digital connectivity with mobile devices becoming more affordable, access to better communication networks, and cheaper technology. A relevant example of this is Kenya's M-Pesa. M-Pesa has transformed the financial services sector of the country through its e-payment platform. Emerging technologies can streamline the credit application process and significantly reduce the cost of infrastructure and turn-around time.

3.3 Emerging Policies for DFI models

As we continue to walk on the road to recovery from COVID-19, now is the time to take stock, to build back stronger, more inclusively, and learn from our collective policy responses. Digital financial literacy as well as financial consumers and MSME protection policies will be key components to increase digitization, so that the vulnerable segments can truly benefit from DFS. Regulation is one among the main challenges for the deployment of mobile financial services, especially e-money and agent regulation. Lessons can be extrapolated from the various successfully deployed DFI models across different countries, the main driver of which have been innovative policies.

Kenya has the largest and most successful mobile money sector in Africa and has consistently led the continent both in scale and innovation. Regulatory flexibility has been a key enabler of this DFS expansion. The Competition Authority of Kenya (CAK) has taken action to promote greater competition in the market and lower fees for customers which led to a drop in the price of mobile money services leading to greater adoption by customers.

The World Bank's CGAP played a crucial role in the development of DFS in Ghana by allowing mobile networks in the country to innovate. Ghana allowed non-banks – specifically mobile network operators – to issue e-money, which was earlier the exclusive

domain of traditional financial institutions. The Government of Ghana has taken further steps to foster an inclusive digital financial system through the passage of the Payment Systems and Services Act in 2019 which would open the country's fintech infrastructure and represent an unprecedented opportunity to expand the adoption and use of DFS. Bank of Ghana took DFS growth to the next level in 2018 through its policy which mandated all mobile money providers to be connected to the Ghana Interbank Payment and Settlement Systems Limited (GhIPSS) infrastructure, enabling full interoperability between mobile money providers and banks (Pazarbasioglu et al., 2020).

Bangladesh's regulatory changes in 2011 allowed banks to establish regulated subsidiaries offering mobile banking services. The guidelines specified that bank, with the oversight of the central bank, should be the lead partner in any mobile financial services venture which eventually led BRAC Bank to establish bKash as a subsidiary (International Finance Corporation, 2018). In Indonesia, they adopt a principle-based approach in regulating the industry in order to create a conducive Fintech Lending ecosystem that ensures customer protection while supporting innovation (PwC-Indonesia, 2019).

Brazil has the largest share of adults receiving government payments into a financial account or a card. The latter likely reflects the success of Brazil's cash transfer program *Bolsa Familia*, channelling monthly allowances to around 13.8 million families through debit cards in 2020. Brazil adopted its FI strategy as early as 2011 and was also a forerunner in adopting a law on payment institutions including electronic money issuers in 2013. In 2018, Brazil passed legislation to allow the issuance of digital invoices that can be used as collateral by firms to get a loan, and in 2020, created "segregated rural properties," which can be easily transferred to creditors in case of default and are expected to support rural producers' access to credit (Rousset et al., 2021).

4. DFI in BRICS Countries: An Analysis

The world's emerging economies and political power centers are Brazil, Russia, India, China, and South Africa (BRICS). The phrase was originally used in 2001 to emphasize the importance of these rising economies, which at that time only comprised Brazil, Russia, India, and China as BRIC countries (Bhurat, 2019). In BRICS countries the push for greater FI is both urgent and justified with a focus towards the inclusion of most vulnerable and low-income groups. The BRICS countries have adopted progressive regulation for the development of the financial sector with a diverse range of financial services, from banking to insurance and equities, at an affordable cost for the users.

In the next subsection 4.1 (a) & (b), the DFI in BRICS countries are assessed through two broad dimensions: (i) Access to financial services, and (ii) Usage of financial services. The High Level Policy Guidelines (HLPGs) achievements of BRICS are discussed in sub-section 4.2.

4.1 (a) Access to Financial Services

The access to financial services are measured through three parameters namely – (i) the number of Automated Teller Machines (ATMs); (ii) the number of bank branches; and (iii) internet connection. When comparing India with other BRICS countries and the developing economies, India falls far behind in all three key financial access parameters.

According to Global Findex (2017), Russia has the greatest number of ATMs among the BRICS nations, followed by Brazil, China, and India. Russia accounted for about 164 ATMs per 100,000 adults by 2017 (figure 1). According to figure 1, the number of ATMs per 100,000 adults in Russia has steadily decreased from 2011 to 2017. India has been behind these nations. But it may be deduced that individuals migrated away from physical transactions and toward digital transactions. As a result, India may have made strides in digital banking services.

Further, wide variations are found in the number of bank branches per 100,000 adults across the BRICS countries (figure 2). There is a gradual decline in the number of commercial bank branches per 100,000 adults in Russia. Brazil's number of branches has increased by a small number during the period 2011 and 2014, but declined in 2017. India has recorded gradual increase in the number of bank branches from 2011 to 2017.

While, BRICS countries are trying to promote formal financial access to people, the most important factor for digital financial access is the access to the Internet. During 2017, the percentage of the population with more than 15 years of age, who have reported having access to the internet in their homes, was highest for Russia among all BRICS nations. However, during 2017, India's position in access to internet facilities is lowest among the BRICS countries (Figure 3).

4.1 (b) Usage of Financial Services

When it comes to usage of financial services, there are three important factors, namely, (i) bank accounts with adults aged 15 years and above; (ii) number of credit and debit cards ownership for adults; and (iii) made digital payments in the past year.

According to Global Findex (2017) data, in all BRICS countries an increase in adults having a bank account is observed. The number of adults having bank accounts in India and China has increased much faster than Brazil and South Africa. In BRICS nations as a whole, poor people make up a disproportionate part of the unbanked, while account ownership is significantly greater among individuals in the top 60 percent of households. In India, 79.88 percent of people 'over the age of 15' have a bank account. However, women continue to trail well behind males in having the banking account across the globe, with 65 percent of women having an account compared to 72 percent of men, a seven-percentage point disparity. Within the BRICS, Russia and South Africa have more women than male bank accounts, whereas Brazil, China, and India have a 5, 8 and 6 percent gender disparity, respectively (figure 4).

Over the years, India has improved to a great extent in account ownership due to the Pradhan Mantri Jan Dhan Yojana (PMJDY). Among the BRICS nations, India is uniquely positioned in account ownership for the population of above 15 years age (figure 4).

Another measure of usage is the ownership of credit card and debit card by population of above the age of 15 years. As depicted in figure 6 except for South Africa, all BRICS nations have witnessed a considerable growth in debit card ownership in the last six years. However, all BRICS countries have seen an increase in credit card ownership among persons over the age of 15 years. Among the BRICS nations, Brazil has shown the lowest credit card ownership growth (figure 5). South Africa saw a significant rise (13 percent) in 2014 compared to 2011, but a decrease (8 percent) in 2017. Debit card ownership in South Africa (figure 6) has been seen to be the same as credit card

ownership for persons aged 15 and up. Even in India, debit card ownership has increased significantly, rising from 8 percent in 2011 to about 32 percent in 2017.

The increased usage of DFS is mostly due to government relaxations and new approaches, private players adopting remote business and payment models. The major increase can be seen in the Russian Federation (62 percent in 2017) and China (61 percent in 2017) for making digital payments with people aged 15 and above. It is expected that there would be a good increase in coming years for all BRICS nations. The COVID-19 initiative has increased the focus on all elements of DFI. FI enabled by technology is a critical component of the endeavour to meet the United Nations Sustainable Development Goals (SDGs) by 2030. India has also seen a small increase in digital payments from 16 percent in 2014 to 20 percent in 2017 (figure 7). Due to the pandemic, there may be a large -scale increase in the digital adoption across the BRICS nations, more specifically in India.

4.2 Implementation of High-Level Policy Guidelines (HLPG) in BRICS

An initiative and full-fledged campaign for DFI by the G20 committee, the HLPG stands for High Level Policy Guidelines, which is an effort to lead the DFI trajectory for nations, recommending them substantial goals to achieve in the FI domain with the aid of Digital advances. The BRICS countries have been able to implement the HLPGs and have accomplished a lot too. ‘The BRICS Digital Financial Inclusion Report’, India, 2021 and the central banks of BRICS have provided this following status on the HLPG accomplishment:

HLPG 1: The focus is on promoting and developing a healthy digital environment, interoperable payment systems and infrastructure. In this particular domain, *Brazilian Instant Payment System (Pix)* and *Indian Instant Real Time Payment System Unified Payment Interface (UPI)* have been doing a tremendous job on every aspect, right from regulation, convenience, and interoperability to transaction handling, infrastructure, etc. On the other hand, *Faster Payments System (FPS)* in Russia, *China National Automatic Payment System (CNAPS)* in China and *South African Multiple Option Settlement System (SAMOS)* have been at various stages of their implementation.

HLPG 2: The focus is on encouraging availability and affordability of digital financial products, safeguarding of AML/CFL, digital identity systems. Brazil is at the forefront of AML/CFL safeguarding with their latest March 2021 resolution, whereas, the other countries are working on their outdated policies and researching on their digital inefficiencies.

HLPG 3: The focus is on to improve the availability and accuracy of disaggregated data with regard to access and the use of financial products and services. The details on the current status of the HLPG is not available.

HLPG 4: The focus is to support the adoption of targeted policies and initiatives in national strategies. All the countries have been incorporating policy goals to their budget and national goals, Brazil have *ESTRATÉGIA NACIONAL DE CIÊNCIA, TECNOLOGIA (ENCTI)*, Russian *Digital Economy of the Russian Federation* vision, Indian *Science, Technology, and Innovation Policy (STIP)*, Chinese 12th Five Year Plan with various DFI goals and South Africa has its *Protection of Personal Information Act (POPIA)*. The Indian STIP Policy is the most recent one out of this all and it encompasses major DFI inclusion pointers.

HLPG 5: The focus is to support regulatory and legal reforms that reduce unequal access to responsible DFS. All the countries have been perpetually trying to eradicate the gap in accessibility and facilities. Brazil has started implementing *Brazilian Open Banking Project* (BOBP) from February 2021, Russia has outdone its peers and has taken a very positive step to include the elderly and *Person with Disabilities* (PWD) in their FI during 2018-2021 strategy, and this has been the top priority for them. India's Jan Dhan-Aadhaar-Mobile (JAM) trinity has also been much appreciated and was a substantially well accomplished step towards incorporating remotely located excluded citizens in the financing milieu. China's Guidelines on Promoting Sound Development of Internet Finance in July 2015, and South Africa's efforts to enhance and provide the insurance services to every citizen was also a favourable step towards equal accessibility.

HLPG 6: The focus is on to consider developing a regulatory framework that supports responsible innovation in private and public sectors. The details on the current status of the HLPG is not available.

HLPG 7: The focus is to enhance financial, business and digital literacy and capabilities through targeted interventions and by leveraging technology. Brazil's Central Bank of Brazil (BCB) launched the *Aprender Valor Program* in 2019 with a view to offering ready-to-use classroom projects for teachers, the program is aligned with the OECD's recommendation. Russian central bank, the Bank of Russia (BoR) launched its mobile application (app) 'CB online' in August 2020, which helps in connecting all the consumers through chat and verify financial news as well as connect the officials for resolutions. India's *The National Strategy for Financial Inclusion* (NSFI): 2019-2024 and the mission of *National Centre for Financial Education* (NCFE), (set-up by NSFI as a Non-Profit entity) is to undertake financial education campaigns to help people manage money more effectively, achieve financial well-being by accessing appropriate financial products and services. Chinese financial awareness policy is the most elaborate as well as thoroughly organized one. China's State Council issued during June 2021, a National Action Plan for Scientific Literacy – 2021-2035 with an objective to achieve 15 percent scientifically literate citizens by 2025 and 25 percent target by 2035. The Plan targets five priority groups — teenagers, farmers, industrial workers, elderly and civil servants and officials, especially in rural regions. In South Africa, the Financial Sector Conduct Authority (FSCA) is mandated to provide, promote, and support financial education, awareness and confidence regarding financial products, institutions and services. The FSCA has launched the 'My Life, My Money' consumer education website with a view to assist consumers to make their financial decisions and other services as well.

HLPG 8: The focus is to support financial consumer protection measures including data protection that address the needs of youth, women and SMEs. The Brazilian government launched a mobile app 'Caixa TEM', which enables the citizens to request emergency services through this app. According to the Ministry of Citizenship of Brazil, the benefit of this scheme reached more than 126 million people or 60 percent of the Brazilian population. Although the privacy norms were too generic in Brazilian data law 2008, CAIXA also worked on that and improved upon that too. In 2009, Bank of Russia (BoR) included a separate complaint window on their website, in 2005, for transparency, they launched 'Bank of Russia Online Reception' software to automate its complaints handling processes. During 2020, BoR received around 165.6 thousand complaints/queries, of which around 50 percent of the queries are related to financial sector. In India, RBI has its own Ombudsman Scheme (January 2019). In 2019-2020, 2,481 complaints were handled by the Ombudsman for digital transactions, with 91

percent complaints getting resolved. The Financial Sector Regulation (FSR) Act of South Africa was put into effect in 2018 and it introduced a Twin Peaks model of financial regulation for the country. The Financial Sector Conduct Authority (FSCA) also actively scans and cautions South African consumers against potentially harmful individuals and firms that are either operating without the required authorization, operating in a fraudulent manner, or in breach of financial sector laws/compliances.

5. DFI in India: Journey and Policies

In India, FI has been defined as “the process of ensuring access to financial services, timely and adequate credit for vulnerable groups such as weaker sections and low-income groups at an affordable cost” (Rangarajan, 2008). The country's journey toward FI can be traced back to the 1950s, when the focus was on providing credit to underdeveloped sections of the economy and lower socioeconomic groups. Various initiatives have been implemented over the years, including branch expansion, the introduction of Priority Sector Lending (PSL), the launch of the Lead Bank Scheme, the promotion of Self-Help Groups (SHGs), Joint Liability Groups (JLGs), and the implementation of the Business Correspondents (BC) model, to name a few.

The installation of brick-and-mortar branches, which have been supplemented by the BC model, has aided the spread of the banking system across the country. The scope and reach of FI have accelerated in recent years. The depth of DFS has increased significantly as a result of technological advancements and application. The JAM ecosystem has significantly altered the landscape of FI (Mondal, 2020). India's rise in DFI has been powered by significant innovation in both the public and private sectors. One of the major drivers has been government policy that explicitly supports access to the financial system as a tool for poverty reduction and inclusive growth. In the private sector it started with the launch of Paytm wallet in January 2014 which was followed by OLA Money, Jio Payments Bank, WhatsApp Pay and others. In public sector banks, accounts have been opened for the majority of Indian residents via the government's Pradhan Mantri Jan Dhan Yojana (PMJDY) scheme, and these accounts have become the default channel for government payments, such as through the Direct Benefit Transfer (DBT) system. The goal is to surpass more traditional financial access models by tying bank accounts to biometric identity, the Aadhaar and phone numbers.

The government has promoted a differentiated banking model in which companies such as mobile network operators (MNOs) and fintechs can provide banking services under a Payment Bank licence, while microfinance institutions (MFIs) are encouraged to use technology to align with the market and as an incentive for their growth into Small Finance Banks through the licencing of new tiers of financial institutions (Vinay Kandpal & Rajat Mehrotra, 2019). The government's abrupt demonetization campaign in November 2016 gave the growth of digital payments a one-time boost. The government has also prioritised the private sector's development of enabling infrastructure, such as digital identity and payment technology. The UPI, which has grown to become the major form of digital payment, surpassing debit cards and pre-paid wallets, is the best example of this. UPI is developed and managed by the National Payments Corporation of India (NPCI), a collaborative initiative of the RBI and the banking sector.

Some of the challenges that India faced during its journey towards DFI includes, challenge to overcome the geographical access, cost of inclusion which included high

interest rates (Arun & Kamath, 2015) and high transaction costs for low value transactions (Varghese & Viswanathan, 2018), inadequate financial products and services and financial literacy which accounted for only 11.3 percent of rural households (NAFIS, 2017).

5.1 Glimpse of India's FI Policy and Initiatives

The Table 2 presents some of the selected FI policy and initiatives of government of India, RBI, banks and other stakeholders from 2005 to 2021.

5.2 Progress of Digital FI in India

Growth of digital payments in India can be classified as pre and post demonetization (2016). Demonetization led to significant growth in the digital infrastructure of Indian economy. Table 3 presents various major payment system indicators from the year 2012. As classified before, in pre demonetization period that is from 2013-16, the payment system indicators increased slowly and steadily. But we don't see the similar trend during the post demonetization period, post demonetization the digital payment transactions and indicators increased drastically from 2016-21. The annual turnover in volume as well as value of digital transactions has increased from 2013-21.

The digital payments in India have shown upward trends, both from value and volume of transactions during 2013 to 2021 (figure 8). Post demonetization (2016) there is a rise in some of the retail digital payments (figure 9), more specifically UPI based digital payments.

The outbreak of Covid 19 pandemic played a major role in adoption of digital transactions, especially the mobile banking transactions. Due to the complete lockdown that took place from March 2020, the physical need of cash has reduced which has led to the growth of digital payments through various modes such as mobiles phones, tablets and computers. The Table 4 and figure 10 and 11 presents month-wise mobile banking transactions and its growth rate both in volume as well as in value in the banking industry after the onset of the Covid-19 pandemic.

Along with the Covid 19 pandemic as we discussed above, demonetization also played a significant role in the adoption of mobile banking transactions. Figure 12 shows the mobile money transactions per 100,000 adults before and after demonetisation. It is clear from the figure that the mobile money transactions per 100,000 adults was around 733 in 2013 and which was grown to 31,790 in 2017 with annual compound growth rate of 113 percent.

The International Monetary Fund (IMF) through its financial access survey (FAS) has published various FI indicators. The table 5 presents progress of various (digital) FI data from 2015 to 2020 in India.

The number of ATMs per 1000 square kilometre (61.93 to 73.67) and ATMs for 100000 adults (19.64 to 21.49) has increased during the period 2015 to 2020. The number of commercial bank branches per 1000 square kilometre was 42.62 in 2015 and it has increased to 50.53 in 2020. Similarly the number of commercial bank branches per 100000 adult population was 13.51 in 2015 and it has increased to 14.74 in 2020. The table also reveals that the outstanding deposits (64.78 to 71.62) and credit (49.94 to 53.70) with commercial banks as a percentage of GDP has increased during the period

2015 to 2020. The number of registered mobile money accounts per 1,000 adults has increased from 73.29 in 2015 to 1671.54 in 2020. It is also evident from the table that the value of mobile money transactions as a percentage of GDP has increased from 0.05 in 2015 to 0.93 in 2020. Further, the outstanding small and medium enterprise (SME) loans from commercial banks as a percentage of GDP has increased during the reference period.

The figure 13 represents the internet penetration rate in India from 2007 to 2021. It is apparent from the figure that there is a sharp increase in the internet penetration rate from 2015. Interestingly, during lockdown and post lockdown the usage of internet has increased more than 10 percent. The penetration of internet facilities has greatly contributed for the deepening of DFI.

5.3 The Rise of Digital Start-up and Fintech for deepening of DFI

With the growth in digitalization in the past one decade, an exponential growth has been witnessed in the number of innovative tech-based business models coming up to give a share in the FI in multiple ways. A few such ventures having unique business model supporting various target groups such as farmers, MSMEs, women, school students, etc., have been analyzed to understand the digital innovations across many sectors and economies. The brief discussion on these innovative business models are presented in this sub-section and further details are available in Annexure 1(a).

(i) Instamojo: Started as a simple payment solution company, Instamojo now offers one of the most affordable e-Commerce platforms in India being trusted by more than 2,000,000 plus MSMEs, start-ups and small businesses. The offerings of the company include diverse range of products for all types of need of the businesses making it a one-point solution to all the problems without any setup fee or annual charges being paid by the businesses.

(ii) Lendingkart: It is a market place lending company which acts as an intermediary between partnered lenders and borrowers by providing unique proprietary algorithm-based underwriting thus making the lending quick and hassle free for the borrowers in turn reducing the counterparty risk faced by the lenders due to traditional methods of underwriting.

(iii) Mswipe: Making digital transactions easier, Mswipe has made it possible by providing handy and affordable POS solutions to SMEs. It provides a range of such products.

(iv) Khatabook has been accepted as one of the most unique business models providing Software as a Service (SaaS) to small businesses and facilitating maintenance of digital ledger on a few clicks along with ancillary features such as reports, payment links and QR code thus incorporating a culture of proper trail maintenance and empowering every contributor to the economy.

(v) Neogrowth: The supply chain finance acts as a thread in competition of regular operations by providing finance involving both buyers and sellers into it. One such company is *Neogrowth* which gives credit based on its unique model of evaluating the future transactions (sale) of small and medium businesses using various types of digital POS methods for payment collections. Data is used to develop business rules, and an innovative credit risk score method is used in their automated underwriting.

(vi) Avail Finance: It is an innovative business model catering the needs of the salaried class. This fintech aims to offer credit facility to those blue collared workforce who generally face difficulty in availing finance from banks due to lack of collateral or documents. Such credits are not specific to one need of these people and can help in increasing the overall standard of living and education of such families.

(vii) Capital Float: It offers a tailor-made credit platform offering various personal and business finance products using its API based auto data pull technology and algorithms for application review in real time.

(viii) Financepeer & Shiksha Finance: Right to education is one of the fundamental rights of every child. With the aim to ensure affordable education and reduce economic disparity, some modern days ventures have come up with innovative loan products. *Financepeer*, a google incubated and RBI governed NBFC provides personal loan for school education. It is a platform that manages to minimise economic disparities and influence the lives of millions of people. *Shiksha Finance* is yet another digital lending platform ensuring access to quality education to the bottom of the pyramid. These platforms play an important role in DFI not just by the method of disbursement of the loans, but also in the tech-based credit worthiness evaluation increasing the scope of bringing together the unconnected dots in the formal economy.

(ix) Jai Kisan: It is a Mumbai based fintech offering innovative finance solutions to the farmers for various needs. They help farmers comprehend their financial situation by digitizing their finances and agricultural capacities for financial institutions using a next-generation/hyper-localized agriculture credit score. For the vendors of the products and services it finances, the platform also provides securitization solutions and a tech-driven value proposition. It also relies on a network of tech-enabled channel partner retailers to help find new clients, as well as the existing vendor network.

5.4 Innovative use cases from Banks on DFI

Indian banking and financial sector has witnessed some major partnerships with technology firms to bring about a change in the society and the economy at a large. A few such initiatives from the banking sector have been analyzed briefly in this sub-section of the paper and further details are available in Annexure 1(b).

- (i) HDFC's Milk-To-Money** terminals are multipurpose terminals that give a transparent way for farmers to be paid precisely according to the quality of milk provided, removing any mistakes or inconsistencies. Farmers' accounts are electronically credited, and they may instantly take funds from cash dispensers if necessary. It automates the whole payment process, assisting in the creation of a viable support environment for small and marginal dairy producers. It also includes opening up zero balance accounts and financial literacy programme for the dairy farmers. Micro ATMs for simple banking activities and Missed Call Banking on mobile phones are among the services offered by HDFC Bank as part of its 'Go Digital' initiative.
- (ii) Paytm Payment Bank's Ashakiran Programme** was created to provide technology and information to rural women in order to help them achieve a brighter future. By 2020, their goal was to educate one million rural women about financial services and to enrol 200,000 women in formal banking institutions. They would

give impoverished women with skill development possibilities, allowing them to work as business correspondents.

- (iii) **PNB LenS:** The lending system is an IT-based loan management solution launched by the Punjab National Bank (PNB). This method is being phased in for all types of loans, namely MSME, agriculture, retail, and other credit up to Rs. 25 crore. The digital mechanism uses data analytics, end-to-end digital lending has been facilitated through pre-approved personal loans. The goal is to speed up loan processing and credit proposal sanctioning while maintaining uniformity in underwriting criteria.
- (iv) **Suraksha Salary:** Airtel Payments Bank introduced Suraksha Salary Account keeping in mind the MSMEs and other businesses which will be able to conduct cashless payments as well as offer their employees with a financial safety using this unique account structure. Given the limited penetration of insurance in India, Suraksha Salary Account also offers additional perks such as Hospicash Insurance and Personal Accidental Insurance thus ensuring access to various financial products by small business and individuals associated with them
- (v) **BOB NOWW:** With the goal of providing superior service to each and every client, Bank of Baroda's BOB NOWW is supported by five pillars i.e., 'Mobile first,' 'Digital-led experience,' 'Reimagined network,' 'Unlocked growth potential,' and 'New methods of working'. These activities are aimed at maximizing development potential and adding value to all parties involved. Customers will interact with the bank primarily through its mobile application. Customers will increasingly use their mobile phones to satisfy their banking needs, with the exception of a few services that are better offered in a branch.
- (vi) **Axis Sahyog:** Since 2018, Axis Bank has been running a comprehensive Financial Literacy Program called Axis Sahyog, which is a retail microfinance initiative aimed at increasing FI and deepening financial literacy among women from economically disadvantaged backgrounds in both rural and urban India. Financial literacy initiatives, better knowledge of family health and hygiene, and awareness of key government programmes like as the Pradhan Mantri Mudra Yojana (PMMY) and PMJDY are all part of the programme.
- (vii) **ICICI Digital Village:** The ICICI bank has piloted the "ICICI Digital Village" in Akodara, Gujarat's Sabarkantha District, to help people use technology in a variety of areas including banking, payments, education, and healthcare. After its's success, ICICI Bank vowed to turn 100 villages throughout the nation into ICICI Digital Villages within 100 days.
- (viii) **Artoo:** Ujjivan Small Finance Bank's digital field application powered by Artoo, which is a cloud-based platform, digitizes the whole credit process, including loan creation and underwriting, allowing field officers to enter client data directly into the system using their phones or tablets.

6. Discussion, Policy Implications and Conclusion

6.1 Implications for India from Global DFI initiatives

As per a report of World Bank on DFS, India is currently at Stage two of digital transformation in the financial sector. Along the evolution trajectory, different policy

actions and enablers become increasingly relevant for further growth and adoption of DFS. The main policy clusters that India needs to focus on and keep improving in are encouraging conducive legal and regulatory frameworks, continue to enable financial and digital infrastructure and capacitate more ancillary government support systems. Some of the pertinent implications for India gathered from this study of the various DFS business models and policies of different countries across stages, have been summed up as follows:

- i. Establishing credit infrastructure and enhancing coverage of credit relevant data can prove to be an impetus to more responsible lending and simultaneously lowering cost of funds by eliminating or reducing the fundamental challenge of information asymmetry.
- ii. Ensuring high penetration of smartphones and internet connectivity across geographical areas.
- iii. Establish a comprehensive regulatory framework for DFS providers.
- iv. Adopt comprehensive legal measures for data protection and privacy- Policymakers have to lay down rules to ensure clear and timely disclosure by standardizing total-cost metrics for mobile money products and remittances, requiring pricing information to be provided before transactions are undertaken, and adapting disclosure for mobile phone screens.
- v. “Test & learn” regulatory approach can be feasible for India which involves the creation of a custom framework for each individual business case, allowing it to function in a live environment, with close supervisory attention.
- vi. Bringing in more policies to generate demand for DFS and incentivizing switching away from cash are required alongside efforts to augment the availability of DFS. Better awareness of the benefits of using DFS and the adoption of digital financial tools can motivate and make it easier for informal firms to register and operate in the formal economy.
- vii. Subsidies and other tax inducements can be used to encourage both businesses and consumers to adopt DFS. The Government needs to leverage DFS for contributing to and accelerating steps toward formalizing areas like registration, tax payments and compliance with labour, health, safety, and environmental laws and regulations.
- viii. The government has made several attempts, such as the Digital India programme, to equip a significant portion of the country with basic digital literacy skills. However, in order for the entire population to benefit from DFI, this newly acquired literacy must now be channelized into economic activities thus enabling people to participate in the digital economy.
- ix. Despite the huge amount of innovation from outside the banking sector, such as fintech and global IT companies, it should all work together with the banking sector and use its infrastructure. Many innovations can be seen to serve only select segments and are better for wealthy urban people. This means innovation and outreach do not benefit those who have low-income and the marginalized.

6.2 Implications from BRICS DFI initiatives to India

Many FI programs, including the PMJDY, DBT, Atal Pension Yojana, and RuPay cards, have accelerated the digital revolution and brought more citizens, particularly in rural areas, within the reach of DFS in India. However, India still has to go a big way to ease up the process of financial access to the financial services. Brazil has already begun to mandate the supply of fundamental banking services. The accepted best practices, such as basic accounts in Brazil, it highlights first, access to money transfer methods and the payments system and second, deposit facilities. Based on banking licenses issued by the Bank of Russia, banks and non-bank financial entities provide financial services to consumers. A basic license allows for easier regulation, but it also comes with a number of restrictions. One-thirds of Russia's banks have basic licenses. With over 560 million internet users, India is the world's second biggest online market, after only China. It is expected that by 2023, India would have more than 650 million internet users.

Significant innovation in both the public and commercial sectors has propelled the rise of DFI in India. To reduce the immediate economic impact and support the financial sector, the Russian government and central bank announced a series of policy measures aimed at injecting liquidity and easing monetary conditions, supporting the banking sector and stabilizing financial markets and providing non-financial support. By the end of June 2020, outstanding loans to China's SMEs and agricultural areas amounted to 40.7 trillion yuan and 37.8 trillion yuan. This corresponds to 24% and 22% of the total loans of financial institutions. India is better than Brazil, Russia and South Africa with respect to the number of people with bank accounts.

The governments of BRICS nations have placed a large stake on technology in order to achieve quick growth in account opening. Because of increased internet availability and smartphone usage, the future of banking in India is projected to be more digital.

Brazil has been implementing their March 2021 policies for 'Encouraging availability and affordability of digital financial products, safeguarding of AML/CFL, digital identity systems', whereas, India's policy on the same stance has been a bit old and doesn't encompass the vital elements given the ever-changing nature of technology and threats. India needs to formulate policies on the above at earliest. To 'support regulatory and legal reforms that reduce unequal access to responsible DFS', India should draw lessons from Russia, where the govt. has put in a lot of efforts to eradicate the gaps among the citizens as well as given special attention to welcome and include the elderly and PwD people.

The South African Financial Sector Conduct Authority has launched the 'My Life, My Money' consumer education website with a view to assist consumers to make their financial decisions and other services as well. And to comply with HPLG 7 - 'Enhance financial, business and digital literacy and capabilities through targeted interventions and by leveraging technology', Brazil's Aprender Valor Program is very effective and India could follow that by training the classroom teachers and making the people aware enough to make wise financial decisions.

6.3 Conclusion and way forward

There are two parts to improving DFS. First and foremost, it entails integrating every individual into the country's official financial system. Increased access to finance

also necessitates that the digital financial infrastructure be built and executed in such a way that there is no longer a large gap in FI among the poor. Second, ongoing innovation is required to keep consumers from abandoning the formal financial system in favour of private financial products and services, in part by making them more convenient to use within the system.

In September 2020, RBI has updated its OVD (Officially Valid Documents) list and has added “Proof of possession of Aadhaar number” for opening a bank account. However, applicants can use their Aadhaar card for identity and address verification on a voluntary basis only. It is not mandatory to furnish Aadhaar to open a bank account at present. In addition to the bank account, Indian residents can use the Aadhaar card as a proof of identity and address for getting a new SIM card as well. After this move, banks will now be able to go for Aadhaar authentication or offline verification of customers who provide Aadhaar on a voluntary basis. This stance by RBI will enhance bank account opening and authentication mechanism among unbanked and underbanked people, besides it will also enable them to quickly get a mobile SIM connection.

To incentivise and codify the benefits of disruption within the regulatory framework, India has implemented a public sector "stack" architecture. India also shows how various policy reforms related to digital finance, such as the transformation of the traditional banking system with the central bank (regulatory authority) playing a significant role, can address a variety of financial development challenges, including those that previously seemed insurmountable. Stack generation rails can be created in parallel or in sequence, and they have a tremendous combinatorial effect not only in terms of FI, but also in terms of social protection and greater access to government services.

Digital payment products in India are sometimes extremely complex and inappropriate to the needs of mass market customers. Designers of digital banking systems should draw lessons from companies like Facebook, Google, WhatsApp and YouTube, which provide relatively better user experiences and have effectively reached low-income areas. UPI and Bharat Interface for Money (BHIM) have established the standard for a streamlined user experience for digital payments, with few clicks and no distractions. The challenge for competitors and new suppliers is to keep simplifying and innovating around product design and user interfaces to make digital payments easier and more comfortable for individuals.

One of the development industry's responsibilities is to assist in the development of more socially conscious business models. Support can be offered to digital finance models that especially target women or the rural poor, for example, so that they can focus on making an impact in their target markets without being distracted.

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Table 1: Some Select DFI Models implemented in various countries across the globe

<i>Country</i>	<i>DFI Model</i>	<i>Business Model</i>	<i>Technology used</i>	<i>Products/ Services</i>	<i>Impact</i>
Bangladesh	bKash	Started as joint venture between BRAC Bank Limited, Bangladesh and Money in Motion LLC, USA, bKash Ltd. Later attracted International Finance Corporation (IFC) and Ant Financial as equity partners, and Bill & Melinda Gates Foundation became the equity investor of the company.	Builds multiple distribution partnerships for dense coverage, Uses existing distribution infrastructure, bKash accounts run on a fully encrypted VISA technology platform for free. Its simple interface can be accessed by the cheapest (i.e. \$15) handsets.	Cash in, Cash out, Interest against saving, Mobile recharge, send money, Loan Repayments, Foreign Remittance, ATM withdrawal, Salary Disbursement, merchant payment	110 million transactions are conducted through bKash every month, enabling the unbanked to access financial services and gain a foothold on the ladder to FI. It facilitates disbursement of various types of financial grants to targeted recipients on behalf of NGOs and other institution. bKash has increased the efficiency of Bangladesh's \$200 billion economy.
Philippines	Cropital	The business works by allowing people to choose a farm to invest in from a list of approved farms. The team manages the funds and helps farmers get crop insurance and capital to protect against weather and pest risks, and once the farm receives the fund, investors get their returns.	Users can invest either through direct investment (using an e-wallet) or pledges. Pledge, ideal for users who do not have virtual wallets, gives users three days to deposit the money and invest in a farm of their choice. A memorandum of agreement is sent to users once the farm receives the funding.	Crowdfunding platform that enables individuals to help finance farmers	To date, the firm has provided financial support to around 560 farmers across the Philippines. Through low-cost and sustainable investment methods, the enterprise supports farmers, promotes inclusive growth, reduces poverty, and ensures food security.
Indonesia	Crowde	Provides access to people who are willing to invest their funds in farmers who produce poultry, beef, fish, chili or rice and share in the profits made. The field agents visit across Indonesian villages to convince the farmers to sign up.	Uses a crowdfunding platform that has a profit-sharing scheme. Calculates a customer's credit score by assessing the type of crops and by their community connections. GPS tracking is employed in the creditworthiness assessment process and connects	Peer-to-peer lending, Crowd funding, financial education	Currently works with more than 14,000 farmers, 500 agriculture suppliers, and 132 agriculture buyers, and partners with several banks in Indonesia, they also work with village administrations and Disadvantaged Regions to help the people by providing hands-on training

<i>Country</i>	<i>DFI Model</i>	<i>Business Model</i>	<i>Technology used</i>	<i>Products/ Services</i>	<i>Impact</i>
			customers with potential buyers of their crops.		and expert farming consultation
South Africa	JUMO ¹	Uses non-traditional data points (mobile wallet transaction data, GSM records) with the help of mobile network operators such as Tigo, Airtel and MTN Group, to do credit analysis of each loan applicant. This distinctive credit model that leverages digital data is apt for customers who have no account ownership or credit history. The model also requires no in-person customer interactions as the entire process is automated.	AI & Machine Learning: Aimed at providing products for people with no former credit history or collateral, JUMO uses AI and ML to formulate accurate credit scores.	Portfolio strategy & analytics: Provides eMoney service, and all reporting, analytics and insight needed to offer individualised financial services; Provides a platform for their partners to offer customers loans and savings; Offer digital banking experience services through 'Core' and 'Unify'	(i) Has helped micro-entrepreneurs attain access to easy loan, (ii) Has helped create employment through their ecosystem, (iii) Has helped provide opportunities to women and strengthen their position
USA	Juntos Finanzas ²	Customized text messages are sent to customers reminding them to save and become active users of the banking services. Customers can utilize a platform to respond and provide more information on personal financial needs and goals and this information is used for future communications.	Developed a tool that uses advantage of behavioural research and design, technology, customer data analytics, and real-time customer interaction to send customized text messages.	Artificial intelligence-enabled automated SMS conversation service	Bancolombia (Financial services company based in Columbia) partnered with the firm to increase usage among customers with largely inactive payroll or social benefit payment accounts. Through the venture, the bank increased the use of agents and mobile channels among new customers, lowering costs for the bank and customers.

1 <https://www.jumo.world/>

2 <https://www.centerforfinancialinclusion.org/juntos-harnesses-artificial-intelligence-to-improve-customer-engagement-for-bbva-bancomer-and-bancolombia>

<i>Country</i>	<i>DFI Model</i>	<i>Business Model</i>	<i>Technology used</i>	<i>Products/ Services</i>	<i>Impact</i>
Jordan	Liwwa	The team manages the entire underwriting process from loan origination to repayment. For operating the business, a 3.00-4.00% assessment fee is charged on all repayments that borrowers make; They also use capital and debt to invest in the loans and generates interest income	Uses a credit analysis engine, mCAE, to predict, within two days, whether the loan is likely to be a good investment or not by comparing the data to any outstanding or repaid loans. It uses the applicant's data (operational years, cash flow and background of the applicant) for the analysis.	Technology-enabled Peer-to-peer lending for SME businesses	Liwwa as on 2017, has extended over \$2 million in loans to 55 Small and Medium Enterprises (SMEs) in Jordan and the UAE, Created 308 jobs supported in Jordan, \$1.12 million in income for Jordanians, \$8.95 million in output to the Jordanian economy
Kenya (expanded to Tanzania, Mozambique, DRC, Lesotho, Ghana, Egypt, Afghanistan, South Africa and Ethiopia)	M-Pesa	Transaction charges can vary depending on the amount of money being transferred and whether the payee is a registered user of the service. The actual cost is fixed for a given range of transaction sizes	Uses a simplified customer due diligence procedure, allowing virtual and remote account opening without any additional documentation requirements.	Mobile phone-based money transfer service: deposit, withdraw, transfer money, pay for goods and services, access credit and savings	By December 2019, there were 58.3 million mobile wallets, representing 1.7 mobile wallets for every adult, actively lifting 2% of Kenyan households out of poverty. Has driven shift from farming towards business, contributions to the informal savings groups and a significantly positive effect on women.
Kenya	Pezesha	Uses alternative transactional data from suppliers and partners to produce credit scores (Patascor) that give them access to credit for purchasing additional inventory. They connect MSMEs with suitable capital investors (banks, FIs).	Alternative transactional data used to create credit scores that enable customers to access credit from investors. The investor is matched to secure SMEs using algorithms thereby reducing risk of lending.	Credit Scoring, Matching, Financial Education	Provided more than 200,000 of their customers with credit score and financial education, 50% of their ecosystem comprises of women and 80% are youth.

<i>Country</i>	<i>DFI Model</i>	<i>Business Model</i>	<i>Technology used</i>	<i>Products/ Services</i>	<i>Impact</i>
Brazil	Pix	Banco do Brasil (BB) customers can use whatsapp to make payments through pix. Customers can interact with the bank through BB's personal virtual assistant. Pix is also embracing FinTech.	Incorporates a series of innovation, to digitize, remove red tape and give dynamics to the wire transfer and payment market. Direct transaction of amounts takes place between accounts held by persons and/or companies, reducing the number of intermediaries and operating costs by using identification keys for each account, through people's regular information.	Democratize access to electronic means of payment; Boost the electronization of payments; Fund transfers between people, companies, or the government.	Pix encourages FI of the population. Fastest adoption around the world. Since the Pix launch, 83 million individual users and more than 5.5 million companies registered more than 242 million Pix keys (address of a user's account), with transactions amounting to BRL1.109 trillion since its launch. 75 million Brazilians have used Pix either to pay or receive, representing 45% of the adult population. Pix has also had a positive effect on the FinTech market in Brazil.
Ghana	Universal QR Code and ProxyPay Platform ³	Uses an app that is linked to your bank account or to your wallet that then represents the card. These two instruments can be used to effect payments.	Service built on the rails of the Ghana Interbank Payment and Settlement Systems Limited (GhIPSS) Instant funds transfer platform that allows a customer of a member financial institution to register an Alias/unique identifier which is then uniquely mapped to his or her bank account to receive payment via the alias.	Instant electronic payment system. Payment of fixed fees, tangible goods, and services payments, taxes.	Accelerated e-payments, making Ghana a pioneer in this regard being the first country in Africa to introduce a national, QR code payment system. It has helped Ghana in its quest toward a modern, cashless society

³<https://ghanatalksbusiness.com/2020/03/universal-qr-code-and-proxy-pay-platforms-gamechanger-to-financial-inclusion/>

Table 2: India's various Policy initiatives in FI

<i>Year</i>	<i>Policy Initiatives</i>
2005	<ul style="list-style-type: none"> ● RBI asked banks to offer a basic banking no-frills account with low or zero minimum balances.
2006	<ul style="list-style-type: none"> ● RBI permitted banks to use the services of non-governmental organisations.
2008	<ul style="list-style-type: none"> ● RBI announced the operative guidelines for mobile banking transactions.
2009	<ul style="list-style-type: none"> ● RBI further enlarged the scope of the BC model. ● Increase in daily limits for mobile banking transactions from Rs. 5,000 to Rs 50,000. ● Doing away with the need for a license for opening a bank branch in towns and villages with populations below 50,000.
2010	<ul style="list-style-type: none"> ● RBI has further expanded and liberalised the Business Correspondent (BC) model by permitting for profit companies to serve as BCs and subsequently by allowing cooperative banks to use the services of BCs.
2011	<ul style="list-style-type: none"> ● RBI issued guidelines for convergence of implementation of Electronic Benefit Transfer (EBT) and FI Plan (FIP).
2012	<ul style="list-style-type: none"> ● RBI encouraged banks to set up ultra-small branches (USB). ● RBI has issued guidelines to banks to ensure opening of Aadhaar Enabled Bank Accounts (AEBA). ● RBI decided to permit interoperability at the retail outlets or sub-agents of BCs. ● Banks adopted a new approach for selection of Agent Network Management (ANMs).
2014	<ul style="list-style-type: none"> ● Nachiket Mor Committee releases report on Comprehensive Financial Services for Small Businesses and Low-Income Households. ● PayTM wallet launched. ● Draft guidelines for Payment Banks (PBs) and Small Finance Banks (SFBs) released by RBI. ● PMJDY launched, PhonePe receives license to operate for issuance and operation of a Semi Closed Prepaid Payment system. ● Centre for Digital FI (CDFI) Formed. ● Final guidelines for PBs and SFBs released by RBI.
2015	<ul style="list-style-type: none"> ● Finance minister's budget speech emphasising digitizing transactions. ● Micro Units Development & Refinance Agency Ltd. (MUDRA) a financial institution set up by Government of India for development and refinancing of micro units' enterprises Launched. ● Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) & Pradhan Mantri Suraksha Bima Yojana (PMSBY) Launched. ● RBI licenses PB , given to 11 institutions. ● SFB licenses given to 10 institutions by RBI, India joins UN-based Better than cash alliance (BTCA) to accelerate FI. ● OLA Money e-wallet Launched. ● PhonePe begins operations.
2016	<ul style="list-style-type: none"> ● JAM linkages program launched; UPI launched. ● Committee on digital payments formed. ● BharatQR launched, Jio Telecom Launched. ● The U.S. Agency for International Development (USAID) announced the launch of a new initiative, called Catalyst, in partnership with the Indian finance ministry, to scale digital payments systems in India. ● RBI announces demonetization of all 500 and 1000 Rs. banknotes.

<i>Year</i>	<i>Policy Initiatives</i>
2017	<ul style="list-style-type: none"> ● India Post Payments Bank Pilot launched, Airtel Payments Bank launched. ● Jio passes 100m subscribers. ● MAadhaar Pay launched. ● FINO Paytech Payment Bank launched. ● DBT for fertilizer subsidy launched. ● PayTM Payment Bank launched. ● PayTM passes 100m app downloads, Omidyar Network "Innovating for the Next Half Billion" report released.
2018	<ul style="list-style-type: none"> ● WhatsApp Pay (Beta) launched. ● Jio Payments Bank launched. ● FINO barred from opening new accounts on account of violations of certain licensing conditions and operating guidelines, Bharat Inclusion initiative launched by Bill and Melinda Gates Foundation (BMGF), J.P Morgan, Dell Foundation and Omidyar Network. ● UPI 2.0 launched, Supreme Court ruling on Aadhaar (five-judge bench ruled that the scheme does not violate the right to privacy), India Post Payments Bank launched.
2020	<ul style="list-style-type: none"> ● The total number of beneficiaries under Jan Dhan scheme increased to around 380 million. ● Mobile wallet transactions grew from 11.96 million transactions in April 2015 to 387.6 million transactions worth Rs 15,408 crore in January 2020.
2021	<ul style="list-style-type: none"> ● E-RUPI launched. ● RBI Introduced FI-Index. ● RBI published the 'Report on Digital FI in BRICS countries.

Table 3: Major Payment Indicators of India: Annual Turnover – April to March (Volume: numbers in lakh and Value: Rupees in Crore)

Payment System Indicators	2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
AePS (Fund Transfers)	NA	NA	NA	NA	NA	NA	NA	NA	6	300	11	501	10	469	11	623
APBS	NA	NA	NA	NA	NA	NA	NA	NA	12980	55,949	14,949	86,226	16,766	99,179	14,373	1,12,747
ECS Cr	152.5	2492	115.3	2019	1252.9	83273	10.1	144	61	11,864	54	13,235	18	5,145	0	0
IMPS	661	43786	927.5	59804	220.8	1622	506.7	4116	10098	8,92,498	17,529	15,90,257	25,792	23,37,541	32,783	29,41,500
NACH Cr	NA	NA	NA	NA	NA	NA	NA	NA	7031	5,20,992	8,834	7,29,673	11,290	10,43,212	16,450	12,32,714
NEFT	152.5	2492	115.3	2019	1252.9	83273	1622.1	120040	19464	1,72,22,852	23,189	2,27,93,608	27,445	2,29,45,580	30,928	2,51,30,910
UPI	15.4	96	78.4	582	NA	NA	17.9	69	9152	1,09,832	53,915	8,76,971	1,25,186	21,31,730	2,23,307	41,03,658
Debit Transfers and Direct Debits	NA	NA	NA	NA	NA	NA	NA	NA	3788	3,99,300	4,914	5,24,556	7,525	7,19,708	10,456	8,72,552
BHIM Aadhaar Pay	NA	NA	NA	NA	NA	NA	NA	NA	20	78	68	815	91	1,303	161	2,580
ECS Dr	192.9	1268	226	1740	39	1059	8.8	39	15	972	9	1,260	1	39	0	0
NACH Dr	86.5	215	340.2	1221	1404.1	3802	2057.3	7916	3738	3,98,211	4,830	5,22,461	7,340	7,18,166	9,630	8,68,906
NETC (Linked to Bank Account)	NA	NA	NA	NA	NA	NA	NA	NA	15	39	6	20	93	200	650	913
Card Payments	NA	NA	NA	NA	NA	NA	NA	NA	47486	9,19,035	61,769	11,96,888	72,384	14,34,814	57,841	12,93,822
Credit Cards	509.1	1540	615.1	1899	785.7	2407	1087.1	3284	14052	4,58,965	17,626	6,03,413	21,773	7,30,895	17,641	6,30,414
Debit Cards	619.1	955	808.1	1213	1173.6	1589	2399.3	3299	33434	4,60,070	44,143	5,93,475	50,611	7,03,920	40,200	6,62,667
Prepaid Payment Instruments	133.6	81	314.5	213	748	488	1963.7	838	34591	1,41,634	46,072	2,13,323	53,318	2,15,558	49,392	1,97,695
Total Digital Payments	2,523	52,925	3,540	70,710	6,877	1,77,513	9,673	1,39,745	1,95,931	2,15,92,591	2,97,918	2,97,46,682	4,19,643	3,30,87,459	5,03,823	3,80,51,701

Source: RBI website Note: NA – Not Available

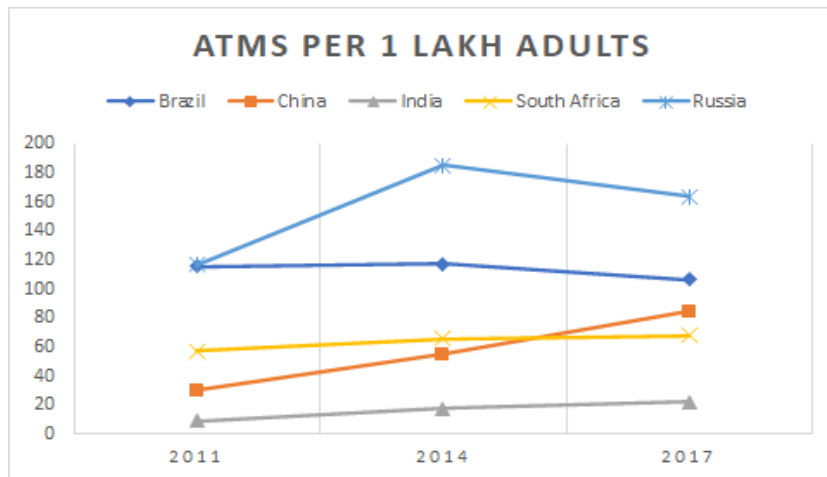
Table 4: Month-wise Mobile Banking Transactions

<i>Months</i>	<i>Volume of transactions (in lakh)</i>	<i>Value of transactions (Rs. Crore)</i>	<i>Growth rate in Volume</i>	<i>Growth rate in Value</i>
Jan, 2020	14,403	5,21,368	--	--
Feb. 2020	14,284	5,25,846	-0.8%	0.9%
March, 2020	13,830	5,20,199	-3.2%	-1.1%
April, 2020	11,276	3,64,031	-18.5%	-30.0%
May, 2020	14,622	4,85,513	29.7%	33.4%
June, 2020	16,188	5,99,420	10.7%	23.5%
July. 2020	17,281	6,37,489	6.8%	6.4%
Aug. 2020	19,865	6,75,277	15.0%	5.9%
Sept. 2020	20,919	7,04,109	5.3%	4.3%
Oct. 2020	22,714	7,92,446	8.6%	12.5%
Nov. 2020	24,198	8,20,024	6.5%	3.5%
Dec. 2020	25,199	8,99,401	4.1%	9.7%
Jan. 2021	25,943	10,20,333	3.0%	13.4%
Feb. 2021	24,274	9,31,529	-6.4%	-8.7%
March. 2021	32,971	12,46,220	35.8%	33.8%
Source: RBI Database				

Table 5: Key Financial Access Survey Indicators on FI for India

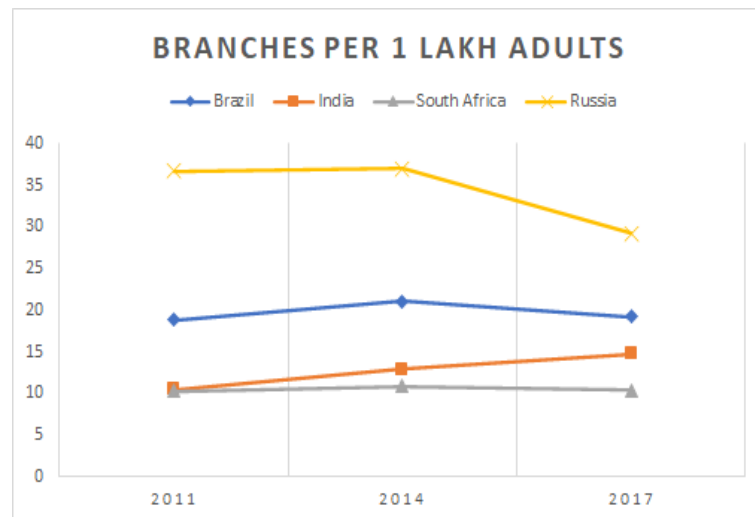
<i>Parameters</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>
Number of ATMs per 1,000 km ²	61.93	67.96	71.83	71.86	70.66	73.67
Number of ATMs per 100,000 adults	19.64	21.16	21.99	21.65	20.95	21.49
Number of commercial bank branches per 1,000 km ²	42.62	45.63	47.37	48.11	49.17	50.53
Number of commercial bank branches per 100,000 adults	13.51	14.21	14.50	14.49	14.57	14.74
Outstanding deposits with commercial banks (% of GDP)	64.78	62.36	62.78	60.54	63.37	71.62
Outstanding loans from commercial banks (% of GDP)	49.94	48.87	46.33	46.41	48.63	53.70
Outstanding small and medium enterprise (SME) loans from commercial banks (% of GDP)	6.97	6.47	6.26	6.08	6.45	7.21
Number of registered mobile money accounts per 1,000 adults	73.29	221.93	443.51	541.93	1264.79	1671.54
Value of mobile money transactions (during the reference year) (% of GDP)	0.05	0.13	0.31	0.57	0.90	0.93
Source: IMF database						

Figure 1: Number of ATMs per 100,000 adult population



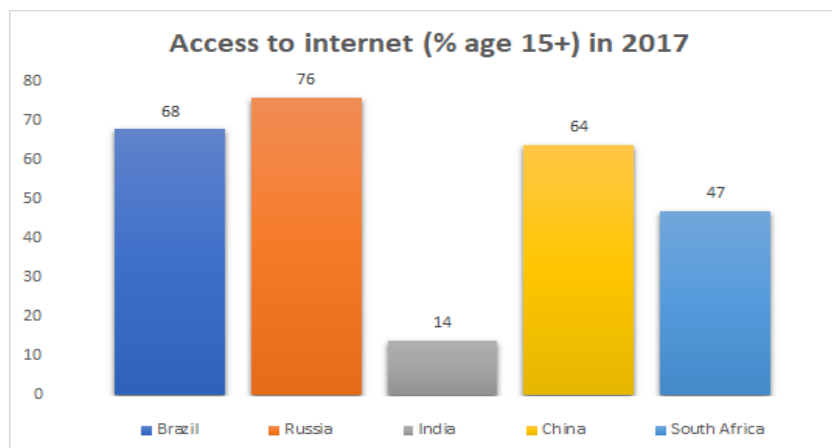
Source: World Bank-Global Financial Inclusion Indicator

Figure 2: Number of Bank Branches per 100,000 adult population



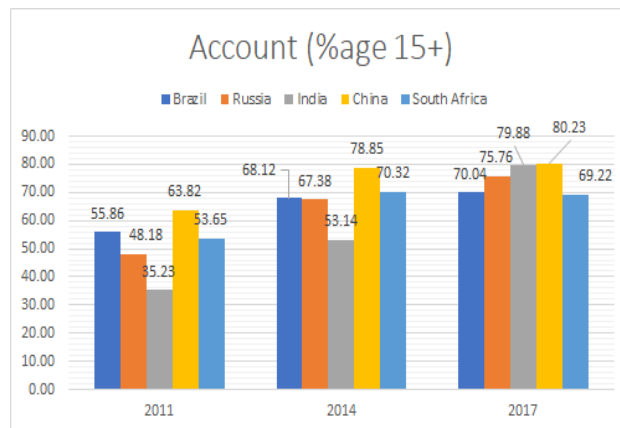
Source: World Bank-Global Financial Inclusion Indicator

Figure 3: Access to the Internet by population above 15 years



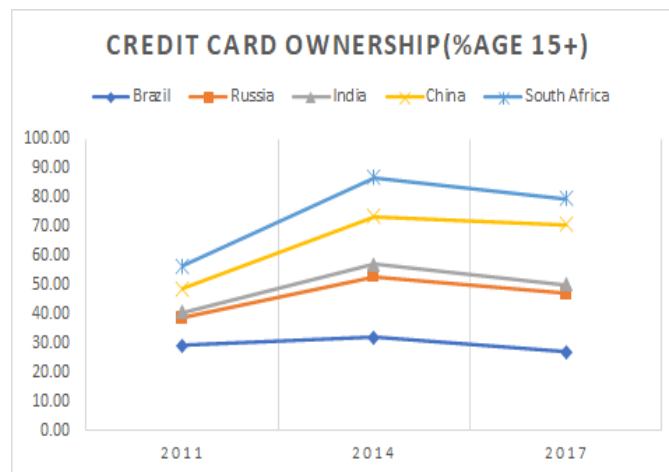
Source: World Bank-Global Financial Inclusion Indicator

Figure 4: Account ownership for population above the age of 15 years



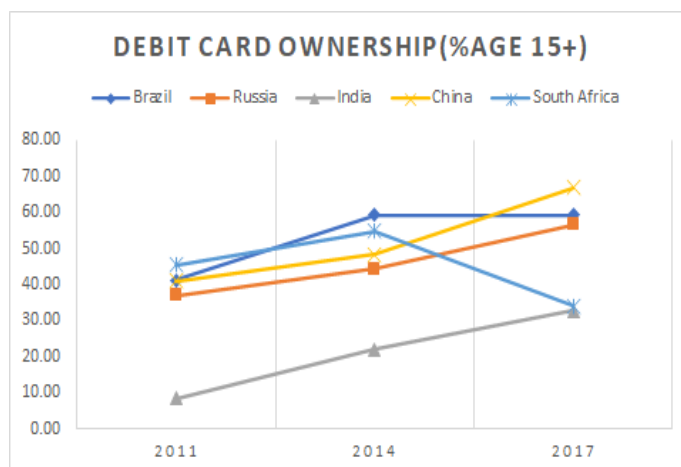
Source: World Bank-Global Financial Inclusion Indicator

Figure 5: Ownership of credit card for population above the age of 15 years



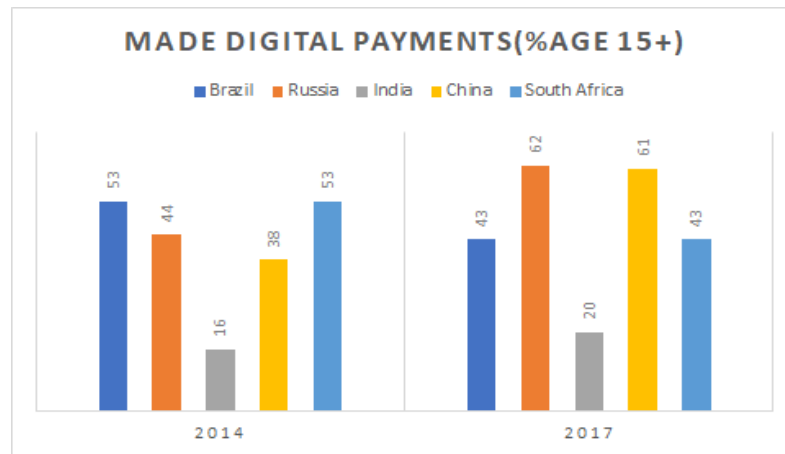
Source: World Bank-Global Financial Inclusion Indicator

Figure 6: Ownership of debit card for population above the age of 15 years



Source: World Bank-Global Financial Inclusion Indicator

Figure 7: Digital payments made by population age above 15 years



Source: World Bank-Global Financial Inclusion Indicator

Figure 8: Trends on India's Digital payments during 2013 to 2021

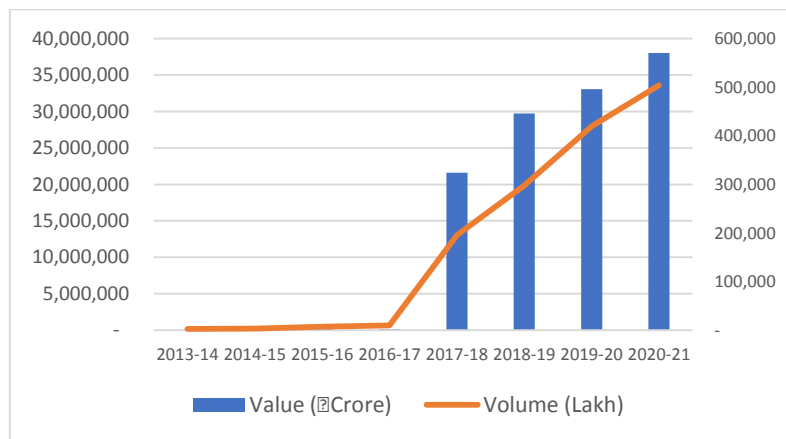


Figure 9: Trends of some selected Digital payments in India during 2017 to 2021

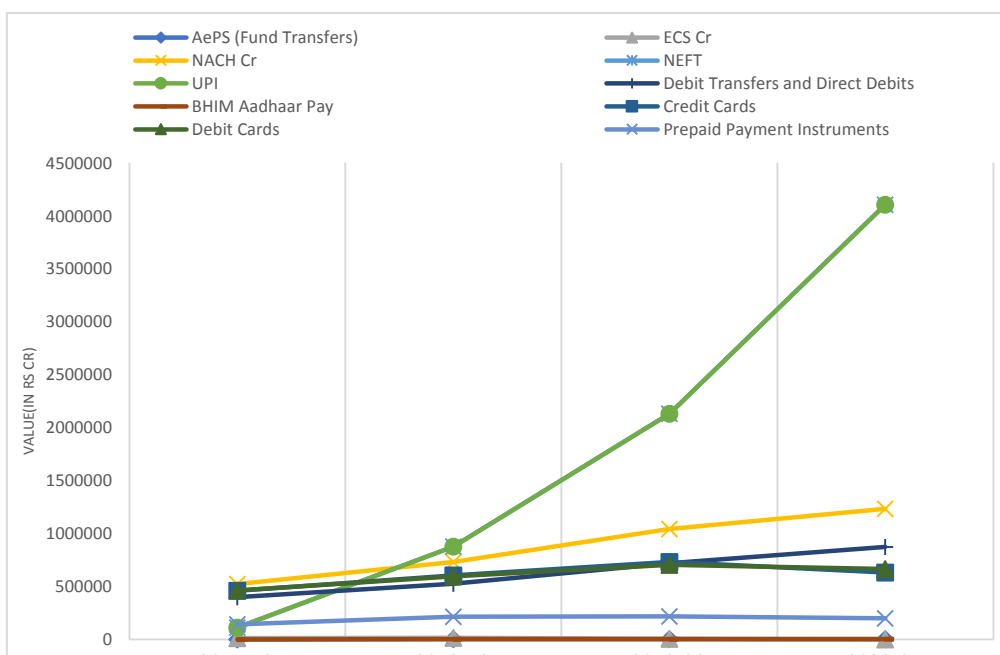


Figure 10: Month-wise Mobile Banking Transactions

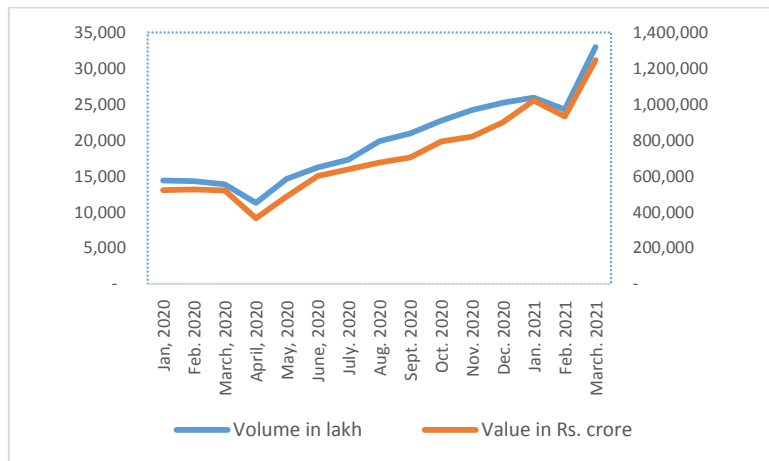


Figure 11: Month-wise growth rate of Mobile Banking Transactions

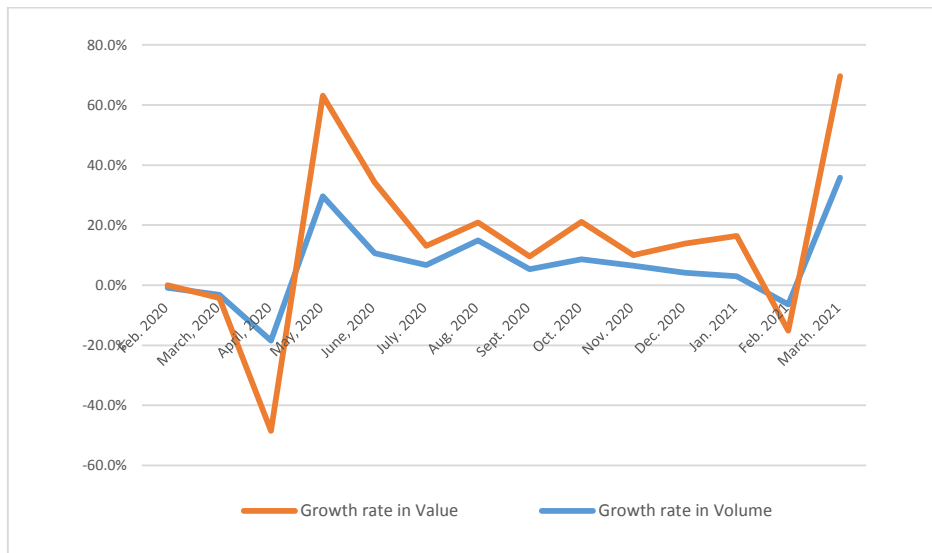
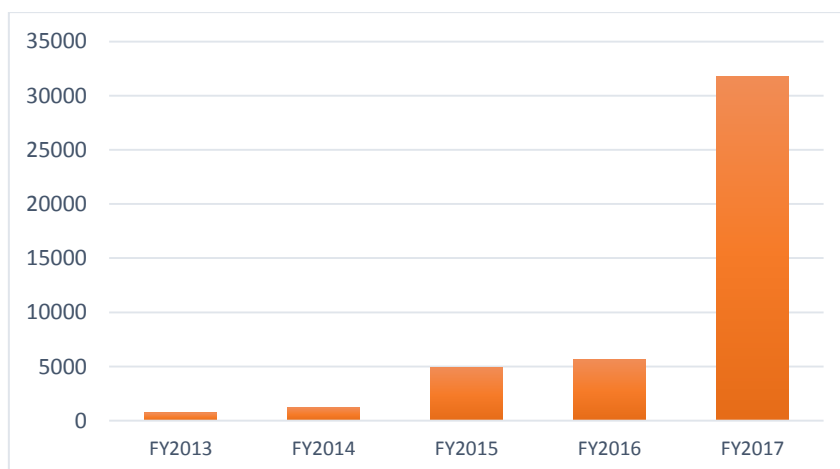
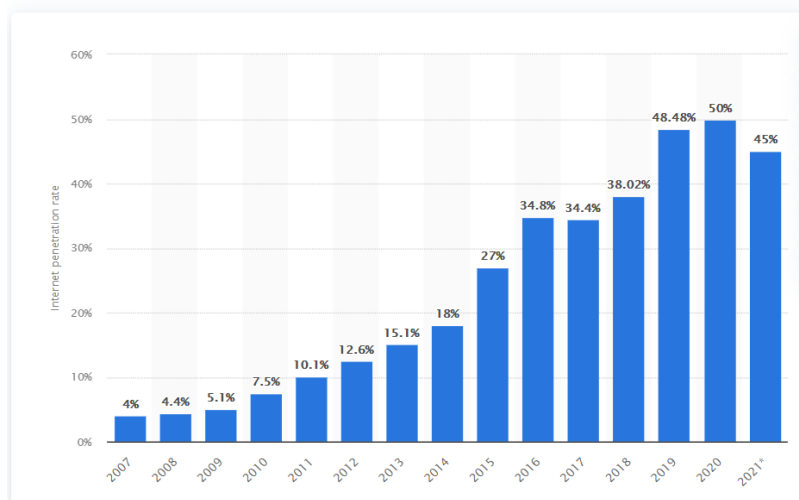


Figure 12: Mobile Money Transactions per 100,000 Adults



Source: RBI database

Figure 13: Internet penetration rate in India from 2007 to 2021



Source: Statista

Annexure 1 (a): DFI Start-ups and Fintechs: Business Models, Technology and Products

<i>Sl. No.</i>	<i>Start-up Name</i>	<i>Year</i>	<i>Business Model</i>	<i>Technology used</i>	<i>DFI Products/ Services</i>	<i>Target Segment</i>
1	Instamojo	2012	It's a peer-to-peer (P2P) marketplace where two people may either purchase or sell a product/ service and be paid practically instantly. It mainly provides a link through which the payments can be done. The transaction fees are paid by buyers thus reducing the burden on seller.	Full Stack Platform, Payment Gateway (Nginx-Application Server, Django-Web framework, Amazon EC2- Application development)	Payment links, pay buttons, integrations, Cash flow loans for your growing business (example MojoXpress, MojoCapital, Get Me a Shop)	MSME and Small Business owners
2	Lendingkart	2014	It's a non-bank financial institution (NBFI) that offers collateral-free loans based on client's cash flow and business growth in the current year. A proprietary algorithm is used to score the underwriting. As a result, once all of the data has been received, the loan is sanctioned and disbursed in a timely manner. When compared to traditional lenders, this type of branchless business model is simpler to scale up and has lower incremental costs.	Proprietary Algorithm based Credit underwriting (Sentry-System Administration, JIRA Software-Application Lifecycle management, Amazon Relational Database Service (RDS) etc.	Business loans, Working capital loans, MSME loans, Business loans for women, Gold loans	SMEs and Small entrepreneurs
3	M-Swipe	2011	M-swipe has applied financial engineering to provide affordable payment acceptance modes to SMEs. Mswipe does not sell its products. Rather, the firm charges a one-time cost for its gadget and a monthly fee for its services. Other sources of income include sign-up fees, transaction processing fees, income from support services, and the sale of products, according to the company's filings.	POS solutions (AutoCAD, Linux, JavaScript)	Set-up of Payment machines, UPI-QR Codes, PayByLink, etc ; Manage your Business (Merchant App, Mventry App, Mera Online Store etc; Grow your Business (POS Loans, NBFC EMI Card, ATM- Express etc)	SMEs

<i>Sl. No.</i>	<i>Start-up Name</i>	<i>Year</i>	<i>Business Model</i>	<i>Technology used</i>	<i>DFI Products/ Services</i>	<i>Target Segment</i>
4	Khatabook	2018	It's a Digital Ledger app that allows the shopkeeper to register and add customer information. The shopkeeper can make the necessary debit and credit transactions for the customers. He can also send text messages and UPI-based payment links, making the process even faster and easier.	Not available	Digital Ledger maintaining app with features like automated reports, payment reminders, Payment links and QR codes	MSME and Small Business owners
5	Financepeer	2017	Financepeer's business approach is simple: it offers parents zero-cost, zero-interest monthly instalments to pay their school tuition. Financepeer also pays the complete year's tuition to the School on Day 1 on behalf of the parent.	AI based P2P Platform (Datadog- full stack monitoring service, Django-Web Framework, Heat map-Web Analytics, SAP Financial Supply Chain Management)	personal loans for school education, Education Insurance, Unique Identification Card (with school ID and tracking system)	School, Vocational institutes and Parents of school going kids
6	Capital float	2013	Capital Float is India's leading Buy Now Pay Later and credit platform, catering to salaried and self-employed persons' financial requirements. Individuals can apply for Capital Float's Buy Now Pay Later or credit programmes by providing simple information. The loan is processed on real time basis and disbursed within 3 days.	`	Personal Finance, Business Finance, Personal Finance Management, Walnut 369 (a buy now pay later)	Individuals, online entrepreneurs MSMEs
7	Avail Finance	2017	Avail Finance gives the masses a neo-banking platform. Its goal is to introduce credit and financial literacy to them who are deprived of it. Avail Finance provides loans to salaried employees earning less than Rs. 35,000 per month.	App based lending platform using NACH for EMI (Microsoft Azure for API, AWS Lambda as Paas)	Saathi Salary Account along with debit card, advance and pre sanctioned quick credit facility	unorganised and low income workforce

<i>Sl. No.</i>	<i>Start-up Name</i>	<i>Year</i>	<i>Business Model</i>	<i>Technology used</i>	<i>DFI Products/ Services</i>	<i>Target Segment</i>
8	Neo Growth	2013	The company has developed a one-of-a-kind business model in which it lends money against future credit and debit card sales to small and medium-sized businesses that employ POS swiping machines and digital transactions. Its API linkages with their partners allow for easy lead sharing and a faster loan processing time.	Not available	Collateral free Online Retail Finance, Supply Chain Finance and Online Seller finance etc (eg.NeoCash, NeoCash Express, NeoCash Insta, NeoCash Plus, Loans etc)	SME retails both online and offline
9	Shiksha Finance	2014	Shiksha Finance provides loans to educational institutions (for asset development, working capital, and building infrastructure) and to students with the goal of improving education quality, infrastructure for everyone, and lowering school dropout rates (for their school fees). Its business concept is built on a speedy procedure, a unique credit technique, and the use of technology.	Not available	Asset Loan and Education Loan	School, Vocational institutes, and Bottom of the pyramid families
10	Jai Kisan	2017	Jai Kisan operates on a B2B2C model, leveraging technology and long-standing value chain networks to provide a suite of financial products to the country's un/underserved rural Indian people to help them meet their income-generating needs.	Not available	Equipment Finance, Input Finance and Invoice Finance	Rural Farmers, SHGs and MSMs
Source: Authors compilation						

Annexure 1(b): Innovative use cases of Banks adopting technology to enable Financial Inclusion

<i>Year</i>	<i>Initiative</i>	<i>Benefited Segment/ Target group</i>	<i>Impact</i>
2010	Milk-To-Money(M2M) terminals	Dairy Farmers	The milk collecting method is transparent, which benefits both farmers and society as payments are paid immediately and without the burden of cash distribution. This has digitized payments at over 1,315 milk co-operatives across 21 states, benefiting more than 5.08 lakh dairy farmers by bringing them into the formal banking economy. This has also provided an ease in DBT transfers
2012	Digital Credit Process and Cloud Based Data Management	MSMEs	The boost in efficiency resulting from the partnership with Artoo has enabled Ujjivan to expand its SME customer base from 60,000 to 200,000 clients in three to four years with a 40% decrease in loan processing time.
2015 and 2017	Akodara- Digital Village and 100 Digital Village Initiative	Rural Women	About 600 villages converted into digital villages with facilities such as digitalisation of commercial and retail transactions, vocational courses to underprivileged along with provision of financing to villages and facilitation of market connections so that they can improve their livelihood possibilities. During the 100-day period, the bank gave vocational training to 11,300 villagers, 70% of whom were women, and created more than 2 lakh bank accounts. Many of the inhabitants in these 100 villages were also given a credit linkage service to assist them make a living.
2018	Paytm Ashakiran (Financial Literacy)	Rural Women	Educate 1 million rural women about financial services and products by organising literacy camps at high footfall, high visibility areas of villages and districts across the country; Bring 200,000 women into formal banking by giving them access to Paytm banking and financial investment products; Employ women as Banking Correspondents for Paytm Payments Bank; Skill Development for women on financial products and services ; Encouraging Women Entrepreneurs - Offering credit and low interest professional loans to women entrepreneurs in the rural sector.
2018	Axis Sahyog (financial literacy programme and loans)	Economically weaker women and Joint Liability Groups (JLGs)	The various regions of Assam, Bihar, Chhattisgarh, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Pondicherry, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, and West Bengal are currently being benefited by this programme.
2020	PNB LenS	Customers	The main goal of the PNB LenS is to standardise the system, process, and appraisal formats for loan processing, speed up the credit sanctioning process, auto-generate loan documents for each type of credit facility, reduce delay, cost, and human errors associated with manual processing,

<i>Year</i>	<i>Initiative</i>	<i>Benefited Segment/ Target group</i>	<i>Impact</i>
			maintain digital records, ensure data privacy and security, and provide ready-to-use monitoring and MIS reports for better tracking and transparency.
2020	Suraksha Salary Account	Informal MSMEs and its employees	India's MSME sector has over 60 million units and accounts for 29 per cent of India's GDP. These units employ large number of informal labour force who are not eligible for social and healthcare benefits as part of their salaries, and lack of any financial protection. This account has specially been designed especially for such MSMEs.
2020	BOB NOWW	Not Available	The initiative's focus is on increasing customer touch points through the Business Correspondent network and a push for digitisation at the branch level along with digital lending for retail and MSME customers.
Source: Authors compilation			