

## *FinTech: The Force of Creative Disruption*<sup>\*</sup>

*FinTech has the potential to fundamentally transform the financial landscape, provide consumers with a greater variety of financial products at competitive prices, and help financial institutions become more efficient. The rapid and transformational changes brought on by FinTech need to be monitored and evaluated so that regulators and society can keep up with the underlying technological and entrepreneurial flux. This article provides a succinct review of the sector, encompassing its evolution, characteristics and driving factors, both for the world and India. For a sustainable business ecosystem, FinTechs need to bridge the digital divide and promote equitable and broad-based customer participation.*

### **Introduction**

The landscape of banking and financial sector has undergone a phenomenal transformation since 2008 Global Financial Crisis (GFC), owing to financial technology firms, popularly known as 'FinTechs'. Both as creative disruptors and facilitators, FinTechs have contributed to the modern banking and financial sector through various channels including cost optimisation, better customer service and financial inclusion. FinTechs have played an important role in unbundling banking into core functions of settling payments, performing maturity transformation, sharing risk and allocating capital (Carney, 2019). The information and telecommunications (IT) revolution is regarded as the fifth 'Technological Revolution' driving growth<sup>1</sup>, and FinTech is at the helm of this creative disruption (Hendrikse *et al.*, 2018). The scope

of operations of FinTechs has also broadened, moving from crypto assets to payments, insurance, stocks, bonds, peer to peer lending, robo-advisors, regtech and suptech.

In India, FinTechs and digital players could function as the fourth segment of the Indian financial system, alongside large banks, mid-sized banks including niche banks, small finance banks, regional rural banks and cooperative banks (Das, 2020). This segment has the potential to fundamentally transform the financial landscape where consumers will be able to choose from broader set of alternatives at competitive prices, and financial institutions could improve efficiency through lower costs. India has emerged as the fastest growing FinTech market and the third largest FinTech ecosystem in the world (Mankotia, 2020). Today, we carry out complex financial actions like sending or receiving money, paying bills, buying goods and services, purchasing insurance, trading on stock markets, opening bank accounts and applying for personal loans online using smartphones, without ever physically interfacing with a bank employee. India has the opportunity of a digital payments market of \$ 1 trillion (PIB, 2018). It recorded 3,435 crore digital payments in the year 2019-20 (Annex 1).

The exciting, rapid and transformational changes in financial services brought on by FinTechs need to be continuously monitored and evaluated so that regulators and society can keep up with the underlying technological and entrepreneurial flux. Regulators need to be creative, nimble and tech savvy with their approach. They will have to further expand their focus from entities to activities, while also becoming experts in assessing the soundness and security of algorithms, which is easier said than done (Lagarde, 2017). Thus, for facilitating discussion and understanding that could be useful for policy and regulation purposes, this article attempts to provide a succinct review of FinTechs, encompassing their evolution,

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<sup>1</sup> The five Technological Revolutions defined by Perez (2002) are the Industrial Revolution, The Age of Steam and Railways, The Age of Steel, Electricity and Heavy Engineering, The Age of Oil, Automobiles and Mass Production and, The Age of Information and Communications.

characteristics and driving factors. Our evaluation throws up sobering concerns regarding the future of FinTechs, such as the status of digital hygiene, data use and privacy. The article proceeds in five sections: the FinTech revolution in the global context, delving into its history, evolution, and adoption in Section II, the FinTech ecosystem in India, its enablers, diversity, funding and collaboration with banks in Section III, challenges for future development in Section IV, and the way forward in Section V.

## II. FinTech Revolution: The Global Context

### *Definition of FinTech*

With no universally agreed upon definition, FinTech is generally described as an industry that uses technology to make financial systems and the delivery of financial services more efficient. It is "technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services" (FSB, 2019). FinTechs are "start-ups and other companies that use technologies (Table 1) to conduct the fundamental functions provided by financial services, impacting how consumers store, save, borrow, invest, move, pay, and protect money" (McKinsey, 2016).

In today's app-centric world, consumers are less concerned about receiving all their services from a single provider, and instead expect a seamless experience. FinTechs are realising this new value expectation and have started to 'unbundle' many of the traditional financial offerings (Basole and Patel, 2018). At the same time, the financial services provided by FinTechs are being re-bundled with a range of non-financial services, thereby allowing services to be provided seamlessly via application software (Bank of Japan, 2018). Illustratively, taxi aggregators bundle ride sharing with instantaneous fare payment upon arrival at destination.

### *FinTech History and Evolution*

Technology-induced financial innovation has a long history. In the 1950s, credit cards appeared for the first time, followed by Automated Teller Machines (ATMs) in the 1960s, electronic stock trading and banks' new data recording systems in 1970s and 1980s, and e-commerce and online brokering in 1990s (Basole and Patel, 2018). The online revolution in the last decade of the 20<sup>th</sup> century connected the world through the Internet, and enabled e-commerce, Internet banking and pioneering online payment platforms like PayPal. The next decade witnessed the emergence of smart technology. The smartphone materialised as a powerful computer in human

**Table 1 : Key Enabling Technologies used by FinTechs**

Technology	Description
API (Application Programming Interface)	APIs comprise a set of rules and specifications that software programmes use to communicate with each other. They allow new applications to be built on top of others.
Cloud Computing	The use of an online network ('cloud') of hosting processors to increase the scale and flexibility of computing capacity, generating cost savings.
Biometrics	The study of distinctive and measurable human characteristics that can be used to categorize and identify individuals.
DLT (Distributed Ledger Technology)	A digital system for recording the transaction of assets in which details are recorded in multiple places at the same time.
Big Data	Voluminous amounts of structured or unstructured data that can be generated, analysed and utilized by digital tools and information systems.
AI (Artificial Intelligence) & ML (Machine Learning)	IT systems that can perform functions that would otherwise require human capabilities. ML entails computers learning from data without human intervention.

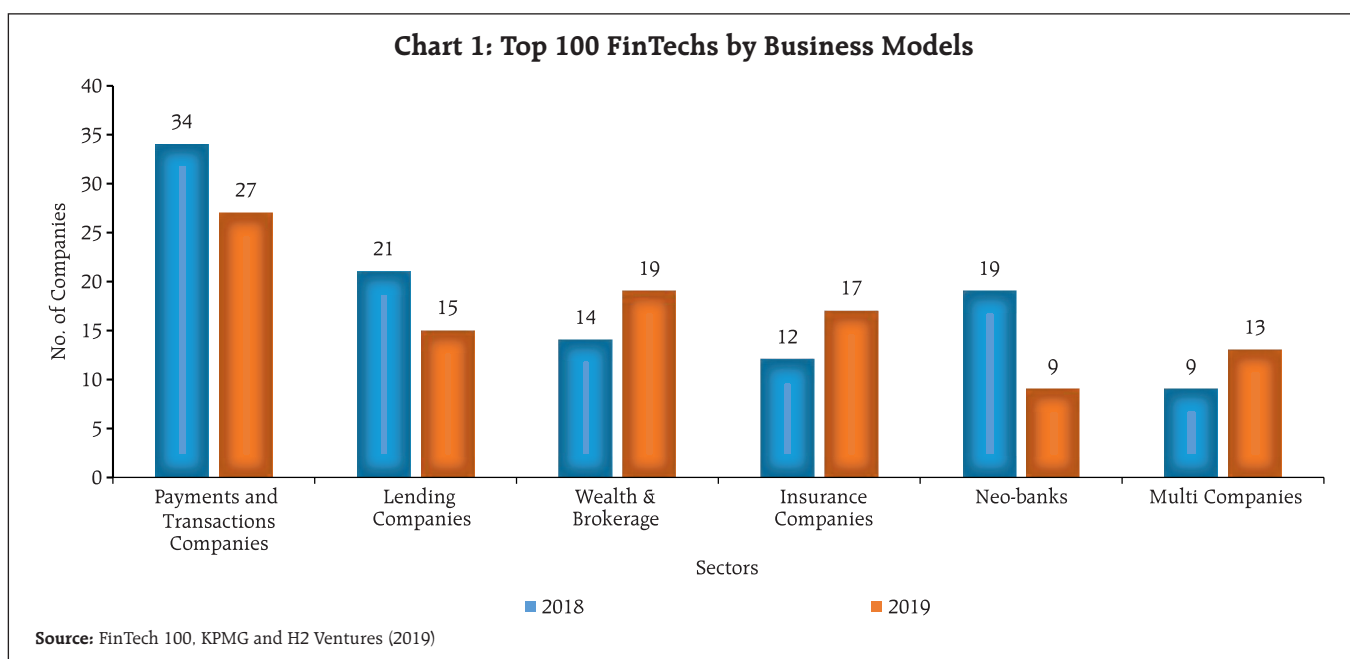
palms, and the movement to app-based operating systems spurred innovation, unbundling and sharing of services. Bitcoin came as another important development in 2009. The present decade is dedicated to the 'rise of the robots', where the emergence of big and unconventional datasets has enabled AI to provide accurate predictions and personalise banking (King, 2019).

The 'new' FinTech sector gained momentum in its modern incarnation after the GFC as FinTech entrepreneurs realised that banking services should be transparent, facilitative and economical (Hendrikse *et al.*, 2018). After the GFC, public perception of banks had deteriorated, as savings were diverted to subprime borrowing without adequate consumer protection. Many finance professionals confronted job losses or pay cuts, which inspired enterprising innovation as FinTechs (Buckley *et al.*, 2016). Also, tighter regulation of traditional banking after GFC supported the growth of the FinTech sector (Cortina *et al.*, 2018).

At present, FinTechs are diversifying into different sectors (Chart 1). Among the top 100 FinTechs, payment and lending companies are being replaced by wealth and brokerage, insurance and multi-sector companies<sup>2</sup> (KPMG, 2019).

**Demand-side Push to FinTech Adoption**

Against the backdrop of globalisation and digitisation, users' appetite for financial services has become increasingly diversified and sophisticated in line with their changing lifestyles. The rate of FinTech adoption is greater in jurisdictions where there is unmet demand for financial services, less competition from traditional finance, macroeconomic conditions are conducive, regulation is accommodative and demographics are favourable (Frost, 2020). According to the 'Global FinTech Adoption Index 2019', the adoption of FinTech services globally has progressed from 16 per cent in 2015 to 33 per cent in 2017 and 64 per cent in 2019. Despite concerns about data



<sup>2</sup> Neo-banks have digital as the only or predominant channel for engaging with customers and challenge either the products, user experience or business models of traditional banks and other financial services organisations; Multi-companies are FinTechs providing a diversified range of financial services products to customers

security, the respondents preferred FinTechs over the traditional sector due to low fees and ease of opening of accounts (EY, 2019).

**Supply-side Support to FinTech**

Reflecting on growing adoption over the past decade, many start-ups have come up with diverse and innovative FinTech products. They have been supported enthusiastically by investors, with investments in the sector increasing from \$5 billion in 2010 to \$78 billion in 2019 (Chart 2).

**Geographical Distribution of FinTechs**

A unique feature of FinTech has been its shifting geography; both in terms of the locus of activities and the area of influence. According to KPMG's FinTech100, the new productive ground for FinTech companies is shifting from North America and Europe to the Asia-Pacific; 42 companies from the Asia-Pacific region (highest among all regions) were featured in 2019 as compared to 31 companies in 2017. Within the Asia-Pacific, China is facing stiff competition from countries like India, Vietnam and Korea. With a total

of 8 companies on the FinTech100, India is emerging as a prominent FinTech force<sup>3</sup>.

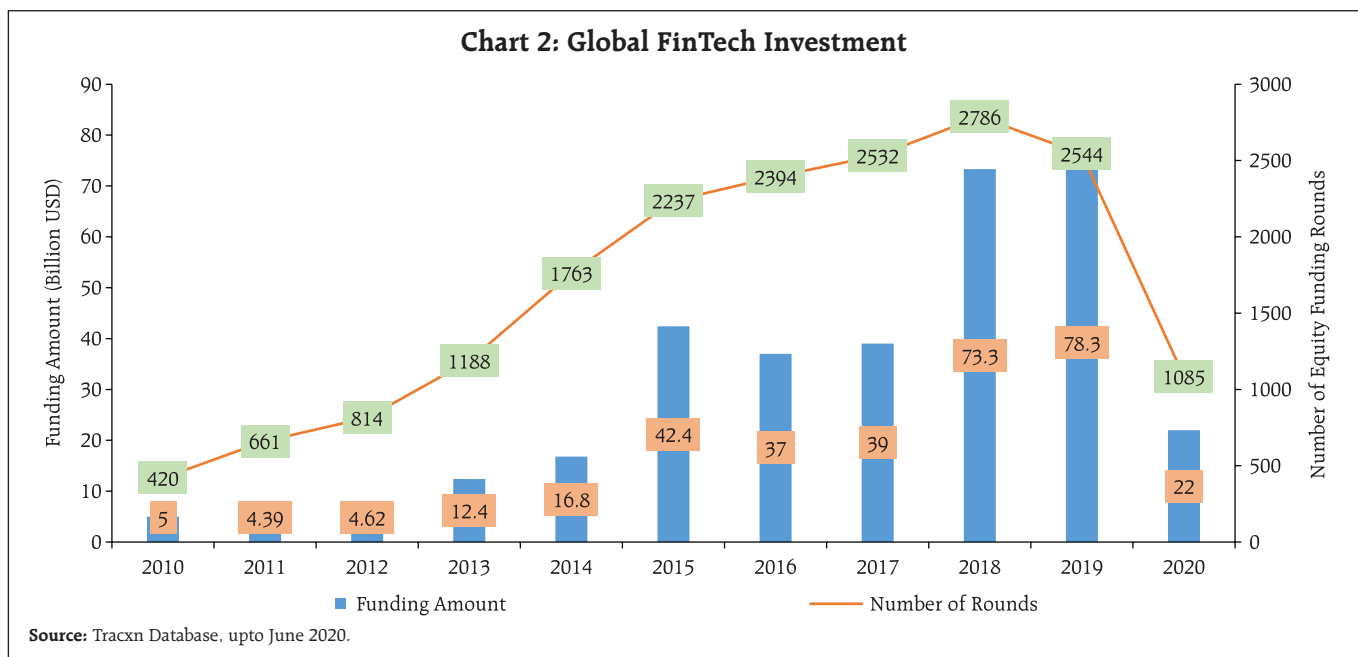
**Benefits of FinTechs**

*Efficiency enhancement*

FinTechs have played a key role in making the financial sector more efficient (Philippon, 2020). In the USA, FinTech lenders enhanced ease of borrowing by processing mortgages 15-30 per cent quicker than other lenders with no evidence of higher (conditional) default rates (Fuster *et al.*, 2018).

*Financial inclusion*

By overcoming market failures such as information asymmetry or high transaction costs, FinTechs help enhance financial inclusion. In a survey of retail borrowers on a large Chinese platform, more than half reported that they had no prior borrowing history from a financial institution (Deer *et al.*, 2015). Big data and machine learning techniques may even help reduce human biases against discriminated groups (Bartlett *et al.*, 2018).



<sup>3</sup> Paytm ranked fifth and OlaMoney ranked eighth.

*Reduced credit risks*

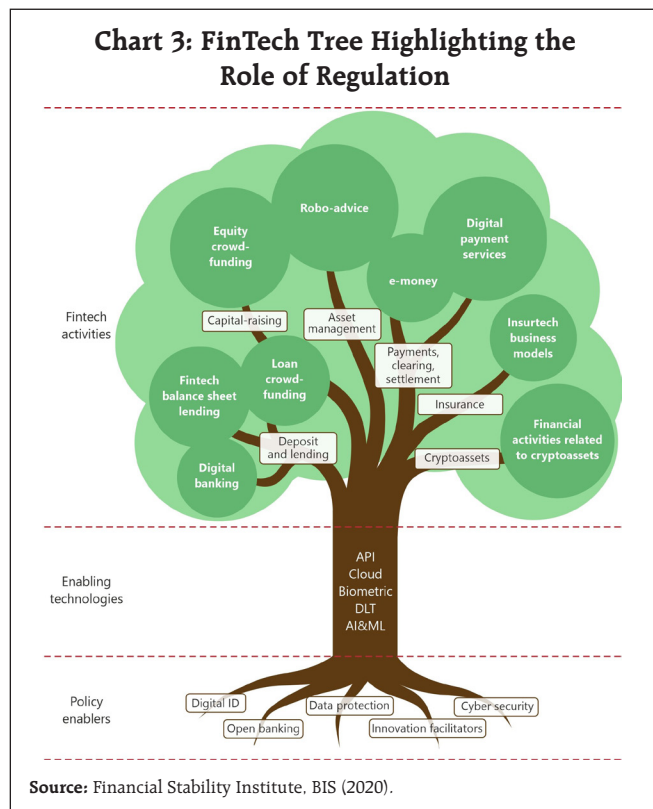
By providing more choice of credit sources, proliferation of FinTechs could lower the risks an economy faces if credit provisioning is dominated by a few banks. FinTechs focused on credit could be beneficial for commercial banks as some of them rely on FinTech platforms' credit assessment processes (Claessens *et al.*, 2018).

**FinTech Regulation**

Fintechs can be viewed as double edged swords. Despite various benefits, these innovations can sometimes magnify existing threats to consumers such as likelihood of privacy breaches and cybersecurity risks, leaving behind digitally illiterate and unconnected consumers. Thus, while the role of regulation is undisputed for the financial system as such, it assumes greater importance for newer innovations such as FinTechs.

A central bank's interest in FinTech is not confined to its impact on the financial sector *per se*, but rather its implications for financial stability and monetary policy. The regulatory environment, like the roots that provide life to a tree, provides a solid foundation for FinTech activities (Chart 3).

A survey-based study under the aegis of the Bank for International Settlements (BIS) summarises the responses of regulators across the world to rapidly emerging FinTech (Ehrehtraud *et al.*, 2020). While most surveyed jurisdictions did not have a dedicated regulatory regime for FinTech lending, many had it in place for digital payments and crowdfunding. For insurance, existing regulations were broadly considered sufficient. Warnings and clarifications were the most common regulatory responses to crypto-assets, but a few respondent jurisdictions also reported emergence of crypto-specific licenses. With regards to enabling technologies, most regulators tweaked existing guidelines to include tech-specific elements. Regulators have been particularly active on application programming interfaces (APIs), cloud computing and biometric identification. With



many FinTechs leveraging on cloud computing, it is becoming systemically important to the financial system. It is possible that going forward some future software could end up being exclusively available on cloud platforms. In such cases, central banks may have to opt for in-house cloud development or collaborate with various service providers. For instance, the US Federal Reserve has visited Amazon's cloud facilities for on-site inspections, while the European Banking Authority has published guidelines for cloud outsourcing (King, 2019). However, for artificial intelligence, machine learning and DLT, regulatory action has been limited to risk assessments and issuance of general guidance.

Financial regulators are facing unprecedented challenges with the emergence of FinTechs. These firms come in new shapes and forms, so fitting them into buckets for prudential or risk-based supervision is not easy. As the scope of activities widens from national to global, regulation too has to reach out across borders. Furthermore, if the importance of

traditional banks in the financial system declines, central banks might have to increase the number of counterparties to their operations in money markets for effective monetary transmission (Lagarde, 2017).

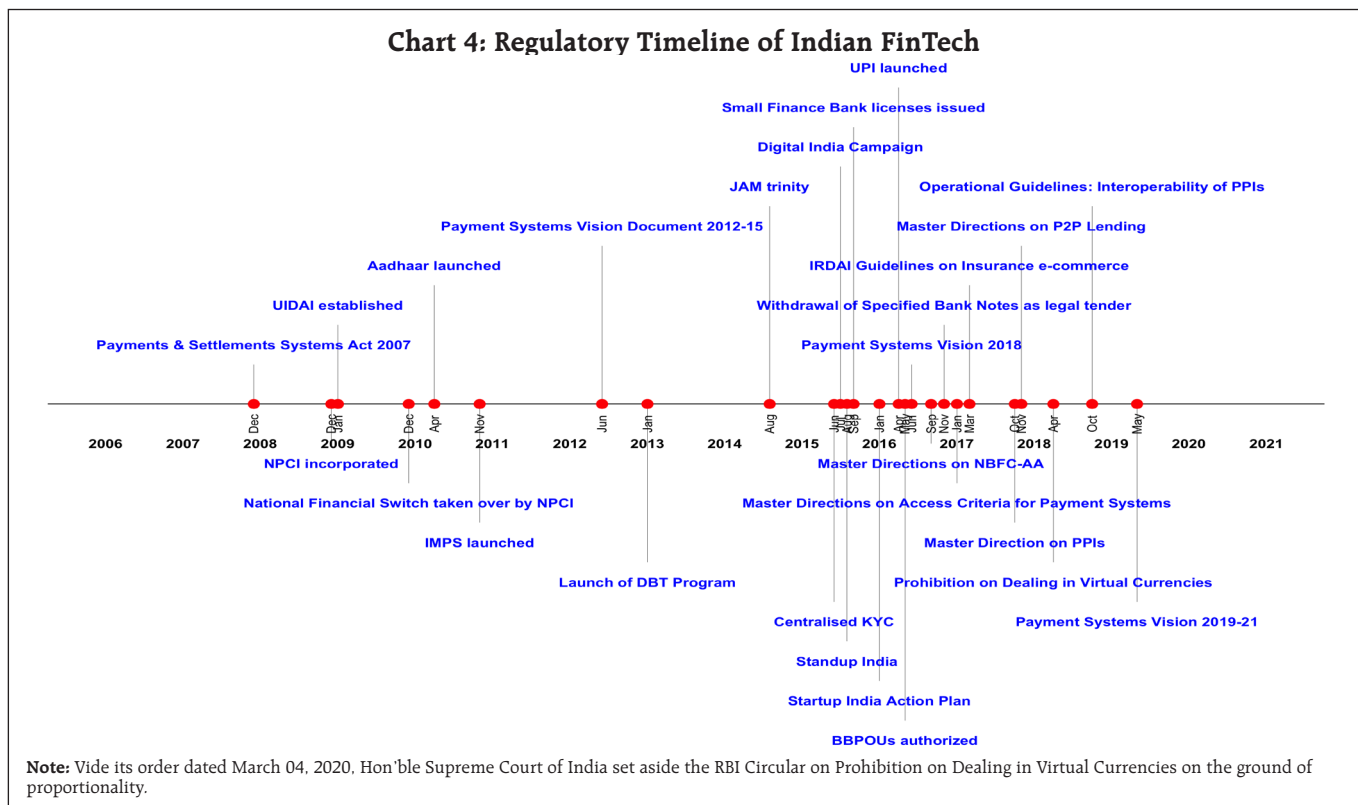
### III. Evolution of the FinTech Ecosystem in India

The roots of Indian FinTechs lie in the groundwork done over the previous decade in developing key enablers. The Indian FinTech industry as it stands today is the result of a unique concoction of technological enablers, regulatory interventions and business opportunities as well as certain other characteristics unique to India.

As the regulator of payment systems, the Reserve Bank has undertaken numerous measures to ensure increased efficiency and uninterrupted availability of secure, accessible and affordable payment systems and to serve segments of the population which are hitherto untouched by the payment systems. To achieve this, Reserve Bank's Vision 2021 envisages four goal posts (4 Cs), *i.e.*, Competition, Cost, Convenience and Confidence.

### Regulatory Environment

India is one of the few jurisdictions with a specific Payments and Settlements law to "provide for regulation and supervision of payments and settlement systems in India and to designate the Reserve Bank as the authority for the purpose and the matters connected therewith or incidental hitherto". The Reserve Bank regulates some FinTechs directly by granting them NBFC licenses (such as NBFC-P2P), or indirectly by regulating the banks and NBFCs associated with them. National Payments Corporation of India (NPCI) is the umbrella organisation for operating retail payments and settlement systems in India, as an initiative of the Reserve Bank and the Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007. The interventions in Payment and Settlement System proposed by the Reserve Bank in its various Monetary Policy Statements over the past year are presented in Annex 2. A regulatory timeline depicting India's favorable policy moves to promote FinTech has been illustrated in Chart 4.



### Major Enablers of Indian FinTech

#### Penetration of internet and smart phones

Propelled by massive strides in internet and smartphone penetration, FinTechs have expanded their reach rapidly in India (Table 2).

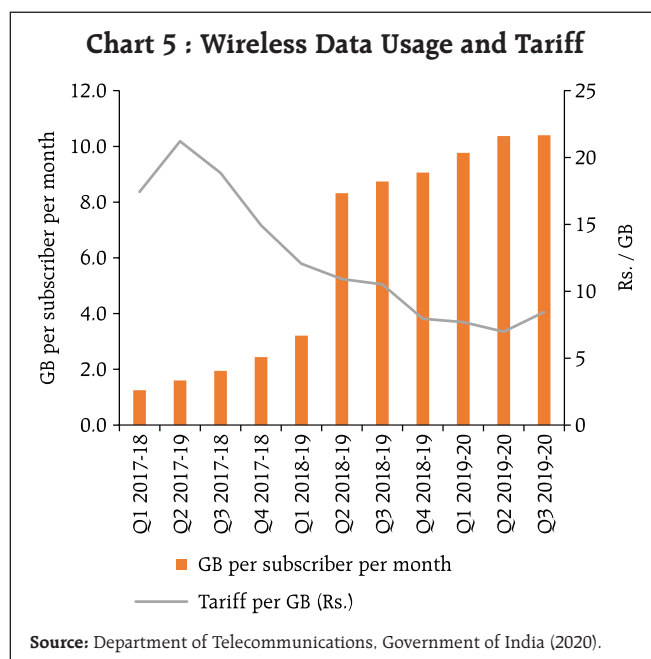
#### Favourable Demography

The Indian market is blessed with a higher proportion of young population, who are more likely to trust and adopt FinTech. There were 1157.75 million wireless subscribers in the country as on March 31, 2020, comprising 638 million urban and 519 million rural subscribers (TRAI, 2020). India and China lead

**Table 2 : Telecommunications Indicators**

Parameter	Period	Cumulative amount
Telephone Subscribers	31-Mar-14 to 30-Apr-20	116.8 Crore
Teledensity	31-Mar-14 to 30-Apr-20	86.6 %
Internet Subscribers	31-Mar-14 to 31-Mar-20	74.3 Crore
Broadband Subscribers	31-Mar-14 to 31-Mar-20	68.7 Crore
Wireless Data Usage	Q3 2019-20	21.402 Petabytes
Telecom Usage (Monthly Wireless Average Revenue per User)	31-Mar-14 to 31-Dec-19	₹ 78.7
Telecom Towers	01-Sep-17 to 27-Jul-20	6,05,788
Gram Panchayats connected under BharatNet	31-Aug-14 to 30-Jun-20	1,41,098
Telecom Licenses	31-Mar-14 to 30-Jun-20	156

Source: Department of Telecommunications, Government of India (2020)

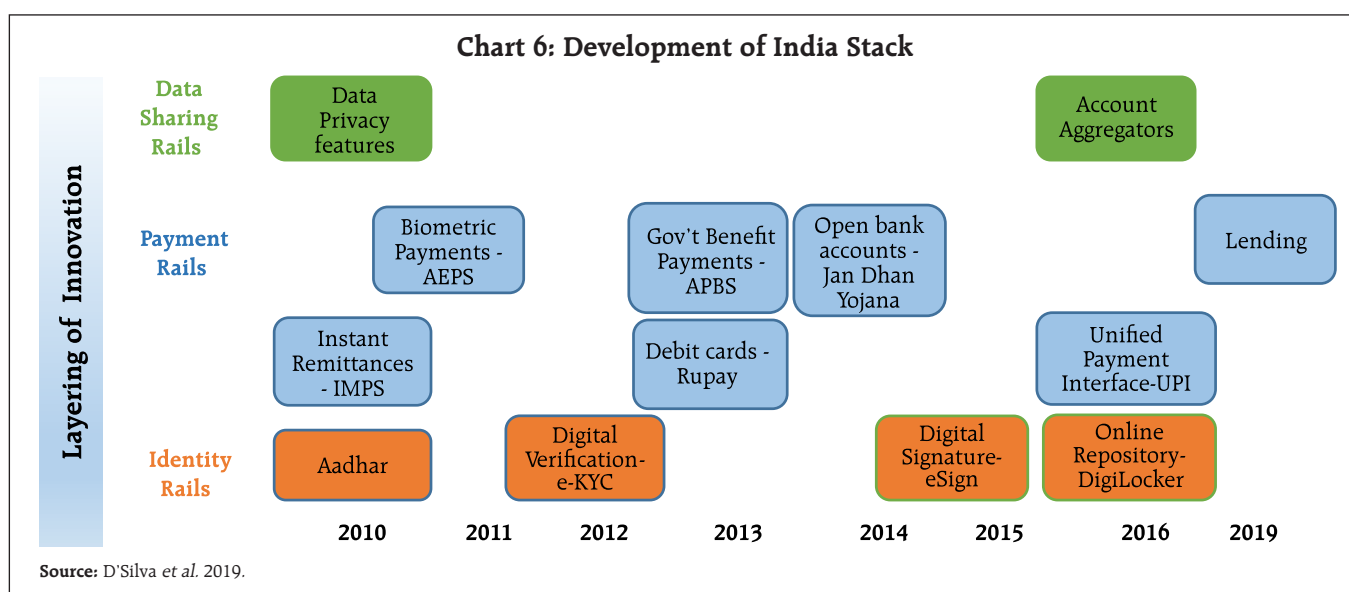


Source: Department of Telecommunications, Government of India (2020).

the Global FinTech Adoption Index 2019 with an adoption rate of 87 per cent. While per capita internet usage has increased, tariffs have declined (Chart 5).

#### India Stack

India's evolution as a progressive FinTech nation happened on the back of the 'India Stack' – an indigenous set of technologies and policies that act as enablers to innovation (Chart 6)



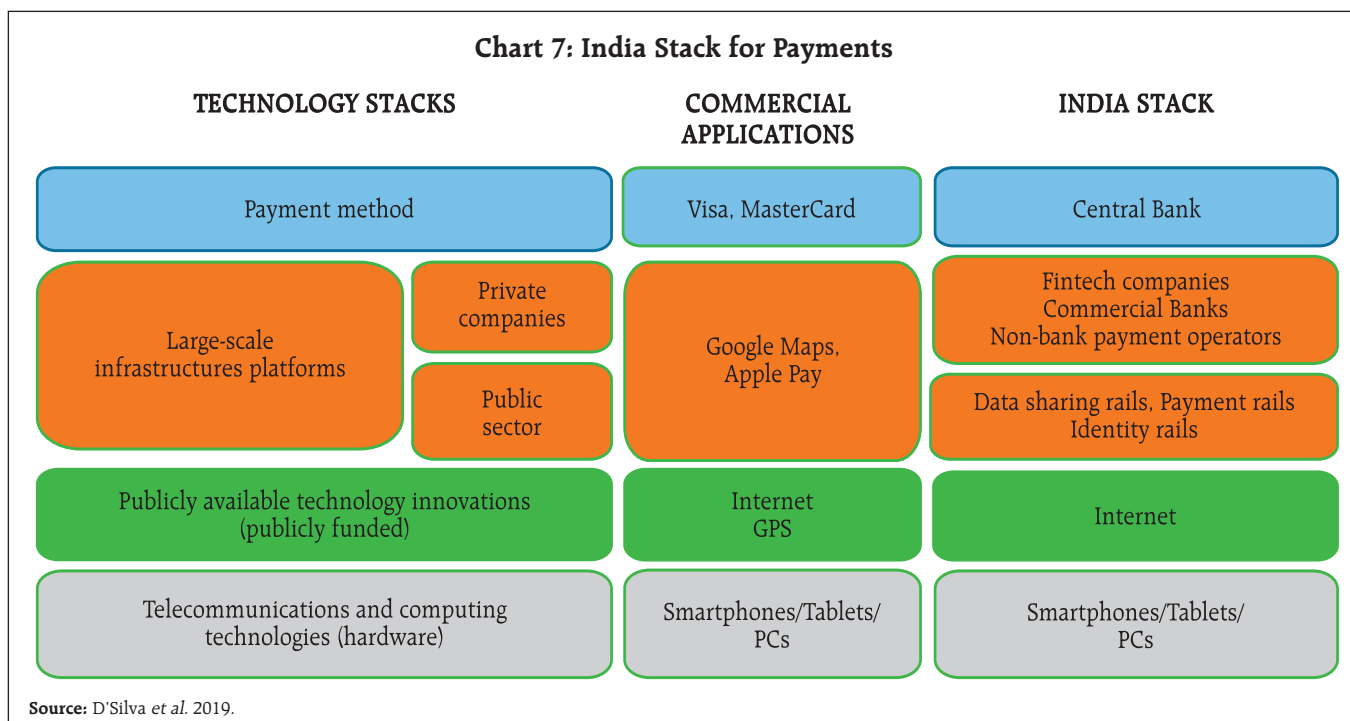
Source: D'Silva et al. 2019.

The 'India Stack' encompasses two core principles - building digital platforms as public goods and incorporating data privacy and security in the design of digital public goods (D'Silva *et al.*, 2019). An example of the India Stack for payment systems is shown in Chart 7. The cornerstone of the India Stack is the Aadhaar enabler, used to access a unique, verifiable identity at low marginal cost by FinTechs. Over 1.25 billion residents of India have been issued Aadhaar, and 30 million authentication requests are processed daily (UIDAI, 2019). Various publicly provided platforms for verification (e-KYC), digital signature (e-sign), cloud storage (DigiLocker) and payments have been developed over Aadhaar, which can be used by innovators to create and exchange value, obviating the need to build their own digital infrastructure.

Unified Payments Interface (UPI) is a pivotal enabler, which virtualises accounts and facilitates customers to undertake merchant payments and fund transfers.

*Data sharing framework*

Wider access to data generated by online activity could be beneficial since they are often obtained at zero marginal cost and are non-rival<sup>4</sup>. Open access to data could also lower switching costs for customers and generally foster competition and financial inclusion. In 2016, the Reserve Bank established a legal framework for a class of regulated data fiduciary entities, called Account Aggregators (NBFC-AA), enabling customer data to be shared within the regulated financial system with the customer's knowledge and consent. Access to data will be granted to regulated entities (under the RBI, SEBI, IRDA and PFRDA) for a limited time for a specific purpose. Innovation facilitators are also important FInTech enablers. The Reserve Bank has set up a 'Regulatory Sandbox' for issuing facilitative regulation to help the fast-developing FinTech sector, allowing live testing of new products in a controlled



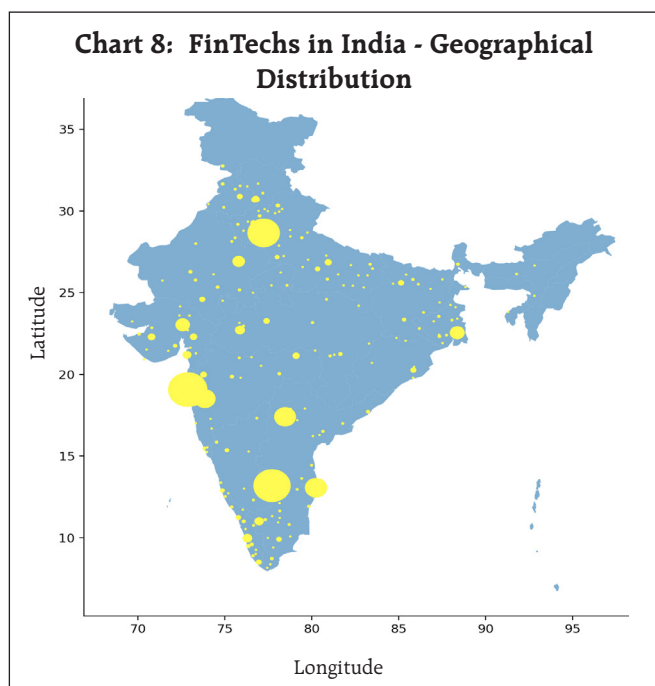
<sup>4</sup> A good is non-rival in nature when its consumption by one individual does not diminish the amount available for others.



regulatory environment to generate evidence on the benefits and risks of financial innovations (RBI, 2019). The first cohort of applications considered for the Regulatory Sandbox was under the operational theme 'retail payments' (RBI 2019a).

### Indian FinTechs: Strength in Diversity

The hallmark of India's FinTech ecosystem is diversity of markets and applications. It is seen that emerging industries often concentrate regionally to benefit from agglomeration effects, but FinTech does not follow this trend (Basole and Patel, 2018). Though concentrated in major metropolitan cities such as Mumbai, Bangalore, Delhi-NCR, and Hyderabad, FinTech is also expanding to smaller cities (Chart 8). Mumbai and Bangalore lead the FinTech momentum and account for 42 per cent of the startup headquarters. Other cities like Jaipur, Pune, and Ahmedabad are also emerging as centers of FinTechs (Medici & Pisabazaar: India FinTech Report 2019). According to the Tracxn database, there are a total of 4,680 companies in India



classified as FinTechs, which can be grouped broadly into fifteen business models (Annex 3).

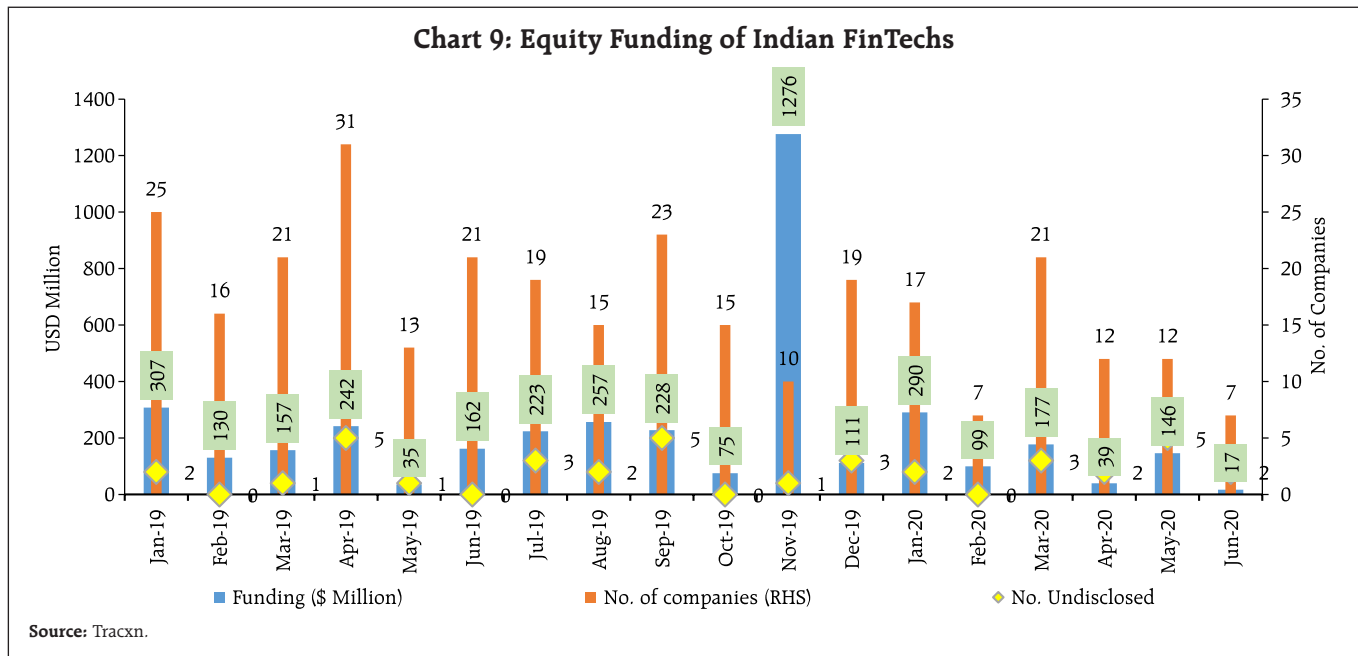
### Equity Funding

Startups tend to raise money through equity, since they usually have no history of demonstrated earnings or collateral to offer to banks, which are generally conservative in lending. Lending to a startup requires assessment of novel parameters like the future earnings potential of the unconventional business model, motivation and suitability of the founders, business climate, domain knowledge, etc. Also, specialised equity investors like Venture Capital firms can be more 'hands-on' and guide startups to make them more successful in the long run. Equity funding also allows startups to take a long view of their business, since they are freed from immediate loan repayment obligations.

According to Tracxn database, 211 Indian FinTechs raised \$ 3.18 billion (in equity rounds and from angel investors) over 2019-20 (Chart 9). 25 FinTechs over and above these 211 also raised funding but did not provide details. Fundraising activity took a hit in April 2020 due to the spread of COVID-19 and the enforcement of a nationwide lockdown.

The distribution of the funding of \$3.18 billion raised during 2019-20 was highly skewed with the top 10 companies (by equity funding) accounting for approximately two-thirds of the total funding (Annex 4). Of this, \$ 1 billion was raised by Paytm alone in November 2019. Most of the top FinTech fundraisers operate in the payments arena. Seed and Series A, Series B and Series C funding<sup>5</sup> constituted

<sup>5</sup> Start-ups tend to raise equity in successive pitches or rounds (Seed, Series A, B, C and so on), which broadly follow the growth/scale of the business, and serve the needs of the business in that stage. Early rounds may be used to establish a foothold in the market, while later rounds can be used for expansion.

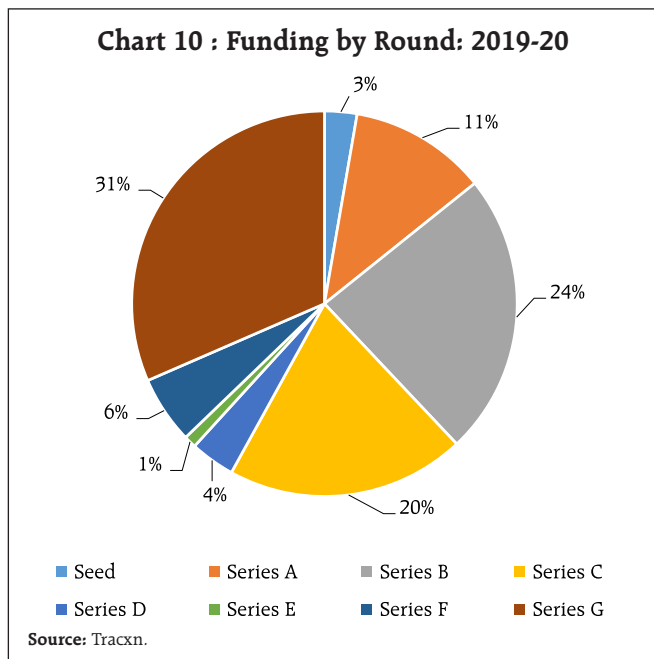


14, 24 and 20 per cent of the equity pie respectively (Chart 10). Almost a third of the entire year's FinTech funding was obtained in the late Series G round by Paytm.

#### FinTechs and Banks: Collaboration

FinTech firms are no longer viewed by banks as disruptive forces. There is evidence that FinTechs

are acting as enablers in banking and finance. Banks are relying on a number of strategies to embrace technological innovation; ranging from investing in FinTech companies and launching FinTech subsidiaries, to collaborating with FinTechs for various operational functions. Banks and non-banks are partnering to offer the combination of trust and innovation to the Indian consumer (Das, 2020). For enhancing revenues and profits, they are diversifying into newer areas such as insurance, asset management, brokerage and other services supported by financial technologies.



There are synergies to be explored between FinTechs and banks. FinTechs, while possessing vast technological knowhow and new ideas, lack a large client base and the expertise to navigate the regulations and licensing discipline of the finance industry. Traditional banks possess a major strength - reputation for trustworthiness built over several decades. Banks have capital and can weather intense competition. They also have the benefit of experience and tried-and-tested infrastructure alongside specific knowledge of risk management, local regulations and compliance. In fact, banks' on-the-ground market and

customer knowledge and pre-existing client base can be of immense value to FinTech projects. In a nutshell, banks and FinTech firms have different comparative advantages and a strategic collaborative partnership between the two would liberate them to focus on their respective core competencies (Mundra, 2017).

#### **IV. Challenges for Future Development**

FinTechs will confront several opportunities and challenges in the future. Broadly, they need to address six concerns to become more efficient, reliable, equitable and resilient.

First, despite immense scope for innovation, cross-border payments are still uncharted territory for FinTechs. Availing remittance services burdens migrant workers due to steep costs associated with such remittances (D'Silva *et al.*, 2019). A high share of cross-border payments flows through correspondent banks, whose dwindling numbers could result in even higher costs and retrogression to informal, unregulated payment networks (Carstens, 2020). In India, cross-border transactions are slow compared to domestic payments and few alternatives are available, despite heavy inward personal remittances (RBI, 2019). To make payment systems in different jurisdictions interoperable, payment instructions need to be translated to a common language. For this, standards and practices across jurisdictions must be coordinated, and mutual confidence in each domestic network's Know Your Customer (KYC) and Anti-Money Laundering (AML) frameworks must be established. Recently, UPI was connected with Singapore's Network for Electronic Transfers (NETS) on a pilot basis at the Singapore FinTech Festival 2019 (ET, 2019), suggesting that significant advances could be made within the existing setup. The UPI system settles in fiat money within the regulated financial system perimeter and therefore, poses less risk than systems such as stablecoins which are usually managed by BigTechs.

Second, the increasing popularity of FinTechs could exacerbate data use, protection and privacy concerns if the statutory rights and obligations of service providers are not clearly delineated. Machine learning algorithms could reproduce and perpetuate existing patterns of discrimination and exclude vulnerable sections. As the Indian population becomes data-rich with increasing Internet and mobile coverage, the next challenge is empowering consumers with the data generated by them through adequate legal and regulatory interventions. Citizens should be able to exercise control of their data like any other personal asset. There is an emerging demand for data localisation from various jurisdictions. In this context, a solution could be a model where data is stored locally, and only binary (Yes or No) queries are allowed on it from abroad, from a specified and globally agreed upon set of permitted queries.

Third, there is a need to ascertain the impact of FinTech on financial stability, due to higher potential for system-wide risk with its expansion. Lending standards could weaken due to wider credit access and higher competition. Since FinTech lenders give advances from debt and equity rather than from deposits, such credit could be more procyclical and volatile due to lack of standard credit guidelines. Further, credit activity outside the prudential regulation space could render credit-related countercyclical policies less effective. Reputational, cyber and third-party risks may arise for banks interacting with FinTechs.

Fourth, there is inequality of access to FinTech services. Despite having the world's second largest Internet user base, the access to Internet is still highly biased towards the urban, male and affluent population segments. Trust in the online marketplace is low and a typical user takes 3-4 months to make their first online transaction. Most users use online platforms for product research, but prefer

subsequent offline purchase (Bain & Company, 2018). Though 'micro-merchants' in India account for an overwhelming proportion of sales, they have been left out of the cashless revolution especially in smaller cities. Despite high penetration of mobile-data and smartphones, use for financial transactions is low due to behavioral reasons like lack of trust, misconceptions about taxation, lack of applied knowledge in using digital payment modes and perceived security threats (IFMR, 2017).

Fifth is the issue of consumer protection and digital education. Regulators need to stress on pre-emptive fraud detection, while also integrating digital literacy into financial literacy to dispel misconceptions. Safety provisions and grievance redressal mechanisms need to be simplified and publicised to encourage participation by low-income groups. However, financial literacy and digital hygiene alone may be insufficient. Cross-country evidences suggest that paying with cash is a habit, generally slow to change. In China, street vendors, buskers, and even beggars accept electronic payments (Jenkins, 2018). However, in Tokyo, six of ten restaurants require cash payment (Lewis, 2019). Cash use increases as concerns about privacy rise, while it declines as confidence in banks rises (Png and Tan, 2020). Thus, policies to promote electronic payments need to address fundamental concerns about privacy and confidence in financial institutions.

Finally, regulators need to conduct themselves neutrally. The Report of the Working Group on FinTech and Digital Banking (RBI, 2018a) cautions that regulators should neither overprotect incumbents, nor unduly favour newcomers by applying differential regulatory treatment. With increasing dominance of big firms in digital payments, there will emerge a tradeoff between data-fueled oligopoly for cheap services and the need for re-aligning incentives to foster smaller, more innovative firms for a competitive

ecosystem. However, to follow the principle of neutrality, "authorities may have to contend with stricter treatment for certain types of activity, such as where a claim on the platform's balance sheet is generated or where retail investors and consumers are involved" (Claessens *et al.*, 2018).

## V. The Way Forward

As a facilitative regulator, the Reserve Bank has broadened the scope of priority sector lending to include start-ups. In order to overcome internet connectivity problems as major hurdle for digital payments in rural areas and encourage innovations that enable offline digital transactions, the Reserve Bank has announced a pilot scheme under which, authorised Payment System Operators (PSOs) including banks and non-banks, will be able to provide offline payment solutions using cards, wallets or mobile devices for remote or proximity payments (RBI 2020b). Over the years, the Reserve Bank has prioritised security measures for digital payments such as the requirement of Additional Factor of Authentication and online alerts for every transaction. These measures have significantly increased customer confidence and safety leading to increased adoption of digital payments. Going ahead, FinTechs need to prioritise regulatory compliance and the management of cyber risks. They should design and implement cyber-risk prevention frameworks and regularly conduct penetration tests.

Indian FinTechs are now witnessing one of their biggest challenges till now - the COVID-19 pandemic. A survey of 250 Indian startups confirms that largely, the pandemic had a negative impact on business, though the FinTech startups among these reported the lowest operational disruptions (FICCI-IAN, 2020). Experts foresee that new firms are bound to lose out and established, well-funded startups and BigTechs in favorable sectors such as payments, e-commerce and online learning will tide through the business

disruptions. Ensuring a high degree of interoperability among startups is key to ensure a coordinated response to market demand and changing attitudes. The pandemic also challenges the belief that FinTechs promote financial inclusion; a topic of future research is to ascertain whether Indian FinTechs helped their vulnerable customers when they most needed them, or were they helpless in servicing their needs. For a healthy and sustainable business ecosystem, FinTechs need to bridge the digital divide and promote equitable, broad-based customer participation across urban and rural areas and the various producing and consuming sectors.

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**Annex 1 : Digital Transactions**

	Volume (Lakhs)			Value (₹ Crores)		
	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20
1. Large Value Credit Transfers (RTGS – Customer and Interbank)	1,244	1,366	1,507	11,67,12,478	13,56,88,187	13,11,56,475
2. Retail Credit Transfers (AePS, APBS, ECS, IMPS, NACH, NEFT, UPI)	58,793	1,18,750	2,06,661	1,88,14,287	2,60,97,655	2,85,72,100
3. Debit Transfers and Direct Debits (BHIM Aadhaar Pay, ECS, NACH, NETC)	3,788	6,382	8,957	3,99,300	6,56,232	8,26,036
4. Card Payments (Credit and Debit cards at PoS terminals and Online transactions)	47,486	61,769	73,012	9,19,035	11,96,888	15,35,765
5. Prepaid Payment Instruments (PPIs)	34,591	46,072	53,318	1,41,634	2,13,323	2,15,558
<b>Total Digital Payments</b>	<b>1,45,902</b>	<b>2,34,339</b>	<b>3,43,455</b>	<b>13,69,86,734</b>	<b>16,38,52,285</b>	<b>16,23,05,934</b>

**Source:** RBI Annual Report, 2019-20.



**Annex 2: Statement on Developmental and Regulatory Policies: Decisions regarding Payment and Settlement System**

<b>Date</b>	<b>Decision Taken</b>
Feb 07, 2019	Regulation of Payment Gateways and Payment Aggregators
Apr 04, 2019	A report to benchmark India's payment systems would be prepared.
Apr 04, 2019	A Framework for Harmonising Turn Around Time for the Resolution of Customer Complaints and Compensation to be put in place for all authorised payment systems.
Jun 06, 2019	Removing charges levied by the RBI for RTGS and NEFT transactions
Jun 06, 2019	Committee to Review the ATM Interchange Fee Structure
Aug 07, 2019	24x7 availability of NEFT
Aug 07, 2019	Expansion of Biller Categories for Bharat Bill Payment System (BBPS)
Aug 07, 2019	'On-tap' Authorisation for Bharat Bill Payment Operating Unit (BBPOU), Trade Receivables Discounting System (TReDS), and White Label ATMs (WLAs).
Aug 07, 2019	Creation of Central Payments Fraud Information Registry
Oct 04, 2019	Internal Ombudsman by large non-bank Prepaid Payment Instrument (PPI) Issuers (more than 1 crore outstanding PPIs)
Oct 04, 2019	Dissemination of granular payments data
Oct 04, 2019	Payments Infrastructure Development Fund (PIDF) to increase digitisation through cards in Tier III-VI centres
Oct 04, 2019	100 per cent digitally enabled districts
Dec 05, 2019	Introduction of a new PPI only for purchases up to ₹10,000, with loading only from a bank account and usage only for digital payments. Only minimum customer details required.
Dec 05, 2019	Previously, NBFC-P2P aggregate limits for both borrowers and lenders were ₹10 lakh, whereas exposure of a single lender to a single borrower was capped at ₹50,000. It was proposed to increase the aggregate exposure limit of a P2P lender to all borrowers to ₹50 lakh.
Dec 05, 2019	Baseline cyber security controls shall be mandated by regulated entities in contractual agreements with ATM Switch application service providers
Feb 06, 2020	Publication of a "Digital Payments Index" (DPI)
Feb 06, 2020	A framework for establishing a Self-Regulatory Organisation (SRO) for the digital payment system to be prepared to foster best practices on security, customer protection and pricing etc.
Feb 06, 2020	A pan India Cheque Truncation System to be operationalized.
Aug 06, 2020	Broadening the scope of Priority Sector Lending to include start-ups
Aug 06, 2020	Scheme of Offline Retail Payments Using Cards and Mobile Devices
Aug 06, 2020	Online Dispute Resolution (ODR) for Digital Payments
Aug 06, 2020	Positive Pay Mechanism for Cheques
Aug 06, 2020	Creation of Reserve Bank Innovation Hub
Oct 09, 2020	Round-the-Clock availability of Real Time Gross Settlement System (RTGS)
Oct 09, 2020	Perpetual Validity for Certificate of Authorisation (CoA) issued to Payment System Operators (PSOs)

**Note:** Updates on the above may be found in the RBI Annual Report 2019-20

**Annex 3 : Indian FinTechs by Business Model**

<b>Business Model</b>	<b>No. of Firms*</b>	<b>Description</b>
Investment Tech	990	Platforms for retail and institutional investors to research and invest in multiple financial assets.
Payments	978	Companies which participate in traditional web based and offline payment cycle; provide alternative mode of payment, and support the payment companies in terms of security, analytics, platform, etc.
Finance and Accounting Tech	906	Automate functions of finance and accounting departments of organisations.
Alternative Lending	702	Online lending platforms (including balance sheet lenders, marketplaces, P2P lenders as well as lead generators) and enablers.
Banking Tech	369	Tech solutions for banking industry including software, hardware, and Tech-enabled services.
Cryptocurrencies	342	Bitcoin and other digital currency products and services.
Crowdfunding	185	Online platforms where people, organisations raise money from the masses.
Internet First Insurance Platforms	161	Tech platforms to consumers for purchasing and managing their insurance
Insurance IT	98	Software products and data solutions primarily for the insurance industry
RegTech	95	Tech products primarily for financial institutions and regulators for efficient implementation and monitoring of regulations
Robo advisory	68	Automated, low-cost investment services to retail investors and technological solutions for automated investments.
Remittance	46	Cross-border money transfer solutions & services
Forex Tech	32	Tech solutions, including internet-first platforms and software for forex market .
Islamic FinTech	7	Internet-first platforms and software for sharia-compliant finance
Employer Insurance	6	Solutions for managing employee insurance benefits.

\* **Source:** Tracxn database. The total is more than 4,680 as some companies have multiple business models.

**Annex 4: Top Indian FinTechs by Funding Raised in 2019-20**

Rank	Company	Founded	Funding Rounds	Total Amount Raised (\$ Million)	Description
1	Paytm	2010	Series G	1000	App-based wallet for consumer payments
2	BharatPe	2017	Series A, B, C	154.3	QR code based payment app
3	Policybazaar	2008	Series F	150	Online insurance comparison platform
4	CRED	2018	Series A, B	145.6	Rewards-based platform for credit card bill payments
5	KhataBook	2016	Angel, Seed, Series A, Series B	140.6	Digital ledger account book
6	Acko	2017	Series C	101.6	Tech-enabled automotive insurance
7	ZestMoney	2015	Series B	30.47	Online platform for point-of-sale financing
8	Lendingkart	2014	Series C, D	87.87	Online platform providing working capital for SMEs
9	InCred	2016	Series A	85.9	Alternative lending platform focusing on SME, consumer & personal, home and education loans.
10	Pine Labs	1998	Series C	85	PoS software solutions for offline retailers
11	Billdesk	2000	Series C	84.8	Payment Gateway
12	Digit Insurance	2016	Series C	84.35	Insurance platform for individuals

**Source:** Tracxn database.