Fintech in India

An analysis of the market, and of the UK's role in supporting its development

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List of Abbreviations

AI	Artificial Intelligence
AISP	Account Information Service Providers
AML	Anti-Money Laundering
API	Application Program Interface
B2B	Business to Business
B2C	Business to Consumer
BBPS	Bharat Bill Payment System
BHC	British High Commission
BMGF	Bill and Melinda Gates Foundation
BPM	Business Process Management
CGAP	Consultative Group to Assist the Poor
DFID	Department for International Development (UK)
DIT	Department for International Trade (UK)
FCA	Financial Conduct Authority (UK)
FCO	Foreign and Commonwealth Office (UK)
FDATA	Financial Data and Technology Association (UK)
HMT	Her Majesty's Treasury (UK)
IRDA	Insurance Regulatory and Development Authority (India)
IBA	India Banks' Association
ISPIRT	Indian Software Product Industry Round Table
JAM	Jan-Dhan Yojana, Aadhaar, Mobile
MAS	Monetary Authority of Singapore
MNO	Mobile Network Operator
MSME	Micro, Small or Medium sized Enterprise
NASSCOM	National Association of Software and Services Companies (India)
NCR	National Capital Region
OFT	Office of Fair Trading (UK)
P2P	Peer to Peer
PMJDY	Pradhan Mantri Jan-Dhan Yojana
PSIG	Poorest States Inclusive Growth Programme
PSR	Payment Systems Regulator (UK)
RBI	Reserve Bank of India
RCA	Regulatory Cooperation Agreement
SEBI	Securities and Exchange Board of India
SEIS	Seed Enterprise Investment Scheme
SME	Small or Medium size Enterprise
TCS	Tata Consultancy Services (India)
TRAI	Telecom Regulatory Authority of India
UKTI	UK Trade and Industry
UPI	Unified Payment Interface

Executive Summary

Fintech in India is on the rise, and it poses both a threat and an opportunity for India's financial sector. Its impact will be felt not just on the supply side – changing business models for banks, driving efficiencies and outreach – but also on the demand side, fundamentally changing the way that India's population accesses and uses financial services. At this early stage in the development of Indian fintech, the British High Commission in New Delhi wanted to better understand the dynamics of the sector: who are its key players, what are the major trends and challenges, and – as the world's leading fintech centre – what can the UK do to support its development?

This report addresses these issues and suggests a roadmap for how the UK and others can support the development of a larger, more effective and inclusive fintech sector in India. It does this by studying Indian fintech as a market system, in which suppliers and consumers of tech-based financial services operate in an ecosystem formed by a range of market enablers and diverse set of policies and regulations.

To date, Indian fintech is largely a story of payments. By far the largest fintech companies to emerge from the sector are providers of mobile wallets and digital payments. Since the beginning of 2015, two thirds of investment in Indian fintech has gone into this space. Two of these companies, PayTM and FINO PayTech, have grown sufficiently large to receive Payment Bank licenses from the Reserve Bank of India (RBI). These businesses will get a further boost from the government's demonetisation drive.

While the highest profile fintech companies are running customer-facing payments and personal finance models, much of the activity is in the B2B space. A new wave of Indian fintechs are identifying inefficiencies and gaps in the structure of existing financial systems and finding innovative, tech-based solutions for these problems. Data analytics, distributed ledger technology and artificial intelligence are three key examples of these growth areas.

Most of the competition in fintech today remains for the wealthier customer base of urban, salaried and middle class populations. However, the people with most to gain from fintech in India are likely to be the people with currently little or no access to financial services. Where there are no existing relationships to disrupt, the opportunity for tech-based solutions to reduce transaction costs and information asymmetries is enormous, and should support a rapid increase in financial inclusion for India's poorer populations. Indeed, India is well-positioned to become a global leader in the *inclusive fintech* space.

On the policy side, the joint push of Jan-Dhan Yojana and Digital India along with the Unified Payment Interface and other interoperability initiatives are providing an excellent long term foundation for fintech businesses. Furthermore, the government's demonetisation policy has provided a unique push factor for Indian consumers and businesses to utilise services provided by fintechs at an accelerated rate. Though it is not yet clear to what extent PayTM and other fintechs have been able to take advantage of a spike in demand, it is likely that demonetisation will push digital payment providers and Indian fintech more broadly on to a more rapid growth trajectory than previously anticipated.

To achieve its potential in fintech, the ecosystem approach points a number of ways in which India's government, private sector and development community can support the sector's growth. And in many ways the UK's experience can be helpful in this this regard.

India's approach to regulation of fintech, led by the RBI, has been largely reactive. Cognisant of the pace of change and the knowledge gaps that exist, regulators are studying the growth of the market and taking time to decide where and how to intervene. Here, there is much to be learned from the UK experience, where the Financial Conduct Authority (FCA) through its projects around innovation and sandboxing has developed an effective model for balancing innovation and regulation.

India already has strong innovation systems that are supporting fintech's growth but more can be done to build the enablers of an effective ecosystem. There is a dearth of incubation facilities for early stage fintech ideas, in particular those looking to serve poorer markets. Though linkages do exist to universities and academia for a good pipeline of ideas, these can be strengthened. While there are a number of investors looking at the sector, there is a lack of high quality investors with the knowledge and expertise to add significant value through

mentorship and advisory services. Industry coordination is also weak and nobody is effectively playing the role of an industry body (as is played by Innovate Finance in the UK). This weakens the networks and the collaboration that can be important drivers of innovation and growth.

Still in its nascent stages, there remains much talk about how fintech could disrupt the financial service landscape in India. There is little doubt that financial services are entering a period of non-linear change and while there is likely to be some consolidation and fewer traditional banks will emerge, it is unlikely that fintech is going to take significant market share away from existing players (who are well entrenched with large customer bases, the vast majority of financial sector assets and close links to the government). Rather we will see fintechs filling gaps that banks and other financial institutions are less able or less willing to fill. Here the UK experience is instructive. While fintech has made dents in funding for SMEs and entrepreneurs (through P2P lending and crowdfunding) it has made little dent in the markets for the big five UK banks and larger financial corporations. In fact, the model has become more one of partnerships, where links between old and new financial sector players are forged in mutually beneficial arrangements. Where fintechs can be nimble, customer-centric and innovative, banks can provide capital, data and customer relationships – enormous synergies exist, and these relationships will be key to the further development of Indian fintech.

Based on the growth path of fintech in the UK and the opportunities and challenges currently facing in the Indian market, the following suggestions indicate the key areas of focus through which the ecosystem may be most effectively supported.

i. A “fintech bridge” needs to be established between India and the UK that will facilitate peer to peer relationships and cross-border transactions between companies and investors.

ii. Sharing of knowledge and experience needs to be supported between functionally-equivalent institutions, such as the Reserve Bank of India and the UK’s Financial Conduct Authority.

iii. The activities of different UK institutions working in the Indian fintech space should be coordinated through the establishment of a cross-governmental fintech committee or working group.

iv. The concept of inclusive fintech within financial inclusion programming should be jointly explored by DFID and other development partners in India.

v. The possibility for a fintech challenge fund should be analysed to promote innovation and scaling of new business concepts.

vi. The UK should look for ways to offer its expertise to Indian authorities around building an accommodative environment for start-ups.

vii. The business case for an Inclusive Fintech Incubator should be examined, to lay a platform for India to become the global hub for inclusive fintech.

viii. Greater industry coordination should be supported, potentially by facilitating Innovate Finance to explore the opportunity for a similar industry association for Indian fintech.

ix. Support greater private sector linkages, to promote partnerships and investment between Indian and UK fintech.

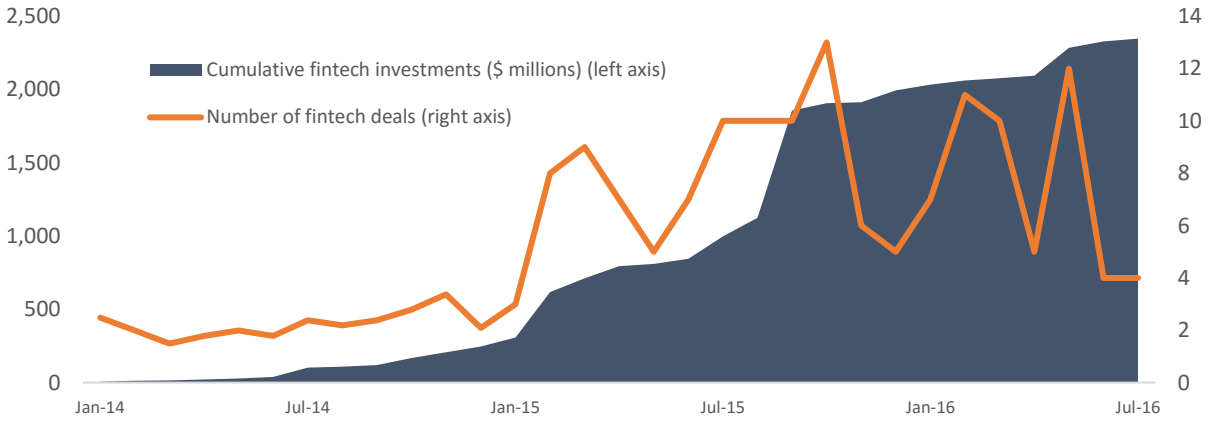
x. Carry out a study on the potential role of a guarantee scheme to support digitally-enabled alternative lending models.

I. Introduction to Indian fintech

Internationally, technology is driving a wave of innovation in finance that is changing the way that markets are structured and services are delivered. From simple money transfer to complex trading systems built around artificial intelligence and machine learning, technology is making financial services more accessible, cheaper, more innovative and more efficient. Since the onset of the financial crisis, investment into fintech businesses increased from $930 million in 2008[1] to $22.3 billion in 2015.

In the developing world, India is overtaking early leaders like Kenya and the Philippines as a centre for financial service innovation and experimentation. A combination of proactive government policy around financial inclusion and digital services, a strong base in technology and innovation and the large outstanding demand for financial services means that over $2.5 billion has been invested in Indian fintech businesses (Figure 1)[2]. The demonetisation policy announced in November 2016, which explicitly aims to push consumers away from cash towards digital transactions, has laid a platform for even faster growth.

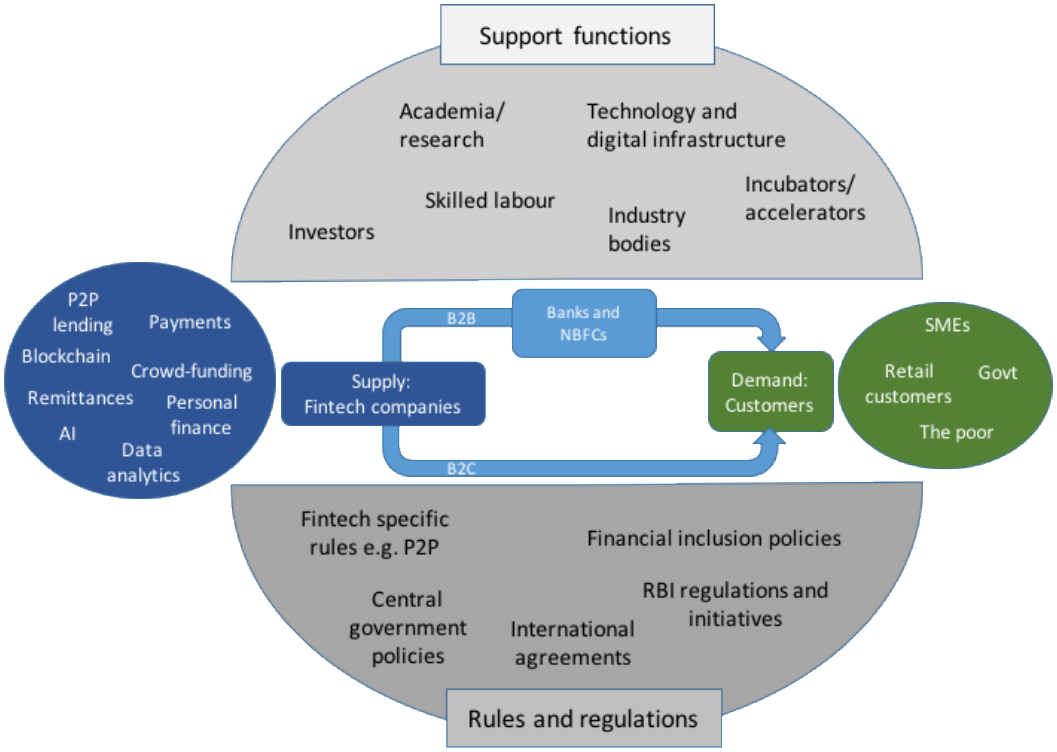
Figure 1. Growth of the Indian fintech Industry[3]



Fintech is a relatively new industry in India, but its rapid growth and potential impact both on the financial sector and on the general population mean that it has garnered a lot of attention. It is heavily covered in the media and is regularly talked about by senior politicians. It is also not very well understood.

The purpose of this report is to provide an overview of the fintech landscape in India, looking at where the market is, where it might go and how it might benefit from linkages with the UK. In order to do this, we will use the market systems framework as an analytical tool with which to study the market. This framework allows us to look at the market from the *micro* perspective (buyers and sellers), the *macro* level of policies and regulations, and also the *meso* level of support functions and infrastructure. A summary of the market system for fintech is shown in **Figure 2** below.

Figure 2. The market system for fintech in India



II. Innovation and the supply side

Fintech in India is a broad industry, imperfectly defined and comprising of a wide range of players and solutions. Suppliers of financial technology services are as diverse as the services they provide, and sit at various points on the spectrum that begins at technology and ends at finance.

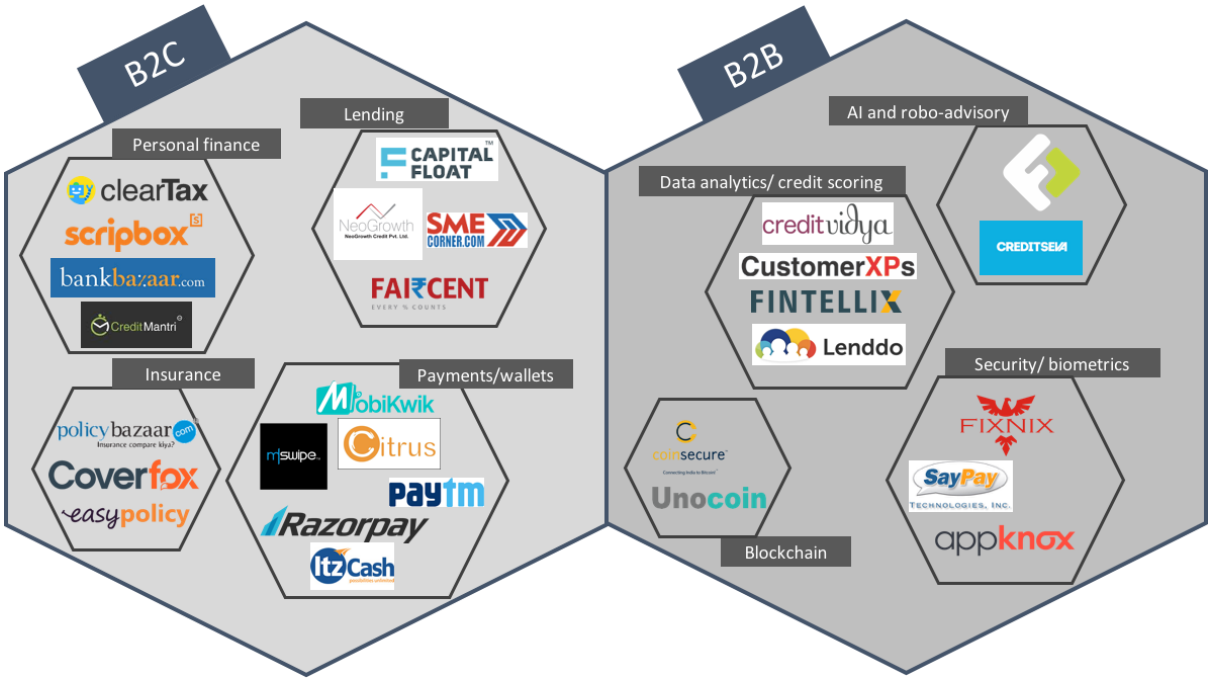
At the technology end, though usually excluded from the fintech discourse, India's large technology companies have traditionally been major providers of technology for the financial sector. Companies like Infosys, Wipro and TCS (and international competitors like IBM) are legacy players in this space and continue to hold large market shares in providing and supporting back end systems for the banking sector. Tech-driven services like payments systems, risk management software, clearing technology and investment banking architecture are large and complex and India's big tech players remain very active in the supply of these services.

At the other end of the spectrum, India's banks and NBFCs are large investors in technology, and have recently ramped up investment to develop new tech-based systems and banking solutions. Recognising the potential of technology to drive efficiencies, reduce costs, save time, increase outreach and improve the user experience, India's financial sector has responded to the opportunity not just with investment but with new business models focussed on generating and harnessing innovation. Private sector banks (like HDFC and YES Bank) have led the way in this space, with some even forming vertical structures within the bank focussed on digital innovation.

At the intersection of tech and finance, fintech has emerged as a major force within India's start-up and entrepreneurial ecosystem. Fintech has come to be associated with the diverse range of relatively new firms that leverage technology to target particular pain points or opportunities within the financial sector.

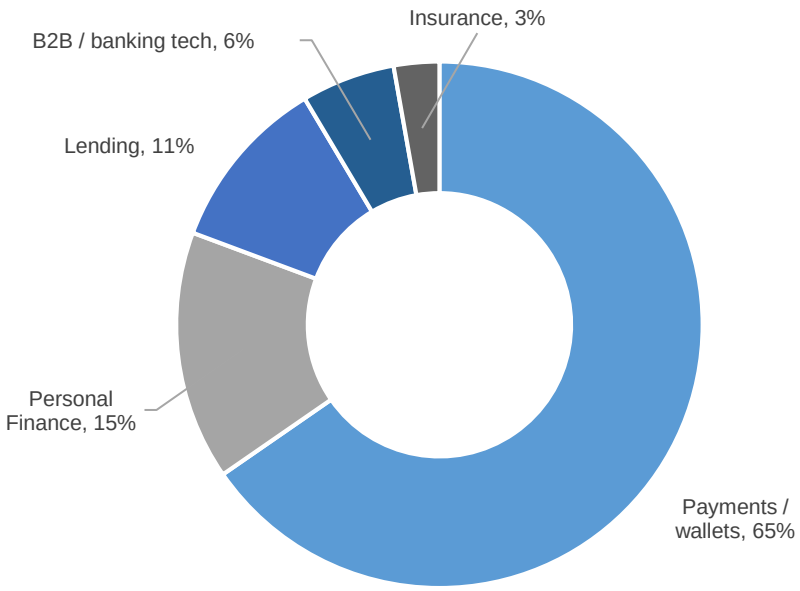
Two broad streams exist within this – fintech firms that are building verticals direct to customers (B2C) and those that work horizontally across the sector, providing services to banks and other financial institutions (B2B). Within these two broad categorisations, a number of parallel industries have emerged that collectively have come to represent the supply side of the fintech market in India.

Figure 3. Segmentation of India's fintech sector



To date, fintech in India has primarily been a payments story. B2C platforms that provide mobile wallets and simple digital payments services account for the vast majority of revenues and investment in the fintech space. Value of transactions generated through mobile wallet providers has grown from INR 27 billion in 2013-14 to INR 81 billion in 2014-15.[4] Companies like PayTM, MobiKwik, Citrus and PayU are leveraging the rapid increase in the use of smartphones, internet connectivity and online shopping to integrate payment processing into web applications. These companies have received an enormous boost from the government's demonetisation drive, which will push people towards digital payments at an accelerated rate. The payments sector accounts for around two thirds of investment to date in Indian fintech companies, led by the $500 million invested by Alibaba in PayTM.[5, 6]

Figure 4. Fintech investment by sub-sector (Jan 2015-July 2016)[7]



Fintech-based personal finance and wealth management have also reached some level of maturity. A number of players have found success as aggregators of loans or insurance options, collecting customer data and matching them to a particular product from a third party. Fintech is providing platforms to consumers to save, invest, manage their wealth and compare costs and returns for a range of financial product offerings. For example, PolicyBazaar provides a digital comparison tool between insurance quotations, and FundsIndia allows customers to explore, compare and buy mutual funds of different companies. These fintechs, which largely target wealthier consumers, effectively play the role of middlemen, leveraging data and using matching algorithms to provide a low cost intermediation service.

While payments and personal finance sites were the first fintech sub-sectors to accelerate, the next most dynamic space may well be alternative lending. A number of companies are leveraging technology and emerging data to design lending models targeting un-banked or under-banked markets (SMEs, millennials, emerging middle classes) and delivering loans more quickly and at lower costs than traditional institutions. Unlike the loan aggregators, these companies generally carry the loans on their own balance sheets, and as such are regulated by RBI as NBFCs. Credit tends to be focussed on working capital or retail purchases. This market is led by players like Capital Float, SME Corner and InCred Finance.

Beyond these verticals, there is an array of B2B solutions that aim to solve technical problems faced within the systems of banks and other financial institutions – these can broadly be classified as *banking tech*. While India is starting to see the development of digital-first banking models, led by Singapore's DBS, there is more activity in the banking sector niches including loan management platforms (e.g. Cloud Lending Solutions) and risk management solutions and analytics (e.g. Fintellix).

Data analytics is another growth area, which often sits horizontally across other segments. For instance, Scripbox employs a scientific investment process, backed by behavioural finance expertise, to collect and analyse market data in order to advise individuals on investing in mutual funds. Though currently small, data analytics offers tremendous potential for supply of fintech. In India, Big data is expected to witness eight-fold growth to reach $16 billion by 2025 from the current level of $2 billion. [8]

Fintech and disruption to India's financial system

Much has been made globally of the potential of fintech to disrupt traditional financial services sectors. Particularly since the 2008 financial crisis, a popular narrative is that fintech will be the Schumpeterian gale of creative destruction that blows through the financial sector, providing better, more efficient and customer-centric services at a lower cost, and ultimately taking market share from banks, insurance companies and other established players.

In India, the potential for disruption is indeed large. The banking sector has not effectively reached out to rural areas and low income populations, and even among the wealthier banked population services they can be slow and unreliable. Cash remains king in a country that is rapidly digitising. But while there is a general consensus that technological progress is driving Indian financial services into a period of unprecedented non-linear change, it is less clear what this change will look like, or what the market will look like in a decade's time.

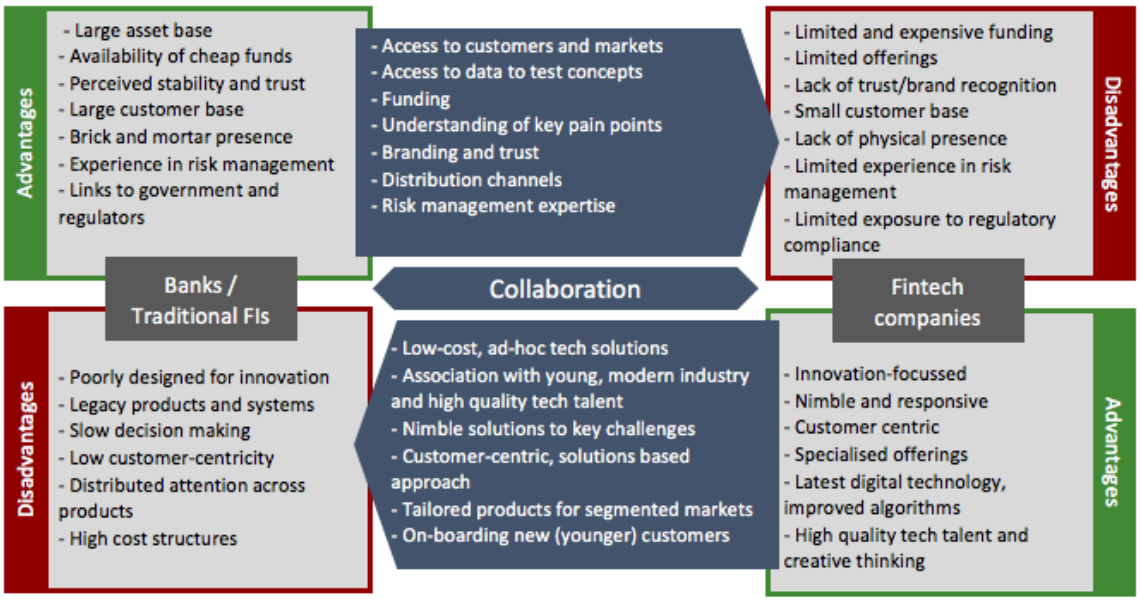
It is tempting to view fintech, with its innovative products and potential for scalable, low-cost solutions, as the agent of disruptive change in the sector. In areas like distributed ledger technology, P2P lending and artificial intelligence, there is certainly potential for leapfrogging of existing markets. However, the story of fintech in India to date is less one of destructive disruption and more one of facilitation. The vast majority of financial sector assets remain in the banking sector. India's banks are so large, so closely-linked to government and so established in their market position, it is not clear that there is great potential for new competition to take significant market share. (It is also not clear whether the government or RBI would consider this as advantageous).

A more feasible scenario for fintech in India, and one that we are already seeing play out, is that fintech helps to fill the gaps that exist in the financial sector. Broadly speaking, the market is big enough for everyone to play a role. The B2C payments operations that have dominated the fintech growth narrative in India so far are rarely competing directly with banks. Though a number of banks are launching their own mobile wallets, a commonly held view is that, by getting low income consumers accustomed to simple digital payments, mobile wallet providers are simply on-boarding the next generation of customers for more established financial institutions. They are not competing in the same market, but playing complementary roles. Recent initiatives by the RBI to bring institutions like PayTM and FINO PayTech (as well as MNOs) into the regulated financial sector as Payment

Banks – are a step towards building this complementarity as fintech companies seem set to play an established role in the digital payments space, and provide a platform to build partnerships with other players through which a broader range of financial services (e.g. loans, insurance) can be delivered.

We therefore do expect that fintech will dramatically change the supply of financial services in India, but that its primary role will be to fill gaps in the market, drive efficiencies and collaborate with existing players through innovative B2B models. As financial services are unbundled, we will see many more fintech companies emerge that fill existing gaps and that open new ones. As demonstrated in Figure 5, there are a number of opportunities for banks and fintech companies to collaborate and solve each other's problems. Increasingly, banks in India are opening up their Application Program Interfaces (APIs) to fintech companies, allowing them to test innovative new products on the bank's customer data. The challenge for both sides is to find the right strategic partners and work collaboratively to solve customer pain points.

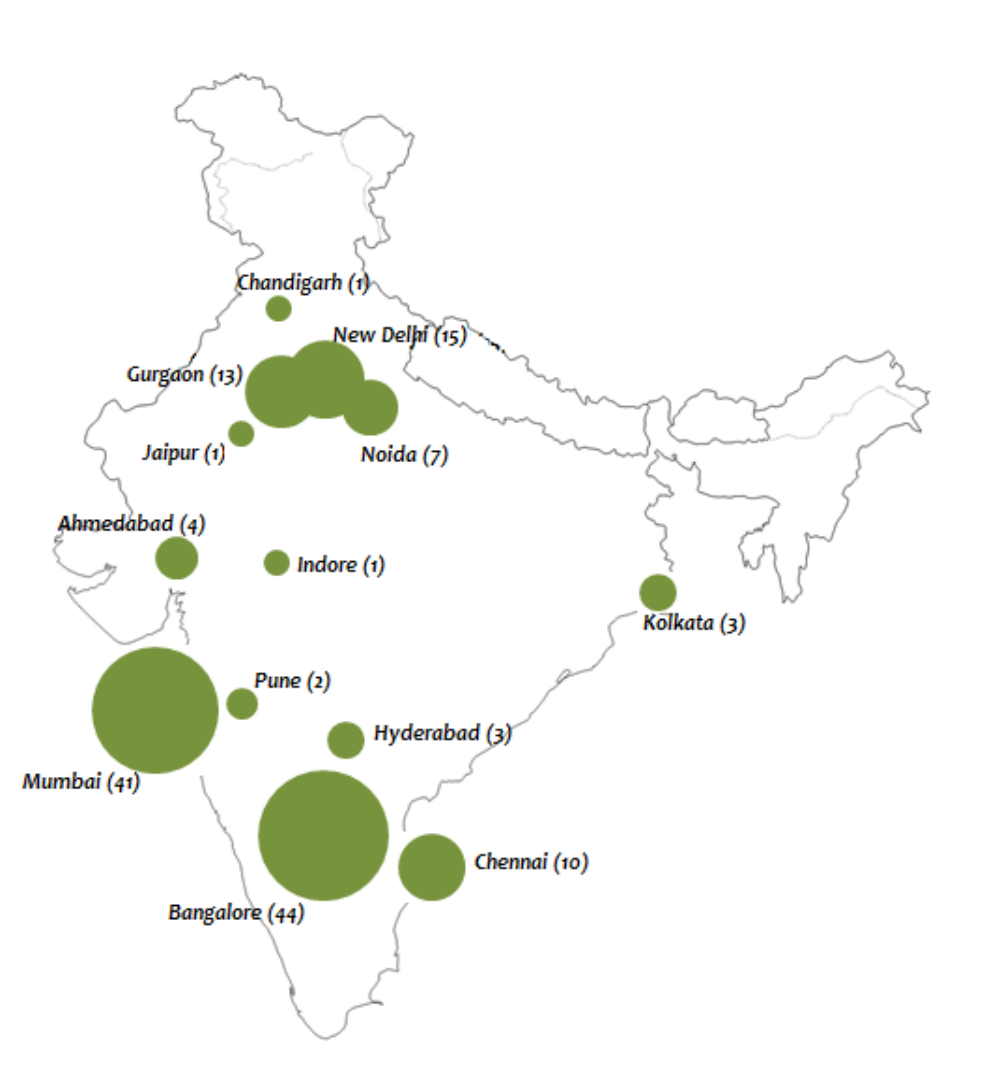
Figure 5. Opportunities for collaboration between fintech and banks



The geography of Indian fintech

Mumbai, Bangalore and (to a lesser extent) Delhi NCR have emerged as the fintech hubs of India. As demonstrated in Figure 6 below, over 80% of fintech companies are located in one of these three centres. This is not at all surprising, given the prominence of finance, technology, business and government in those cities. It is interesting to note however that there are variations in the ecosystems and the types of fintech models emerging from these cities.

Figure 6. Geographical distribution of Indian fintech companies



Source: Trak.in. (July 19, 2016). Indian Startup Funding and Investment Chart (January 2015 - July 2016).

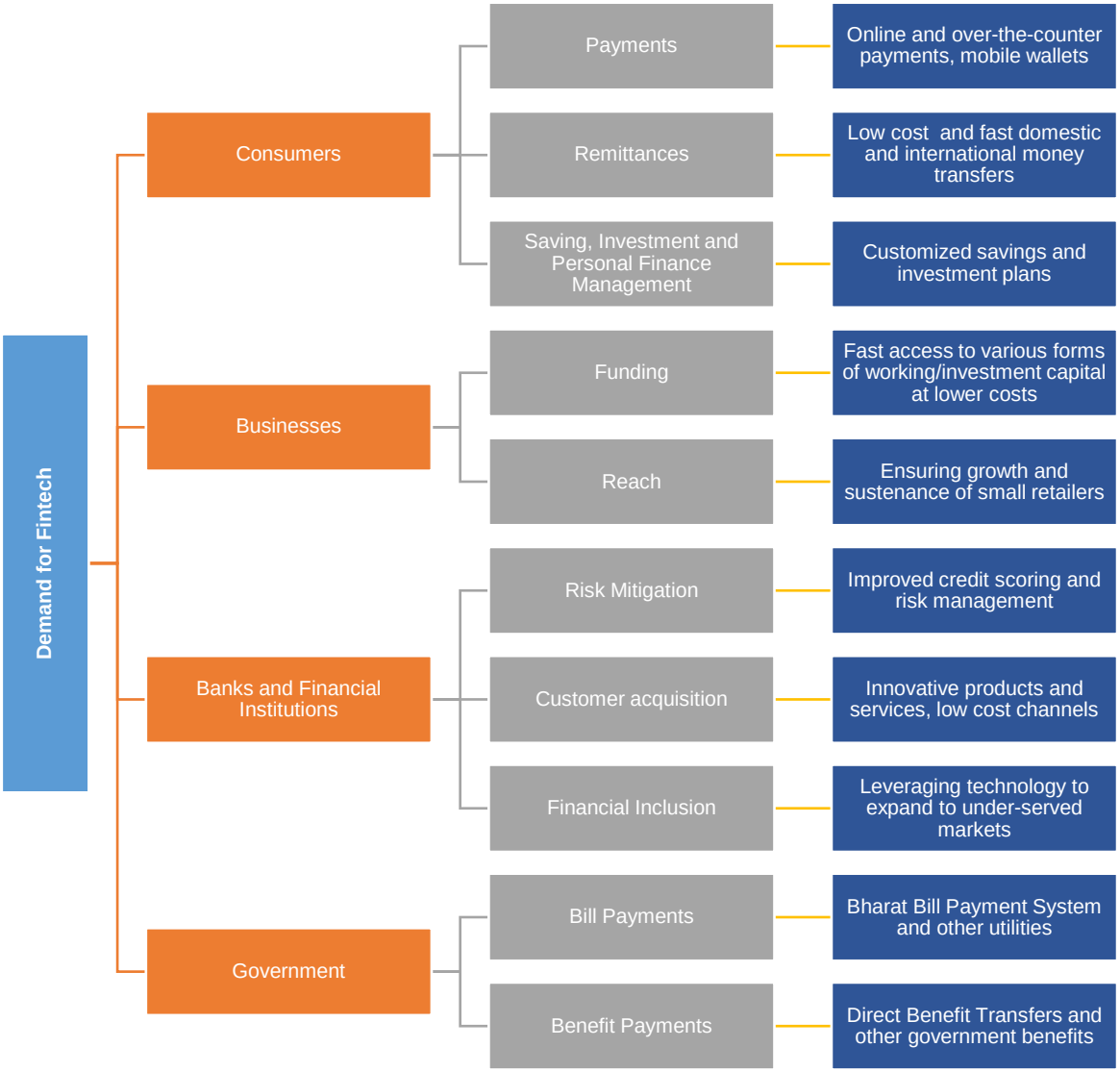
As the financial capital, Mumbai's fintech companies absorb a lot of talent from banks and other financial institutions. Founders are often ex-bankers, who have a deep understanding of the workings of the financial sector and pain points faced by banks and other financial institutions. Here, the challenge comes first and technology is a solution to the challenge. There is a strong ecosystem of bank-led incubators and accelerators, a B2B focus, and founders tend to be older and more experienced.

Bangalore has more of a start-up culture, with younger founders and those coming from a tech background looking at how they can apply their skills to the financial sector. A number of incubators and accelerators provide these start-ups with the necessary infrastructure support to develop their ideas, with fintech forming one arm of these broader tech focussed incubators and accelerators. There are fewer linkages to the financial sector, meaning that it is harder for companies to get a deep understanding of the key challenges and opportunities that exist in the industry.

Though there are slightly more fintech companies in Bangalore than Mumbai, investment in these companies for 2015 was just 40% of what was seen in Mumbai ($188m compared to Mumbai's $465m). Overall investment has been highest in Delhi NCR, skewed somewhat by the presence of PayTM in Noida.

There is a clear and large opportunity for fintech to improve the delivery of financial services to the Indian population. Demand is there at every level of consumer for better, cheaper, varied and more accessible financial services. Businesses, especially micro and small enterprises who are largely excluded from traditional bank lending channels, are also looking to fintech to be connected with lenders who are willing to lend to higher risk borrowers with poor access to collaterals or documentation. Banks and financial institutions demand fintech to devise alternate means to acquire new customers, and the government demands fintech to reduce leakages by establishing digital payments and transfers. The demand spectrum is outlined below.

Figure 7. Demand for fintech



Numerous factors can be attributed towards the growth in demand for fintech in India - these include rapidly expanding internet and mobile penetration, emergence of a younger, wealthier and digital-savvy generation, large gaps and inefficiencies in the financial sector that technology can help to fill, and a regulatory and academic environment which is supportive of the growth of the sector.[9]

While these are the general factors that facilitate growth of fintech in a number of countries, there is one factor that is specific to India that is propelling the growth of fintech in the country. This is potential demand emanating from a massive unbanked population, which has been left behind by the existing financial system. More than anything else, it is this outstanding demand that provides the greatest opportunity for Indian fintech.

India accounts for around 21 percent of the world's unbanked adult population.[10] Formal banking institutions in India have so far been unable to provide rural and remote areas with financial products and services that enable them to operate on a sustainable basis. This is because the average balance in the accounts held by customers in these regions is not enough to make banking service delivery viable in the long-term.[11] Financial inclusion remains hindered by factors such as insufficient documentation, lack of collateral and financial history, insignificant incomes of poor households, high time and monetary cost of maintaining bank accounts, lack of awareness of the use of accounts, and large distances to be covered to reach financial institutions.[12]

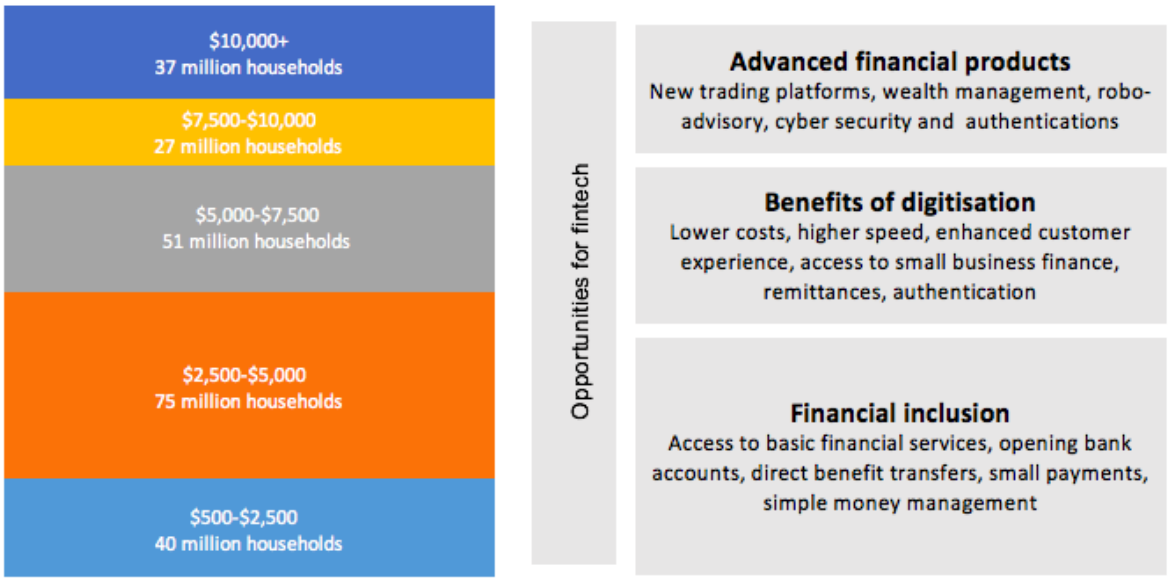
While such exclusion from the formal financial sector is one of the biggest challenges facing the otherwise fast-growing Indian economy,[13] it provides a huge opportunity to the budding fintech industry in the country. Quickly overcoming the many constraints faced by the traditional financial institutions, Indian fintechs are developing innovative and effective models to provide access to financial products and services to the poor – fintech is low cost (limited overheads), involves limited paperwork, documentations and procedural requirements, and can generate quick scalability and efficient last mile connectivity and delivery.[14]

Micro, small and medium enterprises (MSMEs) also often have limited access to financial services due to their small loan requirements, lack of appropriate collateral, and unavailability of proper documents.[15] Such limited access to funds is the second most cited hurdle for businesses (after electricity supply) in developing countries.[16] In India, almost 90% of small businesses do not have access to financial institutions.[17] These MSMEs - which contribute to almost 38% of India's gross domestic product – provide a significant opportunity for the fintech industry to expand coverage.[18]

Recognizing fintech's potential to broaden the financial system, the Government of India is also undertaking several initiatives such as JAM trinity comprising of the Prime Minister's Jan-Dhan Yojana (PMJDY), Aadhaar and Mobile connectivity and Digital India to make India ready for fintech, particularly in poorer and rural areas,[19] in terms of identification, internet connectivity and digitisation. Up till August 2016, 147 million rural bank accounts and 92 million urban bank accounts have been opened in India with 120 million of them Aadhaar seeded.[20] Further, the teledensity[21] rate in rural areas in India has also increased from approximately 41 percent in March 2013 to 50 percent in December 2015,[22] indicating that fintech firms can leverage the improving infrastructure to increase penetration.

Taking a long view, the Indian consumer market provides an enormous potential customer base and the demand based market opportunity for fintech in India. Further, the segmentation of the consumer class based on income, geography, sector, demographics and financial needs makes this demand extremely diverse. This in turn adds to the opportunity for varied fintech models to cater to this demand. This is because all these individual segments of the population – ranging from the rich and affluent to the middle class and the vulnerable groups - are of a considerable size and have varying needs from fintech, each thereby offering an opportunity worth exploring. For instance, while the rich and upper middle class are looking at fintech for cutting edge products, the middle class is looking to reap the benefits of increasing digitisation and the vulnerable groups of society demand fintech for financial inclusion (see **Figure 8** below).

Figure 8. Opportunities for Indian fintech in by income segment[23]

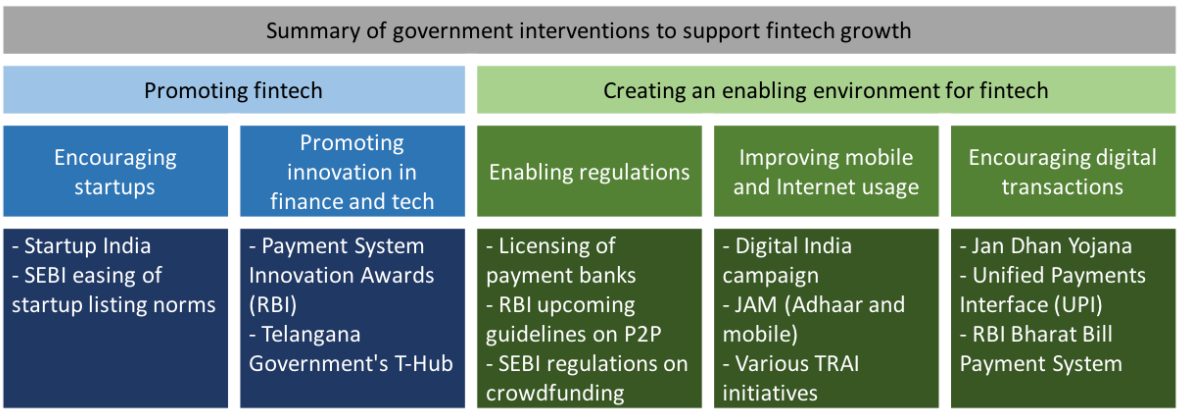


IV. The policy and regulatory environment

Given the dynamic nature of the fintech sector and its overlap across various sectors, effective policy and regulation of the sector are important both for its growth and its stability. Balanced regulations are needed to enable fintech firms to compete with incumbent service providers and provide them with a level playing field; to safeguard the interests of investors and customers, and in influencing the future direction of fintech, particularly in the context of financial inclusion.

In India, the fintech industry falls under the purview of several regulators and governing bodies including the Reserve Bank of India (RBI); the capital markets regulator –the Securities and Exchange Board of India (SEBI); the telecom regulator – the Telecom Regulatory Authority of India (TRAI), the insurance regulator - Insurance Regulatory and Development Authority (IRDA). The Ministry of Finance plays the lead role on the central government side. Although currently there are no specific policies regulating the fintech sector in India, the country is making progress in this regard[24] with the Government as well as many of these regulatory bodies (particularly the RBI) making significant headway in promoting fintech. **Figure 9** below shows some of the various regulatory interventions undertaken by regulators to encourage and enable fintech in India.

Figure 9. Summary of government interventions to promote fintech in India[25]

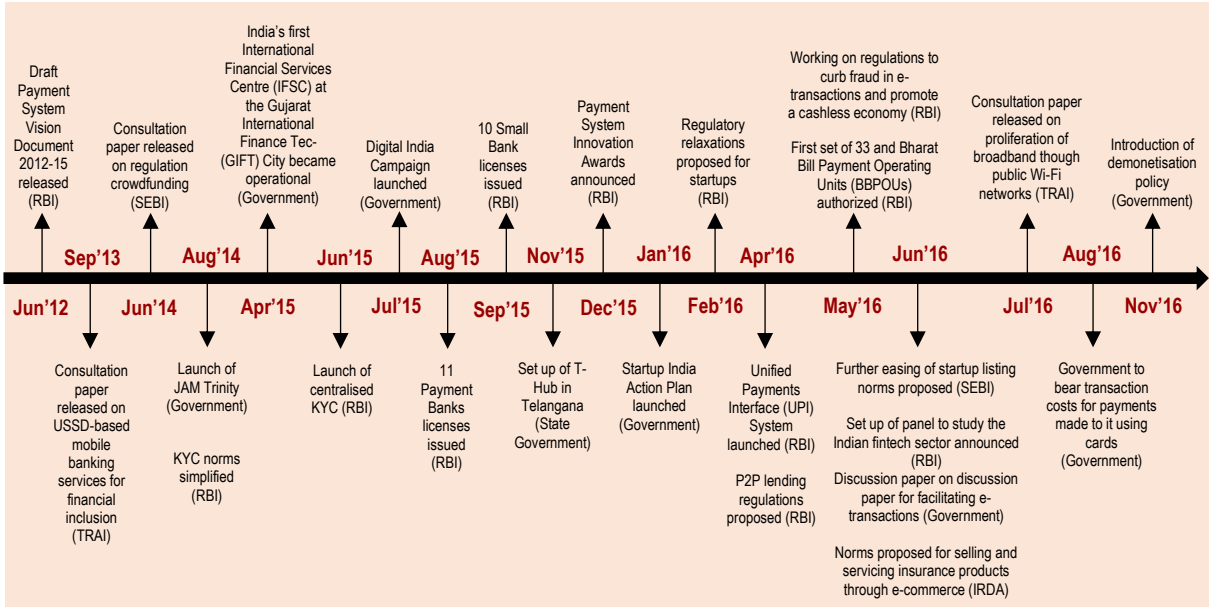


The timeline below shows the regulatory evolution of the fintech landscape in India. While fintech has been on the radar of the authorities for a number of years, activities really ramped up since mid-2015 and accelerated through 2016, culminating in the announcement of the demonetisation policy in November 2016.

While the full effects of demonetisation will take a long time to play out, there is little doubt that the policy has provided a unique opportunity for Indian fintechs to dramatically increase the uptake of digital financial services among Indian consumers and businesses. Demonetisation - depriving currency of its monetary value - provides an unprecedented push for people to look to mobile wallets and digital payment providers. In the short term, the biggest winners should be the largest providers of these services, such as PayTM and Mobikwik, with the largest rewards going to fintechs that are able to effectively manage a rapid spike of demand. In theory, increased demand for digital financial services should trigger a wave of new innovation and supply of new and more diverse services. Competition is likely to intensify with the release of UPI-based BHIM payment service in early 2017, as private fintech companies face an increasing challenge from a government-backed competitor.

Over the longer term, the critical question is whether the one-time shock of demonetisation will lead to persistent behavioural change among Indian consumers, or if there will be a reversion to the dominance of cash as a means of payment and store of value once the money supply returns to an equilibrium.

Figure 10. Evolution of regulations governing fintech in India



Initiatives by the RBI: The RBI has mostly taken a *wait and see* approach to fintech. It is quietly progressive on the sector, and understands the potential of tech to substantially change the banking landscape, however it is also patient to understand how this change will manifest. As previous Governor Raghuram Rajan said on the matter, they will "*cross the river by feeling the stones*".

The RBI is keen to support the development of an enabling ecosystem for fintech, and is taking time to scope out the market to identify key issues faced both on the supply and demand sides. Indeed it recently formed an inter-regulatory working group with the following tasks[26]:

i. To undertake a scoping exercise to gain a general understanding of the major Fin Tech innovations / developments, counterparties / entities, technology platforms involved and how markets, and the financial sector in particular, are adopting new delivery channels, products and technologies.

ii. To assess opportunities and risks arising for the financial system from digitisation and use of financial technology, and how these can be utilised for optimising financial product innovation and delivery to the benefit of users / customers and other stakeholders.

iii. To assess the implications and challenges for the various financial sector functions such as intermediation, clearing, payments being taken up by non-financial entities.

iv. To examine cross country practices in the matter, to study models of successful regulatory responses to disruption across the globe.

v. To chalk out appropriate regulatory response with a view to re-aligning / re-orienting regulatory guidelines and statutory provisions for enhancing fintech/digital banking associated opportunities while simultaneously managing the evolving challenges and risk dimensions.

vi. Any other matter relevant to the above issues.

The RBI has proposed regulations for consultation in the fast growing P2P lending market. Acknowledging the role of innovations in the fintech space, the RBI is encouraging and facilitating generation of ideas through contests and has itself also implemented innovative initiatives such as allowing differentiated banking. The RBI's larger goals of curbing e-fraud and making India a cashless economy through various initiatives are further creating opportunities and supporting growth of the fintech sector in India.

The boxes below provide a snapshot of some of the initiatives being pursued by the RBI to develop the ecosystem for fintech.

Unified Payments Interface (UPI)[27]

Status: Launched

Key Highlights:

- The objective of UPI is to simplify, reduce transaction costs, ensure consumer security and speed up digital money transfers
- The interface (i.e. an application) has been developed by the National Payments Corporation of India (NPCI)
- How it works? – An individual must register with his/her bank for the UPI service, after which a unique virtual ID is created for the person which is also mapped with his/her mobile phone. The system can then be used for transferring money and making payments (up to INR 1 lakh) anywhere (e.g. merchant payments, paying insurance, P2P transfers, money transfers between individuals) by simply approving the payment on the application.
- UPI ensures security as there is no need to share personal/bank account details and follows RBI's 1-click 2-factor authentication.
- 29 banks including SBI, ICICI and HDFC are integrating UPI with their mobile applications and many more are expected to join.

Payment Banks and Small Finance Banks[28]

Status: Issued

Key Highlights:

- Recognizing the need for "niche banking" and with the overall objective of "creating a ubiquitous payments network and universal access to savings", RBI has issued licenses for 11 Payment Banks and 10 Small Finance Banks.
- Payment Banks offer a wide variety of high volume and low value banking services for the unbanked population - facilitating deposits – current and savings, payments and transfer of remittances (domestic and international) including cash out at point-of-sale terminals, internet banking services, and as an agent for distributing financial services such as insurance.
- Small Finance Banks also offer accepting deposits and lending services to small businesses, micro industries, poor farmers and the unorganized sector through high technology-low cost operations.
- They will be subject to most banking regulations applicable to regular scheduled commercial banks, thereby giving them access to the entire banking system and minimizing risk.

Regulations to promote a cashless economy and curb fraud[29]

Status: In progress

Key Highlights:

- The regulatory framework will focus on protecting consumer interests and addressing issues related to consumer grievances and liabilities in case of frauds through e-channels.
- Previously in 2012 the RBI had released a 'Payment System Vision Document 2012-15' with a vision to "proactively encourage electronic payment systems for ushering in a less-cash society in India". The document proposed several "ways and means of ensuring that payment and settlement systems in the country are safe, efficient, interoperable, authorized, accessible, inclusive and compliant with international standards".
- A white paper had also been put up for comments in 2013 to reduce incentives for using cheques beyond a certain limit.

Bharat Bill Payment System (BBPS)[30]

Status: Launched

Key Highlights:

- The objective of the BBPS is to enhance consumer convenience to pay bills. The current scope of BBPS covers repetitive utility payments (e.g. gas); it will be extended to other payments such as school fees
- How it works? - The BBPS will operate as a tiered structure where Bharat Bill Payment Central Unit (BBPCU) will be responsible for setting working standards for the system and Bharat Bill Payment Operating Units (BBPOUs) will be authorized to facilitate payments online or through a network of ground agents. It is mandatory for all bank and non-bank entities which provide utility payment services to become BBPOUs.
- In May 2016, the first set of 33 BBPOUs have been authorized including wallet companies (e.g. PayTM), aggregators (BillDesk) and banks

- BBPOUs can use their channels to provide the service. For instance, banks can use ATMs or bank branches. Non-bank companies can use kirana stores, or set up company outlets.

Proposed regulations on P2P lending[31]

Status: Consultation paper released

Key Highlights:

- RBI released a consultation paper to understand and assess the various business models operating in India and abroad
- Studied regulatory models from prohibition (e.g. Japan) to unregulated (e.g. China) via intermediate models (e.g. UK, Australia), the two-level US model and the bank licensing model (e.g. Germany, France).
- Spelled out arguments for more or less regulation of P2P and sought feedback from wide range of stakeholders.

RBI fintech innovation competition[32]

Status: Ongoing

Key Highlights:

- Through the contest RBI aims to find innovative solutions to deter fraud, reduce transaction costs and develop the e-payment infrastructure – all to support the fintech industry in India
- Organised by the Institute for Development and Research in Banking Technology (IDRBT), the technology arm of the RBI
- Participants (individuals, groups and start-ups) will be recognized with citations and a small cash prize
- Also provide links to market and potential investors

Proposed regulatory relaxation for startups[33]

***Status*:** In progress

Key Highlights:

- The proposed relaxations focus on easing regulations on funding and related operations for start ups
- Key focus areas include easing cross-border transactions and access to rupee loans under External Commercial Borrowing (ECB), issuance of innovative foreign direct investment (FDI) instruments.
- Further, the RBI has allowed electronic reporting of investments and subsequent transactions and has set up a dedicated mail box for startups.

Launch of central KYC system and simplification of KYC norms[34]

***Status*:** Launched

Key Highlights:

- A common Know Your Customer (KYC) form has been introduced for availing all types of products and services offered by all financial services providers under the jurisdiction of RBI, SEBI and IRDAI. The customer needs to fill up this form only once, after which he/she is assigned a 14-digit identifier to be used while availing more products and services of the same or other providers. The financial service providers are expected to upload the data from this common form with a central agency called the Central Registry of Securitisation Asset Reconstruction and Security Interest of India (CERSAI).
- The RBI has simplified KYC norms significantly including Single document for proof of identity and proof of address, no separate proof of address required for current address

Initiatives by National and State Governments: The Government of India has launched several initiatives aimed at creating a digitally empowered and well-connected Indian economy. These initiatives - Digital India campaign, the JAM Trinity and proposed regulations to facilitate e-transactions are supporting growth and providing promising opportunities to the fintech industry. The Start Up India Action plan is encouraging entrepreneurship – a key support function for the fintech industry.

JAM (Jan Dhan Yojana, Aadhaar, Mobile) Scheme[35]

Status: Launched (Ministry of Finance)

Key Highlights:

- JAM is a key step towards financial inclusion and adopts digitalization as an effective delivery channel for financial inclusion
- Pradhan Mantri Jan-Dhan Yojana aims at financial inclusion through opening of bank accounts for the unbanked – at

Digital India Campaign[36]

Status: Launched (Department of Electronics & Information Technology)

Key Highlights:

- Aims to transform India into a digitally empowered society and knowledge economy, based on its 3 vision areas: Digital Infrastructure as a Core Utility to Every Citizen > Governance and Services on Demand > Digital Empowerment of Citizens
- Key pillars include:

least one for every household offering deposit and interest/withdrawal facilities with no minimum balance requirement, access to credit, insurance (inbuilt accidental insurance cover of INR 1,00,000 through the RuPay debit card and life insurance cover of INR 30,000), overdraft facilities (INR 5,000), easy money transfer across India, pension facilities and direct transfer of government benefits. Till now approximately 22 crore bank accounts have opened as part of the scheme.

- Aadhaar helps in identification of all citizens including the poor through biometrics and basic documentation
- Mobile phones connectivity provides easier access to services

- Broadband highways: Ensuring connectivity for all - the National Optical Fibre Network (NOFN) will cover 2,50,000 village panchayats, National Information Infrastructure (NII) will provide high speed connectivity to all government departments till the panchayat level.
- Universal access to mobile connectivity: Focusing on 55,619 villages which do not have mobile connectivity currently
- Public internet access program: Providing internet access through Common Service Centres (CSOs) – one in every Gram Panchayat and 1,50,000 post offices which will be converted to multi-service centres.
- Others include e-governance – reforming the government through technology, eKranti – electronic delivery for services, information for all, electronics manufacturing, IT for jobs and early harvest programs

Startup India Action Plan[37]

Status: Launched (Ministry of Commerce and Industry)

Key Highlights:

- Aimed at providing a conducive business environment for startups to enter the market and grow
- Includes initiatives on simplifying regulatory liabilities (e.g. mobile application and portal for easy registration), providing funding support and incentives (e.g. corpus of Rs. 10,000 crore over 4 years, tax exemptions), creating industry-academia partnership and incubation (e.g. Launch of Atal Innovation Mission (AIM) with Self-Employment and Talent Utilization (SETU) Program, setting up of 7 new research parks)

Promoting and Facilitating e-transactions[38]

Status: Discussion paper launched (Ministry of Finance)

Key Highlights:

- Initiatives proposed are aimed at simplifying e-transactions for individuals, building a transactions history to enable improved credit access and financial inclusion, reducing risks and costs of cash transactions and managing cash in the economy, reducing tax avoidance and the impact of counterfeit money.
- Broad areas of focus include promoting e-transactions in government collections, promoting wider adoption of e-transactions (e.g. reducing merchant discount rates (MDRs), providing tax benefits to merchants accepting card payments), creating an enabling infrastructure (e.g. increasing number of point of sales terminals), encouraging mobile banking/payment channels and establishing awareness and grievance redressal systems.
- Recently, the government has issued a circular that it will bear the transaction costs (MDR) associated with using a card or net banking for making payments to it. Currently, this cost is borne by the customers for making digital payments to the government

Gujarat International Finance Tec-City (GIFT)[39]

Status: Launched (Government of Gujarat)

Key Highlights:

- Set up to harness Gujarat's potential in the space of financial services tied up with technology
- The target business segments that GIFT will provide infrastructure support to include financial services, select product market (private banking, product development, and microfinance), capital market and trading and IT services.

Technology Hub (T-Hub) in Telangana[40]

Status: Launched (Government of Telangana)

Key Highlights:

- Launched as a public private partnership between the Government of Telangana, Indian Institute of Technology (IIT) Hyderabad, Indian School of Business, NALSAR and key private sector leaders.
- It is a technology incubation centre, located at IIT-Hyderabad campus and is aimed at bringing together entrepreneurs, venture capitalists and mentors onto a single platform; creating/attracting best start-ups & entrepreneur organisations in/to Hyderabad; and, linking, educating and promoting all entrepreneurship-related stakeholders.
- The Government is now also planning to set up T-Works which will be a place (like a manufacturing lab) for hardware start-ups to develop and experiment with technology solutions.

Initiatives by other regulators (SEBI, TRAI and IRDA): In line with the direction of the Government and the central bank (RBI), the sectoral regulators have also undertaken several initiatives that are expected to boost the growth of fintech in India. SEBI has proposed norms for crowdfunding with key focus on balancing regulation

for safeguarding investor/customer interests and promoting crowdfunding as a viable means for raising capital. Further, its efforts to allow and facilitate startups and small and medium enterprises (SMEs) to easily raise money through the capital markets is a move to support the fintech ecosystem in the form of encouraging entrepreneurship. TRAI is making efforts towards identifying and encouraging the use of the cheapest and most convenient modes of communication (using mobile technology) and connectivity to the internet, in turn promoting growth and reach of fintech in India. With the objective of increasing insurance penetration and realizing efficiencies created from the online selling channel, IRDA has proposed norms to facilitate sale and servicing of insurance products through e-commerce.

SEBI regulations on crowdfunding[41]

Status: Discussion paper released

Key Highlights:

- The regulations proposed by SEBI aim to encourage crowdfunding in India by providing startups and small and medium enterprises (SMEs) access to capital markets as a channel for early-stage funding through more efficient and effective internet based platforms and an easy to comply with regulatory framework, while at the same time ensuring investor protection.
- The proposed initiatives focus on allowing only accredited investors to invest in crowdfunding platforms, imposing limits and conditions for investment in crowdfunding platforms, conditions on type of entities allowed to raise funds through crowdfunding, setting up disclosure requirements for companies intending to raise money through crowdfunding, obligation on crowdfunding platforms in terms of risk management and setting up additional requirements for equity based, debt based and fund based crowdfunding.

Easing of startup listing norms[42]

Status: Proposal released for public comments

Key Highlights:

- Previously, SEBI set up Institutional Trading Platforms (ITPs) at Bombay Stock Exchange and National Stock Exchange to facilitate easier listing of startups through initiatives such as relaxing the mandatory lock-in period for promoters and other pre-listing investors, reducing disclosure requirements, relaxing delisting, etc. The ITP however restricted investment to institutional investors and high net worth individuals to safeguard interests of retail investors.
- However, the ITP has not been successful. Thus, SEBI has proposed to further ease these norms based on market feedback. The new norms focus on relaxation in shareholding patterns, introducing more investor categories, reducing the minimum trading lot, etc. Further, the ITP is proposed to be renamed as 'High-tech startup and other new business platform'.

Review of regulatory framework for USSD[43]

Status: Discussion paper released

Key Highlights:

- In September 2013, TRAI released a consultation paper on USSD-based mobile banking services for financial inclusion
- In August 2014, the infrastructure for USSD for provision of basic financial services (e.g. checking balances) had been put in place by the government. However, the initiative has not been a success. Thus, TRAI has released a consultation paper to review and obtain feedback on the current USSD regulatory framework.
- The issues and proposals for consultation focus on capping costs, shifting burden of cost from user to service provider, determining tariff, creating a uniform platform across all payment platforms (e.g. merchant payment, utility bill payment), etc.

IRDA norms for selling and servicing insurance products through e-commerce[44]

Status: Norms proposed

Key Highlights:

- The norms aim to increase penetration of insurance in India and to benefit consumers by offering real-time connect, improving transparency and utilizing the benefits and reach of digitization.
- The insurance e-commerce activities will be undertaken by the insurance companies (or even brokers and agents – who will get commission) through their Insurance Self-Network Platform which can be a website or a mobile application. In case of brokers and agents, regulatory compliance will be a prerogative of the insurance companies.
- The process will be completely online now with no need of a physical form. Further, insurance companies can undertake differential pricing across channels and can offer discounts for their products sold online.

Regulation, technology and regtech

To date, financial technology and regulation have moved in lockstep. Regulators, led by RBI, have closely monitored the market and responded to changes as they see them happening. Due to the rapid pace of change and unbundling in the financial sector, the RBI recognises the need to accelerate its market understanding and understand not just where the innovation frontier is but also where it is likely to go.

This is particularly important on the alternative lending side. India has been burned before by an over-extended credit market, and fintech can learn lessons from the 2008 Andhra Pradesh microfinance crisis. The foundations

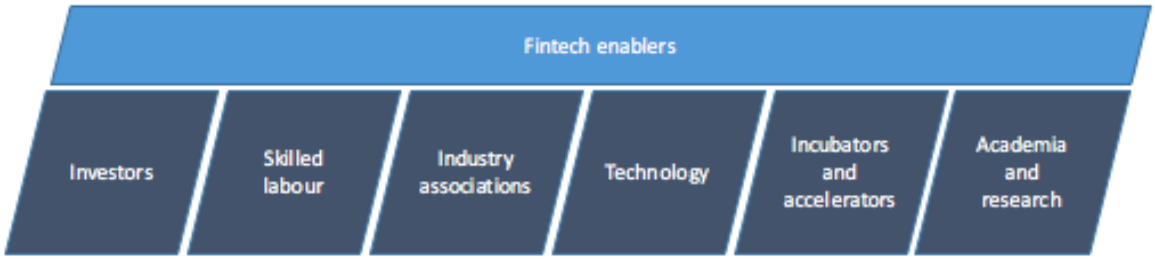
laid down by Aadhaar, e-signature, e-KYC and other initiatives form a solid basis for a robust market but care is being taken to protect consumers from predatory lenders and the potential for over-indebtedness, particularly as demand for consumer credit spikes. Setting norms for transparency and effective e-arbitration systems (learning from the experience of e-commerce providers) is a step in the right direction. RBI will also need to work closely with the supply side (including the nascent association of Indian alternative lenders).

From the supply side perspective, regulatory technology ("regtech") is a nascent sector in India but likely to grow rapidly in coming years. Regtech describes a range of companies looking to leverage technology to address regulatory challenges such as compliance, transaction reporting, data management and anti-money laundering (AML).

V. Support functions and fintech enablers

The fintech ecosystem is also reliant on a range of meso-level structures and institutions. These provide services to market players and the infrastructure to support effective functioning of the market. Much of the infrastructure is shared with the tech and financial sectors. These fintech "enablers" can come in various forms. For instance, investors support fintech firms in the form of equity and debt funding during different stages of growth; academic institutions and incubators provide infrastructure support as well as help fintech firms develop their ideas; industry associations provide fintech firms with a voice in the sector; while professional service firms support fintech firms by providing them with auxiliary support services.[45] **Figure 11** below highlights some of the key enablers for Indian fintech.

Figure 11. Support functions in India's fintech sector



Investors

Investments into the fintech space have increased considerably over the past few years – be it in the areas of digital payments and lending, or personal finance management, investment technology and wealth management.[46] A wide range of investors such as angel VCs, family offices, private equity funds, and financial institutions are recognizing the potential of fintech in India and are funding fintech companies.[47] Increasingly, e-commerce players (Amazon, Alibaba), tech companies (e.g. PremjiInvest, the investment vehicle of Wipro) and corporates (e.g. Tata) are playing a major role in fintech investment. At the inclusive fintech end, impact investors such as Unitus Seed Fund and Accion VentureLab provide funding for fintech companies looking to achieve social impact. The diversity of investors can be seen by looking at who has invested in India's ten largest fintech firms (by investment).

Table 1: Top 10 Fintech Firms in India by Value of Investment[48]

	Investee	Nature of Investee	Investor(s)
1	PayTM	Payments, mobile wallet, and payment bank	Alibaba, Tata Group, SAIF Partners
2	MobiKwik	Mobile wallet, recharge, bill payments	American Express Ventures, CISCO, Sequoia Capital, Tree Line Asia, GMO, Mediatek, Innoven Capital

3	BankBazaar	Online marketplace for loans and insurance	Amazon, Fidelity, Sequoia Capital, Walden International
4	PolicyBazaar	Online insurance aggregator in India	ABG Capital, Info Edge, Intel Capital, Inventus Capital, PremjiInvest, Ribbit Capital, Steadview Capital, Tiger Global Management
5	FINO PayTech	Financial inclusion technology provider	ICICI Bank, Headland Capital Partners, IFC, Intel Capital, Blackstone
6	Itz Cash	Multi-purpose Prepaid Cash Card	Intel Capital, Matrix Partners
7	Capital Float	Online lending platform for small businesses	Aspada, Creation Investments, SAIF Partners, Sequoia Capital
8	Mswipe	PoS terminal for accepting card payments	Axis Bank, DSG Consumer Partners, Falcon Edge Capital, Matrix Partners, Meru Capital
9	Ezetap	Payment device maker	American Express Ventures
10	Citrus Pay	Payment gateway and mobile wallet	Ascent Capital

Despite the rapid growth in number and size of investors in Indian fintech, it is important to note that some of the best fintech companies in India (and globally) have bootstrapped themselves through the early years, either by generating early revenues or by savings, family and friends. Bootstrapping is particularly important in the case of young markets where there is a dearth of high quality investors. An important challenge for Indian fintech is to not get carried away with investment. Increased awareness of bootstrapping as an option may take some of the heat out of the fintech investment market and encourage fintechs to concentrate less on raising money and more on building a viable product.

Incubators, accelerators and academic institutions

Incubators are programmes or initiatives designed in order to provide assistance to startup firms during their inception phase by providing various services such as equipment, office space, and professional services such as accounting and legal services. They also assist startups in raising capital, performing networking activities and build a sustainable business environment.[49] Accelerators tend to work in a more focussed manner than incubators , taking fintech companies in batches for a period of time (typically 3-6 months) with a programme of mentoring and networking aimed at quickly taking the company to its next growth stage.

The recent growth of fintech in India has resulted in a number of incubators establishing in the country for the purpose of funding and mentoring entrepreneurs. These incubators are providing entrepreneurs with peer connections, industry exposure, and soft skills to develop their products.

There are four broad categories of incubators and accelerators that have emerged, serving India's fintech space:

i) Financial institution-led: A number of banks and other financial institutions are bringing fintech companies in house to solve the particular challenges faced within the institution. Examples include Barclays' RISE and Axis Bank's Innovation Lab.

ii) Equity-led: There are a number of incubators following a typical equity-led model, often focussing on fintech as part of a wider tech portfolio. These are particularly concentrated in Bangalore and will often offer preferred access to banking partners. They will typically take 6-8% of equity and run a 3-6 month incubation programme. Examples include TLabs and Khosla Labs.

iii) Public sector-led: State governments looking to harness the potential of technology have been setting up public-private partnerships to incubate tech companies looking to solve social problems. Some of these have supported fintech innovations, including T-Hub by the Government of Telangana and GIFT by the Government of Gujarat. On a similar track, incubators like Villgro focus exclusively on social enterprises.

iv) University-led: Incubation cells have also been established by some of India's top academic institutions to nurture entrepreneurship and guide innovative startups through proof of concept, testing and early growth. Some of these incubation cells include, the Incubation Cell at IIT Madras; Technopark TBI and MobME Wireless in Kerala; and the Society for Innovation & Entrepreneurship (SINE) at IIT Bombay. Funding for R&D in these institutions often comes from government agencies. For instance, the Ministry of Electronics and Information

Technology has set up the Global Innovation and Technology Alliance (GITA), a fund towards supporting research and development in industry and academic institutions.[50]

One additional model that has not yet taken hold in India is the consulting firm-led model. Accenture's FinTech Innovation Lab, currently running in New York, London and Hong Kong, seeks to bring together innovative startups with a range of financial sector players with a view to building relationships and collaboration. For the consulting firm, it provides linkages to existing and potential financial sector clients while also opening up access to the innovation frontier on the startup side. Such a model may yet emerge as a fifth category within the Indian fintech ecosystem.

Industry coordination

Currently, there exists no dedicated industry association for fintech in India (the role played by Innovate Finance in the UK, China Fintech or Fintech Australia). This is in part a function of the relative youth of the market, and also its fragmentation (between sub-sectors and between geographies).

As it stands, the industry body for India's tech sector, NASSCOM, has some coordinating role. NASSCOM has been active in producing fintech industry analysis and providing a platform wherein early-stage firms can engage with established firms to form strategic partnerships. Through their 10,000 startups initiative, NASSCOM have helped to showcase and develop a number of fintech startups with high growth potential. They have also hosted a number of fintech-focussed events like the TCS–Startupbootcamp FinTech event in February 2015[51] and India's first block-chain based hackathon, HackCoin, along with Zone startups.[52] Fintech remains however just one part of NASSCOM's overall IT and BPM mandate.

In recent years, ISPIRT (Indian Software Product Industry Roundtable) has established itself as a leading voice in the Indian software ecosystem, and has dedicated significant effort to the fintech space. As a think tank and a community of leading software experts and companies, it is designed as a network wherein entrepreneurs help other entrepreneurs.[53] ISPIRT works closely with the startup ecosystem and has also engaged with financial institutions to promote innovation in the financial services sector. For example, in December 2015, ISPIRT collaborated with YES Bank to launch a Fintech App Store, which will hold a governance structure making it easy for fintech startups to access the store.[54]

Though fintech as a market is fragmented, within its different streams there does appear to be appetite for coordination to provide a unified voice and leverage the benefits of a tight network. An association of alternative lenders is in the pipeline, and it is likely that other segments (payments/wallet providers, Blockchain companies) may build intra-sectoral ties. On the banking side, the India Banks' Association (IBA) manages some coordination around technology and innovation through its Gyan Sangam initiative.

Labour and skills

Arguably India's greatest comparative advantage in fintech is its large pool of high quality tech talent. As is the case across the tech sector, IITs and other top universities, combined with the prevalence of large international technology companies, provides a large pool of talent with education and experience to leverage into fintech. This labour supply is also relatively low cost and easy-to-hire by international standards. India also benefits from its close linkages to Silicon Valley, and the reverse brain drain as NRIs and MBAs look to return to potential and entrepreneurial opportunities in India.

While many founders and employees do come from a tech background, it is equally likely that fintech labour will emerge from the financial sector. One of the major drivers of London's fintech success was the exodus of talent from the banking sector after the 2008 crisis. As financial sector jobs became harder to access and less rewarding, many ex- or potential bankers sought to leverage their skills in the more entrepreneurial fintech space.

India has to an extent benefitted from talent leaving the banking sector. There are a number of cases of Indian fintech founders having emerged from a bank (e.g. CreditVidya in Mumbai and CreditMantri in Chennai), with a solid understanding of the bank's systems and pain points. Crucially, these founders also have access to a network within the financial sector and contacts to access and accelerate the usual sales cycle.

Across the tech sector in India, only 22% of roles are filled by women. The IT talent pipeline appears to be successful at attracting women out of university – 38% of entry level tech jobs are filled by women – but at executive level this falls to just 7%. At the intersection of tech and finance, fintech in India is heavily male-

dominated and the gender disparity could cause a challenge for the innovative and inclusiveness of the sector going forward.

Technology

Technological progress is a major force behind fintech's growth in India, and it offers a unique platform on to which the sector can transform financial services. The India Stack, a complete set of APIs that includes Aadhaar, e-KYC, e-signatures, a digital consent system and unified payment interface (UPI) means that many of the challenges that may have hindered fintech growth have, in one go, been unlocked. In particular the UPI – an open API that allows phone-to-phone transfers directly from bank accounts – will allow India's one billion plus mobile phones and the estimated 500 million smartphones (by 2020) to act as financial access points for P2P transfers, remittances and payments.

The India stack provides the necessary foundations for a raft of new tech-driven solutions to the challenges faced in the delivery of financial services to the masses. No other country has a set of technological public goods openly available to entrepreneurs, and it lays the ground for India to leapfrog other countries in financial sector development.

VI. The outlook for Indian fintech

The following table summarizes the current status of fintech in India. Considering factors influencing the demand and supply, we can say that the Indian market is ready for the fintech wave. However, significant efforts need to be undertaken to strengthen the necessary enabling environment for fintech to grow in India, primarily in the form of increasing financial literacy, building on industry coordination and creating stronger links with academia.

Table 2: Readiness of Indian fintech for take off

	Lagging		Medium		Ready
Supply side					
Existing providers investing in innovation			■		
Large number of startups entering ecosystem				■	
Demand side					
Existing users seeking new products and platforms				■	
Outstanding demand from unserved populations					■
Financially literate population		■			
Support functions					
Large and varied pool of capable investors		■			
Skilled labour force understanding finance and tech			■		
Industry coordination and systems for collaboration	■				
Availability of technology platforms					■
Incubators and accelerators			■		
Links to academia and cutting edge research		■			
Policy and regulations					
Pro-active government policy for fintech				■	
Environment for innovation in financial services				■	
Positive business environment for startups			■		

This provides a framework for identifying where are the key gaps in the Indian fintech landscape, and the areas that could be supported to assist its growth. While it is clear that a number of factors are coming together to provide a fertile ecosystem for fintech development, there are a few key challenges for the sector to overcome. During these fluid early years of growth, there are opportunities for both the public and private sectors to shape the future trajectory of Indian fintech.

Industry coordination and financial sector linkages

Indian fintech is scattered and lacking a central hub. The geographical disbursement of fintechs between Bangalore, Mumbai and elsewhere, as well as the absence of any industry body, means that knowledge and

information is not spread through the industry as well as it could in a tighter network. An effective ecosystem facilitates innovation through informal conversations and chance encounters. India's fintech sector performs poorly at creating these dialogues.

Similarly, there are inadequate lines of communication between the financial sector and the tech sector. Startups need conversations with industry players to understand their R&D requirements and processes.

Challenges for startups

Despite the gains made by the government's Startup India campaign (such as simplified business registration and process digitisation), startups in India's fintech sector remain constrained by bureaucracy and unfavourable policies. In many cases, startups are subject to the same reporting requirements as much larger businesses but are limited in time and capacity to fulfil these. There is a lack of seed stage funding to develop fintech business ideas, and those without significant capital behind them (or from family and friends) find it difficult to take the leap into a new venture. In particular, there is a lack of seed stage grant funding for inclusive fintech businesses and social enterprises. Where funding policies do exist they tend to favour bank lending models rather than alternative debt and equity that may be more suited to early stage funding requirements.

Regulation

Despite increased competition in recent years, India's financial sector remains relatively well protected by the government. This can serve to disincentivise innovation and lead to underinvestment in technology that can improve services and increase efficiencies. This is an opportunity for fintech (as a driver of innovation) but also a challenge as fintechs seek to compete with established financial institutions. There is also a challenge for regulation to keep up with the dynamism and complexity of fintech business models. Currently, fintech is growing into a regulatory vacuum and the RBI and other regulators will need to build a regulatory framework and internal capacity to effectively promote fintech innovation while balancing against stability and consumer protection.

Opportunities for inclusive fintech businesses

Though fintech is growing rapidly, India is not exploiting the opportunity that it has to become the centre of the global inclusive fintech industry. As the worlds of fintech and financial inclusion increasingly overlap, there is growing demand for innovation centres to produce the next generation of tech-based solutions to reach poor and excluded populations. Fintech centres in Europe and the USA are too far removed from the challenges of reaching developing populations, and India is one of very few middle- or low- income countries with effective innovation systems and technology skills. Add to this the government's commitment to both financial inclusion and a digital economy, and India is a natural centre for inclusive fintech.

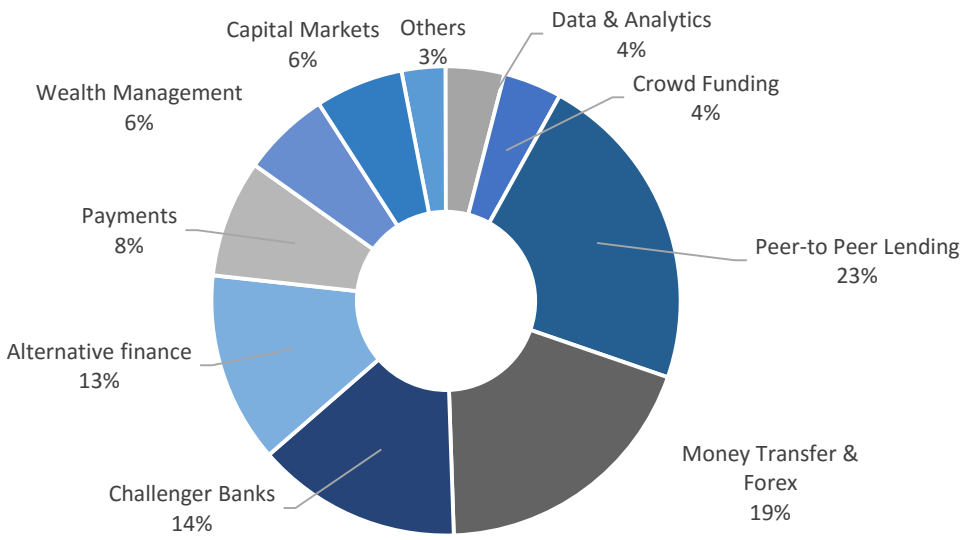
India's fintech ecosystem needs to do more to take advantage of this opportunity. There is a lack of seed funding for social enterprises and incubation facilities to help fintechs develop business models for serving the poor. Incentive mechanisms to nudge fintech entrepreneurs towards excluded populations are lacking. Later stage impact investors are present but the sector is in its very early stages. Finally, India's complex visa regime disincentivises foreign participation in the sector, which takes away from its potential to become a global hub.

VII. Fintech in the UK

The UK has emerged as the world's leading fintech sector, and there is much that India can learn from UK fintech's growth experience. The following sections look at the growth of fintech in the UK and the key areas in which its development is instructive to Indian markets.

In 2015, the sector made £6.6 billion[55] in revenues, with 88 percent of fintech business reporting revenue in 2015.[56] Investment in UK fintech companies in 2015 reached £ 901 million across 72 deals (second only to the US).[57] This was led by investments in P2P lenders (such as Zopa and Funding Circle) and money transfer firms (like Transferwise).

Figure 12. Investment by fintech sub-sector in the UK[58]



UK's fintech sector employs a workforce of 61,000 which is 5 percent of the total workforce in the financial services in UK. This is also more than the combined workforce for Singapore, Hong Kong and Australia and second to California (74,000).[59][60]

Following is an overview of some of the key segments and trends in the UK's fintech landscape.

Sector	Size	Trends
1. Payments	• The UK payments sector was valued at £10 billion ($15.5 billion) in 2015, [61] and constitutes a major portion of the UK fintech market. [62] • The sector has the highest adoption rate, as compared with other fintech sectors, and attracted an estimated £243 million($376.65) (46 percent) of total fintech investment in 2015.[63]	• Amongst the payments segment, digital payment services have in particular proven attractive in the public transport and parking industries of the UK[64]. For instance, contactless cards, first issued in 2007, received a tremendous boost in adoption rates when Transport for London started to accept them in 2014.[65] • Also, a surge is seen in adoption of new digital payment technologies in recent years, especially for smaller transactions and mobile applications with built-in payment services.[66] • Despite the recent rapid upsurge in the digital payment adoption rates concerns include hacking of personal information and stealing of customer data.
2. Alternative Finance/ Lending Platforms	• The size of the market in 2015 was £3.2 billion ($5 billion).[67] • The market is expected to surpass a value of £5 billion ($ 7.75) in 2016. In 2015, the number of funders was 1.09 million people, and the number of fundraisers was 254,721.[68]	• In 2015, business-lending platforms constituted 12% of the total small business lending market, while equity-based crowdfunding was 15.6 percent of total UK seed and venture-stage investment.[69] • Alternative finance firms are seeking an increasing number of private and public partnerships to acquire high-quality investors and institutional funding. • Further there is increasing institutionalization of the sector; there was institutional involvement in 45 percent of all platforms.[70]

3. Financial Data and Analysis	• Estimates suggest that between 2012-17, use of big data could contribute £216 billion ($334.8 billion) to the UK economy and create 58,000 new jobs.[71] • Research suggests that 82 percent of UK insurance companies with more than £500 million turnover are concentrating on big data strategies in 2016.[72]	• Big data is a high growth area. It has already shown its potential in the traditional industries such as retail banking, trading, consumer goods and telecommunications but insurance industry is still progressing in using data analytics to create efficient insurance models, predict accurate risks and understand customers' needs.[73]
4. Robo-Advisory	• The estimated market size for personal wealth platforms is approximately £0.7 billion pounds or $1 billion.[74] • There are 6 fintech firms in the B2B robo-advisors market: Alpima, eValue, QuantStore, Wealth Objects, Wealth Wizards, and Wealth Kernel.[75] • There are 13 FinTech firms in the B2C robo-advisors space, including Nutmeg, NetWealth, Scalable Capital, Wealth Horizon, and Zen Assets. [76]	• Greater competition amongst industry players such as Nutmeg and Wealth has led to better choice and advise to the consumer. • Also, UK banks such as Barclays, Royal Bank of Scotland, Lloyds and Santander UK are trying to start their own robo-advisory which has turned out to be a disruptive space of the traditional wealth management companies.[77]
5. Challenger Banks	• In 2015, total profits from challenger banks increased by £194million ($301 million) against a drop of £5.6billion ($8.68) for the Big Five.[78][79]	• Challenger banks are providing new competition to the traditional banks - Starling, Mondo, Atom and Tandem emerged in 2015 with a model for digital banking. [80] • Challengers' lending increased by 31.5 per cent last year, compared with a decline of 4.9 per cent at the "big five".[81] • Bank of England has also committed to grant 15 new licenses by 2020.[82] Further, one of UK's first challenger banks to launch, OakNorth, targets the SME business credit market.[83] • The biggest challenge still remains building up a customer base against brand loyalty and inertia
6. Blockchain	• Blockchain technology created a lot of stir in 2015 but is still at early stages of development.	• The first blockchain platform-as-a-service agreement has been signed by the UK government. The distributed ledger technology (DLT) is now available to buy through Government Digital Services' Digital Marketplace, under the G-Cloud framework agreement, for government organisations that want to experiment with it.[84]

The UK's strength in fintech lies in the confluence of a number of factors. It has some the most well-developed and sophisticated financial markets in the world, London being a global trading destination and a financial gateway for Europe. It has excellent universities and a large pool of talent (the fintech labour force benefitted from an exodus of talent from the financial sector after the 2008 crisis). There is availability of business capital, a large and technologically-sound customer base, supportive and progressive regulatory support and financial services infrastructure[85]. London also benefits from the confluence of technology, finance and government in one place, as opposed to countries like India and the USA where these industries are focussed in different parts of the country (Bangalore and San Francisco for tech, Mumbai and New York for finance and Delhi and Washington D.C. for government).

Industry coordination

Industry associations are established with the primary objective of providing firms an opportunity to voice their concerns and opinions to champion causes, while setting new standards for the industry. In the UK, there are two such associations – Innovate Finance and the Financial Data and Technology Association (FDATA).[86]

Innovate Finance is the apex fintech industry association, launched with the purpose of advancing the UK's status as a leader in fintech innovation in the global fintech market.[87] The association is responsible for fostering

innovation, cultivating opportunities, and developing a fintech ecosystem through organizing and hosting programmes, pitch events, and product showcases.[88] In recent years, the association has gained prominence, and its regional strategy was recognized by the UK government as the best tool to deliver an exceptional fintech ecosystem.[89]

In addition, the Financial Data and Technology Association (FDATA) is a trade association set up with the purpose of opening up UK's financial sector to the benefits of financial data and technology,[90] and for formulating the technical and ethical minimum standards which will govern the UK fintech sector.[91] FDATA's role is to not only ensure that the benefits of fintech are borne by the UK consumer, but will also support a strict code of industry practices that will ensure complete data security.[92]

Policy and regulation

The UK fintech sector is supported by effective financial regulations, including an ecosystem created by UK sector regulators – the Financial Conduct Authority (FCA),[93] the Payment Systems Regulator (PSR),[94] and the Bank of England[95] – that fosters innovation from within the established sector and from new entrants.[96]

UK fintech has benefitted from a number of key policy and regulatory initiatives, both at the national and EU level. These include:

- FCA Innovation Hub

The Innovation Hub acts as a platform for the FCA to engage with innovative businesses and the government in order to (a) gain a better understanding of the needs of fintech businesses and possible benefits and risks of their fintech products and services; and (b) identify areas in the existing regulatory frameworks that need modification and structural barriers that need to be eliminated so as to benefit consumers.

Since its inception in 2014, the Innovation Hub has received 413 requests for support, of which 215 (52 percent) firms were supported. Of the first batch of firms that were supported, 30 percent of the firms have either been authorized by the FCA or are in the process of being authorized. The Innovation Hub is testament to the progressive nature of the FCA and has become a benchmark for other countries looking to promote innovation in the financial services sector. It has also worked to attract international fintech talent – in 2015, over 25 non-UK innovators approached the hub for support or information.

- FCA Regulatory Sandbox

As part of their Project Innovate, which also houses the Innovation Hub, the FCA offers a regulatory sandbox which provides participants with a range of options including authorization for testing, no enforcement action letters, individual guidance, and waivers. In the duration of the programme, the FCA also tests the participants' fintech products in a controlled and safe environment in order to verify their feasibility before permitting them to enter into the market.

- Crowdfunding Policy

Crowdfunding, P2P lending and other alternative lending models have emerged as a key vertical in the growth of UK fintech, led by firms such as Zopa and Funding Circle. In April 2014, a phased regulatory structure was introduced that allowed loan-based crowdfunding platforms to operate on a valid consumer credit license from the Office of Fair Trading (OFT) until they receive authorization from the FCA. Investment-based crowdfunding platforms may only offer securities promotions to those retail clients who meet certain criteria, such as high net-worth or sophisticated investors or those who invest less than 10 percent of their net assets.

- EU Directive on Payment Services (PSD II)

PSD II provides Europe's banks with a new way to allow customers to authorise third party providers to make payments and to access account and transactional data. It opens up technology-based competition by allowing Account Information Service Providers' (AISPs) to offer direct insights into all products and transactions across banks. It will significantly reduce transaction costs and barriers to entry, in particular for card and internet payments, and further standardise and make interoperable card, internet and mobile payments.

- Seed Enterprise Investment Scheme (SEIS)

The SEIS is established by the UK government to provide assistance to early-stage companies looking to raise equity finance. It provides for tax relief to individual investors who purchase new shares in startups. It has helped to develop the investment ecosystem around startups and allow for greater tolerance of risk by investors.

Disruption in UK fintech

In the early days of UK fintech, there was great concern about the potential digital disruption and the coming challenge to established financial sector players. There is no doubt that fintech has changed the forces of competition for the big five (HSBC, Barclays, Lloyds, RBS and Santander UK) but brand loyalty and inertia remain strong forces in customer retention. The banks themselves are also investing heavily to meet the challenge – UK banks now invest more than £3 billion per year in technology[97]. Despite the rapid rise in challenger banks (including digital banks like Atom, Mondo and Tandem) the number of people switching banking provider in 2015 fell by 11% from 2014, and the majority of current account switches were within the big five or to larger challengers (like Nationwide and Halifax), not to new digital challengers.

In the P2P lending space, alternative banking models have started to make a small dent in the market shares of the large lenders. In 2015, digitally-enabled alternative lenders provided £2.2 billion in business funding for approximately 20,000 SMEs in the UK. Total alternative business lending accounted for 3.4 percent of bank lending to SMEs.[98] However, rather than disrupting the banks in their core business lines, P2P and alternative financing models appear to be more effectively filling gaps in demand that banks are less able (or willing) to serve. In the small business sector in particular, P2P lenders last year supplied the equivalent of 13.9 percent of the £6.34 billion lent by banks to small businesses in 2014. Likewise, equity-based crowdfunding represented 15.6 percent of total UK seed and venture stage equity investment. These are spaces that fintech is taking a lead in, and the banks appear generally happy for fintechs to grow, as banks themselves are badly designed to serve these markets.

More broadly, as the UK's financial sector responds to the changes brought on by technology there is growing acceptance that the banks aren't going anywhere – customers seem happy enough giving core banking business to a name they can trust with their savings. Banks know that customers don't want a dozen different providers for every aspect of their financial lives. What technology, partnerships and open APIs do however is to enable a digital banking ecosystem in which banks become platforms for services provided by others – like an app store for financial services. It is this kind of collaborative disruption that appears to be the driving force behind UK financial services, and is one that is also likely to playout in the Indian market.

VIII. Key lessons for India from UK fintech

India's fintech sector is young and fluid. Though it generates a lot of excitement in the business media and the financial and political circles, the sector is small and its real growth is ahead of it. In order for the sector to achieve its potential in terms of innovation, efficiency and development, there are a number of challenges for it to overcome and in order to do so, there is much that it can learn from the UK's experience. At the same time, we need to be cognisant of the fact that Indian fintech is likely to (and should) follow a different trajectory to UK fintech, and it is not a simple case of catching up. Here we summarise five key areas in which there are opportunities for Indian fintech to learn from and collaborate with the UK sector.

Proactive approach to policy and regulation

To date, the RBI and other regulators in India have taken a wait and see approach to regulation. This has been appropriate in the nascent stages of the industry, and has allowed for a good amount of experimentation and innovation. For the most advanced areas of fintech – payments and mobile wallets – the RBI has looked to bring the largest players (PayTM and FINO PayTech) into the formal system through issuance of Payment Bank licenses.

Moving forward, the RBI and others will need to play a more proactive role in fintech. As the sector grows and business models become ever more complex and inter-linked, regulations need to keep ahead of the industry. Regulations need to be conducive and not restrictive to innovation. It is vitally important that the regulatory framework is seen to encourage innovation and positive disruption, and is seen to be just as supportive of new players as it is to incumbents.

As Indian regulators (led by the RBI's Inter-Regulatory Working Group on Fin Tech and Digital Banking) look to build the capacity of India's financial systems to manage and regulate emerging fintech business models, there is much that they can learn from the UK.

The FCA's Innovation Hub provides a good example for how a regulator can positively engage with the private sector. By providing direct support to innovative fintechs who are looking to develop new products and services, the regulator can keep track of where the innovation frontier lies. The regulator can also use this to identify where current policies and regulations are obstructive to innovation, and remedy these before they have a larger effect on the market.

The UK's positive approach to fintech regulation and entrepreneurship is one that should be closely studied by RBI and other regulatory bodies. This may take the form of studying best practices from the UK and elsewhere, bringing in external expertise, peer to peer learning sessions, or study tours – all things that can be supported by the FCO.

Financial sector partnerships

The financial sector in the UK has established itself as a key ecosystem player for fintech. Today, there is less talk in UK banking markets of destructive disruption and more of collaborative disruption – "what can fintech do for us?". Banks, insurance companies and other legacy players have in many cases been able to develop a genuine value proposition for fintech companies and startups, with important lessons for India. This value proposition has four main threads:

Firstly, banks can be an important customer for fintechs. Banks retain the majority of financial sector assets and customer relationships that have been historically hard to break down. Banks look to technologists and entrepreneurs for solutions to their problems and to drive efficiency gains, for example by onboarding innovative credit scoring (e.g. Santander and Kabbage) or building artificial intelligence solutions.

Secondly, UK banks are playing a key ecosystem role by supporting and developing new incubators and accelerators, such as Barclays Rise, and supporting for fintech-focussed hackathons, such as Lloyds sponsoring blockchain and AI hackathons. This often provides the seed for longer term relationships, and can provide fintechs with critical insights and data as they attempt to scale their ideas.

Thirdly, financial institutions are increasingly investing in fintechs. Corporate Venture Capital (CVC) funding has been competing with venture capital as a major investor in fintech startups. This has been led by Santander's $100m InnoVentures fund (which has invested in Ripple, iZettle and MyCheck among others), with other UK financial corporations such as HSBC and Aviva following similar models[99].

Finally, at an industry level the financial sector has supported the emergence of coordinating bodies such as Innovate Finance (both as members and through the City of London Corporation and Canary Wharf) and TheCityUK. By engaging closely with the fintech sector, banks and the financial sector have retained a strong voice in influencing policy around fintech and innovation, and helped to develop the ecosystem for the growth of the sector.

Look beyond national borders

From an early stage, London pushed itself as an international destination for fintech. Policy initiatives like a simplified visa process for tech talent, and fintech bridges with other countries, helped to establish London as a global leader in fintech with an international workforce and reach well beyond the UK's financial sector.

India has potential to be a major exporter of fintech businesses, and Indian fintech should adopt a similar outward looking approach. There is a lot of competition to be Asia's fintech hub, and India is behind countries like Singapore; however it is not a zero sum game and India should look to become a global centre, particularly for inclusive fintech. This means following the approach of the UK in providing an attractive proposition for international fintech experts and companies, particularly those looking at financially inclusive business models. India should look to develop fintech bridges with more markets, particularly in Asia and Africa, and make immigration and business registration more open to foreign talent.

Importance of physical centres

The UK's fintech sector has benefitted from having a physical centre in London, which allows for the informal meetings and cross-pollination of ideas that are vital to an effective innovation system. The formation of clusters

for fintech around Silicon Roundabout and around Level39 in Canary Wharf has provided a fertile breeding ground for fintech innovation.

The fragmented nature of Indian fintech provides a challenge for the growth of the sector. There is a need for investment in fintech hubs that can generate and incubate ideas that are closely linked to both the finance and tech communities. Mumbai and Bangalore are obvious centres to be developed, as are state capitals looking to use fintech to drive entrepreneurship and financial inclusion in their states.

Diversity

Fintech works at the intersection of two sectors, finance and technology, that is overwhelmingly populated by educated males. Both in the UK and India, there is shortage of diversity both in founders, employees and ecosystem players. Of the 100 fintech companies that raised venture capital funding in Europe in 2015, only five had female chief executives[100]. This homogeneity can be reflected in the output of the sector, and the range and diversity of solutions that it creates.

The UK fintech sector is working to address this through introduction of more mentorship opportunities for female entrepreneurs, introduction of more flexible working practices and initiatives like www.womeninfintech.co.uk. Both countries have a long way to go, but Indian fintech would benefit from following the UK's lead from an early stage.

IX. Roadmap for UK support to Indian fintech

This section summarises the value proposition of the UK in supporting the development of Indian fintech. Having gone through the process of establishing itself as the leading ecosystem for fintech development, the UK has plenty to offer both at the policy and regulatory level and in the context of fintech enablers.

Roadmap for the policy and regulatory environment

i. Expedite the process of signing a Regulatory Cooperation Agreement and establishment of a fintech bridge between India and the UK

Efforts have already been made to establish a fintech bridge between the UK and India. Such a bridge would lay the foundations for regulator-to-regulator and government-to-government collaboration to share experiences around what has worked to build an enabling environment for fintech and to promote innovation (and manage the trade-off with financial stability). At the business level, a bridge would help fintech firms to understand regulatory requirements in the other country and open up access to new markets. It would facilitate relationships between counterparts and likeminded businesses in the two countries, and provide a basis both for collaboration and competition. It could also include provisions such as a preferential or accelerated visa regime for employees of fintech companies to go from India to the UK or vice versa.

A UK-India Fintech Bridge was announced by Francis Maude (Minister of State for Trade and Investment) in September 2015. Since then, UKTI has been active in promoting bilateral initiatives around fintech, for example the Tech Rocketship Awards and support for the establishment of Startup Bootcamp (SBC) focused exclusively on fintech (to be launched in Mumbai in early 2017). The work of the India-UK Financial Partnership (IUKFP) has also been instrumental at building cooperation between the two countries on issues relating to the financial sector (including fintech).

However, it is not clear that steps are in place to formalise this relationship through the signing of a Regulatory Cooperation Agreement (RCA). The FCA established its first fintech bridge with Singapore in May 2016 by signing an RCA with the Monetary Authority of Singapore (MAS). Other fintech bridges have since been established with Australia and South Korea. The FCA have indicated that although a number of countries have approached them to support the replication of innovative regulatory approaches for fintech, India would be in a preferential

position. As India tries to establish itself as a major fintech hub in Asia, having a bridge that allows it to effectively bring key aspects of the UK fintech ecosystem across will be a major asset, and is something that should be re-energised.

In the year since the India-UK fintech bridge was first announced, the case for the implementation of a RCA has become even stronger and its signing needs to be expedited.

Recommendation: The signing of a Regulatory Cooperation Agreement between India and the UK should be expedited. The BHC in India can play a coordinating role, bringing together the Ministry of Finance and RBI in India and the Treasury and FCA in the UK. There is also an ongoing role, to identify bottlenecks and to push the smooth passage of the agreement. After signing, FCO can continue to support the development of bilateral relationships between regulators, governments and private sectors in order to maximise the bridge's efficacy.

ii. Support increased collaboration between equivalent bodies in Indian and UK fintech ecosystems

Currently much of the dialogue around fintech cooperation has been between India's Ministry of Finance and the UK Treasury. At a more practical level however, the relationship between RBI and FCA is crucial. Through Project Innovate and the Regulatory Sandbox, FCA has established itself as a global leader in forward-thinking regulatory policy around fintech. The FCA has expressed its willingness to support India in the development of its own fintech regulatory strategy. The FCO could facilitate staff from the FCA's Innovation Hub to share knowledge and experiences with the RBI and other key stakeholders.

RBI is at an early stage of establishing a regulatory framework for fintech. An Inter-Regulatory Working Group on Fintech and Digital Banking has been established, chaired by RBI and including representatives of SEBI, IRDAI, NPCI, PFRDA and others. At the same time, ISPIRT is starting to work with RBI and Omidyar Network to develop a regtech sandbox in India. The RBI has also expressed a willingness to learn from the UK experience.

Recommendation: The FCO should seek to build partnerships between parallel bodies in the Indian and UK fintech ecosystems to provide opportunities for peer to peer learning. For example, the International Section of the FCA's Innovation Unit could be supported to make a presentation to the RBI's Inter-Regulatory Working Group to share the UK's experience in regulating fintech and promoting innovation. The FCA representative should also visit the Ministry of Finance and other key stakeholders working around fintech regulation.

iii. Establish a cross-governmental fintech committee to coordinate the UK's activities in Indian fintech

The UK is well-positioned to support the enabling environment for fintech in India, but it needs to take a joined up approach. There are a number of UK government agencies that have a stake in this: the FCO has responsibility to support prosperity and poverty reduction in India, as well as promotion of UK interests; UKTI (now Department for International Trade) has a remit to help UK companies grow in India, and help Indian companies grow in the UK. DFID is heavily invested in inclusive finance in India, and supports digital financial inclusion projects in its priority states. The British Council works in the Social Enterprise space. The FCA has plenty of expertise and experiences that could be valuable if shared with Indian counterparts. Finally, the Treasury plays an overarching role in policy coordination.

Recommendation: The establishment of a "UK in India" fintech committee or working group would help to play a coordinating role in all UK government initiatives that deal with fintech in India. This will ensure that efforts are joined up and complementary, and also provide a clear touch point for coordination with Indian counterparts.

iv. **Work with development partners to develop the concept of inclusive fintech in financial inclusion programming**

Increasingly (and pushed by government initiatives such as Digital India and the JAM trinity), financial inclusion in India is going digital and the line between digital financial inclusion and fintech is blurred. Institutions in India like CGAP and the Centre for Digital Financial Inclusion (supported by Gates and Dell Foundations and Omidyar Network) are spanning the gap between fintech and financial inclusion.

This would be a natural place for DFID to take its financial inclusion programming. Through the Poor States Inclusive Growth (PSIG) programme and the Samridhi Fund, as well as historical investments in and support for the microfinance sector, DFID retains a significant presence in India's financial inclusion landscape. At the same time, global initiatives like the Global Innovation Fund, DFID touches upon fintech and the development of innovation systems for social enterprise. When visiting New Delhi in August 2016, the Secretary of State for International Development, Priti Patel, mentioned fintech as a key area for collaboration between the UK and India.

As DFID's role in India moves further away from traditional aid and towards an investment-focussed model, there is great potential for DFID to invest in innovation around fintech as a model for tackling ongoing challenges around financial and social exclusion. The fintech sector is well aligned with DFID's desire to support Indian entrepreneurship and business solutions to poverty.

Recommendation: There is a need to further analyse the potential for inclusive fintech in India and the role of different stakeholders in building the ecosystem. Given their position in the donor landscape, DFID could take a leading role in this. One way would be to commission a study on how fintech can support development outcomes in priority states, how this can link to DFID's ongoing work in India and recommendations for how the UK can best support the development of scalable inclusive fintech models. Ideally this would incorporate inputs from BMGF, CGAP, Omidyar and other development partners. This work could form the basis for a longer term engagement, and also provide international learnings for DFID's financial inclusion work.

v. Consider developing a fintech-focussed challenge fund.

The Tech Rocketship awards have been a useful tool for UKTI to engage with India's startup community. Across India's tech hubs, UKTI has been able to market its services to startups and build a valuable link to the UK tech community.

As one of the five categories, the fintech sector has played an important role in throwing up new ideas and business models. However, it is not clear that this is the most effective way of identifying and supporting innovative and high potential fintech companies in India. Furthermore, the potential scale of fintech in India suggests that it could support an initiative all of its own separate from other areas of tech.

The fintech landscape in India goes beyond startups, and founders tend to be older and more experienced than other tech sectors. Business models (particularly B2B models) are often complex and harder to sell at a pitch event. The Tech Rocketship awards seem to be focussed towards younger founders, with a bias towards an exciting idea, rather than the more mundane (but high potential) ideas that might come out of fintech.

Recommendation: Building on the success of Tech Rocketship Awards, the FCO and UKTI/DIT could consider rolling out a standalone fintech challenge fund, that allows fintech companies to enter into an innovation competition that places greater emphasis on their ability to present a solid business plan.

The FCO and UKTI/DIT would need to explore the various modalities for designing this challenge, understanding the specific demands from the fintech sector (potentially within different fintech verticals) and how awards can be built to best incentivise strong proposals. FCO and UKTI/DIT could also look at crowding in other partners to this that may provide technical assistance, mentorship, funding or other services to fintechs with a high potential for impact.

An initial scoping piece of work would require a rigorous analysis of fintech applicants to Tech Rocketship and a mapping out of potential demand for a fintech challenge. Then it should present 2-3 options for the design of the fintech challenge. This work could be carried out internally by UKTI/DIT or more likely through a short term consultancy.

vi. Support the Government of India to develop more startup-friendly policies and incentives

Part of the UK's success in fintech, and in tech more generally, has been the proactive initiatives taken by government to support the growth of the ecosystem, particularly around investment and labour. The Seed Enterprise Investment Scheme (SEIS) aims to promote entrepreneurship by offering income tax and capital gains tax relief to investors in return for investment in riskier early stage UK startups. Due to restrictions on FDI in India, development of domestic investment in startups is key for the long term health of the sector.

UK fintech has also benefitted from a progressive visa regime that allows talented tech entrepreneurs from around the world to work in the UK market. As India looks to develop as a fintech hub (particularly in inclusive fintech), it has the potential to absorb talent from across Asia and the world, but its visa regime can often be restrictive to foreigners.

A one size fits all approach that treats startups the same way as large companies places a large burden of reporting and bureaucratic requirements on small companies with low capacity to do this. The Government of India has made some progress in this space, particularly through its Startup India campaign, but there remains a long way to go (for example, a lot of the financing policies push startups towards bank lending, where other financing options may be more appropriate).

The UK can add value to this policy environment, particularly around what has worked for promoting fintech.

Recommendation: The FCO should consider engaging with Startup India and other key stakeholders around the startup ecosystem in India to offer support for development of a more favourable policy environment, particularly around investment and labour. It could also commission a study of the policies that helped to promote fintech in the UK as a guide for India (and other markets) as they look to develop their own frameworks.

Roadmap for developing fintech enablers

vii. Develop a business case for an Inclusive Fintech Incubator

Fintech in India is increasingly overlapping with the financial inclusion agenda. While much of the competition to date is in the 'already banked' space, the real potential for Indian fintech is serving customers who currently have no or limited access to formal financial services. As well as the huge potential demand in India, there is great potential for India to export fintech models to Africa, developing Asia and Latin America. India should aim to become the centre of the global inclusive fintech industry.

With a view to poverty reduction and shared prosperity, there is great potential to support the development of an ecosystem for inclusive fintech. This is closely aligned with the Government of India's policy objectives around financial inclusion. Much of the investment and buzz around fintech in India is firms competing to improve the experience or efficiency of serving already-banked customers. There is less on the social enterprise and financial inclusion side. Though some impact investors are in this space, there is still a need for more patient capital to support double bottom line businesses, and possibly also grant funding to help them get off the ground.

There are a number of players working in the inclusive fintech space, for example Accion and Village Capital providing mentorship and patient capital. Telengana's T-Hub provides a compelling model for how public and private money can combine for the social good. Most of the activity however tends to be at the funding or accelerator level. The greatest need is at the earlier stage incubator level, in which people with development-oriented fintech ideas can explore the market opportunities, understand and build business plans with overlapping financial and social objectives, and learn from others.

A central hub for inclusive fintech can play a critical role as a springboard for new inclusive business models and social enterprises. It would be a place to incubate ideas and provide advice and information to grow business models. It can also actively engage more women and under-represented demographics to work in fintech. It would also provide a pipeline of inclusive businesses for impact investors to find the next scalable investments.

One idea may be for the FCO, through its Prosperity Funds, to provide seed funding for an Inclusive Fintech Incubator and crowd in funding from development agencies (e.g. CGAP, DFID), philanthropists (e.g. Gates Foundation) and impact investors (e.g. Omidyar Network).

Recommendation: The first step would be to carry out a scoping exercise on the demand for and potential impact of an inclusive fintech incubator, probably based in either Bangalore or Mumbai. This exercise should evaluate the needs of the market and the role of various stakeholders in developing such a facility. It should also analyse the UK's value proposition in this space and how it could link to other UK government initiatives through DFID, DIT and British Council. If deemed worthwhile, this should lead to the development of a Business Case and options for what the incubator might look like.

viii. Support Innovate Finance to visit India and explore the possibilities for expanding their model of industry coordination and ecosystem building to the Indian market

India's fintech industry lacks a single focal point. No association or central body plays a coordinating role in sharing information, building relationships and representing the industry to the outside. An industry coordinator can provide the informal and formal linkages through which new business relationships are formed, and play the crucial role of intermediating between banks/NBFCs (who face many challenges) and fintech companies (who may be able to overcome them).

Some banks are going their own way hosting their own incubators (e.g. Barclays Rise). This is a reasonable outcome, but it means that fintech firms are limited to solving the problems of that bank and that bank only. To encourage problem solving at a more systemic level, there is a need for more of an industry-wide platform. To an extent this can be played by India Bankers Association (particularly their Gyan Sangam initiative), or by a body like Startupbootcamp (which is already being supported by UKTI to set up a physical centre for Indian fintech in Mumbai). However, neither of these are well placed to play the central, arm's length sector-wide coordination role.

Though some level of coordination is already happening in certain verticals (e.g. digital lending), coordination across the sector remains at a nascent stage and there are insufficient platforms for networking and thought leadership. An independent fintech body would play a key role in ecosystem development and the UK has valuable experience to leverage here.

Innovate Finance has unique experience in coordinating stakeholders in the fintech ecosystem and, as a representative body for UK fintech, is an important partner in building bridges between the two markets. Innovate Finance is building out its expertise as a global player and recently expanded its operations to New York. They are also actively interested in the Indian market, particularly in the context of building a presence in the inclusive fintech space.

Recommendation: Innovate Finance could be supported for a scoping mission to survey the Indian market and map out the potential for an expansion of their model into the Indian market. There may be a role for BHC here to support the discovery phase, coordinate meetings to allow Innovate Finance to clarify what can be achieved, hold roundtables of key stakeholders and lay out a roadmap (including potential funding arrangements) for how an equivalent body may be established in India.

ix. Support greater investment and partnerships between the UK and Indian fintech

Through their launch of the Rise incubator in Mumbai, Barclays have demonstrated the potential for UK banks to support the development of India's fintech ecosystem. The value proposition for Barclays and other international banks is not just to leverage Indian tech skills to improve the bank's operations in India, but to use India as a high skilled knowledge hub to build tech solutions for global operations. We expect that there is value for other UK banks to build similar operations. This can be done individually, or through a collective effort perhaps coordinated by an organisation like TheCityUK.

Another UK export, Startupbootcamp has launched its first programme in India and has great potential to establish itself as a key ecosystem player. UKTI has played a key role in anchoring the relationship at both ends and facilitating dialogue between UK and Indian counterparts.

The approach needs to be one of partnership, in which UKG can play the role of facilitator. The role would be simpler if an industry body for Indian fintech is established, however there would be benefits from bringing together counterparts in certain industry verticals. For example, as India's alternative lenders look to develop their own coordinated voice through association, they would benefit from conversations with the equivalent association in the UK (the P2PFA) – the FCO and DIT can play an important coordinating role here.

Recommendation: The Department for International Trade and FCO are well positioned to work together to support UK businesses to enter the Indian fintech space. Much of this is matchmaking between UK institutions looking to enter India, and key industry stakeholders in India with the ability to develop the model for the Indian market (as was the case of Startupbootcamp). The provision of financial support – for example for scoping trips and UK-India fintech workshops – would also help to build business to business bridges.

x. Carry out a scoping study on the potential for a guarantee scheme for alternative lending.

A number of innovative alternative credit models are emerging from Indian fintech companies. Many of these are testing new data-driven lending models that bring in alternative credit scoring algorithms and distribution technology to customers that were traditionally under-served by credit markets (e.g. SMEs). Given the potential for alternative lending models to deliver financial services to underserved markets, there could be a role for public policy in de-risking lending to stimulate innovative models.

These models often face an initial hurdle in testing their new lending approaches and managing the associated risks. Credit guarantee schemes, which offer a form of insurance against excessive losses from higher risk loans, have been widely used by the development community to support innovative lending models and the nudging of lenders towards higher impact segments (e.g. agriculture, MSMEs and women entrepreneurs). It is possible that new lenders could develop and test new lending models if, for example, first losses were covered by a guarantee fund. It would work as an insurance policy against which lenders can take greater risks than they otherwise would.

Recommendation: An initial step should be a scoping exercise on the demand and potential for such a scheme among alternative digital lenders in India. This could be coordinated between the FCO, DFID (which has experience using credit guarantee schemes, e.g. in Bangladesh) and other development partners such as USAID (which runs Development Credit Authority (DCA) guarantees in a number of countries). This needs to be a high level scoping exercise that examines the likely costs and benefits of such a scheme, and the market demand. It should also look at the potential role of the Government of India, which actively uses credit guarantees for SME lending, as a partner.

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