

INDIA
FinTech
Opportunities
Review

YES BANK Initiative

A COMPREHENSIVE ANALYSIS OF
INDIA'S FINTECH LANDSCAPE

INDIA FINTECH OPPORTUNITIES REVIEW REPORT 2017-18

AN INITIATIVE BY



#IFOR

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01.

INTRODUCTION: INDIA FINTECH OPPORTUNITIES REVIEW (IFOR)

Definition Fintech

Fintech, which is essentially the application of technology in financial services, has witnessed a surge in recent years owing to dramatic technology advances along with post-crisis changes in regulations. The financial services sector has seen a new wave of participants, including Fintech startups, e-commerce and technology firms, alongside incumbent financial institutions.

Fintech is a dynamic and diverse industry which is still evolving. Hence, there are multiple definitions of Fintech. For the purpose of this report, we would be referring to the following definition basis Fintech EY UK, Copenhagen Fintech and recognized works of Professors Chuen and Teo.

“Fintechs are high growth organizations combining innovative business models and emerging technologies to enable, enhance and disrupt Financial Services. This definition includes startups, mature companies and even non FS companies working in the digital finance space”



Impact of Fintech: GDP Multiplier, Job Creation and Cross Sector Impact

Over the last few years Fintech has made a significant impact on the financial services sector, not only redefining the development of financial services products but also creating alternate channels of delivery, and providing the opportunity to significantly expand the reach and scope of financial services.

The traditionally cash-driven Indian economy has responded well to the fintech opportunity, primarily triggered by a surge in e-commerce, and smartphone penetration. The transaction value of the Indian fintech sector was estimated to be approximately USD 33 billion in 2016 and is forecast to reach **USD 73 billion in 2020 growing at a five-year CAGR of 22%***.

Despite concerted attempts, banks have not been able to cover a significant chunk of population under the purview of financial services, which has given an opportunity to fintech companies. Many fintech companies are working in different ways to contribute toward achieving deeper financial inclusion in areas such as microfinance, digital payments, credit scoring and remittances.

MSME financing is another area where Fintechs have shown early promise. The sector is witnessing the emergence of new Fintech players addressing the structural issues of information asymmetry and reducing turnaround times for underwriting loans to small businesses. Fintech also holds the promise of lowering the cost of credit, particularly by lowering operating expenses for lenders. Better KYC procedures lower due diligence costs and operating expenses.

Fintech also has the potential to impact Governance in several ways. First, Fintech has the potential to increase transparency as it **reduces the need for cash and more payments are made through digital means that can be better monitored**. Secondly, the rise in economic activity could reduce the size of the informal sector if Governments stimulate and facilitate businesses to formalize. Thirdly, increased business activities and an improved labor market increase the Government's tax base to increase expenditure. According to research from the McKinsey Global Institute many as 300 million Indians could gain access to banking services and raise their incomes by 5 to 30 percent . These Fintech induced increases in national income could raise producer and consumer confidence which will trigger new rounds of investment and consumption. If the ecosystem is supportive, Fintech could boost the cycle of economic development.

Fintech Impact Snapshot

1. The Indian Fintech market is forecast to touch USD 2.4 billion by 2020 from a current USD 1.2 billion, as per NASSCOM
2. The transaction value for the Indian fintech sector was estimated to be approximately USD 33 billion in 2016 and is forecast to reach USD 73 billion in 2020 growing at a five-year CAGR of 22%*
3. Economic Impact of Fintech and Digital finance**
 - a. GDP Impact: USD 700Bn boost by 2025
 - b. USD 800 Bn New deposit
 - c. USD 600 Bn new credit
4. e- Governance – USD 3 Bn reduction in leakages – resulting in USD 2 Bn savings in subsidies
5. New Employment Creation
 - a. India produces 12 million STEM graduates every year
 - b. Fintech and digital finance can create 21 million new jobs

Source: *KPMG Report
**McKinsey Report

Fintech: Impact on Job Creation: Case Study - Maharashtra

To gauge the impact of Fintech as an engine for 'job-creation', IFOR undertook an analysis of Fintech's potential to create jobs – focusing primarily on the State of Maharashtra.

India's employment landscape is in transition, with a gradual slowdown in employment in core sectors and a concurrent emergence of new engines of job creation. Future technologies like artificial intelligence, blockchain etc. are creating an exciting space in which gainful employment opportunities have emerged. While the same technologies are responsible for a job slowdown in the organized sector, if nurtured and supported they have the potential to transform the job landscape in the country.

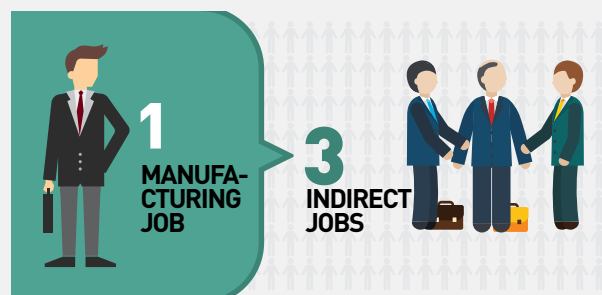
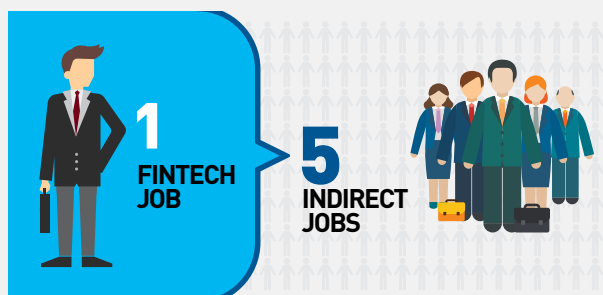
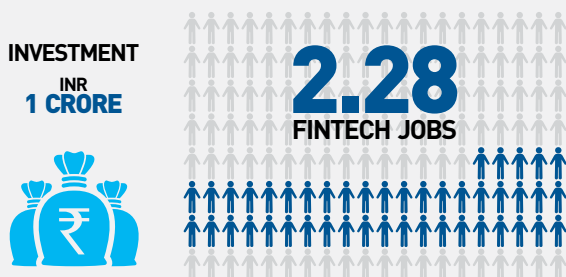
As per a research report by McKinsey Global Institute, widespread adoption and use of digital finance could increase the GDP of all emerging economies by 6 percent, or a total of \$3.7 trillion, by 2025. This is the equivalent of adding to the world an economy of the size of Germany, or one that's larger than all the economies of Africa. This additional GDP could create up to 95 million new jobs across all sectors of the economy .

Indirect Jobs:

As per the Maharashtra State Manufacturing policy 2011, every job in the manufacturing industry creates 2-3 additional indirect jobs. However a Massachusetts Institute of Technology analysis has found that hi-tech and emerging technology focused sectors like Fintech have a multiplier effect of creating 5 additional jobs.

Higher investments and increased trading activities can improve the labor market as MSMEs grow their business. Consumption would increase as a result. It would also help them acquire necessary skills and improve their longer term income potential.

According to a KPMG - Google report, Fintech would drive 5x more employment, increase MSME contribution to the GDP by 10 percentage points by 2022. The number of direct jobs created per crore of investment in Fintech industries is thrice the number of direct jobs created per crore of investment in the traditional industries in Maharashtra.



Research Background

With the growing relevance, influence and impact of Fintech as highlighted briefly in the earlier sections, a frequent question at various seminars, panels, roundtables and edits has been 'What do Fintechs in India need to become sustainable businesses' or its close variant 'What will it take to set up a Fintech Hub in India'.

There have been several discussions, expert opinion pieces, and efforts led by the Government of India as well as several State Governments to support Fintechs. Some of these are focused efforts while some were part of the larger startups agenda. However, till date there has not been a focused and comprehensive analysis of India's inchoate Fintech ecosystem.

Welcome to the inaugural India Fintech Opportunities Review for the calendar year 2017. YES BANK, India's fourth largest private along with Pricewaterhouse Coopers (PwC), Let's Talk Payments (LTP), Ourcrowd (global crowdfunding leader) and Burnmark (Research Partner) is pleased to share with you the findings of this research initiative.

IFOR is India's largest and most comprehensive analysis of the Fintech ecosystem to date. As per Tracxn estimates, there are 1218 Fintechs operating in India, the 611 respondents of this survey including 123 global Fintechs are a strong representation of this sector. The IFOR survey also include inputs from 100 plus ecosystem members including investors, academia and incumbents.

The Indian Fintech market is poised to touch USD 2.4 billion by 2020. Favorable demographics, increasing mobile phone and internet penetration, an active startup ecosystem puts India on the cusp of a Fintech revolution, akin to where Fintech hubs like London, Singapore and New York were a couple of years earlier. Supported by a facilitating ecosystem of future skilled talent, growth capital, sustained demand and enabling policies, **India can emerge as a global Fintech Hub.**

This research initiative will form a critical part of our efforts to create an enabling Fintech ecosystem or 'hub' in India. IFOR 2018 will be shared with Governments (both center and state), regulators, investors, corporates and academia in a bid to bring together to all key stakeholders of a Fintech 'hub'. Hence, it was critical to ensure that the insights and recommendations were rooted in facts and 'hard data' collected directly from the community (Fintechs, incumbents, funds and academia) itself.

Over the next few pages, the report maps out India's Fintech sector, benchmarks top 3 global Fintech hubs for best practices, and identifies key drivers and enabling factors which can help build an enabling ecosystem.

A dedicated webpage with further access to all data and insights of IFOR has been created at www.yesfintech.com/ifor2018.

Research Objective & Methodology

IFOR 2017 was launched in November 2017, as part of a 90 day exercise to

1. Provide a snapshot of India's Fintech industry
2. Identify the key drivers for creating an enabling Fintech ecosystem in India
3. Benchmark the current state of these drivers in India with global Fintech hubs
4. Share a roadmap for strengthening the drivers and developing a Fintech hub in India

Towards the foregoing, the research methodology was segmented into

- 1. Quantitative Research to gain a broad snapshot of the industry**
 - i. 15 minute Online Survey
 - ii. 611 respondents, 488 Fintechs from India and 123 global
 - iii. 87% of the respondents were founders/CEOs
 - iv. 13% were CXOs – CTO, CFO and COO
- 2. Qualitative Research for an in-depth understanding of all key challenges and opportunities in the sector**
 - i. Focused group discussions in Fintech hotspots of Mumbai, New Delhi and Bangalore
 - ii. 99 participants across the 3 cities – with equal participation from Fintechs (across segments), Investors, Academia and Incumbents
 - iii. 32 participants in Bangalore, 36 in New Delhi and 31 in Mumbai
 - iv. All participants were CXOs
 - v. 60 minute round table discussion
- 3. Inputs from IFOR Advisory Council:** To bring in wider insights and perspective to the research, an IFOR Advisory Council, comprising of influencers, technology experts, ecosystem founders and global sectoral experts was formed. The Advisory council shared their inputs on
 - i. Key ecosystem drivers
 - ii. Steps taken by Global Fintech Hubs
 - iii. Roadmap for creating a Fintech hub in India
- 4. Secondary Research**
 - i. Comprehensive analysis of all existing publicly available information
 - ii. In particular, sector analysis of all Fintech hubs have been referenced in this document
 - iii. The CPH Fintech report created by Copenhagen Fintech has also been referenced in this report

IFOR Advisory Council

GLOBAL

Chris Skinner

Non-Executive Director,
11:FS

Dr. Robin Kiera

Fintech & Insurtech
influencer

Phillip Nunn

CEO,
The Blackmore Group

Richard Teng

CEO, ADGM Financial
Services Regulatory Authority

Chris Gledhill

CEO & Co-founder,
Secco

Lawrence Wintermeyer

Principal,
Capstone

Simon Cocking

Senior Editor,
Irish Tech News

Renauld Laplanche

Co-founder & CEO,
Upgrade

Sue Britton

CEO & Co-founder,
Fintech Growth Syndicate

Vladislav Solodkiy

Managing Partner,
Life.SREDA

Dr. Alessandra Buonfino

Head of International
Development, Mishcon de Reya

Ewan Macleod

Chief Digital Officer at Nordea

Julie Lake

CEO & Co-founder,
The Fintech50

Ayesha Khanna

CEO,
ADDO AI

Brad Chun

CEO,
Mooti

Ghela Boskovich

Founder,
FemTech Global

Devie Mohan

Co-founder & CEO,
Burnmark

Avi Cohen

Co-founder & CEO,
The Floor

Damien Kopp

Senior Technology Advisor &
Head of Products, BluePool

Laurent Nizri

CEO Altéir Consulting -
Strategy & Innovation

Nasir Zubairi

CEO, The Luxembourg House
of Financial Technology

Ricardo Vidal

International Awarded Fintech
Product Professional

David Brear

CEO & Co-founder,
11:FS

Felix Tan

MD,
The Finlab

Mali Marafini

Advisor,
Novo Ordus Capital

INDIA

Anurag Jain

COO & Co-founder,
KredX

Rohas Nagpal

Chief Blockchain Architech,
Primechain

Amit Sachdev

Co-founder & CEO,
Cointribe

Suvodeep Das

VP Marketing,
Sodexo

Shanti Mohan

Founder & CEO,
LetsVenture

Alok Mittal

Founder & CEO,
Indifi

Alok Patnia

Founder & CEO,
Taxmantra

Vidhya Shankar

Executive Director,
Grant Thornton India

Ajay Kaushal

Co-founder & Director,
Billdesk

Rajat Gandhi

Founder & CEO,
Faircent

Lizzie Chapman

Co-founder & CEO,
Zestmoney

Pallav Sinha

Founder,
Mera Job India Pvt. Ltd.

02.

INDIAN FINTECH LANDSCAPE: SNAPSHOT

Fintech in India is still an inchoate sector

- 64% of these organizations have been in business for 3 years or less
- Median employee strength is 14
- Dominated by young tech entrepreneurs
 - 25% less than 30 years of age
 - 35% between the age of 31-40
 - 34% have less than 2 years of experience, 60% have less than 5 years of experience
 - 91% have a STEM background

The sector though is growing rapidly. Fintechs in India are spread evenly (21%-27%) across ideation, prototype, early revenue and business expansion stages. Given the vintage of most of these startups it is quite commendable that 7% of fintechs have already turned profitable.

While many equate Fintech in India as largely digital payments, the sector has evolved considerably with domains like digital wealth management, lending and robotics process automation picking up rapidly.

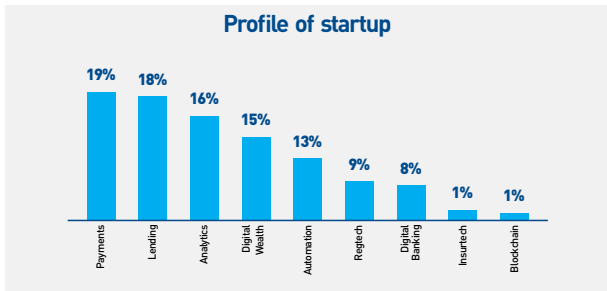
The most significant evolving demographic of this sector though is the remarkably high receptiveness of Fintech solutions in India. EY's recently released Fintech adoption Index shows

- 33% global adoption of Fintech solution
- India ranks second with 52% adoption rate only behind China at 69%*
- The level of adoption clearly shows that the sector is nearing tipping point, wherein if aided by a robust ecosystem it is poised for take off

Basis global benchmarking we believe that the sector is poised for take-off, though the degree of success in the future will depend on the support ecosystem.

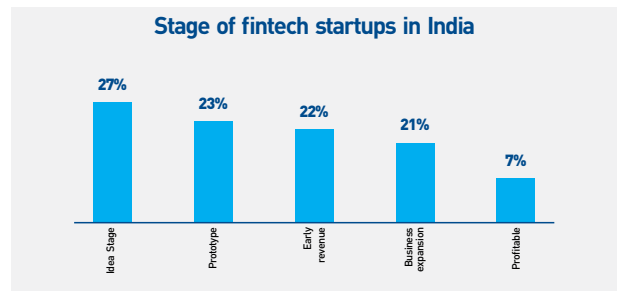
India Fintech Snapshot

Sector Snapshot



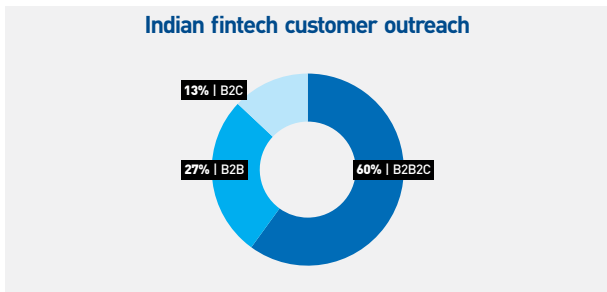
Payments and Lending dominate the landscape but Analytics, Digital Wealth and Process Automation are gaining importance

Stage of Fintechs

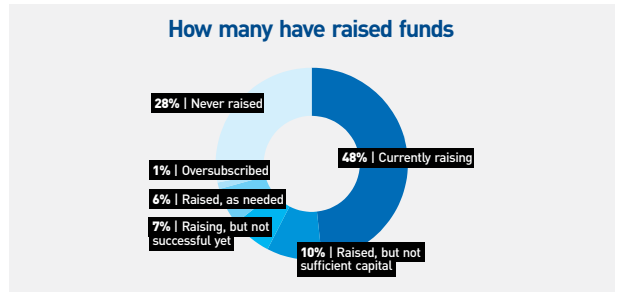


Majority of Fintechs are in a Pre-revenue stage (50%)

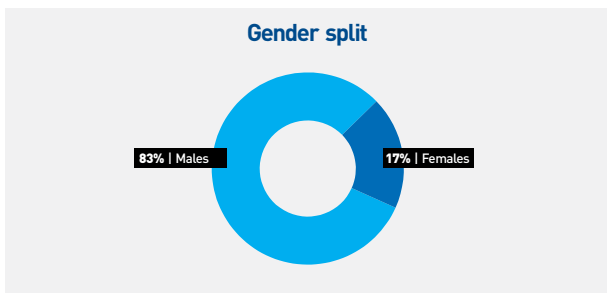
Customer Outreach



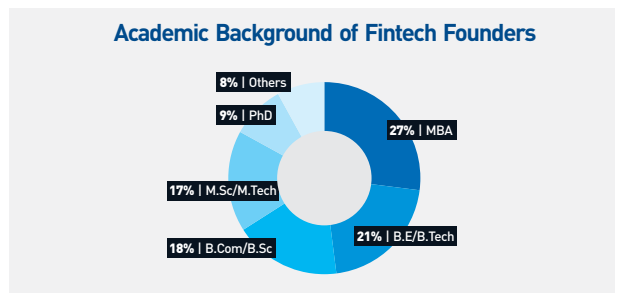
Funding



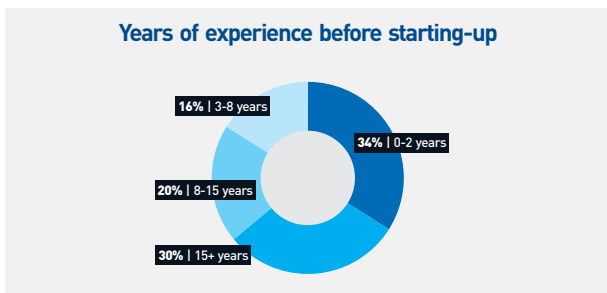
Founder Profiles



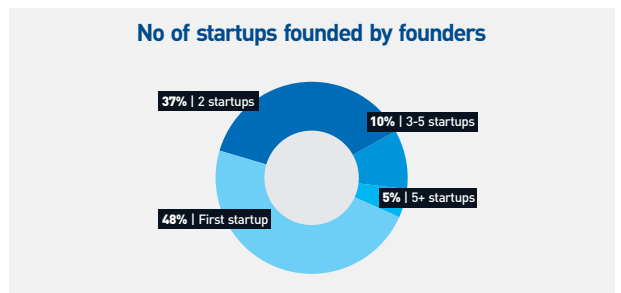
Education



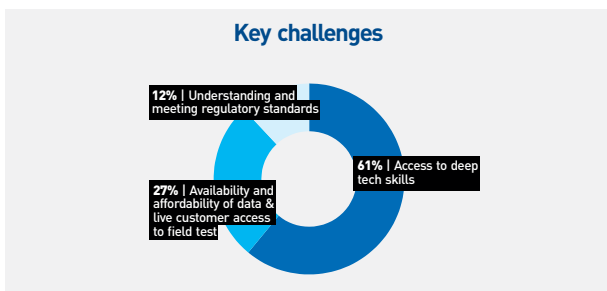
Experience



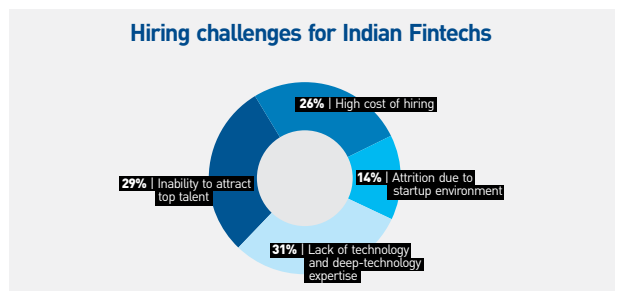
No of Startups



Key Challenges



Hiring challenges for Indian fintechs



03.

FINTECH HUB BENCHMARKING: CURRENT AND EMERGING HUBS

Fintech has become a truly global phenomenon, with hubs being established in cities around the world, which were earlier the financial centers of their respective countries.

A Fintech hub is a self-sustaining ecosystem comprising of enabling infrastructure, organizations and people within itself, and is thus, the focal point for any Fintech activity within a region or a network. Hubs can comprise of wider regions like Silicon Valley or narrower locations like London's Level 39.

Similar to organizations which have distinctive traits to differentiate them from competitors and peers, fintech hubs possess inherent traits that make them unique. This can be based on their history or local intricacies. However, as with organizations, there is a common set of identifiable and interrelating factors that contribute to a hub's overall success.

The success of any fintech hub lies in an integrated all-encompassing ecosystem. A successful fintech ecosystem is where all the market participants connect, engage and share ideas across vibrant communities and networks, as well as identify and convert opportunities into business. In the current age of technology driven financial services, no market participant can afford to operate in silos.

In this report, we have explored established and emerging fintech hubs – London, Singapore, Australia and Hong Kong and identified the key enablers of these ecosystems*.

Fintech Hub Evaluation Parameters

| Hub Evaluation Parameters | Fintech Hub Attributes | Attribute Description |
|------------------------------|------------------------|--|
| Policy Environment | Regulatory environment | Regulators support for fintech startups such as sandboxes, helpdesks, funding help, licensing etc. |
| | Funding access | Govt. policies & initiatives for fintech startups including country ranking from global agencies on governance effectiveness |
| | Talent availability | Tax benefits for fintech startups & entrepreneurs |
| Growth Capital | Risk Capital | Access to risk capital from angel investors, HNIs, Governments |
| | Innovation culture | Access to growth capital from VCs, banks & tech ventures |
| Future Skilled Human Capital | Talent Access | Access to local talent from academic institutes, tech firms, FIs and ability to obtain a visa for hires from abroad |
| | Talent Quality | Ability to hire fintech experts from global banks, fortune 500 firms |
| | Talent Cost | Salaries for fintech hires- engineers, fin experts, co-founders etc. |
| Sustained Market Demand | Retail demand | Macro factors like internet penetration, smartphone penetration, retail banking generation, digital saviness |
| | SME demand | SME segment size, growth rates, demand for innovative financial products & services |
| | FI demand | Banking segment size, legacy infrastructure, collaboration trends |
| Environment | Accelerators, events | Presence of independent accelerators or bank sponsored accelerators, frequency and quality of fintech events |
| | Foreign market access | Global connectedness of fintech hub and how well its startups can access foreign markets |
| | Fintech unicorns | First mover fintech firms which are established and can offer a pool of knowledge and network for startups |

I. London

London is a Global Financial Hub housing the world's largest financial services sector, supported by a booming tech sector. These factors make London one of the greatest connected global cities in the world with the key ingredients for digital success: capital, talent, regulatory and Government support and demographic diversity. London has established itself as one of the most attractive locations in fintech with high digital connectivity, an indigenous financial services workforce, solid funding landscape and enabling regulatory environment.

UK's Financial Conduct Authority (FCA) has built into its governance model a mandate to promote innovation & competition, as well as traditional mandates of financial stability and consumer protection. In particular, it is the FCA's regulatory sandbox that attracted worldwide attention. The sandbox is a way for companies to test products with temporary regulatory approval.

It is part of FCA's Project Innovate, an advisory group which mentors Fintechs on the regulations they need to bear in mind when trying to bring new products to market. Project Innovate was developed by FCA to foster competition and growth in financial services by supporting small businesses that are developing products and services that could genuinely improve consumers' experience and outcomes.

■ Sustained Market Demand

London is ranked number one as a global financial centre, and edges out Singapore in its access to customers. According to the EY Fintech Adoption Index 2017, UK's fintech adoption rate is 42%, well above the USA's 33%, Singapore's 23%. There are currently over 350 different banks in the UK; many of which still rely heavily on legacy systems. With the world's highest concentration of banks, asset managers, insurance and trading firms, London provide excellent opportunities for fintech startups to innovate and disrupt.

■ Future Skilled Human Capital

With an estimated Fintech workforce strength at 61000, UK probably has the best mix of talent across all global hubs. There is ample availability of talent in FS domain, entrepreneurial talent, combined with availability of tech experts and developers.

■ Growth Capital

Since 2014, there has been a strong growth in the financial institutions openness to participate as both investors and early clients of fintech firms. London is undoubtedly Europe's capital when it comes to tech ecosystems. Investors have pumped more than 825 million pounds (\$1.1 billion) into UK fintech start-ups since the start of 2017, with London attracting more than 90% of that investment.

■ Environment

Despite the traditional disconnect at regulatory and business fronts within EU and the perceived impact of Brexit, U.K.'s business environment for fintech has been given a strong boost by policy alignment, digital infrastructure, demand generation and expanded outreach. Initiatives like the Single Euro Payment Area and Payment Services Directive 2 are helping to create a stronger environment for fintech companies.

■ Policy Environment

London has maintained its focus on providing the strongest regulatory support to its fintech sector through taxation, disclosure mandates, consumer protection regulations and risk management. The UK is a global gold standard for the progressiveness of its regulatory regime. Through Project Innovate, a dedicated program to assist Fintechs to navigate the regulatory authorization process, the FCA has established a program that Fintechs describe as supportive and collaborative, and significantly simplifying regulatory complexities. The UK Government has also appointed a Chief Scientific Adviser to lead a review into the future of Fintech. UK Government has also implemented tax incentives, such as Seed Enterprise Investment Scheme (SEIS) which encourages individuals to invest in small businesses by allowing them to offset part of their investment against their UK income tax liability and Entrepreneur's Relief (ER), which reduces the effective rate of capital gains tax to 10% in certain circumstances and R&D relief which reduces the corporate tax liability for qualifying companies.

II. Singapore

Singapore is a leading international financial centre and a serious contender for the global number one spot in Fintech along with London. Government support for Fintech is strong with S\$225m committed to the development of Fintech projects and proofs of concept.

In April 2016, the financial services regulator of Singapore – Monetary Authority of Singapore (MAS) appointed a Chief Fintech Officer to be responsible for formulating regulatory policies and developing strategies to facilitate the use of technology and innovation to better manage risks, enhance efficiency, and strengthen competitiveness in the financial sector. This was a clear indicator of the onus placed on the sector by the Government and the regulator.

The development of a vibrant Fintech ecosystem required close collaboration amongst Government agencies in Singapore. A Fintech Office, established on 3 May 2016, serves as a one-stop virtual entity for all Fintech related matters and promote Singapore as a Fintech hub. In February 2017, MAS also appointed a Chief Data Officer to lead efforts to harness the power of data analytics to unlock insights, enhance the supervision of financial institutions, make regulatory compliance more efficient for financial institutions, and improve work efficiency across the organization.

Other initiatives include the Regulatory Sandbox, Cloud Computing Guidelines, Strategic Electronic Payments, MAS Innovation Lab, International Technology Advisory Panel and Talent Development.

■ Sustained Market Demand

Singapore is a globally connected financial center with a high technology adoption rate. Singapore is a city-state with one of the highest per capita income levels in the world and highest smartphone penetration rate (80 %) in Asia. Singapore is also well placed to serve as a hub for other Association of Southeast Asian Nations (ASEAN) countries. Singapore serves as Southeast Asia's leading financial center with 117 foreign banks in Singapore and five global banks headquartered in the region.

■ Future Skilled Human Capital

With an average age of 28, Singaporean entrepreneurs are among the youngest in the world. Singapore has the 6th highest percentage of immigrant founders in the world at 35%. According to the Global Startup Ecosystem Report 2017, in terms of access to talent, Singapore beats global cities such as San Francisco, London and New York. With an estimated Fintech workforce strength of 10000, Singapore retained its top spot in Asia Pacific for the fourth consecutive year in the Global Talent Competitiveness Index (GTCI) 2017, Singapore was ranked second globally for the fourth consecutive year. The Singaporean populace is well-educated in technology and management and is well-placed financially.

■ Growth Capital

Startups in Singapore gain significantly from a growth in late-stage funding from venture capitalists. Fintech investments in Singapore are on an upward trajectory hitting \$34.52m (US\$25.3m) over six deals in Q3, as per KPMG. Singapore has a Smart Nation initiative and under it, MAS created the Smart Financial Center where it allocated US\$225 million for the Financial Sector Technology & Innovation scheme to support proof of concept (PoC) creation of fintech products. It is also launching a S\$27 million grant to support the adoption and integration of artificial intelligence and data analytics in financial institutions.

■ Environment

Singapore's importance as a financial hub lies in its talent pool, infrastructure and presence of global giants in the proximity. This serves as a steady source of funds, mentorship, innovation and incubation support. International banks such as Citi Bank and global consultants such as KPMG have set up innovation labs, driving tech innovation in financial services. Singaporean bank DBS has allocated SGD 10 million investment for the development of the Singapore start-up ecosystem.

■ Policy Environment

Financial technology in Singapore has seen an explosion in the last couple of years, slowly catching up to its counterparts in Europe and America. At the forefront of this growth are the Singaporean Government support and forward-looking initiatives of Monetary Authority of Singapore (MAS). To support the development of a vibrant Fintech ecosystem, MAS has taken steps to ensure Singapore's leading position as a leading global Fintech hub, the launch of the Fintech and Innovation Group (FTIG) and the Fintech Office, creation of a Fintech regulatory sandbox, a move towards an open-API architecture, the "Singapore Payment Roadmap" and the opening of the MAS's Fintech innovation lab – the "Looking Glass @ MAS," amongst other first of their kind initiatives.

MAS is encouraging more Fintech experimentation so that promising innovations can be tested in the market and have a chance for wider adoption, globally. MAS also launched the world's first dedicated PoC testing fund, through which it supports PoCs in Fintech to the tune of 70% of the project costs.

III. Hong Kong (HK)

Hong Kong has the natural branding of Asia's largest financial centre. This provides an immediate attraction for Fintech and has driven its development in recent years. Hong Kong's position as Asia's super connector is particularly useful for B2B solutions. Furthermore, its proximity to China makes it hard for other hubs to displace Hong Kong. Hong Kong is shaping up as a strong fintech hub in Asia, backed by robust investment support from the Government and venture capitalists to nurture entrepreneurship. Hong Kong has emerged as a major financial center, employing a population base in excess of 235,000. Its affluent and well-educated population, entrepreneurial history and proximity to funds provide start-ups a promising platform to establish their roots and grow their businesses.

The Hong Kong Monetary Authority (HKMA) in particular has been very supportive of fintech, leading several initiatives to boost development and growth. In March 2016, the HKMA established its Fintech Facilitation Office. In September, the HKMA announced a Fintech Supervisory Sandbox, albeit only for incumbent banks. A HKMA-ASTRI Fintech Innovation Hub was announced in November 2016. In addition, Hong Kong's Applied Science and Technology Research Institute (ASTRI) is engaged with an increasing range of private and public sector participants in building Fintech solutions, including partnering with the academia. The HKMA is also undertaking research into digital currency.

■ Sustained Market Demand

Hong Kong, driven by high rate of education and technology usage by Govt., ranks ninth globally as one of the most advanced digital economies with a score of 3.66, and third in Asia Pacific behind Singapore (3.69) and South Korea (3.68), but ahead of Japan (3.52) and China (2.49).

■ Future Skilled Human Capital

Universities in Hong Kong are placing greater emphasis on the fintech sector through talent and mindshare building for leadership, entrepreneurship and management, in a traditionally analytical workforce. Number of Fintech startups have more than doubled in 2016 from 40 to 90, currently employing 8000+ people. The workforce is a little thin overall with particularly niche future-skilled tech talent, as a result of which Hong Kong has one of the most accommodating skilled immigration regimes. Being a major financial hub in South East Asia, Hong Kong is able to attract skilled professionals. Its proximity to China also makes the country a lucrative business destination for multinational organizations. In order to retain a skilled workforce, Hong Kong has already implemented a flexible visa policy.

■ Growth Capital

The VC landscape is emerging in Hong Kong with considerable funds pouring in through private equity as well as crowdsourcing. Corporate venture fund amounting to HKD50 million was allocated for co-investment opportunities by the Hong Kong Science and Technology Park, established to assist investment and financial needs of start-ups. Hong Kong fintech startups got USD 160 million in funding in January 2016.

■ Environment

Accelerators and incubators are gaining traction in the region, spurred by a favorable business environment in Hong Kong.

- FF16 campaign, a fintech competition launched by NxtBnk as part of StartmeupHK Festival
- SuperCharger Accelerator, a 12-week program for fintech companies and RISE, a conglomeration of world's biggest companies and HK's most exciting start-ups has attracted global fintech community attention
- Nest is a program investing in early stage startups and high growth businesses by running a corporate-backed accelerator

■ Policy Environment

The Government's intent for the growth of the fintech sector in the region is reflected in its all-encompassing policy recommendations for financial, talent, exposure and infrastructural maturity needs. The Government of Hong Kong has introduced several initiatives, incentives and incubator programs like InvestHK, Startmeup.HK, Cyberport and many more that will further bolster the growth of this key fintech ecosystem of Asia. The HKMA, Securities and Futures Commission (SEC) and the Office of the Commissioner have set up Fintech dedicated platforms to ensure a balance between market demand and investors' understanding (and tolerance of risk) when introducing innovative financial products and services. In September 2016, the HKMA launched a Fintech Supervisory Sandbox to facilitate the pilot trials of Fintechs and authorized institutions, before they are launched on a larger scale, and to provide faster approvals for Fintech experiments.

IV. Australia

Australian fintech community has quietly emerged as a major player in the global fintech ecosystem, with **14 per cent of the global funding raised flowing into Australia**. With a robust financial sector that is larger than many Asian and European counterparts in size, it has a strong breeding ground for domestic consumption of emerging fintech capability.

The Australian Government has conducted a review of the nation's Fintech needs and potential, as part of a broader review of the financial system as a whole- Australia Fintech Survey. Basis this, a Fintech Advisory group has been appointed to advise the Treasury, which aims to work with the industry to make Australia the leading market for Fintech innovation and investment in Asia. Key initiatives include the following- Australian Securities and Investments Commission (ASIC)'s creation of a regulatory sandbox for Fintechs, ASIC's establishment of an Innovation Hub, Government procurement and active support of Fintech solutions, promotion of greater data availability, including standard APIs to support Fintech innovators, tax concessions for investments in Fintech, a national cybersecurity center, a global innovation strategy, including overseas 'landing pads' for Australian Fintechs to operate overseas & a regulatory framework to support equity and debt-based crowdfunding.

▪ Sustained Market Demand

As per a 2017 Frost & Sullivan study, 'Fintech in Australia – Trends, Forecasts and Analysis 2015 – 2020' the Australian Fintech Sector is expected to grow at a CAGR of 76.36% and reach A\$4.2 billion by 2020; of which A\$ 1 billion will be completely new added value. In 2015, the total market size of the Australian Fintech Sector was estimated at A\$ 247.2m. The Fintech sector is poised to take advantage of the more personalised and innovative financial solutions preferred by customers in the current financial sector.

▪ Future Skilled Human Capital

Sydney has a well-developed skill base, with a strong education and research sector. The Sydney Metropolitan Region has six major universities and nine campus sites for non-metropolitan universities. The universities drive innovation through research and commercialization of research through applied research grants and partnerships. They also contribute to the pool of talented students, academics and graduates who often form start-ups. With Australia's technology immigrant population reaching an inflection point, there is a sudden rise in the available technology workforce in popular areas of fintech (such as mobility, analytics, Big Data), to ease the pressure on the talent needs of the sector.

▪ Growth Capital

Australian Fintech investment has remained strong with \$US675 million invested across 25 deals in 2016 and Sydney has been the major recipient of Fintech related VC investment at \$US171 million between 2014 and 2016. In just five years, Australia has seen the creation of a healthy and active fintech sector, from an extremely low base of just \$51 million of fintech investment in 2012 to over \$600m in 2016.

▪ Environment

Australian business environment and Government support has led to an abundant inflow of institutional support through incubation and innovation hubs. In May 2015, collaboration between the private and public sector helped to establish a fintech co-working hub, 'Stone and Chalk' which provides office space at subsidized rates, promotes cross-sector collaboration and helps to attract international talent and capital to Australia. The hub offers event space and accommodates up to 240 entrepreneurs through fixed and hot desks.

Ever since Innovate Australia was launched, it has been connecting technology SMEs and businesses to develop globally competitive B2B solutions that address compelling needs. The Entrepreneurs Infrastructure Program, started in July 2014, offers advice and mentorship on commercialization of business ideas. AWI Ventures Accelerator Program, launched in March 2014 invested AUD 1 million for fintech startups operating in the wealth management space.

▪ Policy Environment

The Australian Government has been keen to address the longstanding need of Fintechs, with immediate benefits in taxes and protecting employee stakes in start-ups. It announced a formal set of fintech priorities, with fintech included in recent Federal Budget measures.

In August 2015, the Knowledge Hub supported the launch of Stone & Chalk (S&C), a not-for-profit Fintech hub that fosters and accelerates the development of start-ups by co-locating venture capital, technology start-ups and established financial services firms. In March 2017, ASIC launched a regulatory sandbox that allows eligible Fintech businesses to test certain services for up to 12 months without an Australian Financial Services License (AFSL) or Australian Credit License.

A right mix of 4-5 key factors are driving growth in these fintech hubs. The availability of right technical skills, significant growth in capital investments, emergence of Government policies, and an entrepreneurial and innovative mind-set are the driving forces for establishing a fintech hub. The four global case studies mentioned above have been presented in order to help policymakers and the wider public understand in concrete terms what it takes for a fintech hub to be commercially viable, competitive and successful.

04.

WHAT DO FINTECHS NEED: KEY ENABLERS OF A FINTECH ECOSYSTEM

Fintechs are redefining the services industry from business models to delivery channels. While the sector focuses on innovation and differentiation, the true test of the sector's success is commercial viability. This section, apart from presenting a snapshot of the current state of the industry also:

- Identifies the key factors or enablers which can improve the development of Fintech startups
- Explores the current state, opportunities and challenges in each of these enablers

The key enablers were identified by evaluating the internal and external challenges faced by Fintechs globally as well as in India. The online survey and focused group discussions helped force-rank these challenges. This was then combined with the challenges faced by Fintechs globally and the key steps undertaken in these ecosystems to address them.

The top challenges faced and the benchmarking of Global Fintech hubs have been captured in subsequent sections. This along with inputs from the IFOR advisory council and secondary research, helped identify the following 5 key drivers of a fintech ecosystem.

1. Sustained Demand:

Sustained Market Demand to ensure commercial viability of both B2B and direct to customer Fintech solutions is a key enabler

2. Future Skilled Human Capital:

Quality and Depth of talent in financial services and technology, is an important factor in scaling up solutions. Basis inputs from respondents, Indian Fintechs run lean organizations (median 14). This further increases the importance of talent availability as well as attracting and retaining the best talent

3. Availability of Growth Capital & Investment:

Availability and access to early stage funding was identified as a strong driver both by Indian and global Fintechs. Respondents in the discussions also stated that viable exit options for investors are also important

4. Enabling Environment:

Strong support networks of incumbents, investors, accelerators and incubators, and mentors were highlighted as a key area by respondents. This is an area where support is required by idea, growth and expansion stage startups

5. Policy Framework:

Analyses of all top ecosystems by Burnmark, and discussions with ecosystem players identified supportive policies and regulations, and access to regulators as an important driver

For each of these enablers identified above, there are a number of variables which can have a potential impact on the growth and expansion of the sector– either at an industry-wide level, or from an individual firm’s perspective.

These factors have been isolated and discussed in detail in the following sections, with an in-depth analysis of the current state and future requirements.

Sustained Market Demand

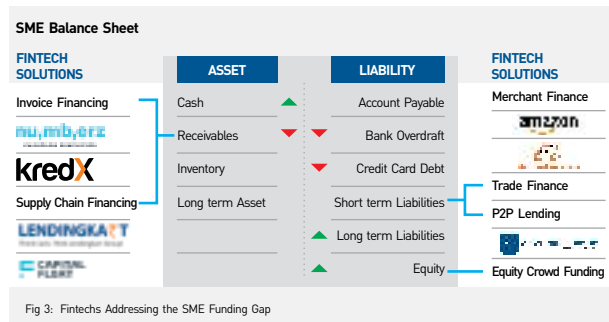
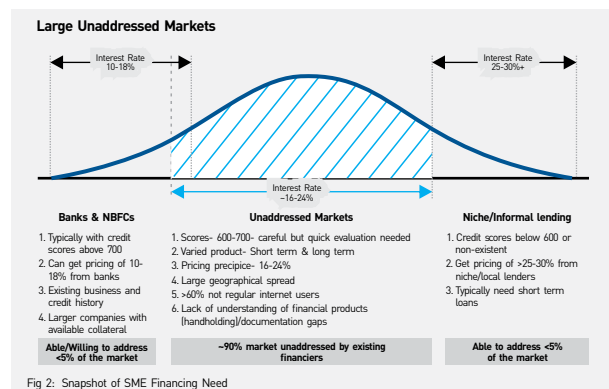
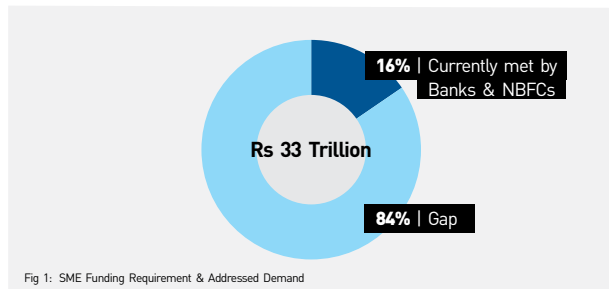
Adoption rates of Fintech solutions (including digital finance) have grown globally and in India, especially among retail customers. The last twelve months have seen several favorable developments including demonetization and the concerted push for a 'less-cash' economy.

A clear indicator is the growth trajectory of transaction using the Unified Payment Interface (UPI) – transaction volume has grown from 0.1 million in Oct 16 to 79 million in Oct 17.

We delved deeper into the growing demand for Fintech solutions, and following are some of the key findings

- 1. India has the Second Highest Global Fintech Adoption Rate:** As noted earlier, Fintech has experienced a strong demand led development, especially in India. India's adoption rate (as per EY) of 52% is only behind China (69%) and significantly above the global adoption rate of 33%. Majority of this innovation is startup led and during the IFOR research we found out that 90% of startups fail in early stage either due to lack of data to test the innovative solutions or a corporate partner or funding. We infer that this presents a significant opportunity for Fintechs in India as well as corporates including incumbents to look at increased Fintech collaborations.
- 2. Incumbents are largely viewed as Partners though Commercialization of PoCs is still nascent:** Our findings point to the fact that incumbents and fintechs have moved from competition to co-opetition and collaboration. 79% of the respondents view incumbents as partners while 13% are indifferent and only 8% of them view them as competitors. Though Fintech-incumbent partnerships are taking off, commercialization of co-created PoCs is still nascent globally. As per Life SREDA, only 11% of PoCs created by incumbent Fintech partnerships globally were commercialized in YTD 2017 (compared to 4% in 2016).
- 3. Accelerators/Incubators are helping develop solutions through PoCs via Industry Partners:** Secondary research and landscape study show that Fintech incubators and accelerators have grown significantly in 2016-17. Fintech/Insurtech focused accelerators have increased 200% in the last year, growing from just 4 in 2016 to 12 in 2017. One of the key focus areas of these accelerators including those of the 4 major private sector banks is PoC development. 50+ PoCs have been developed in 2017 in accelerators and incubators across India.
- 4. Enterprise customers prefer working with funded startups:** While growing number of accelerators and incubators have helped in the development and commercialization of PoCs, our findings show that enterprise customers prefer to work with funded Fintechs. Another point to note is that 72% of Fintech respondents across sectors found investment comparatively 'easy' post acquisition of their first enterprise customer (for B2B Fintechs).
- 5. Rs 26.5 trillion of SME debt demand unmet by formal channels:** Owing to complexity and difficulty in accessing credits, MSMEs often do not have access to formal lending channels, and rely on the informal sector, at interest rates as high as 30%. Moreover, smaller businesses also have limited financial history and might not have detailed

documentation available. This becomes a major hurdle in the loan disbursement process. A typical Bank's credit underwriting process of lending to MSMEs with credit history on bureau, and strong collateral becomes a chicken-and-egg problem. Fintechs can address these with existing SME focused solutions by Fintechs like Invoice financing (KredX, SME Corner, Numberz,); Supply Chain Financing (Capital float, Lending Kart) and Merchant Financing (Alibaba, Amazon).



GLOBAL CASE STUDY

Case Study 1:

Technology User Consortium/Association for PoC funding & Commercialization

In Israel and Denmark, organizations have created sectoral industry consortiums, comprising of around 6-7 corporations per sector. The members of the consortiums collaborate and identify 'problem statements' which affect the industry at large. These use cases are then shared with the Fintech associations of the country. Then the interested fintechs submit their applications.

Selected fintechs work on the use cases and the solutions are adopted by the consortiums. The PoCs are jointly funded by the members of the consortiums who also help mentor the startup and help in product commercialization.

Similar models are taking-off in India, one such example being the Bankchain consortium of banks who are working with a blockchain startup, Primechain, in developing banking use cases on blockchain technology.

Case Study 2:

Global Fintech Bridges – Cross border commercialization

Top Fintech ecosystems around the world – UK, Singapore, Israel, UAE have signed agreements with each other to help in

- Sharing of information on emerging trends, key technologies and regulatory developments
- Providing Fintechs in each country the opportunity to expand into respective regions – creating a global market
- Cross border funding as well as global industry consortiums



Fintech and financial services are increasingly collaborating across the world. Partnering with innovators allows incumbents to outsource a chunk of their R&D and bring solutions and products to markets quickly. Fintech companies also benefit from those partnerships – they can test theories and models and in some cases can access larger data sets. Banks and insurance companies are increasingly supporting tech hubs and encouraging others to do the same.

Chris Skinner,
Non-Executive Director, 11:FS

Future Skilled Human Capital

As detailed in the earlier section on Global Fintech Hubs, quality and depth of talent skilled to work on emerging technologies, is a key enabler of a Fintech hub. Delivery of most fintech solutions involves future technologies like AI or blockchain. These require specific technology expertise and knowledge. This coupled with lean team size, limited pool of trainers/mentors and limited funds make it important to hire, train and retain the right talent.

The research had the following key observations on the current talent availability and opportunities to build an enabling ecosystem:

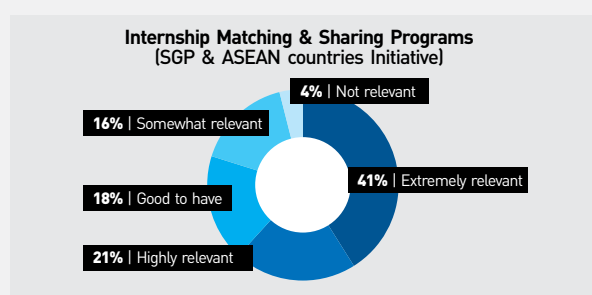
- 1. Technology focused employees/coders form the core of Fintech Startups:** All survey respondents (87% founders) identified employees focused on technology development/coders as the core of their workforce. On an average, 33% of total employee strength comprises of coders, this number is as high as 67% in idea and pre-revenue stage startups.
- 2. Current available talent pool is rich in technology graduates, but low on future tech skills or knowledge:** India has a very rich and strong STEM talent pool of 2.4 million including 1.5 million engineering graduates and 0.3 million masters in technology, creating a strong prospective employee pool for Fintech startups. However, respondents feel that there is a significant gap in the deep-tech expertise required by them. 71% of the respondents state lack of deep tech expertise as a key impediment to their growth. The number is even higher (81%) for B2B fintechs. This finding was further substantiated in the discussions – **all fintechs using blockchain technology highlighted that the availability of coders in the technology is especially low and many respondents hired their coders from Russia, Poland or Silicon Valley.** The FGDs held in Bangalore, Delhi and Mumbai reinforce the need of development of human capital for the future.
- 3. Current academic curriculum is not completely equipped for future skills but the creation of a representative Fintech body can create more synergy:** 28 of the 31 Fintechs participating in the focus group discussions, and all Fintech members of the IFOR advisory council highlighted that the current academic curriculum and R&D in bachelor degree courses are majorly aligned to the IT/ITes sector, whose needs are distinct from Fintechs. The last few months have seen some effort in this regard though with Centers of Excellence and future technology institutes being set up in some regions like IIT Madras, Gitam University and International Institute of Digital Technologies, Tirupati.
There is a silver-lining with the launch of Fintech focused courses in 9 colleges across universities.
All 31 respondents and 17 members of academia also stated that representative bodies like Indian Banking Association (IBA) help significantly in creating industry academia partnerships for the Banking sector and a similar body representing Fintech could help in building future skills in areas like AI and blockchain.
- 4. Skilled Tech Talent retention presents a challenge for non-funded, bootstrapped Fintechs:** The limited future technology talent pool implies that hiring and retaining available talent is key. The respondents highlight this as a challenge especially for pre-series A startups. 63% of pre-series A and 83% pre-revenue fintechs state retention of skilled technology talent as an area of concern.
- 5. Mature companies increasingly use digital channels for hiring but referrals still dominate:** Talent recruitment is still largely through referrals – 90 % of the respondents hired through referrals of fintech founders/co-founders. Hence networking and 'match-making' events/initiatives have become increasingly important. However, as fintechs mature, modes of hiring become more evolved, with 77% of profitable startups and 83% of those with Series A funding stating online channels like job portals and LinkedIn as their preferred source of hiring.

GLOBAL CASE STUDIES - Creating Future Skills Curriculum

Our benchmarking exercise and consultation with IFOR advisory council presented 2 case studies for promotion of future technology skills. Through these initiatives top global Fintech hubs – Singapore, UK and Israel have i) increased future skilled talent and ii) helped Fintechs hire talent from top universities directly

Case Study 1:

Internship Matchmaking Programs



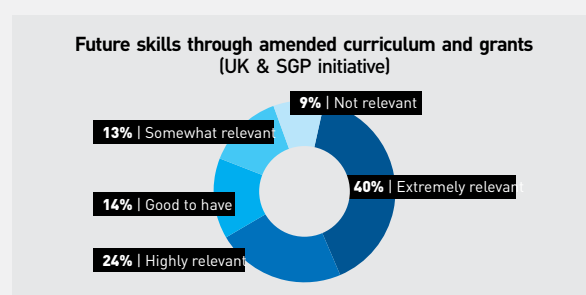
Singapore and ASEAN countries, have constituted internship match-making and talent sharing programs, where, top technology institutes partner with fintech startups, who can hire students from these institutes as shared resources. As part of these programs, technology institutes create a combined pool of students looking to work in the sector. The list of students is put up on a limited access website.

The pool is then shared with affiliate Fintech startups, who can either hire them individually or jointly hire them for the internship period (Month 1 in Startup 1 and Month 2 in Startup 2). Over the internship period the startups train and develop these young professionals for a variety of roles. Fintech associations also periodically share their overall talent requirement and suggested curriculum amendments with academia.

80% of Indian Fintech startups find this relevant to address their problem of hiring suitable talent.

Case Study 2:

Applied research promotion in Fintech through Industry-academia partnerships



Singapore and UK among others have set up centers of excellence, to encourage students to develop knowledge and undertake research in emerging technologies which are of interest to them and the specific sectors of the industry. To identify these areas, industries appoint representative bodies or create consortiums (Fintech and cleantech are 2 areas with multiple industry consortiums). These bodies along with respective Centers of Excellence then finalize the priority projects for the year and provide grants upto 100% for research in these areas. The cost of the research is shared between academic institutes and industry consortiums. In case any of the R&D projects leads to an idea, the consortiums incubate these ideas and commercialize a successful PoC.

In 2016, 91 ideas have come through these grants in UK alone of which 60 plus have been incubated by industry bodies and consortiums. *78% of Indian Fintech startups feel that this is key to developing deep tech talent and it is important to upgrade the existing curriculum to integrate knowledge of emerging technologies in order to develop skills for the future.

Incentivizing STEM education, knowledge and research for the next generation will be key to an equipped and adaptable workforce in the future. It is important that STEM education also adapts to the changing needs of the industry. Financial technology and new age technology have very different requirements compared to traditional industry with proficiency in data analytics, new age coding and database management skills like blockchain coding and python db management gaining importance. Hence it is important to include these in STEM courses as well as create R&D labs to hone these skills. There is also a clear need of Fintech organizations to liaise better with academia. Also, education in STEM, financial literacy, innovation and design should begin in early school.

Lawrence Wintermeyer
Principal, Capstone

More academic institutions are looking to develop the next generation of fintech talent by training science and management graduates through fintech courses. Democratizing the access to fintech know-how will be increasingly important to ensure that countries that would truly benefit from financial technology are not excluded – and this is where partnerships with the financial services sector could really make all the difference, enabling brilliant startups in emerging and developing markets to learn how to grow, though bespoke programmes and university/private sector partnerships.

Dr. Alessandra Buonfino
Head of International Development, Mishcon de Reya

Growth Capital & Investment

IFOR survey revealed interesting facts on the challenges faced by the fintech entrepreneurs, right from the role played by the founder's background to the customer segment playing a role in gaining access to funding.

The ability to raise funds at the right time and effectively manage the 'burn rate' is fundamental to the success of a startup. This is especially true for the Indian Fintech sector given its nascent stage. Funding of startups especially in Fintech is complicated due to the requirement of initial investment in technology and talent hiring costs. IFOR's deep-dive into capital investment in Fintech, sheds light on several interesting findings

- 1. Access to capital is gaining momentum, though PoC and early stage funding is still limited:** Fintech funding in India was USD 300 mn in 2016 and has risen to USD 2.7 bn in 2017. The creation of the Startup India fund by the Government of India, several state level fund of funds as well as dedicated Fintech focus of major VCs has boosted the availability of capital. Venture capital funding in Fintechs has shown a 34% y-o-y jump and 54% of Founders described fund raising as a simple process without complications.

While this is a significant boost to the Fintech industry, Proof of Concept (PoC) and early stage funds are limited as per respondents. 71% of pre-revenue and 81% idea stage Fintechs noted 'severe difficulty' in raising funds. The respondents highlighted an even bigger challenge in PoC funding – only 11% report that they received funding, and 19% stated that their industry partners paid for the PoCs.

Accelerators and incubators looking at early stage Fintech investments are starting to grow, and might help in PoC funding as well.

- 2. Founder's Educational background and experience appear to influence funding:** Our analysis of the funding patterns of the respondents and their educational background seem to point towards a clear linkage. 74% of startups whose founders are post graduates & above were able to raise funds relatively easily. 85% of founders with 15+ years of experience describe their funding search as easy, the number goes down to 69% for 8-15 years of experience and 44% for those with less than 8 years of experience. Given the profile of Fintech founders this would also indicate a growing ease of fund-raise. This could also indicate a better industry connect, and possibly better understanding of the domain resulting in a more investor friendly product.

- 3. B2B SaaS startup Founders found it difficult to raise funds, despite growing Fintech investments:** There is a slight disparity in funding as per B2B SaaS respondents. Only 11% of respondents focusing on the B2B segment described fund raise as 'easy' or 'moderately easy'. Our focused group discussions across 3 fintech hotspots reinforce this finding. 14 B2B Fintech founders (of the 31 Fintech participants) stated fund-raising was difficult and often linked to them having an anchor enterprise client.

- 4. Government Funds are available but respondents and industry experts indicate that the process and criteria are ambiguous:** The Government of India and several state Governments have established funds for direct or indirect investment into startups. However, till date the fund disbursement has been low.

For example, Startup India launched a 10000 cr fund which is accessible via SEBI registered funds and in order to separate the funds which invest in early-stage companies, a sub-category of category I funds called venture capital funds (VCFs) was created.

According to the regulations, a VCF is defined as an AIF (Alternative Investment Fund) which invests primarily in unlisted securities of start-ups, emerging or early-stage companies mainly involved in new products, new services, technology or intellectual property right-based activities or a new business model.

However, these start-up-focused VCFs are few and have been able to raise very little money. As of November 2016, only 23% of registered AIFs were "Category I – VCFs", according to SEBI. When it comes to raising funds, their share was even lower. As of September 2016, registered AIFs had raised around Rs 29,000 crore, out of which only 7% was raised by VCFs.

- 5. Managing Burn Rate is Emerging as a Key Issue:** 74% of the startups have a burn rate between \$10k-50k per annum and only 7% of them are profitable. Burn-rate guidance is an important area for Fintechs. Several Fintechs are already seeking mentorship or guidance on business modelling, fund management as well as managing burn rate. 21 of the 31 Fintech participants sought mentorship in the last year in these domains.

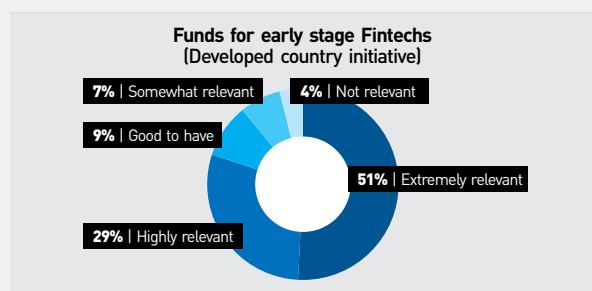
GLOBAL CASE STUDIES - Growth Capital

Globally Fintech funding is on the rise as well, while overall VC funding has dipped slightly. In consultation with our research partner Burnmark and IFOR Advisory council, we are pleased to share 2 global case studies to highlight steps taken globally to address

- Early Stage Funding
- PoC funding

Case Study 1:

Collaborative Early Stage Funding



Across 7 major Fintech Hubs, including the 4 hubs included in the report we noted a standard practice. Most Fintech hubs have set up an ear-marked fund or fund of funds to assist early stage Fintechs in R&D, testing, company registration, etc on specific KPIs.

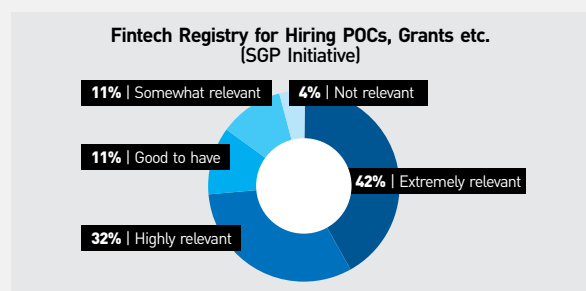
In Hong Kong for example the Government has identified Blockchain as a key focus sector and created a matching fund for early stage Fintechs, tech startups to create PoCs on relevant use cases using blockchain as the core technology. The Government invests funds to match investments made by investors in early stage Fintechs.

Another model is also gaining salience especially in Israel, wherein investors and corporate incubators accelerators pool in to create funds for early stage Fintechs in mutual areas of interest.

89% of Indian fintech startups voice overwhelming need for setting up funds for early stage fintechs either through Government/Investor or Investor/Corporate Partnerships

Case Study 2:

PoC Funding through Creation of Fintech Registry



Singapore has created a registry for fintech startups which helps identify startups for PoCs and helps Government in rolling out grants. The registry created by Let's Talk Payments in partnership with Singapore Fintech Association maps out Fintechs, their focus areas, stage and founder profiles and current product stage. Investment firms as well as incumbents seeking partnership have been actively using the registry. Similar registries have been set up in Hong Kong and Israel albeit on a smaller scale. Our discussions with experts and IFOR advisory council has noted several instances of PoC funding post setting up of the registries.

85% of Indian fintech startups find this relevant in order to create increased access to funding.



To enable funding R&D in emerging technologies, there is a need to engage various stakeholders in the ecosystem to contribute for a shared benefit in future. If the stakeholders come together to form a fund for these initiatives, it will help the broader ecosystem and help develop India as an innovation hub. We really need more R&D and PoC funding in India as it's a clear gap area in the country

Anurag Jain
Co-founder & Executive Director, KredX



Access to capital whether it comes from private investors, Governments or corporates is a key driver of fintech activity across hubs. In addition to start & scale up funding, investment is also required to fund initiatives such as sandboxes, incubators/accelerators that foster collaboration within the fintech ecosystem.

Dr. Robin Kiera
Fintech & Insurtech influencer

Enabling Environment

In India, the role of incubators, accelerators and innovation labs is critical not only for funding, mentorship and peer connections but also financial industry exposure and soft skills. The fintech sector is driven by young, first generation entrepreneurs who are now competing with the largest financial institutions in an extremely tough, cost-conscious Indian market. The research has highlighted the need for a strong network and ecosystem, beyond the Fintech startup team and its advisors and mentors. Several support ecosystems including incubators, accelerators, mentor groups have emerged in India over the last year (12 focusing on Fintech and 100 + core technology accelerators) to help Fintechs build a strong network, gain mentorship, commercialize products as well as seek funding across stages of development. Some of the notable initiatives on this front are 91 Springboard, Innov8, K-start and Zone Startups India.

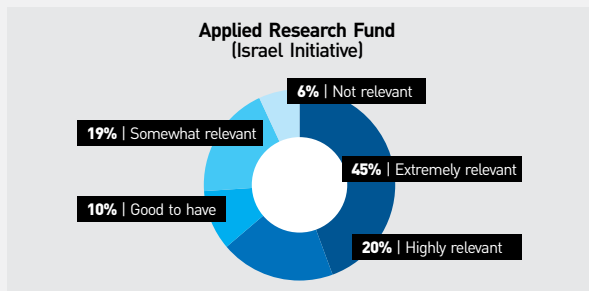
In this research, the role of established players, accelerators/incubators & co-working space was explored in India and top 4 global Fintech hubs.

- 1. Industry, Academia partnerships and Fund Access for fintechs is growing but sporadic:** In order to facilitate the growth of fintechs, there need to be support mechanisms in place for helping with the initial critical step of finding and working on an idea. There is also a need to bring the academia and industry closer to Fintechs, facilitating idea and information exchange. Currently, the nature of such interventions is sporadic. FGD participants suggested the creation of Fintech representative body to co-ordinate and structure such interactions and derive maximum value.
- 2. Accelerators & Incubators provide support in Commercialization and Mentorship, a representative Fintech body can further enhance the support network:** Our research and benchmarking highlight that across Fintech hubs, accelerators/incubators play an important role owing to their ability to provide mentorship and access to investors, corporates and funding. 74% of all respondents to the online survey are part of more than 1 accelerator program. 85% state that PoC development and commercialization as their top reason for enrolling in accelerator programs. Benchmarking with global fintech hubs highlight that a Fintech representative body (like Fintech Australia) could help in Fintech-Academia, Fintech-Industry and Fintech-Regulator interactions.
- 3. Early Stage/PoC Stage startups seek Mentoring Support:** Fintechs across stages have partnered with accelerator and incubator programs. A key finding of the research is that while revenue and post-revenue stage Fintechs look at accelerators for commercialization of their products, early stage Fintechs seek mentorship. 71% of early/PoC stage respondents stated that they seek mentorship guidance. 65% of these respondents seek mentorship for business modeling and fund management.
- 4. Infrastructure & Set up costs too high:** 73% of Fintech respondents to the online survey in their early stages mentioned the need of a co-working space which can help them share ideas, experience, expertise with investors and established players while taking care of their accommodation needs. Our benchmarking indicates that this model has worked successfully for leading fintech hubs like Singapore, London and SV. India has seen exponential growth in co-working spaces over the last 12 months (all top 5 global co-working spaces including We-work have set up in India). While both demand and supply are high, respondents across discussions and online survey (81%) indicate that current prices are too high.
- 5. Lack of understanding of regulatory requirements:** The Fintech revolution is being encouraged by the various Government initiatives such as Jan Dhan Yojana, Aadhaar and the emergence of UPI which provide a good foundation for fintechs to permeate last mile touch points and boost financial inclusion in India. However, there is a need for better understanding of regulatory standards. 12% of respondents along with the 34 FGD participants cite understanding and meeting regulatory standards as a challenge in their day to day business.

GLOBAL CASE STUDIES

While several case studies have been highlighted in the subsequent section, this section includes a couple of case studies which could be implemented in India as per our respondents.

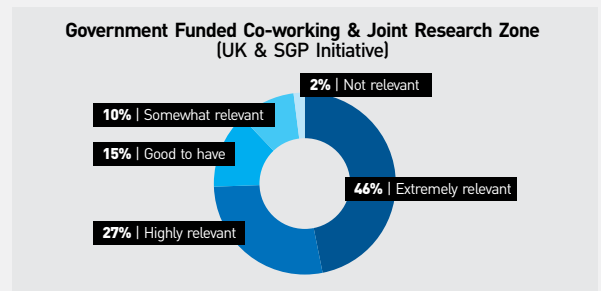
Case Study 1:



Israel, one of the world's top Fintech ecosystems, has set up an applied research fund, wherein academic institutions, Govt & industry partner to fund research on emerging/future technologies (for use-cases defined by them).

75% of Indian Fintech startups find this relevant for developing a vibrant fintech ecosystem in the country.

Case Study 2:



Singapore and UK, have also set up a Govt funded co-working space and joint research zone- which provides free space/infra like cloud credits etc., registration, patent and mentorship.

88% of the Indian fintech startups find a Government funded co-working and joint research zone to be extremely relevant for them



The most important thing an ecosystem can offer is pro-active regulations, encouraging environment and Governmental support. It should also provide opportunity for local partnerships, diverse skills and ability, learning and skill development to become part of multiple initiatives.

Devie Mohan
Co-founder & CEO, Burnmark



An independent industry association is the heart of a Fintech hub and can go a long way in delivering open innovation and collaboration between industry, Government and academia.

Danielle Szetho
Fintech Australia

Policy Framework

Financial services is a highly regulated industry in India and only recently, with initiatives like Indiastack, PMJDY & JAM, Govt. & regulator have taken proactive steps towards acknowledging innovation in the sector. RBI set up an inter-regulatory working group to study the regulatory issues faced by fintechs, headed by Shri Sudarshan Sen. In light of Startup India, several state Governments have also gone ahead and released respective Startup policies to provide additional incentives to entrepreneurs.

Benchmarking of global fintech hubs including Singapore and London showcases the impact of proactive and flexible policies and regulations, and visible Government support. Monetary Authority of Singapore and FCA, UK have led the way in creating enabling regulations for fintechs. The Government of Hong Kong took the first steps in establishing a Fintech Hub including significant investment on future skills and early stage Fintechs.

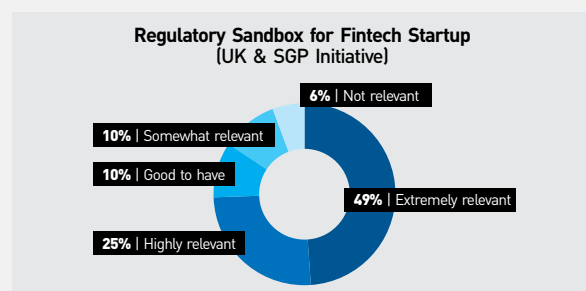
In India, our research highlighted that several state Governments have taken initiatives, with the Government of Maharashtra taking the lead and announcing a dedicated Fintech policy covering some areas like co-working space and funding. Indiastack open APIs – a collaboration between NPCI and iSpirt have been a step towards open technology frameworks, in addition to several banks opening up their key APIs. The regulator also released its first set of fintech focused guidelines on PPIs and P2P lending. Detailed below are some key findings from our deep-dive into current Indian policy frameworks with IFOR.

- 1. 50+ Schemes introduced by Govt in last 5 years to assist the growth of Startups & SMEs:** The Indian Govt. has introduced over 50+ schemes for startups in the past few years. Each startup scheme is missioned towards boosting the Indian startup ecosystem. Several departments and ministries have launched various schemes and initiatives to unlock the potential of startups like Startup India, Atal Innovation Mission, SIDBI Make in India SMILE fund, Aspire – Scheme for Promotion of Innovation, Entrepreneurship, And Agro-Industry, NewGen Innovation and Entrepreneurship Development Centre (NewGen IEDC), Infrastructure Development Scheme, MSME Market Development Assistance, Promoting Innovations in Individuals, Startups & MSMEs (PRISM) etc.
- 2. Accessibility and eligibility for Startup Grants and Schemes:** Eligibility criteria related information of all schemes is easily available on the respective Dept/Ministry website. However given the host of schemes (both central and state), startups in FGDs suggested that all schemes be included in the ambit of Startup India for ease of access and application. Majority of the respondents noted that the formation of the Sudarshan Sen committee on Fintech and guidance on some sectors (Pre-paid instruments and P2P lending) point to the fact that the regulator is looking at focusing on the sector. The focused group discussions highlighted that there is an opportunity to further create a dedicated window and open dialogue between the fintech sector representatives and the regulator as well as greater understanding of the varied impact of emerging technologies.
- 3. JAM TRINITY – Centre’s Push towards Financial Inclusion:** Pradhan Mantri Jan Dhan Yojana and the related Jan Dhan, Aadhaar and Mobile number (JAM) trinity has the potential to link all Indians into one common financial, economic, and digital space. The JAM trinity has created the building blocks for a digital financial infrastructure in the country. Jan-Dhan Yojana, the largest financial inclusion drive in the world, has opened 30+ crore bank accounts accumulating over USD 11.4 bn in 1 year deposits. 116 crore Indians can now be digitally authenticated through Aadhaar, thus addressing the first but most cumbersome step to financial access—KYC. India has 103 crore mobile users, out of which 25+ crore people own a smartphone (likely to grow to 40 crore by the end of 2018), making India the world’s second-biggest smartphone market.
- 4. Rapidly growing penetration of Smartphones and Internet Has Led To The Emergence of Multiple Technologies for Replacing Cash:** In India, rapidly growing penetration of smartphones and internet has led to the emergence of multiple solutions to replace cash, enabling online lending and purchasing of financial products through digital means. Going forward, the provision of payment bank licenses by RBI is likely to aid in monetizing this digital trend and making technology as the core offering. Many fintech companies are working in different ways to contribute towards achieving deeper financial inclusion in areas such as microfinance, digital payments, credit scoring and remittances.
- 5. 87% Of Respondents Suggested The Need Of A Regulatory Sandbox:** 23 global ecosystems including Abu Dhabi, Hong Kong, Australia & UK among others have established a regulatory sandbox, or an equivalent system of exceptions to provide an ecosystem wherein the regulator and innovators can jointly study emerging technologies, the necessary exceptions as well as the probable impact of the exception in a quarantine zone. This will also help the regulator to stay ahead on the innovation curve and test the disruptive innovations in a controlled environment, encouraging innovation along with proactive regulation. Majority of our survey respondents (87%) state that a regulatory sandbox or some form of exceptions would be highly relevant for India. This was re-iterated almost unanimously by 99 participants in the three focused group discussions and the IFOR advisory council.
- 6. Flexible Regulations and Policies in ‘Emerging’ Fintech Domains Suggested by Respondents:** As noted earlier, the Government and several regulators including RBI, NPCI have taken several steps to create an enabling ecosystem for startups. Recommendations of the focused group discussions point towards some next steps. These include the need for flexible regulations or exceptions in ‘emerging’ areas like blockchain, alternative lending, database management and scoring models, outsourcing of core operations of Banks within the restricted experimental phase with adequate information security measures in place. The respondents also suggested relaxation in regulations under Shops and Establishments Act to keep the branch/office open for 24*7/365 days a year.

GLOBAL CASE STUDIES

Since our research highlighted that 23 ecosystems around the world have established regulatory sandboxes, we studied the two prevalent models of regulatory sandbox as part of our benchmarking exercise (detailed further in the Benchmarking section)

- 1. Australian Securities & Investments Commission (ASIC)** recently launched a regulatory sandbox in October 2017, which allows eligible Fintech businesses to test certain services for upto 12 months without an Australian Financial Services License. The ASIC sandbox is a marked departure from other global sandboxes in the fact that an exception is announced as soon as a Fintech is formally inducted in the sandbox. A key fact to note which can act as a guideline is that ASIC worked closely with Sydney Government and Fintech Australia (the representative body of Fintechs in Australia) in creating the sandbox guidelines. Fintech Australia published several papers on the key segments of Fintech and the necessary exception, which was included by ASIC in the regulatory guidelines
- 2. The Financial Conduct Authority (FCA) promotes innovative technologies** & supports companies in developing new business models through their Innovation Hub, which assists businesses in getting rapid feedback on the regulatory implications of their PoC or business plan. FCA has also established a regulatory sandbox which allows startups to test new financial products & services without the usual regulatory impacts. 84% of the fintech startups have mentioned the need for creating a regulatory sandbox in India to test innovative solutions and gain timely feedback from the regulator on its applicability.



Sandboxes are really useful in order to test products in a secure, risk free environment and engage with regulators to ensure that the innovative solutions startups create are in concurrence with regulations before they are launched. It is also hugely useful for experimentation and innovation, especially for larger corporations and big banks, as they can do this outside of cumbersome traditional operating models, where integrations of solutions for testing can be slow. For fintechs, it can be helpful to get their products in front of experts, real customers and other innovators in order to test and learn quickly without excessive investment or expenditure on market research.

David Brear
Co-founder & CEO, 11:FS

A Government champion to promote Fintech; a robust regulatory policy that enables Fintech growth; Cross-border partnerships and Fintech bridges with other Governments; an open-minded and collaborative regulatory approach are key enablers of a fintech ecosystem.

Richard Teng
CEO, Financial Services Regulatory Authority, ADGM

05.

IFOR RECOMMENDATIONS: INDIA'S LEAP TO A FINTECH HUB

Basis extensive study of India's fintech ecosystem, global Fintech hubs and inputs from global experts IFOR believes it is the need of the hour to create a Fintech Hub in India which has a conducive regulatory environment, growth capital access, future skilled talent, and connect between industry players, mentors and Fintechs

The creation of a Fintech Hub can help India take the LEAP into a world class ecosystem

L - Lighter Regulatory Compliance

E - Enabling Environment

A - Augment Infrastructure

P - Partnership with global Hubs

The subsequent section highlights a set of recommendations for setting up a Global Fintech Hub



L - Lighter Regulatory Compliance

IFOR's extensive research shows that complex and lengthy process of regulation not only delays innovation, but also places hurdles in the go-to-market process of Fintechs. Given the dynamic nature of Fintech solutions, there is often an uncertainty over innovations meeting regulatory requirements

Fintechs are typically technology oriented organizations and have limited expertise and understanding of the regulations, or its finer interpretations. It has been observed that Fintechs find it difficult to approach and access regulators on a regular basis to seek clarifications, guidance and approvals. Given that typically Fintechs are bootstrapped and the half-life of innovation is short, access to regulator is a key factor to success.

1. Regulatory Sandbox

To help Fintechs focus on building their solutions and taking them to market, the Fintech hub should support easing out the regulatory regime and also keep the compliance costs low. Regulatory Sandbox is a globally proven test environment for Fintechs to test their products, services and business model, as well as the impact of their solution on end consumers. Globally, many countries & their regulators have set up Regulatory Sandboxes/ Labs which provide for some relaxation in the regulatory requirements, for a limited period of time, and also enable the fintechs to get ready access to the regulators.

Recommended Approach India: Regulatory Advisory Group

Given the importance and relevance of a regulatory sandbox, and the multiple stakeholders involved in the same, the Reserve Bank of India (RBI) has set up an inter regulatory Working Group (WG) under Sudarshan Sen, Executive Director (ED) (https://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=37493) to study the entire gamut of regulatory issues relating to Fin Tech and Digital Banking in India. The Committee has shared preliminary findings and recommended setting up a Regulatory Sandbox governed by IDRBT.

In the interim period while the RBI is exploring detailed regulatory models, to simplify regulations for Fintechs and provide them an enabling test environment, IFOR recommends setting up of a Regulatory Advisory Group. The Advisory Group will guide select Fintechs on regulation and compliance in India and share its findings with the concerned regulator.

The Regulatory Advisory Group (RAG) will invite applications from Fintechs around the world and select Fintechs relevant to the focus sectors such as MSME financing and financial inclusion. The selected fintechs would then be advised by the RAG on key regulatory and compliance issues. Upon finalization of the regulatory sandbox, the Regulatory Advisory Group would cease to exist.

Recommended Composition: The regulatory advisory group could comprise of

- 1 Chairperson: Former regulatory official to ensure comprehensive understanding of current regulatory landscape
- 2 Members: Domain experts of all key Fintech domains – payments, lending, asset management, regtech, insurtech, wealthtech to provide domain guidance to Fintechs
- 3 Industry veterans: The group could also be guided from time to time by industry veterans like bankers; fintech ecosystem experts; seasoned investors; technology experts; taxation, audit and compliance experts and legal advisors



2. Single Point Entity or Fintech Association

Across all top Fintech Hubs one of the first steps taken by Government and regulators has been the creation of a single point entity focused on Fintech – FSTI in Singapore, Fintech Australia, Innovate Finance UK. The body or entity acts like an interface for the sector with industry, academia, investors, policy makers and other ecosystem players. The Sudarshan Sen Working Group also recommends that setting up a body for Fintechs could be beneficial.

India should also explore the creation of an entity along the lines of NASSCOM or Indian Banking Association (IBA). With a number of innovative startups setting up business across the country, the fintech focused entity will help consolidate the efforts and create a formal sector for budding entrepreneurs. This will streamline processes, facilitate cross-pollination of knowledge and information and also give a strong voice to the sector.

The Association should be structured like a formal entity, spearheaded by a Chief Fintech Officer (CFO), an expert with extensive experience in the banking and financial services ecosystem, as well as an understanding of the evolving Fintech ecosystem.

The CFO should have a team of domain experts of each Fintech sub-domain and a team of program management professionals to execute the day-to-day operations.

Fintech Association: Proposed Strategic functions

- 1 Act as a single point of contact and representative body for Fintechs in India and globally
- 2 Maintain and develop a 'use-case' repository of key use cases for Fintechs to focus on, in partnership with industry, academia and policy makers
- 3 Policy advocacy for promoting technology and scaling

- up innovation in India
- 4 Promote India's Fintech Hub globally across the Fintech ecosystem through evangelism as well as various promotional events
 - 5 Set up Fintech bridges with Global Fintech hubs and facilitate information exchange for promotion of Fintech entrepreneurship
 - 6 Liaise with academic institutions in India to update curriculum and introduce relevant courses for developing future skilled talent in key technology areas

3. Creation of an Open Data or API Framework

Globally, open data frameworks including Government data and industry sandboxes have facilitated innovation. The Government of India has already taken the lead in this through the creation of India Stack. Further, the Government of India in partnership with the Government of US has undertaken a massive data digitization and availability project –www.data.gov.in

To further the digitization of Government processes, IFOR recommends creation of relevant APIs (both informational and transactional) for delivering Government to Citizen (G2C), Government to Business (G2B), Government to Government (G2G) and Government to Employee (G2E) services in a timely and cost effective manner.

These APIs can be made available to developers post an application process and evaluation of the potential use case on a case-to-case basis. The open Government data access thorough APIs will create greater transparency of Government operations, increase accessibility and discoverability, facilitate in depth research as well as creation of applications on the foundation data/API layers and have several positive impacts.

The perceived impacts include cost savings, efficiency, ease of business, improved civic services, informed policy, performance planning, research and scientific discoveries, transparency and accountability, and increased public participation in governance.

Recommended Open Data/API Sets

1. Agriculture Data Stack or AGRI Stack
2. Climate and disaster management data stack
3. Government departments and local Government bodies unified stack
4. Education data stack
5. Healthcare data stack
6. Public safety and traffic data stack
7. Land registry and state land records
8. Ownership/Buy/sell/insurance/permits/taxes/fitness/loan/mortgage/enforcement records to provide transparency to transactions.
9. Delivery of Government and private schemes and services to eligible citizens

10. Automated query management
11. Government transit and commute systems
12. Small business registry

1. AGRISTACK : As detailed in the earlier section a key mission of the open data framework and APIs is to increase transparency and significantly reduce information asymmetry. The key sector of agriculture will benefit significantly from the creation of an API framework on the lines of IndiaStack – AgriStack.

In its efforts of digitizing, agriculture and providing farm workers greater access to technology and agri-tech startups access to key data sources, IFOR recommends the creation of a secure open platform on the lines of India Stack and develop APIs - AgriStack

Given the sensitivity of data involved, IFOR recommends a 2 stage process of digitization of data and setting up APIs.

- a. Phase 1 would involve the development of priority APIs on key agriculture/farm information including (priority list - not exhaustive)
 - i. Real time weather updates: Creation of APIs of data already made available by the Indian Meteorological Department. This would also have the provision of regional drill down. This would enable the creation of forecast and pre-warning notification
 - ii. Soil Quality/Data Cards: Digitization of soil cards: Taking forward the GoI's Soil Health Card initiative, this would help digitize the soil health card and creation of APIs which can share status of soil health and effects of land management, irrigation etc. This will be a significant step forward for agri-tech and farm mechanization initiatives
 - iii. Agronomics: Insights using the weather, soil quality and moisture content data and advanced metrics like Growing Degree-Days (GDD), Potential Evapotranspiration (PET). Additionally, this can also be used to provide comparative benchmarking with previous years' known data. This helps in estimating the potential agricultural production for the year. Addition of Geo-location wise data will also help in transforming it into a dynamic system
 - iv. eNAM: With increasing progress on the eNAM platform, the GoM is considering creation of eNAM APIs. This would make the marketplace more robust with live feed of prices and availability of stock. The APIs can be used to create apps which could work without internet connection as well, which would further boost the progress of eNAM
 - v. Policy Updates: All policy related documents are already available in digital form, creation of data APIs would enable integration of the policy enablement in agri-tech and fintech apps
- b. Phase 2 will involve linking of farmer/farm specific data to the APIs to create a personalized/region specific experience for farmers/farm/agri-tech solutions.

- i. The data around farmers can be derived from JAM trinity - Bank account number under PMJDY scheme, Aadhaar number and/or mobile number and the same can be used to verify the farmer
- ii. The data on farms and crops can be accessed via local governing bodies like panchayats. The actual GPS coordinates of the farm will be further validated with satellite or drone imagery
- iii. Farmers and farm data can verify who the farmer is, where is he located, what are his input requirements and future potential of his farm holding. The data on crops can be captured from the records available with local Government bodies, nearest market yards and satellite imagery and drones

1.1 Benefits of AgriStack:

- 1.1.1 Greater data access of key metrics like weather, soil data
- 1.1.2 Amplify the benefits and help eNAM realize its potential
- 1.1.3 The open data can provide instant and targeted access to millions of farmers. Startups selling to or buying from farmers can also benefit immensely with direct access to farmers
- 1.1.4 AgriStack can be used by Banks and Financial institutions to verify the credit worthiness of farmers and tailor make the products suitable to each one of them
- 1.1.5 Help insurance companies to understand farmer and farm risk profile needed in deciding the premium. Government can use Agristack for designing and implementing schemes for farmer welfare as well

2. MSME Stack

On the lines of IndiaStack, to further support the MSME sector, and maximize the impact of Fintech on MSME financing, IFOR recommends the development a collection of APIs for assisting the short-term and long-term financing challenges faced by MSMEs. These would include APIs and data sets for creating access to data as well as unified services like:

- a. Unified database of all MSMEs – an efficient small business registry
- b. Extended Digilocker platform: Expansion of the digilocker initiative from individuals to small business to help in unified cloud storage of data
- c. Easy Invoice financing with GST integration: Single unified invoice financing platform with GST integration for smoother payments and tax collection. The platform can also be used by FIs for better assessment of credit history of small businesses using AI ML solutions.
- d. One Touch Access to Policy Changes/Regulations: Data APIs of all Government schemes and policies and schemes for small businesses would enable MSMEs access all policy data in a simplified format. This would also help Fintechs create targeted applications
- e. A combination of Data API using metadata tags, all information can be de-cluttered into digestible info relevant to the SME concerned
- f. Supply chain financing

In addition to the open APIs for developing fintech solutions, IFOR also recommends the creation of a single invoicing platform for all vendors and suppliers building on the TReDS platform.

| Gov API Stack Portal | | | | | |
|----------------------|------------|-----------|--------------|---------------|---------------------------|
| Agri stack | MSME Stack | Edu Stack | Health Stack | Land Registry | Direct Benefits/ e-GoV |

E Enabling Environment

The Fintech ecosystem comprises of Fintechs, banks and other financial institutions, regulators, investors, industries, academia, mentors and influencers among others. Globally, fintech hubs which have created a conducive ecosystem have been more successful at building their fintech sector

1. Creation of a Fintech Registry

Similar to other priority sectors to ensure that the benefits of a Hub are available to all players in the ecosystem IFOR recommends the creation of an Indian Fintech Registry.

The proposed Fintech registry would enable investors, industry partners, regulators and policy makers to study the Fintech landscape and identify opportunities for investment. The registry should also include platform technology solutions like Big Data Analytics and AI, in addition to Fintechs.

The Fintech registry could be made accessible to licensed/registered corporates, banks, financial institutions, NBFCs and academia basis a subscription fee model and can act as a Fintech discovery platform for locating innovative solutions for specific use cases as well

Registration of Fintechs could be renewable annually basis a defined criteria (vintage, startup operations, focus areas, funds raised)

2. Access to Growth Capital

To ensure seamless and uninterrupted growth of Fintechs, adequate funding support is the key. While several initiatives like Startup India and state wise startup and Fintech policies have enabled funding to Fintechs across stages, there is a need for early and PoC stage funding.

In this regard, basis inputs of the IFOR Advisory Council, IFOR recommends the following

I. Modifications to current AIF Framework

The Government of India's Startup India program launched early last year,

- a. 5,350 startups officially recognised under it, of which
- b. 74 have availed tax benefits so far.
- c. Also, the total commitment from the Rs 10,000 crore fund-of-funds, set up in line with the Startup India Action Plan last year, stands at Rs 605 crore to 17 AIFs, and 75 startups have received funding from the AIFs
- d. Sector: E-commerce leads, grabbing in the majority 18.57% funding from SIDBI led Fund of Funds for startups. Enterprise application and fintech startups closely followed with 15.71% and 12.86% funding respectively.

- e. The startups under the Fund of Funds portfolio are selected by AIFs, and thus shows an inclination towards an investor's mindset of investing in low-risk startups which have already attained their product market fit.
- f. Most startups selected are founded in 2014-15 or earlier – focus largely on pre-revenue but post PoC stage startups (50 of the 70 selected startups are 4+ yrs vintage)

IFOR Recommendations

- a. Two key suggestions of IFOR are (I): Dedicate a significant portion of the fund-of-funds created under the Startup India scheme to VCFs. A mere 20% allocation, Rs. 2,000 crore, will increase the capital base of start-up-focused AIFs by more than 100%. (II), the Government can do what was originally announced in SEBI's AIF regulations: Provide special incentives for VCFs which make them more attractive for investors and fund managers. More VCFs will encourage competition and boost activity in the start-up ecosystem.
- b. Shift to a unit-based taxation system for AIFs this vehicle remains on the to-do list. This can make the AIF vehicle substantially more attractive to investors. Under current tax laws, the costs incurred by investors in generating capital appreciation via AIFs are not deducted when computing 'income' for tax purposes

II. Boost PoC funding through setting up a dedicated PoC fund:

IFOR Recommends the creation of a dedicated corpus within Startup India to fund PoCs to (a) promote the undertaking of more experimentation within the financial services sector, and (b) accelerate the development and dissemination of nascent innovative technologies in the financial services. Through the scheme, PoC funding can be explore to 50-70% of qualifying costs (dependent on project type), with a defined cap for the early stage development of novel solutions to financial industry problems.

Funding support can also be on a reimbursement basis, towards manpower, professional services availed, tools / software purchased for developing the project

Qualifying Projects

PoC funding supported projects may be of the following two types, with varying level of support:

| Project type | Project Details | Support |
|-----------------------------|--|--|
| Investigative Project | Projects focusing on developing a novel solution to an industry-wide problem statement using emerging technology and focusing on key focus areas like Financial Inclusion, MSME Financing etc. | Up to 60% of qualifying costs for each project will be supported, up to a maximum of INR 1 cr. |
| Technical Equivalence Trial | Trials which aim to definitively answer regulatory uncertainty about risks and benefits from replacing legacy processes with innovative ones. These trials should be rigorously designed and conducted without bias. | Up to 70% of qualifying costs for each project will be supported, up to a maximum of INR 1 cr. |

2.1 Qualifying Costs

Funding support under the PoC fund could be on a reimbursement basis, for the following expense items:

- Personnel costs i.e., salaries of employees, annual wage supplements, bonuses, allowances (fixed and variable), and overtime. The salaries of founders and direct owners of the applicants are specifically excluded.
- Professional services costs, including consultancy, sub-contracting or prototyping costs by third-party locally-based companies/vendors
- Equipment / software costs, including purchase price and costs related to commissioning and operation (e.g., delivery, installation, handling). Only project-related technical software costs are supported.
- IP Rights – licensing and technology acquisition costs from non-related parties
- Other Operating Expenditures (subject to specific approval), including project-related training by external parties, patent-related costs, and rental of specialized equipment or facilities

III. Setting up Applied Research Grants

To bridge the gap between academic knowledge and industry needs, there is a need to create dedicated applied research grants, for development and commercialization of solutions in the financial services industry, in conjunction with the top educational institutes in the country.

Basis IFOR research and stakeholder discussions it was observed that a key challenge is that many novel and innovative university-based technologies do not reach the end-user due to the gap between research and commercialization. The Applied Research Grant Scheme could effectively bridge this gap.

All the research activities carried out as part of this incentive program in academic institutions should be accompanied by the support of an organization that sees business potential in the achievements of the project. The main goal is to reach significant milestones by the end of the project, which will enable the industrial company to sign a technology commercialization agreement with the research institution.

The focus of this fund will be on developing solutions for promoting financial inclusion and MSME financing for the initial phase, which are two key impact areas of Fintech and focus sectors for the country

3. Development of Future Skilled Human Capital

As clearly outlined in our research, development and availability of future skilled talent is a key tenet of a successful Fintech ecosystem. IFOR recommends the adoption of a multi-disciplinary approach to promote and foster future skills in academic institutes in the country

- Many universities globally, and in India have developed CoE and advanced curriculum in highly specialized areas like Blockchain, AI, Cybertech Big data analytics, etc. IFOR recommends the creation of centers of excellence in emerging technologies in top institutes in the country basis the specializations offered by technology institutions and the requirements of the Industry, both demographic and geographic. The centers should look to focus their research on highly specialized areas like Blockchain, AI, Cybertech, Reg-tech, Big Data analytics, etc in PPP mode.
- Immersion/ Exchange programs: To ensure global learning, we should encourage institutions and universities to create knowledge transfer programs at all levels (UG, PG, PhD, and Executive courses), providing student's access to more geographical markets and specializations. Exchange programs could be of flexible multiple durations, 4 weeks to 6 months which students can opt for during the course of their education
- Accreditation of MOOCs for inclusion in current curriculum: To amplify reach and depth of knowledge of emerging technologies, IFOR recommends the accreditation of specific programs and courses on fintech / technology, as per defined guidelines, offered by universities and private educational institutions for their inclusion in the current curriculum, esp. for science and technology courses. This step will

allow students to browse through MOOCs recognized by their universities, try out programs/courses from top global universities to check suitability, before enrolling for them. This could be an essential step towards unbundling education and promoting greater participation from students through 'social learning'.

Free credits could be made available to students at schools and universities in the state, to access learning material on the technology courses and encourage process of self-learning and development as well

- d. Development of a central fintech curriculum at university level, along with industry and academia, with benchmarking of existing courses at top global universities.
- e. Industry Academia Partnerships: IFOR recommends the formalization of all engagement between industry and academia, with a definite proportion for interactions with entrepreneurs in relevant domains, from guest lectures and internship programs to final placements of students. Both universities/institutions and industry/startups can put together a framework on the interactions in the existing curriculum.

A Augmenting Infrastructure: Innovation Labs Connecting innovation to demand Areas

The true value of innovation can only be unlocked by delivering the benefit to its intended consumers. Towards this, IFOR recommends setting up dedicated areas or 'Innovation Labs' to provide Fintechs the opportunity to address use cases of importance to the state. The Innovation Lab will also attract Fintechs to 'high-demand' Tier II/Tier III cities thereby achieving the dual purpose of fostering innovation and providing actual access to the intended consumer – 'Innovation Labs' or Hotspots

Innovation Labs will achieve the following:

1. Develop a technology and research facilities in the core-market areas of the state
2. Facilitate development of solutions for the top problem areas of the country
3. Partner with the prospective clients in the region and provide an anchor client/ consumer to the solutions developed
4. Showcase these solutions through global partnerships to give the opportunity to these fintechs to expand internationally

IFOR recommends the following as key Focus areas. A number of use cases basis global benchmarking, research and Advisory Council inputs have been included in the Annexures.

1. MSME Innovation Lab – Nagpur/Nashik
2. Financial Inclusion Lab – Guwahati
3. Smart City Innovation Lab – Ahmedabad
4. Farmtech/Agri Innovations Lab – Kanpur/Hissar

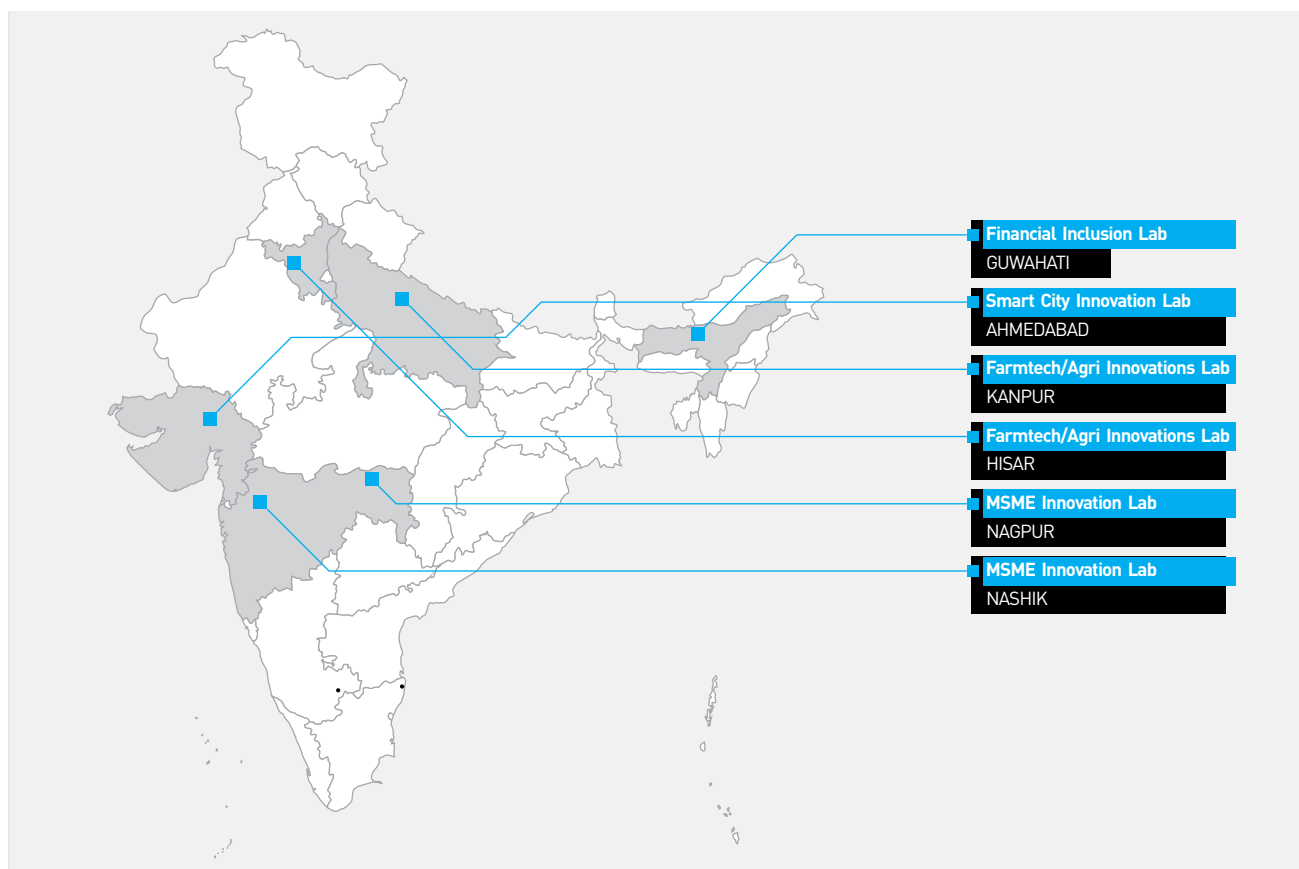


Fig 4: Setting up innovation labs across India

P Partnership with Global Fintech Hubs

Fintech Hubs are establishing bilateral co-operation agreements, so called 'Fintech bridges', with other jurisdictions. These bridges enable regulators to efficiently share information about financial services innovation in their respective markets, including about emerging trends and regulatory issues, aiming to foster innovation in the area of Fintech.

Most of these agreements enable native Fintechs to scale internationally through access to the other market, whilst allowing start-ups from the other market easier access into the country. Moreover, by creating a channel between the two parties, these agreements can help attract investors as well as talent to the respective countries.

Fintech Bridges will help to

1. Develop and promote Fintech entrepreneurship and the financial services industry through knowledge transfer
2. University partnerships to create joint curriculum and CoEs to promote future skill development
3. Participate in joint innovation projects on the development and/or application of technologies in financial services
4. Provide assistance to Fintech entrepreneurs and innovator firms on understanding and navigating any commercial or regulatory requirements in relation to their business activities in respective geography
5. Annual Immersion/Exchange programs for Fintech entrepreneurs, enabling them to understand the ecosystem across top Fintech hubs
6. Participate in respective Fintech events or weeks



06.

FUTURE FOCUS

While our discussions with all stakeholders threw up several challenges facing the sector, the overall outlook of the ecosystem is largely positive and there is confidence that backed by an enabling ecosystem or a 'recognized' Fintech Hub, Indian Fintech sector is poised for take-off.

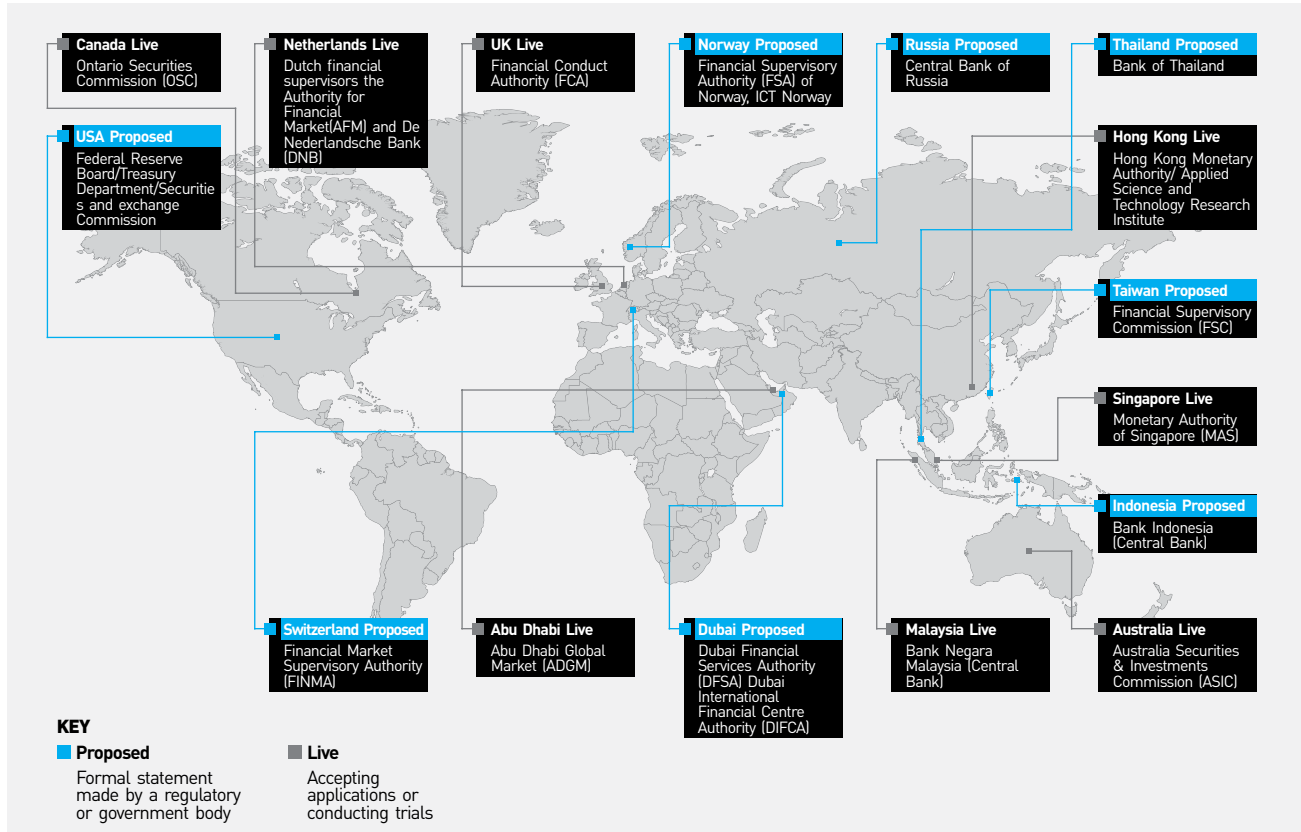
This confidence is highlighted by the fact that 77% of the respondents expect more than 100% revenue growth in the next 12 months, while 25% expect 200% + growth. Several B2B startups stated that they expect significant growth in their enterprise clientele in the coming financial year. The outlook on funding is also largely positive though early stage Fintechs state Government or industry led interventions will help them create funded PoCs which is a major area of concern for them.

The positive outlook though needs to be backed by enabling regulations and the creation of a Fintech Hub in India. Mumbai the Financial hub of the country and Bangalore the startup hub present themselves as natural choices with Mumbai having the edge housing all major consumers of financial technologies, a strong academic sector and the hub for all the financial services regulators.

Annexure I

Since March 2016, a number of regulators have signed co-operation agreements to “enable the regulators to share information about financial services innovations in their respective markets, including emerging trends and regulatory issues” and help Fintechs in their region to scale internationally. The map below shows all the formal co-operation agreements between regulators.

As this is a dynamic space, the map is accurate to 28th March 2017.



Annexure II:

Sandbox Models: Australia, Hong Kong and Singapore

| Australia | |
|---------------------------------|---|
| Jurisdiction/ Agency | Australia Investment and Securities Commission (ASIC) |
| Timing | <p>The consultation on the exposure draft legislation (and accompanying explanatory memorandum) closed on November 3, 2017.</p> <p>The consultation on the exposure draft regulation is open until December 1, 2017.</p> <p>Sandbox is currently in effect.</p> |
| Eligibility Criteria | <p>Businesses would be able to rely on the Australian Financial Services (AFS) licensing exemption by notifying the Australian Securities and Investments Commission (ASIC) that it intends to rely on the exemption from a specified date; cannot carry an existing license or be related to a licensee; cannot be banned from providing financial services.</p> <p>Client Limits: Limited to up to 100 retail clients; no limit for wholesale clients.</p> <p>Exposure Limits: The exposure of each retail client to deposit products, simple managed investment schemes, securities, Government bonds and payment products does not exceed \$10,000; The amount of credit under a credit contract does not exceed \$25,000; The sum insured under a general insurance contract does not exceed \$50,000; While there are no individual exposure or client limits, the total maximum exposure of all clients taking part in the testing must not exceed \$5 million</p> |
| Permitted Timeframe for Testing | Currently up to 12 months. Draft regulations state that the timeframe will be increased to up to 24 months. |

| Hong Kong | |
|---------------------------------|--|
| Jurisdiction/ Agency | Australia Investment and Securities Commission (ASIC) |
| Timing | <p>Fintech Supervisory Sandbox (FSS) launched on September 6, 2016 for Authorized Institutions (AIs) previously overseen by the HKMA.</p> <p>Sandbox is currently in effect.</p> <p>An enhanced Fintech Supervisory Sandbox (FSS 2.0) will be launched by the end of 2017.</p> |
| Eligibility Criteria | <p>AIs can begin trials immediately subject to discussion with the HKMA and compliance with the required principles. The HKMA offers a high level of engagement with each participant, including relaxing supervisory requirements on a case by case basis (builds in some supervisory flexibility).</p> <p>New features being considered: FSS 2.0 will include a Fintech Supervisory Chatroom to provide speedy feedback to banks and tech firms at early stages of their Fintech projects; tech firms may have direct access to the sandbox by seeking feedback from the Chatroom without necessarily going through a bank;</p> <p>As of October 31, 2017, 25 new technology products have been tested in the FSS. Four of these pilot trials have used distributed ledger technologies (DLT).</p> <p>Client Limits: Limited to up to 100 retail clients; no limit for wholesale clients.</p> <p>Exposure Limits: The exposure of each retail client to deposit products, simple managed investment schemes, securities, Government bonds and payment products does not exceed \$10,000; The amount of credit under a credit contract does not exceed \$25,000; The sum insured under a general insurance contract does not exceed \$50,000; While there are no individual exposure or client limits, the total maximum exposure of all clients taking part in the testing must not exceed \$5 million</p> |
| Permitted Timeframe for Testing | Currently up to 12 months. Draft regulations state that the timeframe will be increased to up to 24 months. |

| Singapore | |
|---------------------------------------|--|
| Jurisdiction/ Agency | Monetary Authority of Singapore (MAS) |
| Timing | Consultation paper issued on June 6, 2016. |
| | Sandbox announced November 16, 2016. |
| | Currently, one company is participating in the sandbox, which began on August 10, 2017 and will conclude on May 10, 2018. |
| Eligibility Criteria | The product is technologically innovative or applied in an innovative way; The product addresses a significant issue or brings benefits to consumers or the industry; The applicant intends, and has the ability, to deploy the product in Singapore on a broader scale after exit; the test scenarios and outcomes are clearly defined and the applicant will report to the Central Bank on progress as agreed; The boundary conditions are clearly defined and will sufficiently protect the interests of consumers and maintain the safety and soundness of the industry; Major foreseeable risks arising from the product are assessed and mitigated; and the exit and transition strategy is clearly defined. |
| Permitted Timeframe for Testing | Not specified. |

Use Case Library

a. MSME Innovation Lab:

- i. Agri Stack API creation
- ii. Small business registry
- iii. Central Invoice management and discounting
- iv. Know your customer/ Identification technologies reducing the cost of KYC
- v. P2P lending connecting investors and MSMEs
- vi. P2P Invoice financing
- vii. Cloud based accounting and book-keeping
- viii. Real Time Risk Analytics
- ix. Alternative Credit Scoring
- x. Alternative and digitized loan recovery
- xi. Customized accounting and work-flow solutions
- xii. Supply Chain Financing
- xiii. Digitizing supply chain documentation
- xiv. Merchant Finance
- xv. Trade Finance
- xvi. Equity Crowdfunding
- xvii. Short-term loan offerings
- xviii. Micro-lending marketplace
- xix. Distributed ledger based Automated Regulatory Reporting
- xx. Dedicated query management system for small businesses

b. Smart City Innovation Lab focus areas:

- i. Document digitization and API creation
 - ii. Integrated IoT payment and credit solutions
 - iii. Cashless ecosystems in schools, universities and other 'closed' campuses
 - iv. Tokenization through DLT
 - v. Automated training tools
 - vi. Smart parking +Smart and efficient utilities
 - vii. Smart mobility solutions
 - viii. Smart manufacturing
 - ix. Smart infrastructure and urban planning
 - x. Smart home and buildings
 - xi. Smart energy grid
 - xii. Water Supply & air quality management
 - xiii. Sanitation & Smart waste management
 - xiv. Public space smart design
 - xv. Smart healthcare solutions
 - xvi. Smart Toilets
 - xvii. Micro manufacturing
 - xviii. Smart energy storage
 - xix. Connected vehicles
 - xx. Low cost battery technology
-

c. Financial Inclusion Lab focus areas:

- i. Gamified Finance Literacy & Personal Financial Management
- ii. Leveraging data from alternate sources for credit appraisals
- iii. Scalable biometric identification and authentication
- iv. Migrant worker authentication and domestic remittance
- v. Migrant international remittance
- vi. Remote loan origination and disbursement
- vii. Micro-lending and insta-credit solutions
- viii. Cloud accounting solutions
- ix. USSD/digital payment & remittance solutions
- x. Low cost solutions for P2P transactions
- xi. Payment solutions with deferred payment plans
- xii. Financial education solutions
- xiii. Urban Mobility
- xiv. Sound based payment solutions
- xv. Cash availability at non ATM locations
- xvi. ICDS payment solutions without internet usage
- xvii. USSD/non internet DBT
- xviii. Accounting, workflow management solution for SHGs
- xix. End to end BC management workflow solution
- xx. Merchant marketplace and merchant management solution

d. Agri-tech Lab/Farm to fork innovation use cases/ focus areas:

- i. Crop, yield and weather monitoring
 - ii. Agri-equipment renting/ on-demand farm mechanisation
 - iii. Digitised agri-supply chain solutions
 - iv. Omni channel fresh produce distribution
 - v. Pay-per-use farm services
 - vi. Precision agriculture solutions
 - vii. Farm management software and mobile app for data driven farming
 - viii. Soil productivity assessment
 - ix. Marketplaces to enable better price discounting
 - x. Risk management and last mile delivery of insurance solutions
 - xi. Image processing solutions to detect plant health & product quality through drone/satellite images
 - xii. Weather monitoring
 - xiii. Hydroponics
-

Annexure III

INDIA BANKING & IT : CHANGING TREND OF EMPLOYMENT

a. IT SECTOR IN INDIA:

India has been a pioneer in the IT/ITES sector and is home to some of the finest IT companies in the world driven by the availability by an abundant pool of technical human capital. The IT/ITES sector in India expanded at a CAGR of 11.14 per cent to US\$ 155 billion in FY17 from US\$ 74 billion in FY10, which is 3–4 times higher than the global IT-BPM growth. The Indian software industry already commands tremendous brand equity in the global market. It is estimated that the size of the industry will grow to US\$ 350 billion by 2025.

India is world's #1 sourcing destination for ITES services with 55% market share (2016). As per NASSCOM report, the number of people employed in the IT/ and ITES sector has increased from 2,572,000 in 2010 to 3.9 million in 2017. NASSCOM estimates that ITES industry will be a net hirer and 2.5 – 3 million additional jobs will be created by 2025.

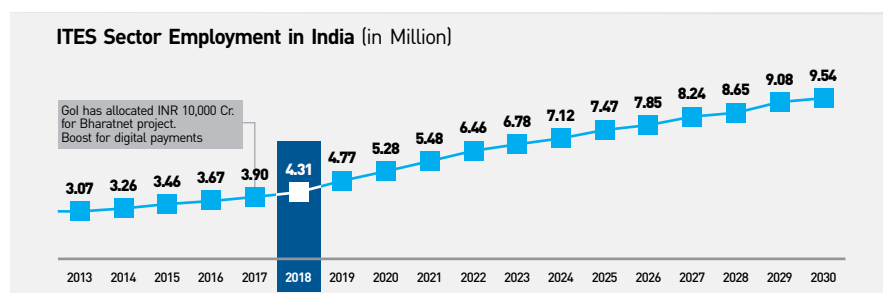


Fig 5: ITES Sector employment in India (mn)

b. IMPACT OF FINTECH ON FINANCIAL SERVICES INDUSTRY

i. THE BANKING SECTOR IS WITNESSING RISING ADOPTION OF AUTOMATION TO INCREASE EFFICIENCY:

In recent years, BFSI sector has been changing with technology adoption. It is witnessing an increasing advent of robotic process automation to increase efficiency and productivity in the day-to-day processes. Moreover Government-backed "Digital India" has further aided the prospects of payment Fintechs in India. Mobile payments and digital wallets have witnessed an exponential growth in the past year. During FY16, total mobile payment transaction volume in India reached 2.9 billion and as per estimated from industry body ASSOCHAM it is expected to reach around INR 460 billion by 2022.

Supply chain optimization through exponential technologies such as chatbots and blockchain is transforming the BFSI sector in the Country. Banks are experimenting with the use of Artificial Intelligence powered Robots, equipped with advanced robotics. Similarly, blockchain technology based cryptocurrencies are fast gaining pace in India. The Reserve Bank of India (RBI) itself has in a statement conveyed its expectation that blockchain can bring cost savings, efficiency, and most importantly transparency to the Indian banking industry.

Technology is replacing rule-based and knowledge-based activities, therefore, the impact on jobs in terms of skill-sets is expected to be significant in this sector. 20-25 per cent of existing jobs in banking, financial services and insurance (BFSI) sector will face existential threat, while 15-20 per cent of workforce in the sector would be deployed in new jobs that do not exist today.



Fig 6: Shifting gears in BFSI sector

IFOR Partners



CONTACT US

Ashmita Nagpal

Manager, Corporate Strategy & Marketing
YES BANK
ashmita.nagpal@yesbank.in

Priyanka Jakhar

Manager, Corporate Strategy & Marketing
YES BANK
Priyanka.jakhar1@yesbank.in

GLOSSARY

| | |
|---------|---|
| AI | Artificial Intelligence |
| AIF | Alternative Investment Funds |
| API | Application Programming Interface |
| ASEAN | Association of South East Asian Nations |
| ASIC | Australian Securities & Investments Commission |
| AUD | Australian Dollar |
| B2B | Business-to-business |
| CAGR | Compounded Annual Growth Rate |
| CFO | Chief Financial Officer |
| CoE | Center of Excellence |
| eNAM | National Agriculture Market |
| ER | Entrepreneur's relief |
| EU | European Union |
| FCA | Financial Conduct Authority |
| FGD | Focused group discussion |
| FI | Financial Institution |
| Fintech | Financial Technology startups |
| FS | Financial Services |
| GDP | Gross Domestic Product |
| GST | Goods & Services Tax |
| GTCI | Global Talent Competitiveness Index |
| HKMA | Hong Kong Monetary Authority |
| HNI | High Net Worth Individual |
| IBA | Indian Banking Association |
| IFOR | India Fintech Opportunities Review |
| INR | Indian Rupee |
| IoT | Internet of Things |
| JAM | Jan Dhan, Aadhaar & Mobile Number |
| KYC | Know your Customer |
| MAS | Monetary Authority of Singapore |
| MOOC | Massive Open Online Courses |
| MSME | Micro, Small & Medium Enterprises |
| NASSCOM | The National Association of Software and Services Companies |
| NBFC | National Banking Financial Company |
| NPCI | National Payments Corporation of India |
| P2P | Peer to Peer |
| PMJDY | Pradhan Mantri Jan Dhan Yojana |
| PoC | Proof of Concept |
| UK | United Kingdom |
| UPI | Unified Payment Interface |
| USD | United States Dollar |
| RBI | Reserve Bank of India |
| R&D | Research & Development |
| SEIS | Seed Enterprise Investment Scheme |
| SGD | Singapore Dollar |
| SGP | Singapore |
| STEM | Science, Technology, Engineering & Management |
| VC | Venture Capital |
| VCF | Venture Capital Fund |

