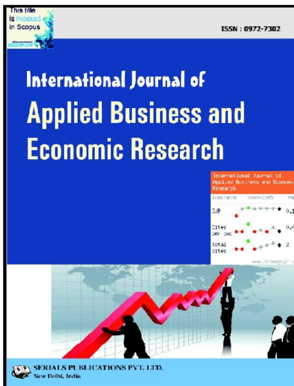

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A Study of the Regulatory Environment of Financial Technology Companies in Selected Countries

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Abstract: Though in existence for a long time, the Indian financial services industry has really matured post-liberalisation. It converts mass savings into productive investments, through banking / insurance companies, non-banking finance companies, mutual funds, payment banks, etc. Financial services involve common man's financial transactions, and are regulated by various laws / regulators - RBI, SEBI, IRDA etc.

Government of India is taking major initiatives to transform financial services through extensive use of technology. Technology start-ups are transforming financial services. Such 'FinTech' start-ups have major growth potential, because of large number of unserved customers, tremendously-talented Indian youth, ever-increasing mobile penetration, etc.

FinTech companies, whose main drivers are technology and public policy, will revolutionise transfer of funds from the common man - to intermediaries - to entrepreneurs; hence the need to regulate 'FinTech' - to protect the 'common man'.

At present there is not much regulation of FinTech solutions in India, except some laws. This article makes an exploratory study of the regulatory environment of financial technology companies in a few selected countries, with a view to suggesting an appropriate framework for India.

The authors suggest "Regulatory Sandbox" approach, to initiate and progressively adopt robust FinTech regulation.

Key words: FinTech, Regulatory Environment, Regulatory Sandbox, Start-ups, RegTech

INTRODUCTION

According to the IOSCO (International Organisation of Securities Commissions) Board report on the evolution of Fintech, investors poured US$19 billion into Fintech in 2016.

Today, technology is disrupting bank transfers, payments, loans, and almost each financial transaction. New technologies and their applications such as Block chain, Robotics, Cloud-Based banking, Internet of Things (loT), Self- Service Investment Platforms and Artificial Intelligence are transforming the financial services world.

While Debit and Credit Cards have been in existence in India for a long time, in financial year 16-17, digital transactions have increased tremendously. NEFT transactions have grown by 44%, IMPS (Immediate Payment Service) by 154% and credit and debit cards by 69%, compared to the previous year.

With more than 600 start-ups in this space, India is fast emerging as a FinTech solutions hub. The total Fintech software and services market in India is estimated at around $8 billion and is likely to grow 1.7 times by 2020. In 2016, India is globally ranked amongst the top ten FinTech markets. The main drivers of this growth are FinTech start-ups collaborating with local and regional governments who are encouraging them through specialized support programs. Funding support can come from major banks, large corporations and venture capitalists.

India provides a unique opportunity for the FinTech firms due to the large no of customers, ever-increasing mobile/broadband/fibre penetration, a conducive start up ecosystem and a large number of technologically talented youth.

However, Fintech as a digital enabler of financial services in India faces some major challenges. There is grossly inadequate infrastructure for financial transactions, especially in the rural areas. The Indian consumer mind set is highly sceptical about the security aspects of FinTech, especially with the recent ransom ware and other cyber-attacks. Low financial and computer literacy is another major challenge.

Innovative products and solutions customized for use by Indians need to be developed considering all the above challenges. There is a special need for FinTech solutions for addressing ‘financial inclusion’ requirements, such as for credit schemes focused on social upliftment, micro finance, crowd funding, and women entrepreneurs.

Indian FinTech companies, encouraged by favourable government policies and a pragmatic banking regulator, are now ready to bring about a paradigm shift in the country’s financial sector. FinTech can act not only as a disruptor, but also as a multiplier for growth of other industries/sectors.

In order to make the most of this opportunity, India has to come up with a forward looking regulatory framework that will provide a platform for exchanging ideas on FinTech, and for sustaining the momentum of innovation. For protecting consumer interests and management of risk, India needs to study and benchmark with the best regulatory initiatives from across the world.

OBJECTIVES

1. To understand the regulatory environment for FinTech companies in selected countries
2. To suggest a roadmap for an Indian regulatory framework for FinTech companies

RESEARCH DESIGN / METHODOLOGY

This paper makes an exploratory study of the regulatory framework followed by banking, insurance and security market authorities in Europe, and countries in middle east (Israel) and south east Asia (Singapore).

The selection covers countries in different continents which are more advanced in FinTech adoption and pragmatic in its regulation.

LITERATURE REVIEW

The literature reviewed is mainly authoritative pronouncements, including those from appropriate government departments / agencies. Some professional publications dealing with regulation of FinTech were also reviewed.

IMF Staff Discussion Note (July 2017), titled "Fintech and Financial Services: Initial Considerations", inter alia, discusses major regulatory problems and their solutions. It suggests that technological innovation is possible, because of entrepreneurs making profit while fulfilling users' needs. Innovations need to be encouraged but also monitored. It also discusses impact of FinTech innovations on financial regulation.

Andrea Enria (2017), in "Fintech: Regulatory Challenges and Open Questions", explains the approach of European Banking Authority towards FinTech regulation and discusses three case studies to explain the practices followed. One of the case studies includes insurance and securities market regulation in Europe, of FinTech.

Global Legal Group Ltd. (2017), on its webpage "Israel: FinTech 2017" gives exhaustive information about the landscape, facilities, incentives and the regulation process in Israel.

Fintech Regulatory Sandbox Guidelines (Nov 2016) published by the Monetary Authority of Singapore explain the FinTech regulation process followed in Singapore.

Deloitte CII Fintech Report, (2017), "Regulatory Sandbox Making India a Global Fintech Hub", explains, inter alia, the Indian Fintech landscape, emerging areas for FinTech and suggestions on operationalizing the regulatory sandbox in India.

Financial Conduct Authority (UK), (2015), "Regulatory Sandbox", reports the feasibility and practical aspects of regulatory sandbox. It discusses sandbox implementation plans and suggests government industry collaboration.

Price Waterhouse Cooper (2017), "Global FinTech Report 2017: Redrawing the lines: FinTech's growing influence on Financial Services" examines business model innovation and newer technologies in financial sector. It recommends a comprehensive strategy focussing on six factors, with a strong partnership perspective.

Chris Brummer and Daniel Gorfine, (October 2014), in their paper "Fintech – Building a 21st Regulator's toolkit" explain why FinTech requires a new approach to regulation and discuss possible regulatory alternatives. They suggest a "toolkit" to tackle rapidly blossoming FinTech Companies.

FINTECH REGULATION: EXPERIENCE AROUND THE WORLD

Regulators the world over have dedicated Fintech offices, as innovative start-ups and technology firms may be unfamiliar with the financial sector and regulation, and the interaction of their products or services on either or both of them. They bridge potential knowledge gaps between regulators and industry and create a healthy environment.

Some regulators have introduced 'regulatory sandbox' frameworks, granting certain regulatory flexibilities to Fintech companies. It is a regulatory experiment in a specially defined environment with specified timeframes.

Some regulators have set up labs / accelerator programmes. They are exploring use of new technologies in achieving regulatory objectives.Some regulators think that a sandbox may create an 'unlevel' playing field between participating firms, and other innovative firms / incumbent players. They believe firms subjected to sound regulation can win confidence of investors and may have more credibility for international ventures.

Challenges for regulators: Earlier, financial players were divided in different partitions for regulating them. Regulation was considered necessary for possibilities of default and resultant risks to customers and the economy.

Today, the financial landscape has radically changed. Financial / technological innovations have blurred the boundaries between financial intermediaries and financial products/solutions. Licensed credit institutions are fast becoming extinct; deposits and loans are being unbundled and are now provided individually or in unprecedented combinations by a much wider spectrum of players.

FinTech is transforming financial products and services. Huge amounts are being invested in new technologies and well known companies are joining hands with FinTech start-ups.

FinTech companies / financial institutions are generally discouraged from innovation or entrepreneurship because of the time / cost of registration, onerous regulations, and the potential consequences in case of compliance failure. FinTech start-ups may have to register before proper development and testing of their business model.

Today, regulators have to be careful in not setting unnecessary barriers, or not to artificially reconstruct the old boundaries. Such regulation would be out of date, against public interest and would be bound to fail.

The Major Challenges

1. Do new products / services give rise to new risks?
2. Is the financial stability of the economy likely to be threatened?
3. Is the confidence of common investors likely to be shaken?
4. Will FinTech hinder the attainment of societal objectives like reduction of money laundering/financial crime?
5. Will there be a greater need for regulatory or supervisory action to protect consumers of financial services?
6. Will rules be applicable differently to different competing players in the same product / service markets, and if so, will it vitiate the level playing field?

Regulators need to appreciate that innovations generally arise from genuine business objectives. These include new streams of revenue generation, cost reduction, broad basing of customer choice/convenience, etc. Innovation generally makes markets more competitive. Innovations need to be encouraged so that

market players keep innovating with confidence. Misappropriation of funds, breaches of security or other irregularities will lead to stifling their growth, which is bad for markets or consumers.

The Main Approaches / considerations

- Rule based regulatory regime
- Principle based regulatory regime
- Agile rule approach
- Trial or pilot approach
- Engagement approach
- Enforcement approach

There are various approaches across the world. In order to be successful and effective, interested parties like industry participants, customer group, investor group etc. should be allowed to play a crucial role in regulation. Clarity of sunset provisions as well as harmonisation of regulations will also increase acceptability of regulations.

FINTECH REGULATION IN EUROPE

The European Banking Authority (EBA) uses the following approach to decide the regulatory / supervisory action needed:

1. Characterise the innovation;
2. Identify types of market participants;
3. Identify potential benefits;
4. Identify / prioritise risks;
5. Identify risk drivers;
6. Do existing rules address the risks?
7. Are additional regulatory / supervisory measures required?

USE CASES IN EUROPE

How Virtual currencies (VC's) were regulated by European banks

Virtual currencies (VCs) came to EBA's notice in 2013. Bitcoins had already been in existence for two years. Consumers were increasingly using VCs to pay for goods / services. EBA as a payments regulator had to protect consumers. At that time, only Blockchain or Distributed Ledger Technology was under consideration.

EBA issued a public warning, widely reported by media across the EU about: price volatility, no consumer rights for re-imbursement in case of insolvency of entity holding the VCs, and risk of seizure by law enforcement agencies.

6 months later EBA followed the methodological approach detailed above: they characterized the innovation by developing a working definition of VCs, identified potential benefits/risks, risk drivers, assessed existing (EU) law and regulations and arrived at some recommendations.

Perception about Benefits of VC's:

- Lower transaction costs
- Lower processing time per transaction
- Contribution to economic growth
- Easier access to financial system and Enhanced financial inclusion, and
- Anonymity and greater security of personal data.

EU legislation had already established an inclusive, fast, and low-cost market for payment transactions, by prescribing maximum transaction speeds and by issuing directives to all banks to open a basic bank account for all EU residents. The only distinctive benefit of VC's was found to be new businesses contributing to economic growth.

EBA then identified and prioritised risks into three types:

- Risks requiring no regulatory mitigation, which can be left to market participants,
- Risks requiring further analysis for mitigation, to decide who should deal with them and how, and
- Risks definitely requiring mitigation, like financial crime, terrorist financing and anti-money laundering.

Risks were also classified as under:

- to users: like security, fraud, lack of insolvency protection;
- to non-user market participants: like merchants accepting VCs;
- to financial integrity, like money laundering, crime and terrorist financing;
- to payment systems / payment service providers in fiat currency (legal tender), like spill-over effects from transactions in VC to fiat currencies.

Major Recommendations

- VC wallet providers and VC exchanges, should be covered under Anti-Money Laundering Directive
- VC is not a payment service;
- Supervisory authorities in EU should work together to mitigate cross-border risks.
- Regulated financial institutions should be discouraged from buying, holding or selling VCs; innovation to continue, but its impact should be minimised.

EBA regulation of Robo-advice (Automation in Financial Advice)

Today, human interaction in financial markets is being replaced by automated tools using algorithms. Recommendations in the nature of advice may be received without any expert human being at the other end.

EBA collaborated with EIOPA (European Insurance and Occupational Pensions Authority) and ESMA (European Securities and Markets Authority).

In this case, the regulators came to very different conclusions. The innovation was 'a tool that is perceived to be advice, in which human interaction is (partly) replaced by algorithms.'

The benefits like reduced costs, wider access, better quality of service, additional revenue opportunities were identified. The risks were: possibilities of flaws in algorithms; lack of clarity in allocation of liabilities; and limitations of consumers to understand, or to process information.

EBA, ESMA and EIOPA, after a public consultation, concluded that existing EU rules on advice were generally applicable to Robo-advice and no new regulation was required. Regulators should continue monitoring, and revise if necessary.

EBA Regulation of Account Information and Payment Initiation Services

EBA was to develop technical standards for payment accounts, especially about security requirements for banks and market challengers. While new firms challenging incumbent banks was good for competition, payments security and consumer protection were to be strengthened. Innovation was welcome, but technology and business model neutrality had to be balanced. Standardisation across the EU might restrict room for innovation.

After lengthy and difficult public consultations and dialogue with all stakeholders, the recommendations included:

- Dedicated interface for third party providers accessing customers' bank accounts ensuring proper authentication.
- Legal obligation requiring banks to ensure same availability and performance of the interface for customers as well as non-customers, with similar contingency measures.
- Exemptions to strong authentication based on transaction risk analysis, with incentives to reduce possibilities of fraud.
- References to technological standards to be removed for greater neutrality and incentives for innovation.

FINTECH REGULATION IN SINGAPORE

While United Kingdom's Financial Conduct Authority was the first to introduce a regulatory sandbox in 2015, Singapore was second. After consultation and public feedback by the Monetary Authority of Singapore ("**MAS**") in July 2016, Australia, Hong Kong, Malaysia, and Thailand have also started their own version of the regulatory sandbox.

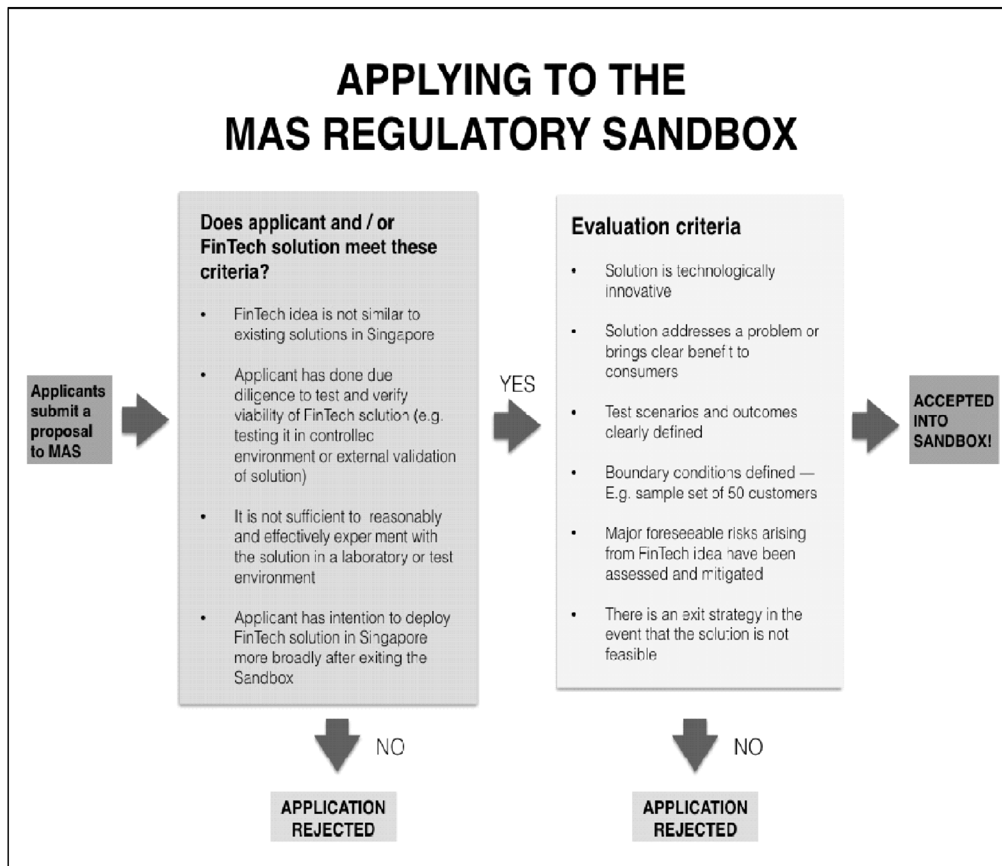
Fintech is a key priority for Singapore government. MAS have taken a series of initiatives to support Fintech sector. It has internally set up a 'Fintech & Innovation Group' to facilitate use of innovative technology by laying down regulatory policies and development strategies. A Fintech office serves as a "one-stop virtual entity".

Fintech businesses can get advice on various government grants / schemes supporting Fintech and technology. The Financial Sector Technology & Innovation ("**FSTI**") scheme facilitates setting up of innovation labs. It is a catalyst for development of innovative solutions by financial institutions. It also builds technology infrastructure across industries to support delivery of new / innovative integration of services. FSTI is creating a national Know-Your-Client utility.

The MAS guidelines in Singapore:

Eligibility and application	*Experimentation*	*Exiting*
1. Technologically innovative solution 2. The solution should solve a problem or gives benefits to consumers 3. The outcomes should be clearly defined. 4. Boundary conditions are defined 5. The expected risk is assessed and mitigated 6. Exit strategy	1. Period of experimentation is stipulated by MAS 2. Extension can be applied for within reasonable time with reasons.	1. Applicants can choose to scale up their FinTech solution after exiting the Sandbox if approved. 2. If not approved – Applicants have to discontinue their FinTech solution after exiting the Sandbox

Source: A Definitive and Practical Guide to the Regulatory Sandbox in Singapore



Source: A Definitive and Practical Guide to the Regulatory Sandbox in Singapore

The regulator in the sandbox is like an "accelerator". New possibilities are discovered, and risks and limitations quickly established. The regulator can make more relevant policies and laws, reducing regulatory uncertainty.

The Regulatory Sandbox Approach of MAS (Singapore)

Any FinTech firm interested in innovative financial services can apply. The innovative experiment will be carried out within specified duration and with appropriate safeguards. The objective is to contain consequences of failure and to preserve the financial system.

Depending on the financial service and applicant, MAS decides legal and regulatory requirements that are to be met, and that can be relaxed, on a case to case basis.

Requirements to be met include: customers confidentiality, honesty and integrity, intermediaries should carefully handle customer's money and assets, and should not result into money laundering etc.

Examples of requirements that **can be relaxed** on a case to case basis:

- Asset maintenance requirement
- Board composition
- Cash balances
- Credit rating
- Financial soundness
- Fund solvency and capital adequacy
- Licence fees
- Management experience
- Minimum liquid assets
- Minimum paid-up capital
- Relative size
- Reputation
- Track record

Upon approval, the applicant becomes responsible for starting and operating the sandbox entity, while MAS provides the appropriate regulatory support. After successful completion of the experiment and exit, the sandbox entity will be fully subject to the relevant legal/regulatory requirements.

FINTECH REGULATION IN ISRAEL

Israel globally leads the FinTech innovation. There are more than 400 FinTech start-ups and more than 500 million dollars of capital was raised in 2016. Some of the Israeli ventures are reaching maturity in bigger markets, e. g. Lemonade, Payoneer, eToro, Forter and Credorax. Citibank and Barclays have both established innovation centers in Israel have their own accelerator programmes.

'The Floor', at the Tel Aviv Stock Exchange, is a Global Fintech Innovation Centre. It is a focal point of access for leading international financial players, tech giants and venture capitalists innovating with FinTech. It is sponsored by HSBC, the Royal Bank of Scotland, Santander Bank, and Deutsche Bank.

'The Floor', provides a platform for exchange of Fintech ideas and enables its partners and members to 'engage, collaborate and grow'. It brings together all the players in the ecosystem, collaborating "to solve today's challenges with tomorrow's solutions".

Though there is no specific regulation for FinTech under Israeli law, there are no prohibitions or restrictions. Financial products and services may fall under different categories like Bank of Israel (regulates banks, payment systems and credits), Israel Securities Authority (ISA) (regulates security exchanges, trading platforms, Investment advice and portfolio management and Capital Markets), Insurance and Savings Authority (regulates Insurance co's/agents, pension and provident funds, pension advisors, non bank lending, credit unions,) etc.

Some recent regulatory initiatives relating to FinTech (not yet finalised) include:

- Regulation of P2P platform by Capital Markets Authority
- New regulatory framework for payment service providers -Bank of Israel
- Crowd funding for corporations by ISA
- Algo-trading/robo-advisory (use of technology for Investment advice/management) -ISA

Protection of Privacy

FinTech businesses which collect, use, process or transfer personal data about natural persons have to comply with The Protection of Privacy Law, 1981 and the regulations. This may require registration of databases with Israeli Data Protection Authority. Providing privacy notifications to data subjects, maintaining security of the database, ensuring review and access rights of data subjects, direct marketing activities are some of such regulations.

Under 'transfer of data' regulation, database owner must obtain a written obligation from data recipient, that due care is taken to ensure privacy and that data will not be transferred to anyone, whether within the country or outside.

Consequences of failure to comply with Privacy laws in Israel

Fines:

- Fines ranging from US$545 to US$1370 may be imposed.
- For corporate entities fines imposed are five times the above level.

Criminal Prosecution:

- Wilful breach of privacy punishable with imprisonment in addition to fine. However, this is imposed only in extremely severe cases.

Civil Damages:

- Statutory damages may amount to US$16350 for infringement of an individual's privacy.
- Under the law of torts, there is no limit on the amount of damages the courts may award.

In addition, the following regulations may be applicable to FinTech Companies in Israel:

- Cyber Security Management and Risk Management in Cloud Computing Environment Guidelines
- Circular on Cyber Risk Management of Financial Institutions
- The Prohibition of Money Laundering Law, 2000
- The Prohibition of Terror Financing Law, 2005
- Consumer Protection Law, 1981
- SPAM Law
- Standard Contracts Law, 1982

Regulatory "Sandbox"

In software development, "a 'sandbox' is a testing environment that isolates untested code changes and outright experimentation from the production environment or repository."

In computer security, "a 'sandbox' is a security mechanism for separating running programs, usually in an effort to mitigate system failures or software vulnerabilities from spreading. It is often used to execute untested or untrusted programs or code, possibly from unverified or untrusted third parties, suppliers, users or websites, without risking harm to the host machine or operating system."

Encouraging financial innovation and safeguarding customer interests at the same time is not easy. Quite a few regulators across the world have built a "regulatory sandbox" which is like *a test environment with relaxed regulatory requirements*. It helps FinTech companies to validate their product/service or business model and its impact on their customers. Thus, the FinTech companies are allowed to operate in a controlled environment for a specified period. During this period, the responsibility of ensuring that there is little impact of business model failure for customers rests with the regulator. The key metrics of this flexible regulatory environment are closely monitored by the regulator and adjusted, if required, on a periodic basis. After successful testing, the companies are allowed to take their products to market subject to guidelines laid down by the regulator.

This "regulatory sandbox" approach enables the regulator to:

- develop guidelines for newer and innovative technologies;
- protect consumer interests, and
- be abreast with latest developments in the sector.

It helps Fintech companies to:

- shorten the time to market for innovative products/services/solutions,
- avoid issues in identifying applicable legal requirements, and
- not be burdened by onerous registration / other regulatory procedures

By reducing regulatory hurdles / uncertainty, the sandbox generally provides an easier access to funding. This allows the Fintech companies to focus more on technological innovations.

Thus, the "regulatory sandbox" approach nurtures healthy collaboration amongst Fintech companies, regulators and eventually consumers.

THE REGULATORY SANDBOX FRAMEWORK

Selected Jurisdictions

Sandboxes provide a controlled and contained environment in which pilot trials of innovative financial services and products can be conducted in a timely and cost-effective manner. While regulatory and supervisory sandboxes share some common features, they might differ in others.

The Sandbox Approach in Selected Jurisdictions

General Information		Type of Applicant		Benefits for Businesses			Safeguards			
Country	Regulator	Authorized/ Licensed/ Incumbents	Unauthorized/ Unlicensed/ Startups	Regulations relaxed or waived	Licensing requirements relaxed or waived	Clarifications on regulatory expectations	Limits on customers, value and/or duration	Additional reporting obligations/closer monitoring	Additional consumer protections/risk mitigation	Specified regulations that cannot be waived
Australia	ASIC	✖	✔	✖	✔	✖	✔	✔	✔	✔
Canada	CSA	✔	✔	✔	✖	✔	✖	✖	✔	✖
Hong Kong SAR	HKMA	✔	✖	✔	✖	✖	✔	✔	✔	✖
Malaysia	BNM	✔	✔	✔	✖	✖	✔	✔	✔	✖
Singapore	MAS	✔	✔	✔	✖	✖	✔	✔	✔	✔
Switzerland	FDF	✔	✔	✖	✔	✖	✔	✖	✔	✔
United Arab Emirates	ADGM	✔	✔	✔	✖	✖	✔	✔	✔	✖
United Kingdom	FCA	✔	✔	✔	✔	✔	✔	✔	✔	✔

✔ Explicitly mentioned in the regulatory authority's disclosure, staff analysis.

✖ Either not required or not mentioned in the regulatory authority's disclosure.

Source: Fintech and Financial Services: Initial Considerations: I M F Staff Discussion Note

The 'sandbox' approach is an attempt to strike a balance between promoting innovations, and preserving financial stability and consumer protection. It tries to reduce restrictions on testing innovative financial products / services; while ensuring adequate safeguards to mitigate risks and protect consumers. Sometimes, sandboxes provide greater clarity on regulatory expectations and applicable rules not covered by existing regulatory frameworks.

Who are eligible?

Generally, the financial product or service:

- must involve genuine innovation through the use of new/emerging technologies or innovative use of existing technologies, and

- must address a problem of, or bring benefits to, consumers or industry.
- must be ready to be tested

The company / entrepreneur should have:

- necessary resources,
- a thorough business plan, and
- the intent to deploy the product or service in the respective jurisdiction

Safeguards

Generally sandboxes provide some safeguards for risk mitigation and to limit possible consequences of live tests. These may be restrictions on scope of live test, number and types of customers, duration, total value and, specific products and services to be tested. Sometimes additional customer protection measures are required, such as arrangements for compensation, mechanisms for redressal or resolution of disputes, and specific requirements for disclosure and for obtaining consent. Risk management controls (against cyber-attacks and system failures), and monitoring and reporting procedures will usually be added.

USE OF EMERGING TECHNOLOGIES TO FACILITATE REGULATORY COMPLIANCE ("REGTECH")

The newer technologies themselves may help ensure regulatory compliance and reduce compliance costs. These new technologies which are already being experimented with in the financial services industry include:

- automated manual processes (e.g. artificial intelligence);
- technologies to aggregate, share and store data (e.g. cloud computing, Distributed Ledger Technology);
- enhanced security (e.g., cryptography);
- identification of suspicious transactions using technology (e.g., biometrics, big data) and
- facilitation of regulator-bank interactions (e.g., APIs).

However, reliance on 'Regtech' solutions could cause major disruptions, due to cyber-attack or a malfunctioning of the underlying technology.

Examples of Regtech Solutions to Facilitate Regulatory Compliance:

Data analytics tools

These tools can be used for:

- continuous risk monitoring and analysis.
- information management and regulatory/transactions reporting.
- identification of virtual currency wallets associated with illicit activities based on common technical information or transaction patterns

Cognitive computing and artificial intelligence (AI)

These technologies use data mining algorithms based on machine learning for:

- organizing and analysing large sets of data
- creating self-improving and more accurate methods
- analysis, modelling and forecasting of data, (e. g. for stress testing).

With artificial intelligence (AI) solutions, regulatory content can be treated as data, which can be managed programmatically. These technologies may even track regulatory changes and interpret new regulations in future.

Application programming interfaces (APIs)

These interfaces enable connection, interoperability and communication of software programs. They can be used for automated exchanges/reporting, which may involve interactive information sharing with regulators.

Cloud applications

These applications can enable flexible solutions for data storage, standardization and sharing at low cost, allowing a single platform for compliance functions. Cloud based central repositories could serve a single or multiple institutions. (e. g. KYC data repository).

Identity verification technology (including biometrics)

Very often, a purported sender's identity needs to be confirmed. Facial recognition software may be crucial for start-ups and anti-money laundering (AML). Pattern analysis between proprietary transaction records and publicly-available digital ledger transaction records can be done using software.

Blockchain and other distributed ledgers

Regulators may have direct, instant access to financial information of institutions and intermediaries. Regulators participating in permissioned-based and appropriately secured 'ledger' or similar systems may even replace regulatory reporting.

CONCLUSION

While United Kingdom was the first to adopt the "Regulatory Sandbox" framework for FinTech regulation, many more countries across three continents have followed suit. Africa is expected to be in line with global regulatory sandbox programmes. Each country has adapted the framework to suit its particular needs. There is no global standard, and sometimes a fear is expressed that divergent frameworks for regulatory 'sandbox' may result into a 'wild west' kind of situation.

A new house bill was introduced in the US of A one year ago, "to make sure the U.S. doesn't lose potential FinTech business opportunities to the U.K." Surprisingly, even some smaller countries like Malaysia, Thailand and Bahrain have aggressively adopted the sandbox approach, ahead of other 'mighty' economies.

India has yet to officially adopt the "Regulatory Sandbox" framework; though it is strongly recommended by CII and professional consultants.

The authors, considering the benefits of the "Sandbox" approach as outlined above, are of the opinion that India should immediately start policy changes for "Regulatory Sandbox" and RegTech adoption.

Luckily, we can learn from and benchmark with a variety of economies, frameworks, and use cases of "Regtech" – use of technologies as a regulation enabler and facilitator.

The sandbox approach creates a "win-win" scenario, as it promotes collaboration, learning while implementing, and adaptation of learning for all the parties involved, in the interest of financial betterment of the masses and the society at large.

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