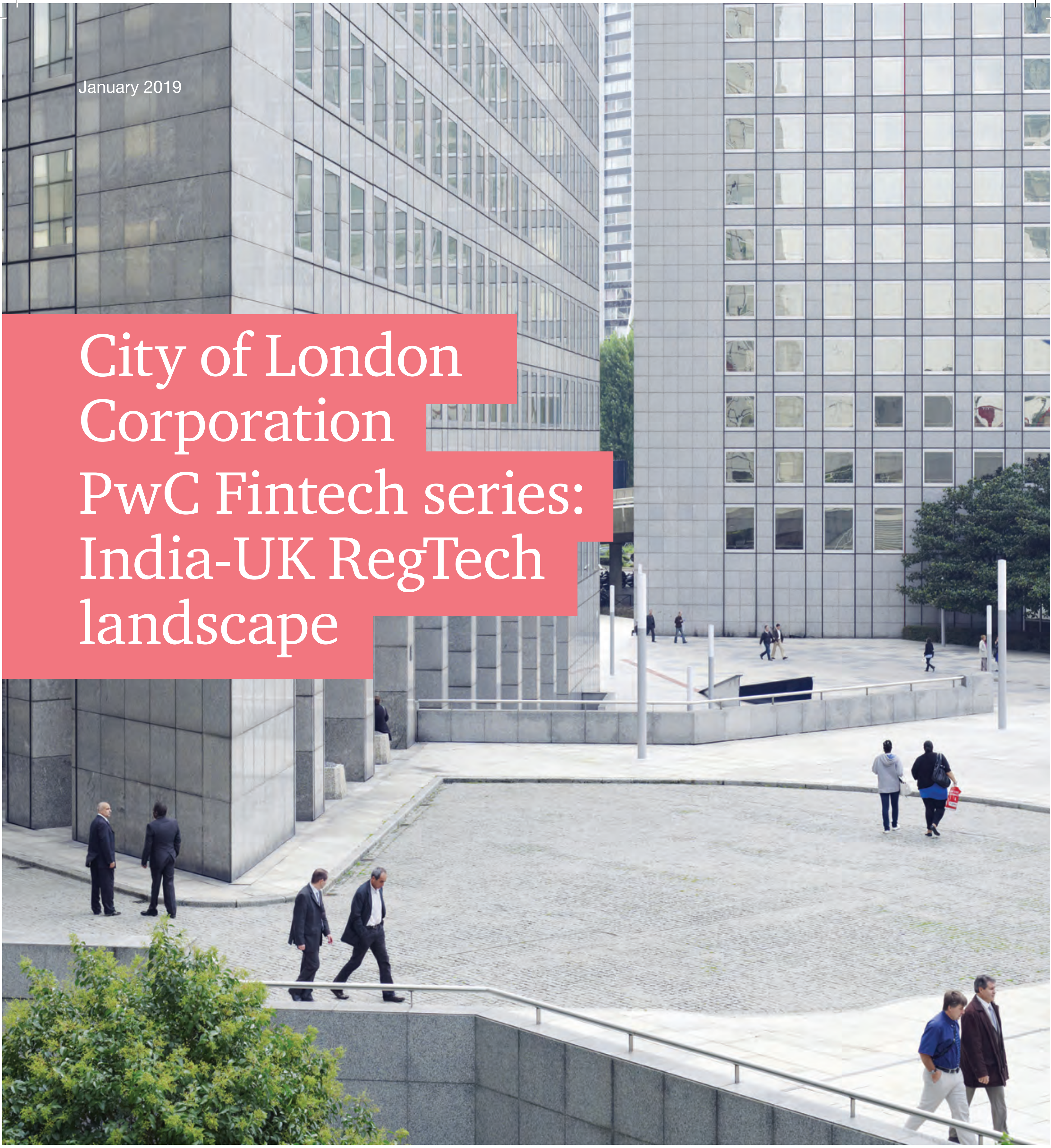
January 2019

City of London Corporation PwC Fintech series: India-UK RegTech landscape



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1 Objective of our research

In line with the series of FinTech round-table events organised in India over the past two years by the City of London Corporation representative office in Mumbai, there is an increasing appetite from both UK and Indian FinTech players to consider in-bound and outbound investments to take advantage of the dynamic markets and scale of opportunities offered by the UK (London in particular) and India.

To foster deeper engagement between UK and Indian FinTech start-ups, the City of London Corporation commissioned PwC India to develop three research reports around governance, risk and compliance over Payments, Insurtech and RegTech in 2018–2019.

In particular, UK FinTech players are keen to gain an understanding of the challenges faced by their Indian FinTech counterparts in the regulatory technology (also known as RegTech) space and are looking to leverage their existing solutions to address these problems. The UK players view RegTech as an opportunity to proactively engage with the Indian RegTech ecosystem considering the dynamic changes in the Indian regulatory environment and technological innovations that are currently underway to address them. While the regulatory environment is not limited only to financial services and spans across all sectors, for the purpose of this RegTech research report, we have considered regulations from the Reserve Bank of India (RBI), i.e. the banking regulator; the Securities and Exchange Board of India (SEBI), i.e. the capital markets regulator; the (Insurance Regulatory and Development Authority of India (IRDAI), i.e. the insurance market regulator, the UK Prudential Regulatory Authority (PRA); and the UK Financial Conduct Authority (FCA).

The objective of undertaking this research is to highlight the opportunities and challenges within the RegTech ecosystem in the UK and India and show how opportunities in India and the UK may be tapped in a seamless manner by UK RegTech firms as well as Indian RegTech players planning international expansion in London/the UK.

2 | Executive summary

The UK has witnessed a major regulatory overhaul of the financial system post the 2008 financial crisis, overseen by the Central Bank of England through the UK PRA and FCA. As such, globally, over USD 300 billion has been paid in fines paid to regulators, with more than 40% coming from the UK and EU region alone post the 2008 global financial crisis. The compliance cost continues to increase for financial institutions across the globe with over USD 780 billion in fines paid annually. With the ever-increasing cost of compliance and the regulatory fines paid by firms, there arises a need to bring about strategic changes in the way technology can be leveraged to help build and sustain a robust ecosystem between regulators and market participants.

The City of London Corporation, in particular, has evolved rapidly in embracing innovative technologies and establishing a mature RegTech and FinTech ecosystem. Globally, RegTech investments have surpassed USD 1 billion and there are currently over 250 RegTech businesses, of which a quarter alone are based out of the City of London. In 2018, 26 UK-based RegTech firms featured in the RegTech 100 list of innovative companies that every financial institution should be aware of in 2018.[1] The world looks upon London in terms of best practices from its robust regulatory regime that encourages innovation. Such an innovative environment enables propositions like seamless integration of RegTech players within the UK and across borders and at the same time keeps consumer at the heart of its business.

With a full Brexit expected to take place by March 2019, it becomes increasingly important for firms in the UK to adapt and assess the potential impact of various regulatory changes that will follow post Brexit and may impact the cost of operating their business.

Asia has seen 80% growth in RegTech investments in the last three years.

India, on the other hand, with a population of around 1.3 billion has been witnessing various structural regulatory reforms since the past three to four years. The rapid growth of FinTech has forced regulators to contemplate new tools to regulate faster and in an efficient manner. India alone has seen 10x growth in the number of digital lenders in the last three years, making way for increased regulation and thus creating a huge market for technology-based solutions. In addition, there is greater risk-based supervision from the RBI with stringent capital adequacy, liquidity reporting, detailed anti-money laundering (AML) and Know Your Customer (KYC) requirements along with SEBI requirements on trade surveillance and algorithmic trading of equities and derivatives. The regulatory landscape in India is further influenced by some of the macroeconomic changes caused by demonetisation, introduction of a single unified indirect tax regime under the Goods and Services tax (GST) and the finalisation of Insolvency and Bankruptcy code.

To complement the growth of RegTech, equal importance is being given to the evolution of Supervisory technology (also known as SupTech), with supervisory agencies around the world, including the UK and India using innovative technology to support supervision. It helps supervisory agencies to digitise reporting and regulatory processes, resulting in more efficient and proactive monitoring of risk and compliance at financial institutions. SupTech has seen major growth in the area of artificial intelligence (AI) and machine learning (ML) for trade surveillance activities. The UK FCA, Monetary Authority of Singapore (MAS) and Australian Securities and Investments Commission (ASIC) are leading the way for supervisory technology in the area of financial risk (trade surveillance) with savings of more than 40%[2] of time consumed by manual activities.

1 http://irishadvantage.com/wp-content/uploads/2018/06/Regtech-Beyond-Compliance-White-Paper.pdf

2 Ibid.

Opportunities in the RegTech space

We have included below a snapshot of some of the opportunities along with potential challenges in the RegTech and SupTech space within India and the UK, including our perspective on the best practices that the RegTech ecosystem in India and UK could possibly look to follow:

Some of the key opportunities in the Indian RegTech space:

Government initiatives:

- The RegTech industry in India is expected to expand further with a push from the Government of India to go digital on all regulatory and compliance obligations. The roll-out of GST and the requirements for all companies to file their GST returns online has turned the attention again on RegTech. The total collection of GST has increased from INR 28,500 crore (around GBP 3 billion) from July 2018 (when GST was implemented) to around INR 94,000 crore (around GBP 11billion) in December 2018[3], and this is expected to increase multi-fold by 2022 with the Government of India's initiative to go digital and provide support to start-up firms. There are close to 10 million registered firms and only half of them file their returns using software tools. With limited technology platforms for GST available for filing returns, this area offers plenty of potential for RegTech players to help firms become compliant with the regulatory guidelines.
- In 2010, the RBI introduced Automated Data Flow (ADF) reporting, which requires banks to provide granular information on capital adequacy, liquidity, etc., on a straight through process from their core banking systems. This has created more opportunities for RegTech players in India to come up with solutions that can cater to the needs of such banks. Currently, most of the major banks in India are in the advanced stage of adhering to the RBI requirements of submitting the report via ADF; however, there are certain challenges in attaining the objectives of being 100% compliant, such as unavailability of RBI guidelines for some of the reports, lack of efforts by firms to re-engineer the existing process and the qualitative nature of some reports.
- An increase in digital transactions in India post demonetisation (400–1000% increase) [4] has led to an increase in the use of RegTech solutions in KYC and AML. There have been 11 new RegTech firms in India over the last two-three years as more and more firms are looking to use RegTech solutions to comply with GST and associated AML and KYC requirements on the back of the huge digital growth witnessed in India.
- The RBI recommends a regulatory sandbox for FinTech and digital banking initiatives. In collaboration with the Institute for Development and Research in Banking Technology (IDRBT), this sandbox offers a more structured launch for new products that will be sufficiently monitored to mitigate any risk to the customer or the stability of the financial institution. Currently, 10–15% of the private sector banks in India are in the process of implementing regulatory technology in-house using the regulatory sandbox approach.
- Some of the leading private sector banks have already implemented, tested and commoditised the use of regulatory technology such as blockchain, AI and robotic process automation (RPA) in the areas of KYC and AML.

Huge untapped potential

- Recent regulations like the storage of Aadhaar data, e-KYC norms and localisation of data storage require strategic data management methods. To store and analyse data huge computational power as well as compliance with enormous governance and regulations from various regulatory and governing bodies are necessary. As per SEBI, there are around 30 circulars (new/amendments) issued by the RBI for banks and financial institutions to adhere to the KYC norms.
- Small and medium enterprises (SMEs) in India account for close to 50% of the total output of India across all sectors and yet contribute to only 17%[5] of the country's GDP due to various systemic issues such as lack of transparency, awareness and access to various regulatory tools available to populate the required reporting requirements.
- 70-80% of the bankers in the financial services sector cited legacy systems as a key hindrance to catering to a host of new regulatory requirements and new product developments for individual customers and institutional investors.

3 http://www.pib.nic.in/PressReleaseIframePage.aspx?PRID=1527288

4 http://fintech.global/globalregtechsummit/global-regtech-continues-to-grow-with-over-500m-invested-in-q1-2018/

5 https://www.finextra.com/blogposting/14977/fintech-regtech-and-suptech

Some of the key opportunities in the UK RegTech space:

Support from the UK FCA's TechSprint (an event organised once a year for two days to bring together various RegTech players to showcase their capabilities) has proven that technologies exist and can be effectively combined to make machine-readable and machine-executable regulatory reporting a reality.

UK government initiatives:

- The FCA launched FCA Innovate in October 2014 and has run several technology-focused initiatives to encourage a collaborative approach to regulatory issues. More recently, the FCA issued a 'Call for Input' on using technology to achieve smarter regulatory reporting (a customisable report in different formats from one platform), which it will implement later this year.
- In addition, under Project Innovate, one of the initiatives is 'Regulatory Sandbox'. The regulatory sandbox is the first of its kind for regulators that underlines a deep sense of commitment to innovation and willingness to think outside the usual regulatory parameters. The FCA regulatory sandbox is in its third phase right now.
- In September 2017, the FCA launched in collaboration with R3, RBS and other global banks built a prototype application for regulatory reporting of mortgage transactions on a distributed ledger technology (blockchain). This prototype can generate automated receipts when a mortgage is booked.

Regulatory changes

- The UK is one of the few countries in the world with a host of regulatory changes like Markets in Financial Instruments Directive (MiFID), European Market Infrastructure Regulation (EMIR), BASEL III and Payment Service Directive (PSD)—all introduced to improve and strengthen liquidity and transparency in the system. With the uncertainty looming around Brexit, it becomes equally important for RegTech players to capture the variability in their solutioning around Brexit when implementing RegTech solutions for large financial services firms.
- The increased use of technology for regulatory and compliance initiatives in the UK has accentuated the growth of new risks like cyber, fraud and financial crimes. Currently, around 25–30% of the all firms in the UK have expressed their readiness to have a process in place to comply with the regulatory guidelines.[6] This has resulted in RegTech firms searching for innovative ways to implement the system in a more prudent and efficient way.

6 https://www.refinitiv.com/content/dam/gl/en/documents/reports/regtech-2020-and-beyond.pdf

Potential challenges

Some of the potential challenges in the RegTech space in India include:

Budgetary constraints

End-to-end implementation of RegTech solutions across the firm could pose huge costs for mid-sized financial services firms, which form the bulk of the financial services sector. Such firms may resist the temptation to adopt the best practice RegTech solutions and may prefer to continue with manual approaches to comply with regulatory requirements.

Lack of integration of various applications with the core banking system

The recent fraud case related to one of the largest public sector banks in India, resulting in a loss of USD 1.1 billion could have been avoided had the core banking system been properly integrated with the SWIFT (payment) system. Of the total public sector banks in India, around 70–80% of the banks are still grappling with legacy systems and siloed information.

Data management issues

Financial institutions have been sitting on a pool of customer data without effectively using it. Banks have to deal with a huge amount of unstructured data on a daily basis, and the increased intensity of data flow along with high velocity, large variety and big volumes are further raising concerns as banks strive to stay compliant and enhance operational efficiency.

Some of the potential challenges in the UK's RegTech space

Uncertainty over alignment with existing regulations

MiFID II, PSD2 and GDPR all came into effect in Q1 of 2018 across the UK and Europe. With all regulations coming into force at the same time, there is a significant issue of cross-sector impact, especially on account of Brexit, which is expected to take effect by the end of Q1 2019. RegTech firms would need to comply with the unenviable task of helping clients fulfil their regulatory and compliance initiatives but still lack clarity as to what regulators expect from them.

Keeping pace with frequent amendments to ongoing regulations

The frequent amendments to ongoing regulations—for example, by the UK FCA—can result in a constant challenge for implementing RegTech solutions for small and medium-sized financial firms. These regulations are often subject to interpretation and unless the RegTech firms combine AI and staff experience to help understand, interpret and keep pace with the regulatory changes, the complexity can lead to unfavourable conditions for the firms.

Higher cost of compliance

The average annual compliance cost for UK financial services firms is close to 20–25% of the total cost for running the business. Firms wanting to move to a more strategic solution in the long term would need to balance the trade-off between enhancing the customer experience and, at the same time, upgrade their legacy system to a more sophisticated system to ensure compliance with the regulations. Considering the UK FCA regulates more than 50,000 firms that provide financial products and services to both UK and international customers, managing the compliance cost effectively through RegTech could be challenging if not balanced with appropriate risk and rewards on the investment.

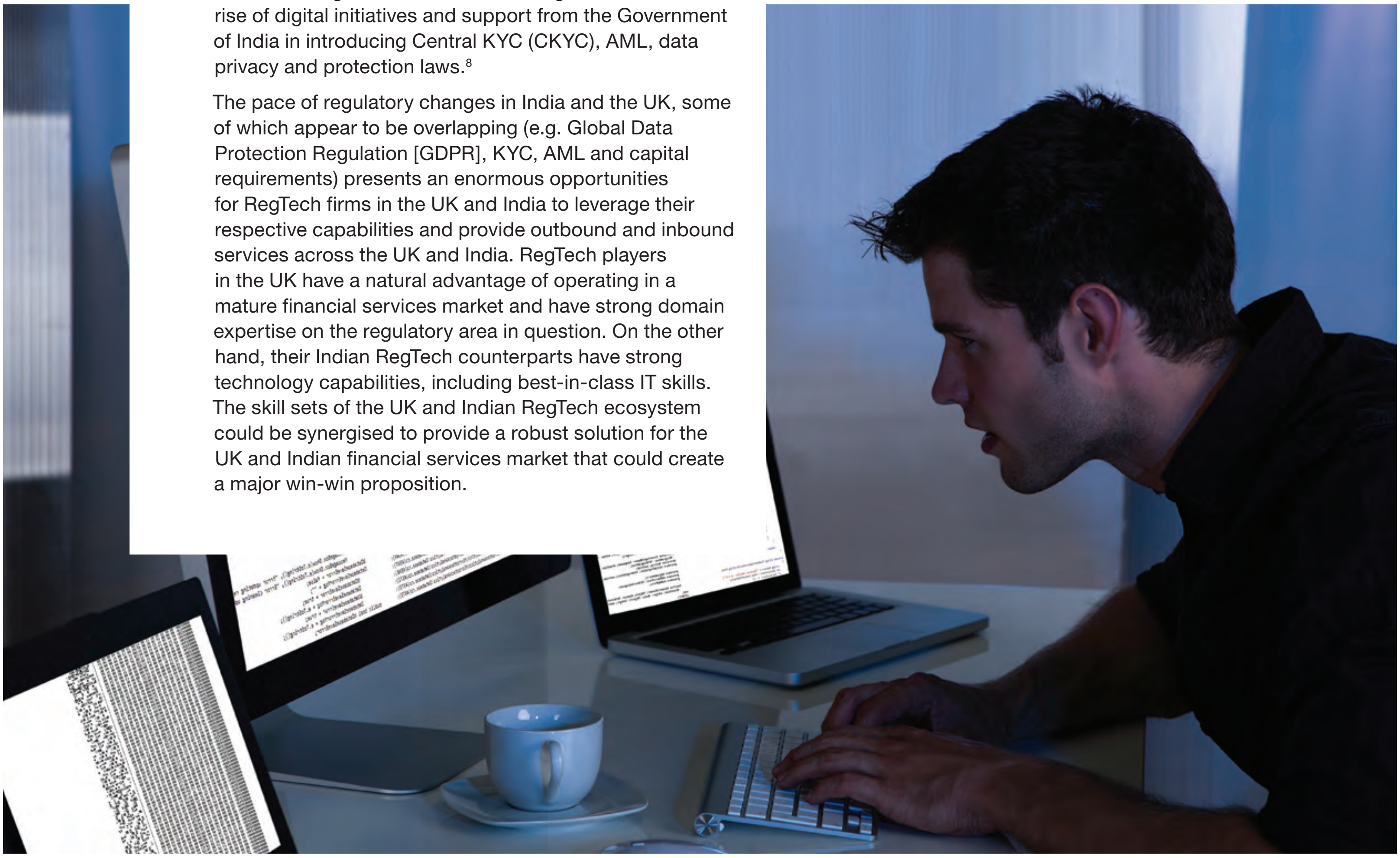
Conclusion

RegTech is on the cusp of a breakthrough that has the potential to transform the industry's approach to compliance and create additional value. RegTech's potential is backed by support from regulators, impetus for digital change, growing levels of investment and a proliferation of start-ups seeking to meet demand alongside big tech companies. RegTech solutions in the UK are an approximately GBP 50 billion per year opportunity. This is due to detailed regulation with hundreds and millions of pages of regulatory texts that firms have to deal with to remain compliant.

India, on the other hand, is a market where RegTech firms can enable the growing financial services firms to streamline their compliance and reporting obligations to the RBI, including protecting customer interests and detecting financial crime. Asia has seen a growth of around 80%[7] in its RegTech investments over the last three years, with Singapore leading the pack, followed by India, which has been growing at a compounded annual growth rate (CAGR) of 30% in terms of developing new regulatory technology with investments of more than USD 10 million. RegTech has seen massive growth with the rise of digital initiatives and support from the Government of India in introducing Central KYC (CKYC), AML, data privacy and protection laws.[8]

The pace of regulatory changes in India and the UK, some of which appear to be overlapping (e.g. Global Data Protection Regulation [GDPR], KYC, AML and capital requirements) presents an enormous opportunities for RegTech firms in the UK and India to leverage their respective capabilities and provide outbound and inbound services across the UK and India. RegTech players in the UK have a natural advantage of operating in a mature financial services market and have strong domain expertise on the regulatory area in question. On the other hand, their Indian RegTech counterparts have strong technology capabilities, including best-in-class IT skills. The skill sets of the UK and Indian RegTech ecosystem could be synergised to provide a robust solution for the UK and Indian financial services market that could create a major win-win proposition.

Given the scale of regulatory changes taking place in the UK and India, some of which appear to be overlapping, it will be useful for the RegTech players in these countries to gain a better understanding of the regulatory landscape. Having better visibility into the challenges faced by the regulators and the incumbent financial services firms will allow RegTech firms to establish a roadmap to address such challenges. We therefore call on regulators, government bodies and industry leaders in India and the UK to help in this process and make it easier for bilateral exchanges to take place which can foster seamless cross border integration of technology between the two countries.

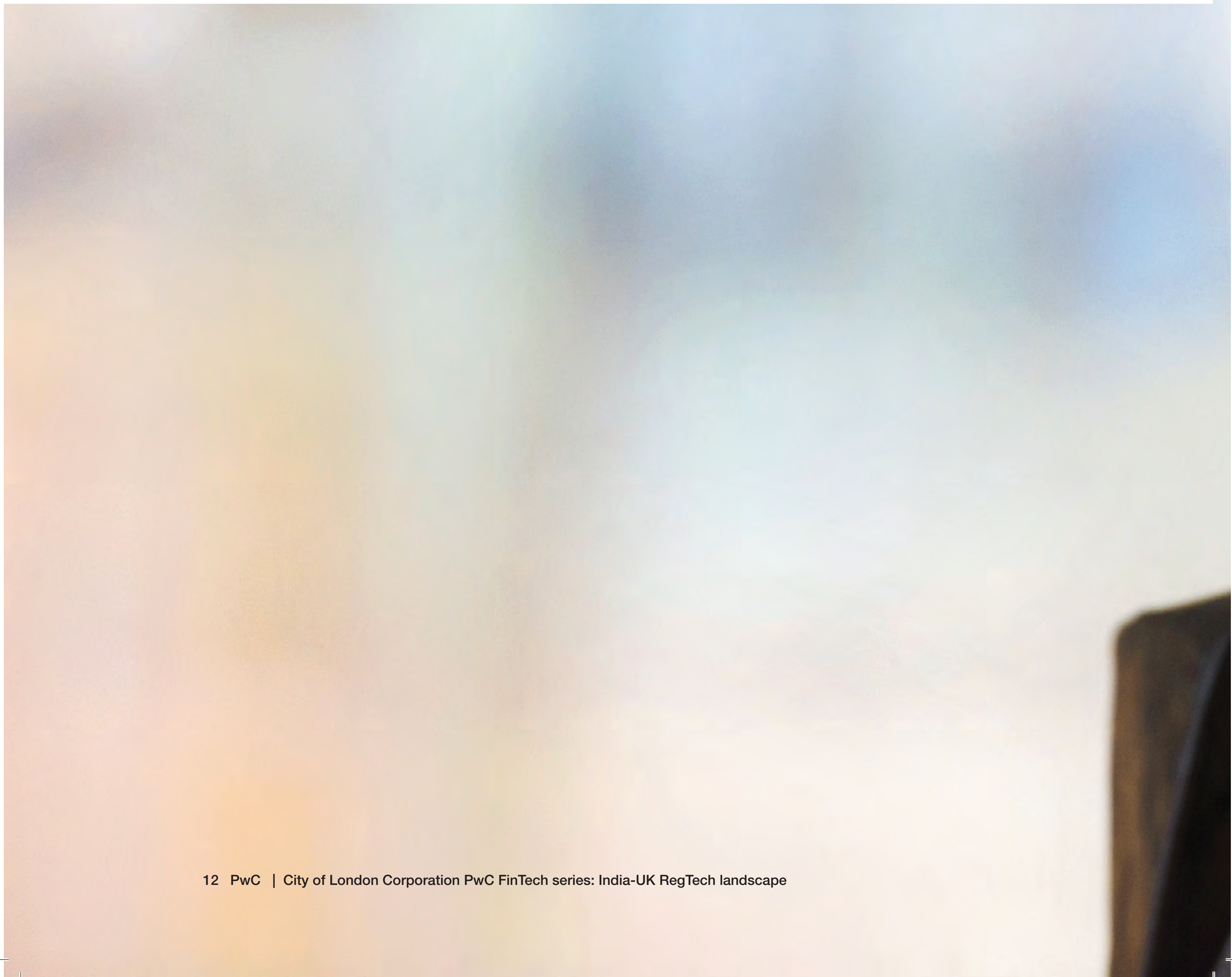


7 https://www.refinitiv.com/content/dam/gl/en/documents/reports/regtech-2020-and-beyond.pdf

8 Section 1, 'About RegTech details', https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/regtech-a-new-disruption-in-the-financial-services-space.html

Key takeaways

- RegTech firms should emphasise implementation propositions in the mainstream system of financial services firms. Finding effective ways of understanding, approving and deploying technology is a puzzle which needs to be resolved at the earliest.
- Firms will have to rethink and redesign their existing compliance models to be more cost-efficient and sustainable in the long run considering the complex and ever-changing regulatory environment within which they operate.
- Regulators, on the other hand, need to embrace SupTech to upgrade their supervisory and risk-monitoring capabilities. Regulators in the UK are constantly looking at how they can apply technology to their own processes. The Financial Conduct Authority (under its Global Financial Innovation Network [GFIN]) is exploring how technology can make it more efficient and relieve the burden of firms across geographies. It has sought the views of firms and holds events to explore potential innovations. The RBI should also look to leverage from such best practices in pursuing SupTech.
- Broader collaboration between regulators, end user firms and RegTech players through new modes of partnership needs to be the way forward for successful implementation of RegTech.
- Embedding a digital mindset will require firms to change their business practices and acquire additional skills in data science. This is a long-term effort but firms can start moving in this direction.
- Technology service providers emerge as the link between regulators and market participants. Leveraging new and emerging digital technologies can provide the necessary tools and platforms to achieve the long-term objectives of the relevant stakeholders.



3 | Evolution of RegTech and SupTech – global landscape

Post the global financial crisis, there has been a sweeping number of regulatory changes and comprehensive reform of the financial regulatory architecture across the globe. The regulations that were put in place after the financial crisis forced banks to keep their banking and trading books in check and revisit their business models, keeping consumers at the heart of their business. A flurry of revised business models that are less risky, along with products and services based on technological innovations, have been developed across the globe. This has created enormous potential for greater competition, customer experience, operational efficiency through cost savings and improved risk management.

The figure below highlights the growing number of regulations across the developed capital markets in the US and UK since early 2000. It clearly shows an exponential increase in the number of regulations since 2000.

2000	2008	2012	2016	2020
• Sarbanes Oxyley Act • Basel I	• Foreign Exchange Tax Compliance Act (FATCA) • Financial Markets Authority (FCA) • Investor Protection and Commodity Exchange Act	• Basel 3 (BCBS 239 - Risk Aggregation) and COREP • Dodd Frank and Market Abuse Regulation • Capital Comprehensive Analysis and Review	• Markets in Financial Instruments Directive (MiFID) II, Global Data Protection Regulation (GDPR), International Financial Reporting Standards 9 • Capital Requirement Directive and Senior Management Regime	• Basel IV, Payment Service Directive II, Anti Money Laundering Directive IV and Fundamental Review of Trading Book (FRTB)

The most direct and obvious effect of the growth of regulation has been complexity in terms of increased cost of compliance and regulatory fines for non-compliance for firms. The headcount in customer-facing roles has been decreasing, and there has been a steady increase in the number of bank staff working in compliance and control roles.

The cost of compliance and supervision and the cost of satisfying new customer requirements have impacted financial institutions and, as a consequence, firms are looking at innovative ways to reduce their cost.

It is estimated that the governance, risk and compliance (GRC) cost in the UK is expected to account for 15–20% of the 'run the bank cost' and close to 30–40% of the 'change the bank cost' by 2022.[9]

Some key statistics from across the globe on the compliance initiatives and fines paid by banks in US dollars are given below. The major proportion of the costs are incurred in the US and the UK.

9 https://pwc.blogs.com/fsrr/2018/11/what-are-the-drivers-to-regtech-adoption-in-financial-services.html

15–25% increase in number of staff working on compliance initiatives

More than **USD 300 billion** paid by banks in regulatory fines

USD 780 billion spent on compliance by financial institutions

USD 100 billion is expected to be spent by RegTech firms by 2022

Source: PwC Fintech Insights (https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/regtech-a-new-disruption-in-the-financial-services-space.html)

The key driver for rising cost of compliance is the number of regulatory changes introduced, especially in the UK and the US, as indicated by the fact that each week an average of 45 new regulatory related documents are issued. It is therefore safe to assume that this level of changes in the regulatory environment is now the 'new normal' and financial services firms must address regulations in this context.

Over the same period that the regulatory burden grew so rapidly, advances have been made in the area of RPA, ML and AI over the last three to four areas across the US, UK and India. Data storage has become cheaper and AI techniques for data learning are finally gathering momentum. Such advances are expected to continue in the coming years and RegTech is expected to transform financial sector regulatory compliance in an innovative way.

The evolution of RegTech can be traced back to 1990, when financial institutions began to introduce newer technologies to monitor and analyse risks.

1

RegTech 1.0 – the period between the 1990s and 2000s – is when financial institutions began to introduce new technologies to monitor and analyse the risks of specific regulations or processes, giving birth to the current quantitative risk management. practices

2

Over the past decade or so, RegTech 2.0 tools have helped companies to comply with rules and improve supervision activities with the help of applications that focus on KYC by improving consumer protection and diligency.

3

The industry is on the verge of RegTech 3.0 – moving from KYC to gaining more access to data usage as financial institutions have started to view risk and regulatory issues as data issues that can be resolved with the help of technology

The need for RegTech

RegTech consists of a group of companies that makes use of cloud computing technology with the help of software as a service (SaaS) to enable businesses to comply with the regulatory norms effectively and in a cost-effective manner.

Increased cost of compliance

Globally, banks are spending in excess of USD 300 billion per year on compliance initiatives and regulatory requirements. New regulations like MiFID 2 and PSD2 has put further onus on banks to transform their existing systems. This has raised a serious concern about the profitability of banks as they need to increase their compliance headcount to tackle this uncertainty.

Regulatory fines

The sheer volume and complexity of regulations have led financial service providers to focus on compliance rather than innovation. In addition, due to regulatory uncertainity underlying the development of new products and deployment of pioneering technology, firms must adopt a balanced approach in integrating regulations with technology.

Narrow margin for error

Growing fines and the cost of implementing new regulations can pose a serious challenge to the sustainability of smaller bannks. In addition, with no margin for error, as regulators are imposing huge penalties for non-compliance, the operating capital required for smaller banks is further strained.

The financial system is on the verge of moving from being a KYC principle to a Know-Your Data (KYD) principle.

The need for SupTech

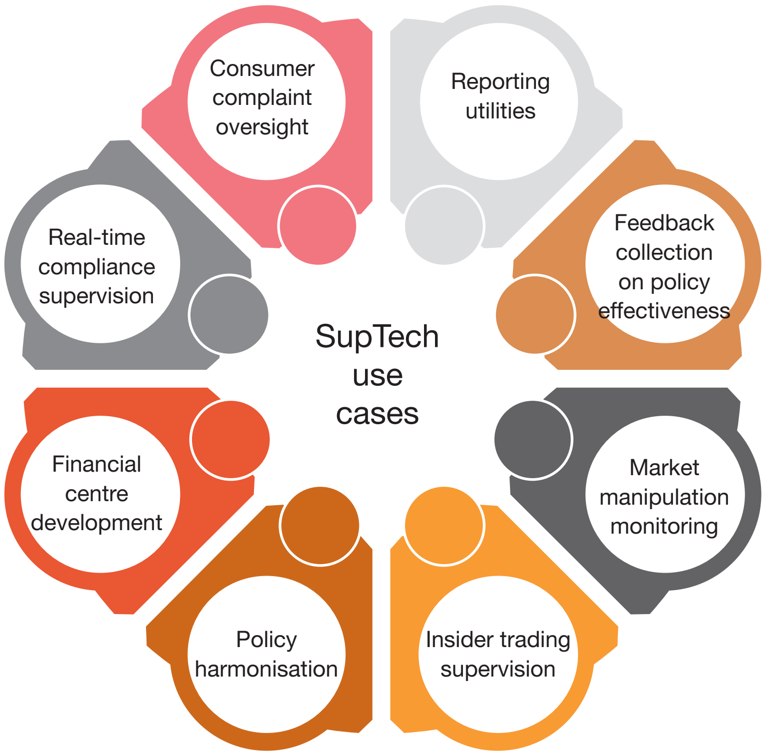
At the same time, SupTech is starting to tackle challenges faced by supervisory changes.

The use of SupTech is currently in two main areas: data collection and data analytics, which allows supervisors to shift to a more data-centric approach, enabling authorities to gain more insights in exercising their mandates.

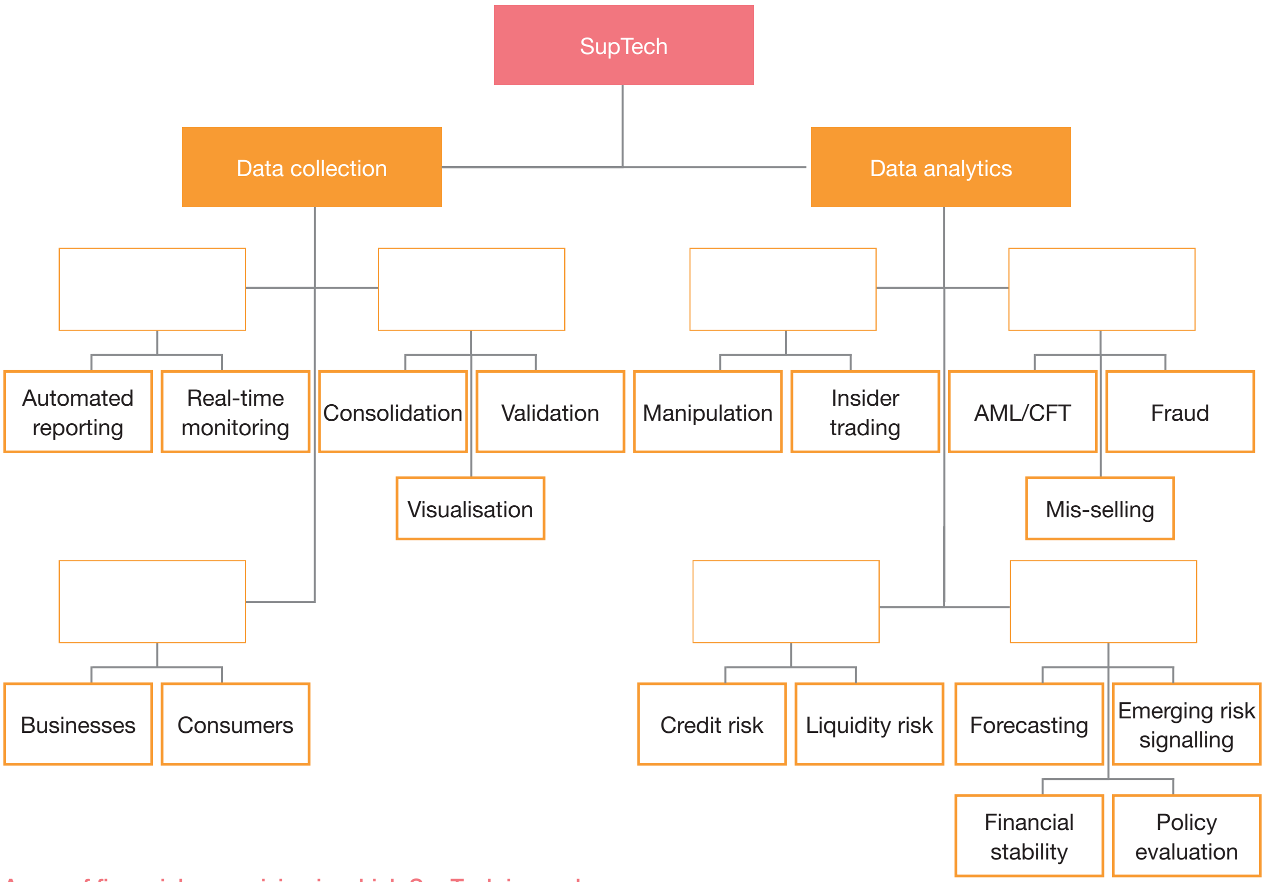
Deploying RegTech will allow regulators (SupTech) to take a more data-driven and predictive approach to supervision and facilitate a shift from a retrospective view to a more forward-looking approach.

SupTech can assist in reducing the time to report, collecting financial and transactional data at a much more granular level, expanding the data utilised beyond the institution-reported data, and reducing or eliminating manual processes in the aggregation and collection of data.

Authorities like the European Central Bank (ECB) and US Federal Reserve are using natural language processing (NLP) to help them identify financial stability risks.



Regulators in the UK have been exploring how best to analyse large data sets to study suspicious behaviour. AI/ML tools are helping to identify cases of collusion involving manipulation of share prices or circular trading to generate a false impression of market interest.



Areas of financial supervision in which SupTech is used

For instance, SupTech supports:

1

Data input approach

The reporting institution packages the business data in a standardised and granular format as required by the supervisors and sends it to a central repository. No aggregation is performed prior to reporting, which saves the cost of compliance as opposed to a template-driven approach thus avoiding error or loss during aggregation.

2

Data pull approach

Non-standardised data is sourced directly from the systems by an automated process trigger and controlled by the supervisory agency and later standardised using the SupTech solution.

3

Real-time access

Monitoring transactions on a real-time basis rather than at a pre-determined reporting period can help develop sophisticated and data-intensive approaches to supervision.

4

Regulatory submission and data quality management

New SupTech products are offered specifically for submission and data quality management which could benefit supervisors in jurisdictions where manual procedures are involved.

5

Inputs from unstructured data

SupTech is creating opportunities for supervisory agencies to collect and analyse unstructured data with greater efficiency, which could relieve supervisors of time-consuming activities like reading numerous PDFs files and searching the Internet (corporate websites, marketing materials, social media and information created internally at the supervisory agency, which are in unstructured format). Currently, regulators across the UK and US are actively involved in using AI and ML to identify potential challenges around trade surveillance, which has increased the efficiency of manual checks by around 40%.[10]

SupTech promises to transform the regulatory process by developing machine-readable regulation which can help automate compliance solutions impacting the business.

10 https://www.pwc.co.uk/services/forensic-services/insights/surveillance-survey-2016.html

Technologies supporting RegTech

Technology allowing the creation and verification of transactions on a network instantaneously without a central authority. Used to track and speed up the transaction life cycle and cut costs while lowering the risk of fraud

Real-time processing tools/big data techniques to create value out of the massive amount of available heterogeneous and textual data

Use of ML and behavioral analysis that offers the potential of powerful data mining and simulation techniques for enhanced decision making and AI

Solution that looks to identify patterns of activity, such as unusual use of communication, non-routine patterns of leaving the office, non-completion of training or missing mandatory leave, which may flag potential conduct concerns

Computer programs to enforce the negotiation or performance of a contract. Smart contracts aim to provide security that is superior to traditional contract law and to reduce other transaction costs associated with contracting through automation

New technical solutions for user-friendly data presentation, allowing users to make to make sense of and speeding up their understanding of complex, heterogeneous and abundant data

Benefits of RegTech

We have summarised both the short-term and long-term benefits of using RegTech solutions to address the ever-increasing regulatory requirements below.

Short-term benefits of RegTech

Reduced cost of compliance

- RegTech can help reduce the number of end user computations by automating the key business processes, thus reducing the need for manual and duplicate checks. In addition, it can effectively simplify and standardise the compliance process by helping end users with identifying the key risk in business process.

Advanced data analytics

- The use of advanced data analytics can help firms comply with various regulatory information on a proactive basis, thus reducing risk.

Sustainable and scalable solutions

- As business grows and firms need changes, the rigid legacy platform can be replaced by a more sustainable and scalable RegTech solution which allows for more flexibility.

Risk and control framework

- RegTech solutions associated with various processes of on organisation like enterprise risk can assist in linking information and risk frameworks seamlessly.

Long-term benefits of RegTech

Positive customer experience

- RegTech can help identfy frauds early on in the process and reduce the number of manual iterative processes the customer has to undergo, thus ensuring compliance.

Improved governance

- Wider governance, identification of risk and transparency in the reporting process can be identified, thus ensuring confidence within the board and shareholders.

Increased market stability

- Technologies that foster growth as well as promote customer experience can be used to protect the financial health of institutions and prevent disruption of market agility and integrity.

Enhanced regulatory reporting

- Enhanced ability to meet the regulatory requirement in a seamless and timely manner.

4 | The RegTech story in India so far

Introduction

In today s competitive environment and post the global financial crisis of 2008, regulatory costs are forcing financial services firms to get leaner and more innovative, leading to an increasing interest in RegTech. Regulators are increasingly being challenged to ensure social and economic outcomes while reducing the compliance cost of running the business. Over the last 10 years, regulators in India have demanded more information and stricter compliance from financial services firms. Whether it is the global financial crisis or the Asian financial crisis, there is a deep interest for regulators to ensure that financial services firms are meeting the standards to ensure transparency and customer protection. This section highlights the evolution of RegTech in India and also presents the various government initiatives, opportunities and challenges for RegTech firms and regulators to ensure and comply with the requirements.

Evolution of RegTech and SupTech in India

As noted earlier, India has three primary financial services regulators—the RBI, SEBI and IRDAI. The emergence of RegTech and SupTech in India for regulators and firms is fuelled by the need to monitor:

1. Risk and compliance monitoring, including detection of financial crime and fraud
2. ADF for streamlining the existing regulatory reporting structure
3. Protecting the interests of customers through data storage and data privacy laws

The increasing push by the Government of India to focus on digitisation, including robust compliance, has resulted in firms shifting to alternative sources to reduce their cost of compliance. Since 2010, the RBI had been actively involved in spearheading ADF reporting from banks to capture, control and monitor all the prudential data from firms on a real-time basis. Before 2010, regulatory reporting to RBI was bespoke, where firms were required to submit various reporting templates as per the prescribed timelines.

The ADF reporting requirements gave rise to a number of RegTech firms in India. In addition, the introduction of Aadhaar for all sections of society for KYC, data privacy and storage laws, and AML protection norms has led to technology being the key force for change in India.

In addition, SEBI has taken various steps to support technological innovations like starting screen-based trading, nationwide trading systems, and adoption of algorithmic and machine-based trading, including considering trade surveillance using AI.

Some of the initiatives taken by the IRDAI are starting digital distribution channels, establishment of innovation labs, development of advanced statistical models, and mitigation of pricing risk by automating the underwriting process based on data collected for both life and non-life insurance.

The Indian RegTech landscape has seen tremendous growth in the last few years. The impact of FinTech solutions can be seen across retail payments, retail and MSME lending, cryptocurrencies and blockchain-based settlement.

The table below highlights the growing interest in technology in various segments.

Areas	Segments	Description
Credit	1. Peer-to-peer lending 2. Crowdfunding 3. Credit scoring platforms 4. Online lenders – NBFCs using their own platform	All forms of lending, including peer-to-peer lending, crowdfunding and equity funding platforms
Payments	1. M-wallets, merchant payments and PoS services 2. Cryptocurrencies	Services that enable transfer of funds for various cases (person to person, person to merchant and government to person)
RegTech	1. Big data 2. Blockchain 3. Customer onboarding (CKYC)	Utilise the data to analyse the spending pattern of customers, providing alternative methods of underwriting to serve people with limited credit data
InsurTech	1. Insurance aggregator 2. Internet of things, wearables and kinematics	Small business and usage-based insurance
Investment management	1. Robo-advisors and smart beta 2. Online financial advisor	Use of technologies to advise mass affluent segments through governed rules and investment strategies

RegTech and SupTech are evolving at a rapid pace in India with the increased push from the Government of India to go digital through various initiatives.

Regulatory sandbox in India

The Government of India has formed a steering committee to consider various issues related to the development of RegTech with a view to making RegTech-related regulations more flexible and, at the same time, pave the way for enhanced entrepreneurship. The steering committee will also invite participants from the private sector. The committee will develop suitable regulatory interventions to drive the growth of RegTech players, along with an appropriate framework for a 'Regulatory Sandbox/Innovation Hub' within a well-defined duration. The Institute for Development and Research in Banking Technology (IDRBT) is well placed to create a regulatory sandbox in collaboration with the RBI.

Some of the initiatives taken by the RBI, SEBI and IRDAI for promoting a regulatory sandbox in India are:

RBI

The IDRBT established by the RBI can work and maintain and run the regulatory sandbox for studying issues related to FinTech and digital banking. In addition, the RBI is also working on a regulatory sandbox for financial technology and setting up data science labs to keep pace with the innovations in the digital lending space.

SEBI

SEBI has called for a working paper on the study of the regulatory sandbox concept and is planning to come up with a policy on the sandbox framework, which will allow companies in the capital markets space to experience their innovations in a closed environment.

IRDAI

IRDAI has set up a panel to dwell on the key regulatory issues FinTech poses across the insurance value chain and study practices followed in the financial services sector. The launch of the first insurance plan in April 2017 under the regulatory sandbox approach by India's First Life Insurance Company has inspired and set the context for insurers to launch various products before their approval stage. This scheme is focused on those working in the unorganised sector and earning seasonal incomes, which allows them to buy multiple pools of single insurance plans on one account and then pay a lump sum premium.

Regulatory sandbox across the globe

The idea of a regulatory sandboxes came from software development; it was conceived to be a type of testing that runs in isolation from the production environment. Sandboxes have been adopted by a large number of financial services regulators to replicate key components of software development. A sandbox basically involves creating an environment which allows for limited testing with restrictions on what firms can and cannot do.

The growing interest in regulatory sandboxes across the globe is evident from the figures below.

15% The number of RegTech firms who have regulatory sandboxes

50% The number of FinTech firms supported by the FCA

80% The number of regulatory sandboxes launched in Asia

Examples of major FinTech regulatory sandboxes across the globe

Selected hub	FinTech regulations/standards	FinTech regulatory sandbox
Hong Kong	Stored value facilities (SVFs) to allow payment services like P2P and mobile wallet, guidance for online distribution and advisory platform	FinTech supervision sandbox by HKMA
China	Regulation on P2P lending (student loans, advertisement and interest rate cap), regulation on third-party payment	Analysing the potential of a FinTech regulatory sandbox
Singapore	Regulation on P2P lending, consultation paper on digital advice by MAS	FinTech regulatory sandbox by MAS
Malaysia	Regulation on P2P lending and crowdfunding	Financial regulatory sandbox by Bank Negara Malaysia (BNM)
Indonesia	Regulation on P2P lending	Regulatory sandbox by Otoritas Jasa Keuangan (OJK) and Bank of Indonesia (BI)
Thailand	Regulation on P2P lending and crowdfunding, relaxation of fiduciary duties for independent investment advisors	Regulatory sandbox by Securities Exchange Commission (SEC)
Australia	Investment solutions by robo advisory, P2P lending, distributed ledger technology and access to customer data	Innovation hub by Australian Securities and Investments Commission (ASIC)
Korea	Regulation on P2P lending and crowd funding	Robo advisor test bed hosted by Korea Securities Computing Corporation (KOSCOM)
USA	Regulation on blockchain and cryptocurrency	Regulatory sandbox by Consumer Financial Protection Bureau (CFPB)

The FCA sandbox has clearly delivered value to firms across the spectrum and provides an underlying technology and platform in a live environment that helps firms better understand and fine-tune their business models.

RegTech initiatives by the government in India

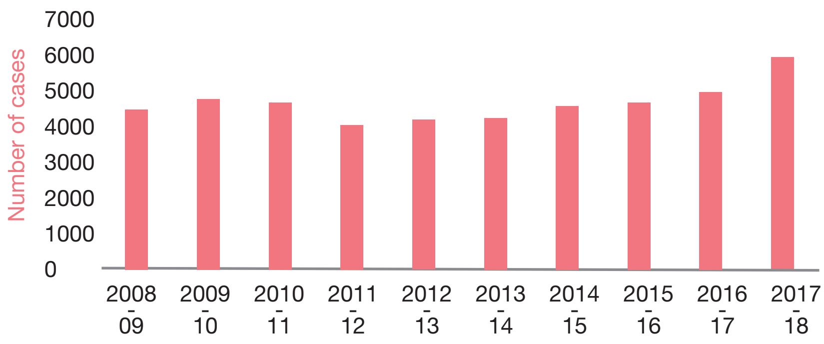
Initiatives by the RBI

The number of fraud cases reported by banks in India increased to around 6,000 over the last 10 years. In 2017–2018, as per RBI statistics, public sector banks accounted for 93% of the amount involved in frauds, while private sector banks accounted for 6%. IT system-related frauds accounted for around 75% of total frauds involving lending transactions, while frauds in deposit accounts hovered at around 3%.

Such frauds costed the Indian economy approximately USD 410 billion. The exponential jump in frauds was on account of high-value and high-volume frauds in the gems and jewellery sector which affected the public sector banks (PSB). It was followed by the manufacturing and aviation sectors.

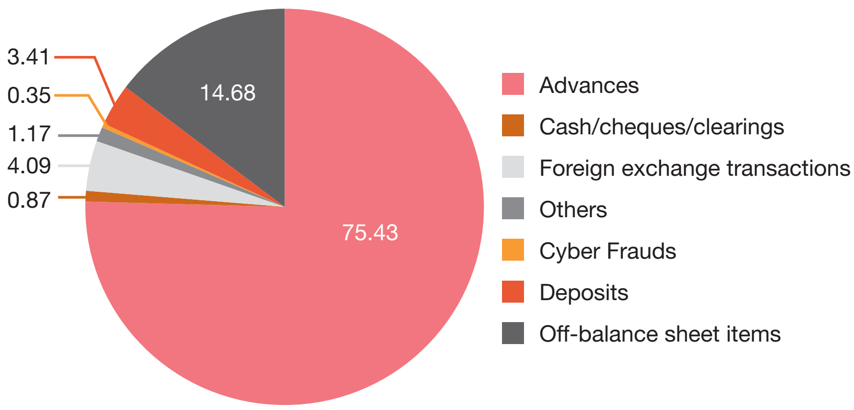
In view of the large divergence observed and the increased provisioning of loan books in banks due to frauds, the RBI, in co-ordination with government of India, launched a series of initiatives to help protect consumer interests and also collaborate with various technological players to work together and ensure adherence to the regulatory guidelines.

Number of fraud cases



Source: RBI supervisory returns

Composition of outstanding banking frauds



Source: RBI supervisory returns

1 Launch of central KYC system and simplification of KYC norms

A common Know Your Customer (KYC) form has been introduced for availing all types of products and services offered by financial service providers under the jurisdiction of the RBI, SEBI and IRDAI. The customer needs to fill up this form only once, after which he/she is assigned a 14-digit identifier to be used while availing more products and services of the same or other providers. Financial service providers are expected to upload the data from this common form with a central agency called the Central Registry of Securitisation Asset Reconstruction and Security Interest of India (CERSAI). This move by the RBI will help keep track of the special mention accounts (SMAs) and, at the same time, help trace the details present in a centralised repository.

A blockchain-based RegTech application can be used to regulate the KYC process which would include:

1. Identifying and verifying client information
2. Screening high-risk individuals
3. Determining the inherent risk of customers
4. Keeping track of customer information
5. Compliance with tax authorities

2 AML norms

The Government of India launched the Prevention of Money Laundering Act in 2002 to prevent banks from being misused intentionally or unintentionally by criminal elements for money laundering or terrorist-financing activities. An excerpt from the regulation is given below:-

"Banks were advised to follow certain customer identification procedure for opening of accounts and monitoring transactions of a suspicious nature for the purpose of reporting it to appropriate authority. These 'Know Your Customer' guidelines have been revisited in the context of the Recommendations made by the Financial Action Task Force (FATF) on Anti Money Laundering (AML) standards and on Combating Financing of Terrorism (CFT). Detailed guidelines based on the Recommendations of the Financial Action Task Force and the paper issued on Customer Due Diligence (CDD) for banks by the Basel Committee on Banking Supervision, with indicative suggestions wherever considered necessary, have been issued. Banks have been advised to ensure that a proper policy framework on 'Know Your Customer' and Anti-Money Laundering measures is formulated with the approval of their Board and put in place."

From time to time, the RBI has issued specific guidelines on AML standards, including combating the financing of terrorism.

Circular 2013-14/94 of the RBI stipulates the following AML/KYC norms:

- Branches should keep in mind that the information collected from the customer for the purpose of opening of an account is to be treated as confidential and these details are not to be divulged for cross-selling or any other such purposes.
- Branches shall ensure that any remittance of funds by way of demand draft, mail/telegraphic transfer or any other mode and issue of travellers' cheques for value of INR 50,000 and above is effected by debit to the customer's account or against cheques and not against cash payment.
- Branches shall ensure that the provisions of Foreign Contribution and Regulation Act, (FCRA), 1976, as amended from time to time and wherever applicable, are adhered to strictly. They shall desist from opening accounts in the name of banned organisations and those without registration. In this connection, branches shall be guided by the circulars issued from time to time.

3 Digital identity

The RBI has approved the adoption of Aadhaar-based biometric authentication which allows bank accounts to be opened through the e-KYC process. However, as per a recent directive from the Supreme Court of India in October 2018, which upholds the constitutional validity of Aadhaar scheme, the 12-digit unique identification number will be mandatory for filing income tax returns and applying for a Personal Account Number (PAN) card. All other financial services and activities do not need to be mandatorily linked with Aadhaar. This can be seen as a major victory by many who believe that the use of Aadhaar for accessing confidential information like bank account details can result in breach of data trust and privacy. India is one step closer to having its own data protection law after the Srikrishna Committee submitted its report on data privacy and protection titled the 'Personal Data Protection Bill, 2018'.

Evolution of data privacy across Asia

2000 — India: Focus on data protection and privacy through the Information Technology Act (IT Act)

2000 — Japan: Act on the Protection of Personal Information (APPI) passed

2010 — China: Tortious Liability Law

2015 — China: Criminal law, as amended by its the Ninth Amendment.

Japan: Extensive amendment to the act on the Protection of Personal Information (APPI)

2017 — India: Privacy declared as a fundamental right. The draft data protection bill and DISHA opened for public comments

China: General Provisions of the Civil Law of the People's Republic of China adopted

4 Automated data flow

The RBI launched the Automated Data Flow (ADF) project to ensure accurate regulatory reporting in India. Banks in India currently submit 222 regulatory reports at different frequencies to the RBI. These reports can be categorized as

- Basic statistical return
- Department of Banking Supervision (DBS) returns analysis
- Statutory returns analysis
- Delinquency and collections
- Financial statement analysis
- Risk management
- Treasury
- Reconciliation
- Foreign exchange and international operations
- Fraud
- Advances
- Deposits

These 222 reports, which were prepared manually until 2010, increased the potential for inaccurate reporting by banks. As part of the ADF project, the RBI asked banks to build a central repository of data (CDR) to ensure data flows into a strategic data warehouse from their core banking systems and other key applications. Once the data flows in from the core system to the central warehouse, auto-generated reports can be produced and monitored by the RBI, reducing manual intervention.

5 India Stack

India's recent multi-level strategy to support FinTech evolution and innovation is an example of a RegTech initiative. It is referred to as India Stack and involves four levels.

- The first level (presence-less) is a national system of biometric identification. Identity is an important aspect of promoting financial sector access. For this, biometric identification cards were created. From 2010 up to May 2016, over 1.1 billion Aadhaar cards have been issued. However, as indicated earlier, this process would need to undergo a change as Aadhaar linkage cannot be made mandatory document for all transactions as per the Supreme Court directive in October 2018. CKYC, launched by the RBI, can serve as an alternative, but that would require the investor/individual to register with the CERSAI for the first time physically with all supporting documents like passport, PAN card, voter ID and driving licences.
- The second level (paperless) is the establishment of bank accounts as part of the financial inclusion scheme in order to deliver national services such as pension, health, and other welfare payments and transfers. Over 300 million bank accounts have been opened in India as part of this process.
- The third level (cashless) is a common payment interface (Unified Payment Interface [UPI]) to enable payments by anyone through a common system supported by the RBI.
- The fourth level (consent) is a series of e-KYC) initiatives that will allow individuals to keep copies of documents needed to meet KYC requirements. This will give individuals control over which financial institutions can access their data.[11]

Vision
Presence-less
• Unique digital biometric identity
Paper-less
• Electronic documentation protected by digital signature and storage
Cash-less
• Single interface to all interconnected payments platform
Consent
• Consent-enabled data sharing framework

Impact		
1000% efficiency gain for end-to-end account creation:		
	Bank	Prepaid card issuer
Days	14–30 days	1–2 days
Time	70–90 mins	6–20 mins
Costs (USD)	USD 5.2 – 8.7	USD 0.34 – 1.6

Source: https://k-learn.adb.org

11 https://k-learn.adb.org

Regulatory technology is still nascent in India. The recent push by the Government of India towards the use of digital services has provided the necessary impetus for firms to reconsider their business strategy and start working with technology players to gain a comparative advantage in the long run.

Opportunities and challenges faced by RegTech players in India

Key opportunities in the Indian RegTech space:

Government push towards digitisation

- The Government of India's ongoing digital initiatives and launch of a single window clearance platform in recent years have put considerable focus on technological companies and start-ups. India has seen 10x growth in digital lenders in the last three years, paving the way for increased levels of regulation and creating a huge market for technology-based solutions. In addition, post demonetisation in 2016 and GST roll-out in 2017, firms are trying to automate their manual tasks in order to avoid operational errors, and are seeking assistance from more RegTech players in order to develop complete end-to-end solutions that integrate processes across various departments of an organisation as opposed to standalone solutions. Firms have seen a 400–1000% increase in their digital transactions and following the launch of GST, with only half of the total number of registered firms filing their applications online,[12] RegTech players can collaborate and ensure seamless integration to help users comply with the guidelines.
- The use of a regulatory sandbox to test new products and the entry of insurance underwriters and investment managers into financial services markets would induce more and more RegTech players to venture into this space to showcase capabilities around solutions in the risk and compliance area for financial Institutions. Considering the regulatory sandbox is still at a very nascent stage in India and the various regulatory bodies are framing policies on the use of sandboxes for development and testing, the authorities are still mooting the establishment of a working group and white paper on the use of regulatory sandboxes in India. Currently, 10–15% of private banks in India are in the process of implementing regulatory technology using a regulatory sandbox approach.[13]
- In addition, in Para (75) of the Budget Speech 2018–2019, it was announced that a separate committee would be set up under the chairmanship of the Secretary, Department of Economic Affairs (DEA), Ministry of Finance, to analyse the regulatory regime, which has proven to be an impediment to the growth of FinTech in India, and also consider international cooperation with countries like Singapore, the UK and China. This is expected to open up opportunities for RegTech players in the financial services to foray into the Indian market space.
- The Union Cabinet chaired by the Honourable Prime Minister of India has also approved the DNA Technology (Use and Application) Regulation Bill in 2018. The primary purpose of the bill is to expand the application of DNA-based forensics technologies to support and strengthen India's justice system. These initiatives by the Government of India show an increased commitment towards the need to address the regulatory barriers around FinTech.
- The introduction of ADF in 2010 by the RBI to promote more accurate regulatory reporting with the aim of maintaining a consolidated strategic data warehouse, launch of Aadhaar-based adoption for CYKC, and proposed data storage and privacy laws have created a plethora of opportunities for RegTech players to develop innovate solutions around issues related to data quality used for reporting.

Huge untapped potential

- Financial institutions in India are always looking to consume structured and unstructured data to generate better customer insights. Recent regulations like the storage of Aadhaar data, e-KYC norms and localisation of data storage require strategic data management methods. To store and analyse the data, huge computational power as well as compliance with enormous governance and regulations from various regulatory and governing bodies are necessary. As per SEBI, there are 30 circulars (new/amendments) issued by the RBI for banks and financial institutions to adhere to the KYC norms. To meet regulatory requirements, banks must access, store and process data on a huge scale. Newer regulations are pushing banks and brokers to take a more holistic view of the entire process. Enabled by data, RegTech solutions will make regulatory filings and compliance more efficient, transparent and useful for everyone who generates, collects and consumes them.
- SMEs in India produce 50% of the total manufacturing output in India and yet contribute to only 17% of the country's GDP.[14] The SMEs are expected to further shrink in India due to their struggle with understanding and implementing regulatory know-how in India. Lack

12 http://fintech.global/globalregtechsummit/global-regtech-continues-to-grow-with-over-500m-invested-in-q1-2018/

13 PwC research

of technological know-how, manual record keeping of all transactions and a dearth of relevant skill sets may all be considered as factors contributing to the lack of compliance culture in SMEs. Use of technology for regulatory compliance is a crucial function that will require SMEs to integrate technology with their existing applications. RegTech players can help to automate the compliance management system by identifying all the applicable and relevant compliances, assigning tasks that are due, and monitoring the progress of tasks and reports. This can help build a huge comprehensive library of acts and laws and a complete repository of the required documents with a centralised system that tracks all processes.

- In India, 70–80% of all banks continue to use legacy systems to cater to a host of new regulatory requirements and new product developments for individual customer and institutional investors. These legacy systems still operate independently and their technical integration to ensure consistent data flows is a challenge. Lack of standardisation of data between multiple systems and multiple data transformations have prevented banks from gaining a 360 degree view of customer feedback. This could also be attributed to resistance from management towards phasing out existing systems. As a result, operational errors have increased due to increased end user computation. The use of advanced technologies like AI, RPA and data mining can help banks and financial institutions get better customer insights and, at the same time, reduce the number of mundane operational tasks by automating them.

Key challenges in the Indian RegTech space:

Budget constraints

- Banks and financial institutions in India are not making enough returns on their investments (due to a large portion of their assets turning into non-performing assets [NPAs]) that shareholders require. As of 2018, the total NPAs of India's public sector banks stood at INR 8.30 lakh crore (around GBP 90 billion).[15] With growing NPAs and the increase in regulatory requirements, banks spend a large portion of their discretionary budget on complying with the regulatory norms. These challenges continue to escalate, and banks have to decide between implementing a strategic system vis–à-vis continuing with their existing system. Many financial institutions may resist the temptation of automating their end–to-end systems.

IT security approvals

- The financial services industry handles sensitive information about individuals and enterprises. With new technologies, more data is available in electronic format which makes it easy to generate customer insights and increases susceptible to security breaches. As more and more services go online, data security is emerging as a new threat and challenge for most of the RegTech players. This challenge is even more serious for the Risk and Compliance department, which deals with a lot of sensitive financial information of customers. IT security approvals from the Chief Technology Officer to enable the integration of new systems is proving to be a major challenge for banks in areas like risk and compliance, where access to data is limited to only a few select individuals.

Lack of integration with the core banking system (CBS)

- The recent fraud case in India involving one of the largest public sector banks in India has highlighted a plethora of issues, one of them being the lack of integration of various systems with the CBS. The CBS system acts as a central repository where all data is stored, right from origination to the settlement process of an individual. The lack of integration can be attributed to the fact that most of the CBSs use legacy platforms which do not allow third-party integration with any other technology. This lack of integration with the CBS system (around 70–80% of the firms are still plagued by the legacy system issues) has resulted in information being manually fed into the CBS from other systems which are prone to operational errors and fraud.

Continuous use of outdated software exposing the firm to cyberattacks

- Most of the banks in India are reluctant to adopt new technologies and continue to use the existing legacy platforms for all their needs. As a result, there are two issues which arise from a security perspective:
  - The software will no longer receive any update from its developers, thus increasing the vulnerability to cyberattacks.
  - The latest security migrations are not present in the old software, which increases the likelihood of successful exploitation and makes the detection of any exploitation more difficult.

Therefore, it is necessary for firms to be more responsive to the increase in cyberattacks and invest in new technology with better security features which are important when dealing with client-sensitive data.

Data management issues

- Financial institutions and banks have been sitting on a pool of customer data without effectively using it. The increased intensity of data flow along with high velocity and large variety and volumes are raising further concerns around compliance and operational efficiency. Banks and financial institutions have to adopt the latest FinTech and RegTech solutions to mobilise the greater volume of data, resulting in greater inflow/outflow through increased data sharing among various functions for analytical purposes.

RegTech is a niche market and requires a lot of collaboration between RegTech firms and incumbent banks. Unlike FinTech, where there is competition with banks on specific service offerings, RegTech complements the efforts of banks to demonstrate robust risk and compliance at all times.

14 https://www.finextra.com/blogposting/14977/fintech-regtech-and-suptech

15 https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/0FSR_JUNE2018A3526EF7DC8640539C1420D256A470FC.PDF"

5 | The RegTech story in the UK so far

Evolution of RegTech in the UK

Since the global financial crisis of 2008 that severely impacted both the US and the UK, the UK regulators (both the UK PRA and the UK FCA) introduced a series of systemic changes in their existing regulations along, with a flurry of new regulations on prudential risks (e.g. liquidity) and conduct risks to address the lessons learned from the financial crisis. The regulatory requirements were comprehensive and required firms to evaluate the end-to-end impact of regulations at a legal entity level as opposed to any specific business division or function within the bank. The UK FCA introduced certain standards to govern the conduct of investment firms when handling client money and safe custody assets. It is therefore mandatory for the investment firms to have a clear robust client asset management system to control and prevent the occurrence of fraudulent events and reputational damage to the firm.

In such an environment of rising compliance costs, technological advances and increasing customer expectations, emerging regulatory technologies such as RegTech have been heralded as a revolution for financial services firms in the UK looking to manage regulation more efficiently. Expected benefits include an improved customer experience, better business outcomes and the ability to manage risks in a more cost-effective manner. Given the current challenges stemming from manual business activities, poor data quality and a lack of holistic monitoring and risk analytics, it is fair to expect that firms in the UK (similar to other developed capital markets like the US, Europe and Singapore) would be rushing to implement RegTech solutions.

Firms recognise the benefits and opportunities presented by these new technologies, but are reluctant to adopt RegTech solutions due to the technical and organisational challenges of digital implementation. Where organisations are choosing to implement technology, they often fail to achieve the digital dividend that they were seeking. Digital change cannot be built into business as usual—a compelling business case for the transformation agenda needs to be developed and the talent, culture and organisation implications of that agenda must be understood.

As a key element of a financial institution's drive towards digital transformation, RegTech promises to:

- strengthen compliance and mitigate risk
- reduce the fixed cost of compliance and increase efficiencies
- improve protection for customers.

But RegTech can do more than that. Through direct improvements and by freeing resources, RegTech also has the potential to:

- provide valuable business insight
- provide customers with better and faster service
- drive new products and services.

The UK RegTech industry is evolving at a rapid pace (more than 50% of the world's start-ups are located in the UK) and is paving the way for new and innovate ways to bring technology into the compliance area.

We have included below some interesting statistics on the investments made by financial services firms towards its compliance function.

Examples of increased investment on compliance

9,000
Increase in the number of compliance staff in investment firms in London from 2014–2018

56%
Nasdaq Compliance Survey respondents report increase in compliance spending between 2016–2017

67%
Banks expect an increase in compliance budgets to cater to regulatory pressure as per the Thomson Reuters Cost of Compliance Survey, 2017

Source: Frost & Sullivan

The rising need to comply with a host of rapidly evolving regulations led the FCA to set up an incubation centre focusing on innovations and solutions provided for various compliance initiatives by the RegTech and FinTech players.

The UK has been paving the way for a large number of RegTech players with support from the FCA and the Bank of England.

UK's RegTech growth so far

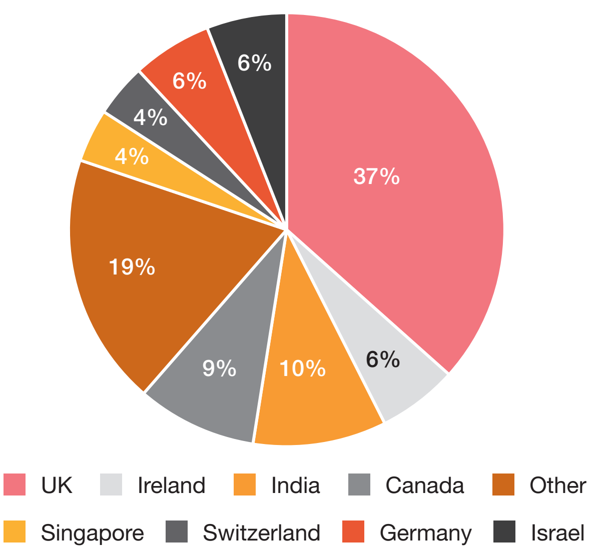
As noted above, the growing number of prudential and conduct regulations in the UK along with digital transformation and cyber risks, frauds and financial crime are significantly driving up the cost of compliance. Financial institutions in the UK have faced an ever-increasing regulatory burden over the past 10 years. The cost of compliance has surged, particularly for global banks operating across jurisdictions but primarily based out of London. Shareholders want management to show they can meet regulatory demands without throwing more resources at the problem. The wider market is challenging.

Margins are slim, interest rates remain low, competition is intense and political uncertainty is feeding economic and financial market volatility. The growing awareness of risks and importance of proactive management of regulatory compliance mean that compliance costs in the UK are expected to double by 2022.

The UK is one of the leading RegTech hubs in the world due to its regulatory regime for FinTech and RegTech start-ups and its facilitation of access to the US, European and APAC financial institutions, with London being the hub for global financial innovation. During the period 2013–2017, there were over 60 UK RegTech start-ups focused on financial services and covering regulatory reporting, risk management, identity management, and control, compliance and transaction monitoring. Being second only to the US, the UK contributed to almost 37% of RegTech deals globally amongst other countries. It is estimated that by 2022, RegTech will be expected to make up close to 25–30% of the total regulatory spending.

Technology entrepreneurs and businesses are attracted to London for its diverse pool of opportunities and unique financial services ecosystem, including banking and capital markets, asset management, insurance and FinTech growth.

RegTech global deal share per country (excluding USA) (2012-2017)

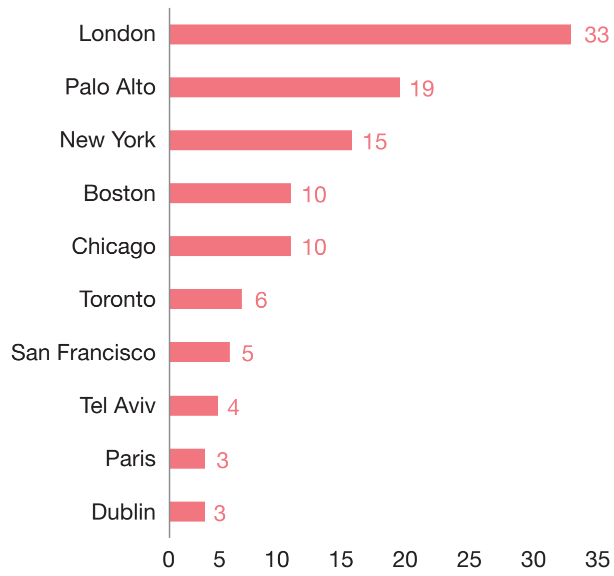


Source: FinTech Global

And though countries like Singapore, India, Canada and Ireland have also attracted increasing investment, the general consensus is that the UK is at the forefront of the RegTech sector.

The chart below highlights the number of RegTech deals per city in 2012–2016 between investment management firms and RegTech players, with London leading with the most number of RegTech deals. These deals indicate successful engagements between RegTech players and the end user firms using the RegTech solutions.

Number of deals per city



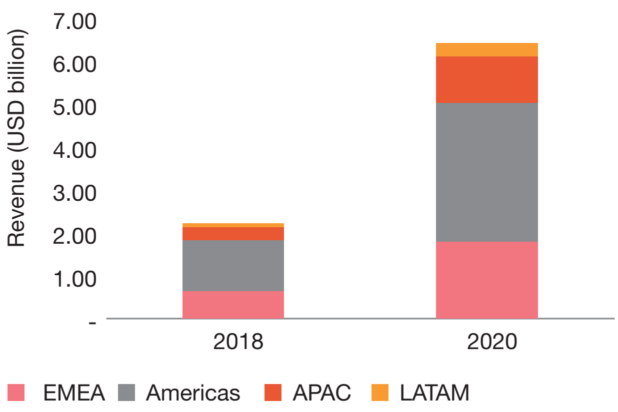
Source: FinTech Global

Since 2014, more than USD 6.1 billion has been raised by RegTech companies across 529 deals across the globe, and investments in RegTech start-ups and firms are expected to double by 2022.[16] .RegTech solution providers, with their composite solutions, can aid companies to meet multiple requirements and across many jurisdictions. For instance, iProov — a UK-based KYC software solution provider is helping governments (including the UK Home Office), banks and financial institutions with their KYC process by providing cryptographic image recognition and an outstanding user experience. Additionally, iProov provides centralised KYC, and AML processes for regulatory onboarding were implemented across various countries and designed to incorporate future potential requirements.

16 https://www.pwc.in/consulting/financial-services/fintech/point-of-view/financial-regulatory-technology-insights-newsletters-vinyamak/february-2018.html

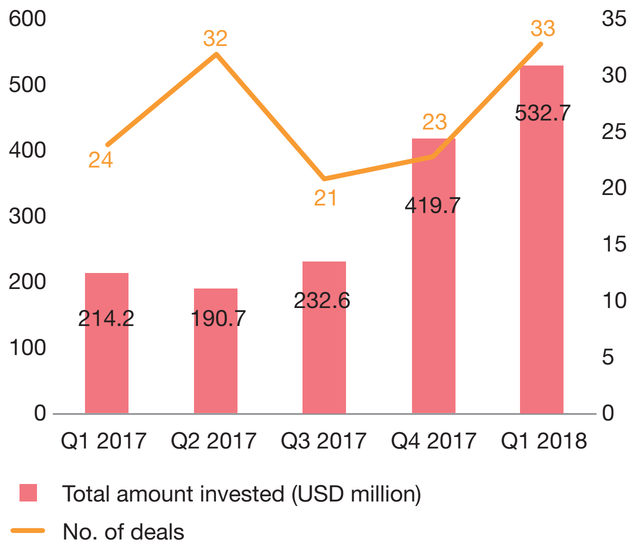
As financial services firms discover the advantage of deploying RegTech solutions, adoption will grow. This is reflected in the expected growth for the industry, as shown below:

Growth potential for RegTech



Source: FinTech Global

Global RegTech investment, Q1 2017-Q1 2018 (USD million, no. of deals)



Source: FinTech Global

Government initiatives for RegTech in UK

The UK regulator has been instrumental in developing the RegTech sector. Steps taken include:

As a vocal participant in the market, the regulator publishes calls for inputs and meetings with RegTech players and organises accelerator programmes to work out ways in which technology can be used to meet the needs of regulated firms.

As 'a convener of new solutions', the UK FCA has hosted tech sprints along with the UK PRA and created regulatory sandboxes to support innovators in navigating regulatory systems and to promote competition in the interest of consumers.

In early 2018, the Central Bank of Ireland announced plans to launch a FinTech innovation hub with the intention of engaging with all firms that are delivering innovation across the financial services sector. Additionally, as part of its efforts, a RegTech round table was organised with University College Cork's (UCC) Governance Risk and Compliance Technology Centre (GRCTC), the UK's FCA and the Bank of England. The round table focused on machine readable and executable regulatory reporting.

The regulator is piloting a series of tests to develop 'machine executional reporting'—in layman's terms, writing law as code—and also looking at how ML technology and NLP technology can be implemented in the regulatory process.

Another technique used often is the regulatory sandbox. Sandboxes are deployed to support the growth of emerging sectors, aid regulators' understanding and provide a controlled setting to test innovative solutions.

On the basis of the same, the FCA kicked off Project Innovate in 2014 with the aim of helping innovators navigate regulatory systems and of promoting competition in the interest of consumers. A regulatory sandbox is supposed to be a safe space from within which businesses can test innovative products, services, business models and delivery mechanisms without incurring the regular regulatory consequences of engaging in the activity. Later, the sandbox would be useful for firms/start-ups looking for clarity on the applicable rules and regulations before starting to test an idea that does not fit in the existing regulatory framework.

The FCA laid some eligibility criteria for using a sandbox:

- The firm should be looking to deliver innovation which is either a regulated business or supports regulated business in the financial services market of the UK.
- It is different than the existing services available in the market.
- There is a benefit to consumers that will continue throughout testing.
- The product really needs to be tested in the sandbox.
- A significant amount of resources are invested in the new solution, the related regulations have been understood and the risks have been mitigated.

In 2016, the FCA received an application from around 69 firms for this programme, out of which only 24 were finalised, covering sectors such as retail banking, insurance, advice and profiling, and initial public offering (IPO). Out of those 24 firms that were accepted, 18 have been confirmed as ready to begin testing by the FCA (HSBC and Lloyds Banking Group are part of these 18 firms). The FCA has not only worked with those firms to agree on testing parameters and building customer safeguards but also conducted tests on a short-term, small-scale basis. The remaining six firms will be considered by the FCA as part of phase 2 of the regulatory sandbox programme.

FCA: Key lessons learnt from the regulatory sandbox

Some of the key observations include:

1. Access to banking system: Failure to offer banking services to some types of customers due to an increased perception of greater money laundering and terrorist financing risk, and some other factors like strategic business decisions, profitability of certain relationships, credit risk assessment and overall compliance cost.
2. Customer acquisition and governance: Acquiring customers is more of an issue observed for smaller firms that do not enter testing with a well-established customer base.
3. Access to customer data and integration with application program interface (API): Smooth integration with APIs sometimes took longer than expected even among firms with experience using new systems and technologies.
4. Meeting conditions for authorisation: In the case of firms which are subject to various business models, meeting the initial regulatory requirements for authorisation and, thus, small-scale testing becomes more difficult.[17]

To cater to the increased need to cater to the regulatory requirements, the FCA held a TechSprint in collaboration with the PRA at the Bank of England to demonstrate the concept of turning regulations into a machine-readable format. TechSprints are two-day events that bring together participants from across and outside of financial services to develop technology-based ideas or proofs of concept to address specific industry challenges. These events help the FCA to shine a light on issues and expand the discussion and awareness of potential solutions. The machine used in the Techsprint was successfully able to simulate a regulatory rule change where a change in the machine-readable regulation resulted in correct information being reported.

Global Financial Innovation Network (GFIN)

The introduction of the GFIN in February 2018 is aimed at a collaborative policy and knowledge sharing aimed at advancing areas such as financial integrity, consumer well-being and protection, financial inclusion, competition and financial stability through innovation in financial services by sharing experiences, working jointly on emerging policy issues and facilitating responsible cross-border experimentation of new ideas.

In February 2018, The FCA published a proposition document on the idea of a global sandbox. Big data, AI and blockchain-based solutions are developed and deployed in many financial markets. As a result, it is imperative that firms begin to build new ways to share experiences and manage the questions that emerge. Financial services must reconsider their existing ways of collaborating and working together in order to balance the potential benefits of innovation and, at the same time, ensuring compliance with the traditional policy objectives.

The GFIN will perform four main functions: act as a network for regulators to collaborate, share experience and best practices, provide a forum for joint policy work, and provide firms with an environment which will foster cross-border solutions to be effectively looked upon.

This would require regulatory cooperation, regulatory engagement, access to international markets, a governance structure and the use of emerging technologies and business models. The GFIN developed by FCA aims to address all these issues by creating an overarching network comprising all GFIN members and regulators who can provide and share intelligence to relevant members, highlight key pieces of domestic work and discuss emerging innovation trends. The network of regulators can also assist in navigating areas such as exploring cross-border policy issues or international expansion.[18]

> The introduction of GFIN, Project Innovate and a host of other collaborative ecosystems by the FCA will help in developing necessary solutions to RegTech challenges.

17 https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf

18 Ibid.

Some of the key regulations in the UK region are:

PSD II

PSD II will strengthen individual ownership of data by allowing an individual to choose the third party for payment initiation and account data services. With a PSD II licence, the external service provider can:

- Initiate payment transactions on accounts held by a bank's customers using the bank's API. The regulation refers to these third parties as Payment Initiation Service Providers (PISPs).
- Use the banks API to analyse a customer's account balance and transactions in order to offer value-added services such as providing financial advice or product recommendations. The regulation refers to these third parties as Account Information Service Providers (AISPs).

In addition, below are some of the key regulations in the EU region which UK players have to adhere to:

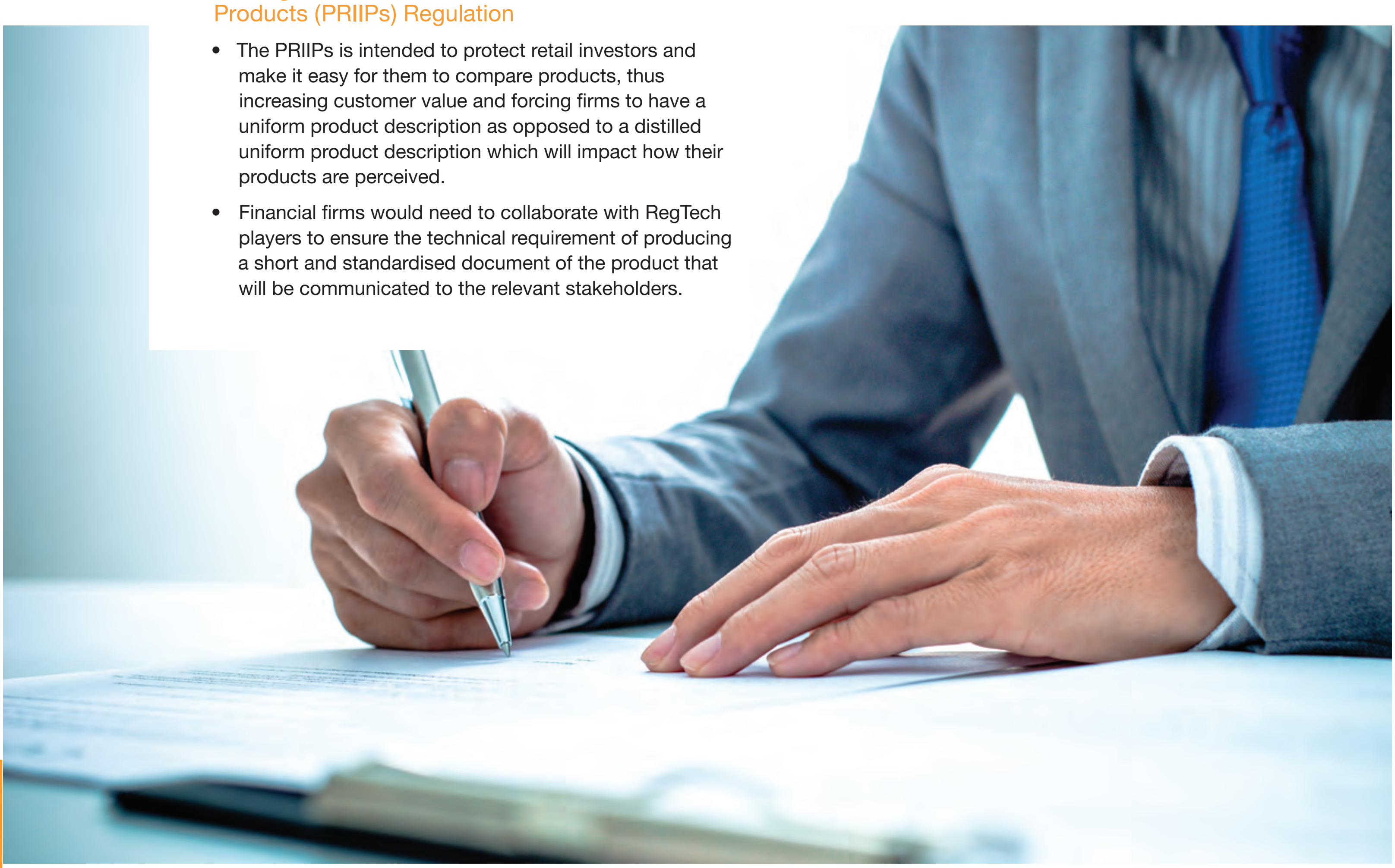
Packaged Retail and Insurance-based Investment Products (PRIIPs) Regulation

- The PRIIPs is intended to protect retail investors and make it easy for them to compare products, thus increasing customer value and forcing firms to have a uniform product description as opposed to a distilled uniform product description which will impact how their products are perceived.
- Financial firms would need to collaborate with RegTech players to ensure the technical requirement of producing a short and standardised document of the product that will be communicated to the relevant stakeholders.

Client Assets and Money (CASS)

- Designed to protect client assets, CASS regulations have become more relevant since the collapse of Lehman Brothers in 2008. The UK FCA's detailed CASS requirements on client money, custody, collateral, mandates and CASS Resolution Pack along with the FRC's revised CASS Audit regime starting 1 January 2016 includes carrying out detailed risk assessments for CASS regulations and demonstrating that all processes and controls have been adequately followed. [19]

Regulations have been driving a new revolution in the UK's banking and compliance space. The introduction of MiFID II, PRIIPs and GDPR is expected to further boost competition and innovation by opening up new opportunities for RegTech players to carve out their niche and provide services to third parties.



19 https://www.worldgovernmentsummit.org/api/publications/document?id=5ccf8ac4-e97c-6578-b2f8-ff0000a7ddb6

Opportunities and challenges faced by RegTech players in the UK

Key opportunities in the UK RegTech space:

The support from the FCA's TechSprint has proved that technologies exist and can be effectively combined to make machine-readable and machine-executable regulatory reporting a reality. Introducing these technologies in regulatory reporting processes could provide significant benefits for regulators and firms.

Government initiatives to promote RegTech

- The FCA launched FCA Innovate in October 2014 and has run several technology-focused initiatives to encourage a collaborative approach to regulatory issues. More recently, the FCA issued a Call for Input on using technology to achieve smarter regulatory reporting (customisable reports in different formats from one platform), which it will implement later this year.
- In addition, under Project Innovate, one of the initiatives is 'regulatory sandbox'. It is the first of its kind for regulators that underlines a deep sense of commitment to innovation and willingness to think outside the usual regulatory parameters. The FCA regulatory sandbox is in its third phase right now.
- In September 2017, the FCA, in collaboration with R3, RBS and other global banks, built a prototype application for regulatory reporting of mortgage transactions on distributed ledger technology (blockchain). This prototype can generate automated receipts when a mortgage is booked.
- These initiatives offer banks and RegTech providers the space and support to provide their views and develop viable, compliant RegTech solutions.
- In addition, investments from large tech companies across the world have pledged their commitment to increasing the headcount in their London office by announcing 1,000 new jobs.

Regulatory changes

- Post the global financial crisis, the UK is one region that has introduced a host of regulatory requirements, including granular prudential regulatory reporting for the UK PRA like Common Reporting Templates (COREP) and detailed liquidity reporting. RegTech intends to solve such complex regulatory reporting problems caused by multiple data sources, systems and errors arising from manual review. A RegTech solution can search multiple data sources and compile reports that are comprehensive, coherent and standardised. This saves considerable time and effort for banks, freeing up people's time so that they can concentrate on more qualitative analysis. In addition, such standardised reporting becomes a lot easier for the regulator to analyse. Machine-executable reporting can enable firms to automatically update as per the current rule requirements and make future changes to their systems much more quickly and at a cheaper cost.
- The UK is one of the few countries in the world that has improved and strengthened liquidity and transparency in the system through a host of regulatory changes like MiFiD II, EMIR, BASEL III and PSD2. Given the uncertainty around Brexit, it becomes equally important for RegTech players to ensure the solutions they implement for large financial services account for this shift.

Increased demand from financial institutions for RegTech

- Since the past 3–4 years, financial institutions are turning to RegTech firms to fill their compliance gaps, reduce costs, get ahead of requirements and detect enterprise risks before the regulators. Firms are using RegTech to deal with the huge amount of data they are generating. Handling more data the right way also means better information and facilitate risk detection and compliance.

Increasing use of AI and ML

- Over the past decade, RegTech tools have helped companies to comply with rules and improve their supervision activities. Most RegTech applications have focused on KYC by improving consumer protection and challenging bad behaviours.
- However since the past 3–4 years, technologies such as AI and ML can enable companies to move from big data to 'smart data' to gain insights into regulatory practices, automate complex reporting, conduct meaningful analysis of critical compliance risk areas and even potentially create an end-to-end view of compliance.

Rapid growth in RegTech firms in the UK to address a wide range of risk and compliance issues

- Since 2013, there are more than 60 RegTech firms in the UK that deal with a variety of risk and compliance requirements, ranging from regulatory reporting, core risk management process from a quantitative perspective (including modelling and stress testing), conduct compliance, including AML and KYC, etc.

Increase in patent applications both by RegTech firms and incumbent banks

- Start-ups have mushroomed and financial services firms have become more active in developing processes and protecting their intellectual property. Leading financial institutions have applied for more patents on an increasingly impressive range of innovative products. But in-house innovation focuses on products and services rather than RegTech, and the financial sector lags way behind big technology companies.
- Forward-looking companies regard patents as an important part of their innovation strategy. Investment in RegTech and smart use of IP can unlock long-term value for financial institutions' shareholders.

Key challenges in the UK RegTech space:

Uncertainty over alignment with existing regulations

- Frequent amendments to the regulations can pose constant challenges for implementing RegTech solutions for small and large-sized financial firms. These regulations are then subject to interpretation and unless RegTech firms combine AI to help understand, interpret and keep pace with the regulatory changes, the complexity can lead to unfavourable conditions for the firms.
- A changing regulatory landscape that means costly investment in technology might not meet compliance requirements down the line. This is evident, for example, from the series of changes made to the client assets regime since 2008, followed by increasingly complex requirements for CASS audits.

Passive resistance from staff members

- With the adoption of new technology, older technology becomes obsolete. As a result, there is passive resistance from senior officers within the firm who are working on corrective actions with a stringent deadline and will not be open to future action plans related to process enhancements. In addition, with new technologies coming in, there is a greater chance of job reduction. Therefore, employees are reluctant to adopt new technologies and this lack of technical know-how can further derail the process of regulatory technology implementation for firms.

Higher cost of compliance

- The average annual compliance cost for a firm is close to 10–15% of the total cost for running the business. Firms wanting to move to a more strategic solution in the long term would need to balance the trade-off between enhancing the customer experience and, at the same time, upgrading their legacy system to a more sophisticated system to ensure compliance with the regulations. Firms that successfully undertake this change will be at a comparative advantage in the long run.
- It took around 30,000+ pages and 1.7 million paragraphs to interpret the rules of MiFiD II, which has cost the financial services industry close to around EUR 2.5 billion till date. Much of this cost has been incurred on interpreting and understanding the regulation and rewriting the rules in business languages and codes. The challenge is to keep the policies and systems under control as regulators and markets demand innovative ways of catering to multiple circulars of the same regulation. The complexity and volume of regulations make it necessary to apply regulatory technology and advanced tools like AI and ML so that the entire process becomes principle based.[20]

Focus on remediation instead of strategic innovation

- Financial institutions are struggling to cope with the host of amendments to regulatory norms. As per FCA, on average, 45 new regulatory changes are published every week, and it is essential for RegTech firms to comply and adapt to these changes. The high volume of amendments forces firms to go back to their drawing board and think about the benefits of implementing advanced technology vis-à-vis adopting and continuing with the existing legacy system with end user computation in place. In the long run, firms with deeper investment in technology would be perceived to have a comparative advantage to those who are yet figuring out the trade-off.

Front-end digital systems are built on legacy systems

- Companies should view RegTech as part of the wider digital transformation process that the industry is grappling with. While most institutions have built digital front ends for their businesses, particularly in consumer-facing markets, these are built on legacy systems. Digital transformation requires a rethink of the whole business model and a redesign that spans the middle and back office as well as the front office, including risk and compliance.

Regulatory conflicts

- MiFiD II, PSD2 and GDPR all came into force in Q1 of 2018. With all the regulations coming into force at the same time, there is a significant issue of cross-sector impact. RegTech firms would need to comply with the unenviable task of helping clients fulfil their regulatory and compliance initiatives but still lack clarity as to what regulators expect from them. With proper clarity, RegTech firms may end up advising clients on issues that may result in potential conflicts.
- In addition, despite the aim of standardization, due to regional variations in interpreting and implementing the principles of transparency and investor protection (MiFiD II in UK and Dodd-Frank in USA), RegTech firms must appreciate this challenges and navigate a way forward to provide clients with unique solution as per their jurisdiction.

RegTech implementation is invariably bound up with the unavoidable cost of transition, a myopic view of change and inherent reluctance by staff members to adopt a more digital mindset.

20 http://irishadvantage.com/wp-content/uploads/2018/06/Regtech-Beyond-Compliance-White-Paper.pdf

6 | Case Studies – RegTech in India and the UK

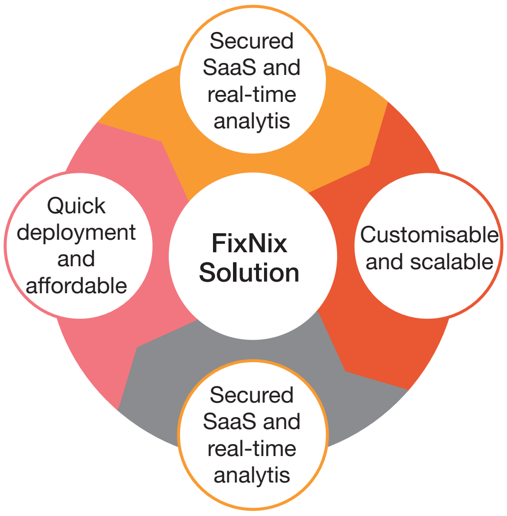
FixNix: RegTech player India

FixNix is one of the leading providers of SaaS governance, risk and compliance. Its RegTech platform was launched in 2013 and is available to firms of all sizes.

The different areas where FixNix software are currently being leveraged are:

- Audit management
- Risk and compliance management
- Asset management
- Policy management
- Business continuity plan management
- Controls management

The four main advantages of FixNix are illustrated below:



FixNix's growth can be attributed to its pricing model and customer acquisition strategy. Its pricing model is based on three factors: subscription-based, licensing and SaaS (pay as you go). This makes it very easy for a firm to realise the pitfalls at an early stage and they can eventually cut down on their losses.

The customer acquisition strategy is mainly driven by partnership with various regulatory authorities, and the sales and partnership model takes the form of a joint business relationship venture.

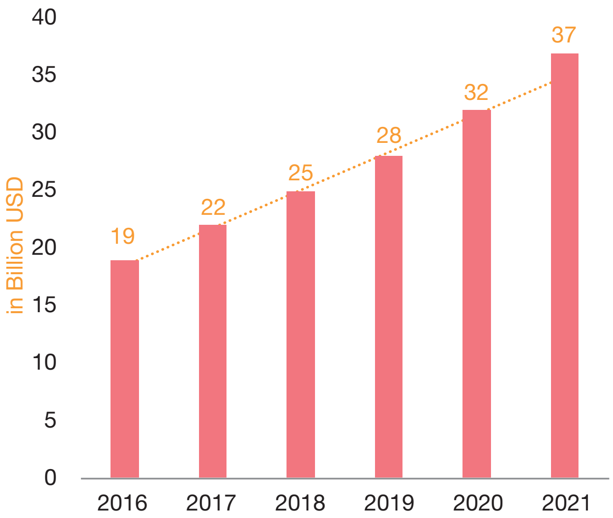
A few select technologies used by FixNix to support its clients:

Predictive analytics: Potential of combining an ML algorithm like binary logistic regression or random forest that can power the predictive modelling capability. Clients can consume real-time analytics using a simple API or in a visualisation dashboard.

Regulatory risk data lake: Ability to handle a huge amount of unstructured data from dark pools, trade risk, etc. In addition, FixNix has tapped into Watson Analytics and Azure Data Lake technology service providers along with homegrown Hadoop systems.

The governance, risk and compliance space is expected to grow at an annual CAGR of 14.5% and players are increasingly adopting cloud-based solutions and integrating risk analytics. Organisations need to focus on a strategic solution rather than tactical remediation of solutions.

Market size and growth (2016-2021)



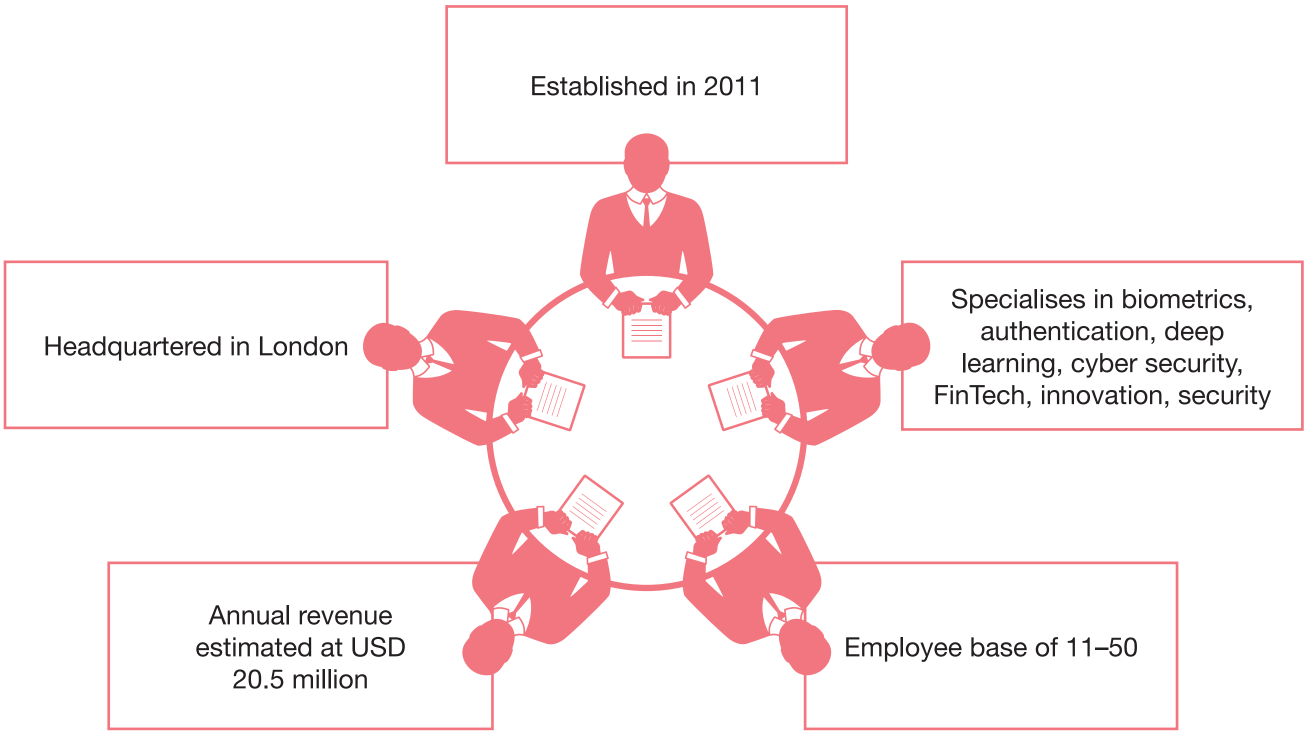
Source: FixNix Solutions

The above chart shows that more and more financial institutions and banks are looking to leverage governance, risk and compliance solutions which can help them to strategically reduce cost and, at the same time, ensure compliance with necessary regulations. Most of the firms in India are still understanding the full economic benefits of RegTech from a long-term strategic perspective and hence, adoption of RegTech solutions by firms is at a nascent stage in India.

iProov: Regtech player in the UK

iProov is a London-based start-up that focuses on strong, user-friendly identity authentication of online users. It focuses on enabling users to log into online services simply yet securely, and specialises in facial recognition software.

iProov is led by a team that has extensive experience in growing global, high-performance mobile and cloud services, with world-class academic research expertise. The business has won many innovation grants from Innovate UK and the UK government's innovation agency.



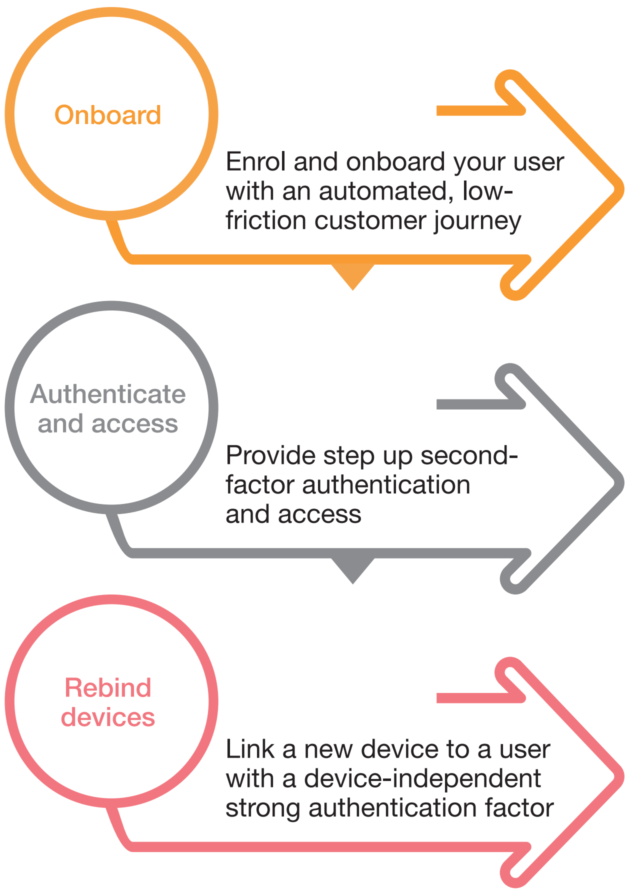
iProov is funded by Microsoft Accelerator London. It actively uses 17 technologies for its website. These include Viewport Meta, IPhone/Mobile Compatible, and SPF. Applications include onboarding, ID verification, border control, strong customer authentication and access control.

Remote KYC for onboarding customers fast and with full compliance requires users to authenticate their selfie against their photo ID. Strong Customer Authentication (SCA) under PSD2 needs solutions that are fast, easy and reliable. GDPR makes strong employee authentication even more essential.

iProov's face authentication is becoming the world's leading solution for both remote KYC and SCA. Its unique Flashmark anti-spoofing technology (for 'liveness', PAD, etc.) is unrivalled in its effectiveness and simplicity, repelling attacks by animated digital avatars, synthetic video and doctored replays. It uses controlled illumination on a user's face to create a non-replicable one-time biometric that:

- Assures genuine human presence – cues generated from controlled illumination confirms that a human face is present
- Protects from spoofing attacks – effective against all known attack vectors such as masks, recordings and 'deepfake' synthetic video
- Links user to a trusted source – iProov matches a user to a trusted source such as a government-issued ID, verifying they are who they claim to be
- Cross platform – cloud-based authentication that works across all operating systems and device types
- Interoperable – consistent experience across every journey – where the user can enrol on one device and verify the authenticity on any other device.

The process used for onboarding and authenticating access is shown alongside:



The case studies of FixNix and iProov clearly indicate that despite potential challenges and constraints, with the right governance, outlook and strategy, RegTech players can leverage the huge untapped potential of the expanding global market in the years to come.

7 Way forward and conclusion

Evolution of RegTech in the UK

RegTech and SupTech are developing in response to various supply and demand factors. Demand is linked to the regulatory changes and the needs of market participants and supervisors to process large amounts of data. Supply factors are primarily driven by advances in technology. RegTech technologies have the potential to reshape the relationship between regulators and market participants. For example, technologies such as API are facilitating more efficient filing of regulatory data by market participants, while regulators are looking to develop AI/ML tools to enhance market surveillance and improve their ability to detect fraud.

Some of the best practices that regulators, end user firms and RegTech players could follow are focusing on technological innovation and undertaking a proactive review of regulatory changes; coordinating, collaborating and effectively communicating with regulators in different industries; and developing their staff and knowledge of regulators and supervisors in the fast evolving regulatory landscape.

Collaboration models are the new way of working with all the players in the regulatory ecosystem and will help all the participants in the long run.

Collaboration model	Examples	Mutual benefits
Bank–Bank	ML tool (NLP, AI) for compliance	Consistent interpretation of regulations and reduced cost of compliance
Bank–start-up	RegTech investments and accelerators	Better technologies for faster and cost-effective compliance
Bank–regulator	KYC – India	Faster onboarding service to customers while ensuring KYC guidelines
Bank–vendor	Cognitive RegTech	Use of advanced technologies to leverage and make strides in RegTech
Bank–regulator–start-up	Distributed ledger for regulatory reporting	Effective future-proof solution to cater to the needs of all the parties involved
Regulator–start-up	Regulatory sandbox Regulatory accelerator	Allow start-ups to test (regulatory sandbox) innovative business models with new technologies for supervision
Regulatory accelerator	Regulator collaboration	Harmonise policies across the border to promote the growth of banks and FinTechs globally

Conclusion

The long-standing marriage of technology and finance has been evolving at a rapid pace. In this paper, we have discussed the stages of RegTech evolution in India and the UK as well as the opportunities and challenges in both countries.

RegTech is an around GBP 50 billion per year opportunity—in the UK alone. There are detailed regulations that run into hundreds and millions of pages that firms have to deal with in order to be compliant. RegTech in India has seen massive growth with the rise of digital initiatives and support from the Government of India in introducing CKYC, AML, and data privacy and protection laws.

The pace of regulatory changes in India and the UK—some of which appear to overlap, such as GDPR, KYC, AML and capital requirements—presents enormous opportunities for RegTech firms in the UK and India to leverage their respective capabilities and provide outbound and inbound services across the UK and India. RegTech players in the UK have the natural advantage of operating in a mature financial services market and have strong domain expertise on the regulatory area in question. In comparison, their Indian RegTech counterparts have strong technology capabilities, including best-in-class IT skills. The skill sets of the UK and Indian RegTech ecosystem could be synergised to provide a robust solution for the UK and Indian financial services markets, creating a major win-win proposition.

India is a market where RegTech firms can enable the growing financial services firms to streamline their compliance and reporting obligations to the RBI, including protecting customer interests and detecting financial crimes. Currently, India is still in the nascent stages of RegTech developments, with annual investments of over USD 10 million per year.

The key messages for both the UK and Indian RegTech players are:

- Considering the rapidly growing RegTech solutions market in India, the adoption of solutions like India Stack, and the corresponding growth of the RegTech sector in the UK on account of complex regulations like MiFID 2, PSD2, CASS and CRD IV, there will be a plethora of opportunities for RegTech players from both countries to participate and actively collaborate to provide the required solutions.
- There appears to be a need for UK RegTech players to have better visibility and understanding of the opportunities and challenges faced by financial services firms in addressing the KYC and AML requirements in India, including the detailed SEBI requirements on trade surveillance and algorithmic trading. For example, AI has been successfully deployed by the London Stock Exchange (LSE) for trade surveillance on equity trades, and the same could be leveraged across the leading stock exchanges in India.
- The scope and opportunities for Indian RegTech players to participate in the UK Financial services market are abundant, provided they undertake a detailed assessment of the RegTech ecosystem in the UK and identify niche areas where they could collaborate with their UK RegTech counterparts, contributing the required value from a technological expertise standpoint.
- Financial services firms in India will need to optimise the utilisation of data, which is one of their most valuable assets. Currently, banks have around 60% of their data in an unstructured format, namely PDFs, scans, etc. This siloed structure of data storage makes consolidation and analysis extremely complex. Failure to comply with changing regulations could lead to frequent penalties, restrictions, legal action and loss of reputation. RegTech players can play an important role by collaborating with firms that deal with a lot of unstructured data.
- Collaboration opportunities can benefit both industry and the regulators. For industry, it can help empower firms to gain better control over their cost and risks, free up surplus capital, and present opportunities for start-up firms, advisory firms and tech companies. For regulators, it allows the development of continuous risk and compliance monitoring tools to identify problems and reduces the time taken to investigate compliance breaches. In addition, collaboration fosters the development of simulation systems and sandboxes which can be used for proposed reforms and new approaches.

RegTech's true potential lies in collaboration across various stakeholders—namely regulators, end user firms and RegTech start-ups. RegTech has tremendous potential to enable real-time monitoring of financial markets and reconceptualising of the financial regulatory ecosystem. The move from a KYC-type transformation to a KYD paradigm will demand further evolution of RegTech with transformative effects on finance and its regulation.

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We aim to:

- Contribute to a flourishing society
- Support a thriving economy
- Shape outstanding environments

By strengthening the connections, capacity and character of the City, London and the UK for the benefit of people who live, work and visit here.

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