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Regtech: Bits and Bytes of Financial Regulation

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Abstract

Global Financial Crisis of 2008 has caused dramatic structural changes in the financial sector and financial services worldwide. Technological disruption has changed the dimension of finance around the world. Increasing threats of cyber-attacks has raised a serious concern for the banking and financial sector across the entire world. Supervisory mechanisms, compliances and regulations have become the key factors of consideration. The paper stresses out an importance of stringent financial regulations and regulatory compliance in the recent era of technological changes and innovations towards financial stability. This paper attempts to establish a strong theoretical overview of the promise and potential of the Regulatory Technologies (RegTech) for the wider financial ecosystem based on existing academic research and also publicly available practice-oriented insights from industry sources. The purpose of this paper is to develop an insight about the implications of RegTech for financial institutions and regulation. This study will help regulatory standard setters, bankers, investors, national & international financial institutions and other academicians to envisage the future of disruptive potential in financial technology.

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Introduction

Global Financial Crisis of 2008 has caused dramatic structural changes in the financial sector and financial services worldwide. Technological disruption has resulted in a paradigm shift in the financial sector at an unprecedented rate. Technology has changed the dimension of finance around the world, though offering new opportunities but on the other hand raising new risks. Supervisory mechanisms, compliances and regulations have become the key factors of consideration. Since the global financial crisis significant increase in the volume of regulatory reporting has increased in a considerable manner (Von Solms, 2021). A new buzzword, 'FinTech', a combination of financial services and information technology, the most cutting-edge technological innovation in the 21st century, has emerged and gaining increasing importance on a regular basis. Arner, Barberis & Buckley (2017) in their study have emphasised on the necessity of new regulations which the financial regulators must develop to balance the welfares of

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innovation and economic progress with financial solidity and consumer protection.

The paper stresses out an importance of stringent financial regulations and regulatory compliancein the recent era of technological changes and innovations towards financial stability. The purpose of this paper is to develop an insight about the implications of Regulatory Technologies (RegTech) for financial institutions and regulation. This paper attempts to establish a strong theoretical overview of the promise and potential of the RegTech for the wider financial ecosystem based on existing academic research and also publicly available practice-oriented insights from industry sources. This study will help regulatory standard setters, bankers, investors, national & international financial institutions and other academicians to envisage the future of disruptive potentialin financial technology.

The Origins of Digital Finance

The technological disruption in the form of artificial intelligence (AI), machine learning, big data, Internet of Things (IoT), blockchain, smart contracts, digital identity, distributed ledger technology, etc. experienced by the financial sector worldwide has introduced a broader financial ecosystem in the form of financial technology, popularly known as FinTech. Though the concept of Fintech has started gaining popularity over the last few years but there are several evidences available which proves that technology and finance has got pretty old bonding with each other.

Regardless of its many benefits, technology based FinTech application with the advent of digital wallets, mobile banking and financial apps may cause financial risks also. Significant insufficiencies in the regulation and supervision of financial markets have been observed during the post 2008 Financial Crisis took place globally has led to the emergence of regulatory technologies (RegTech) to make protected the improvement of Fintech (Bayramoğlu, 2021).

A study conducted by Zetzsche, D. A., Arner, D. W., Buckley, R. P., & Weber, R. H. (2019) has mentioned about four pillars which will reinforce the future of digital financial services in Europe. The four unrelated pillars are "*(1) extensive reporting requirements imposed after the Global Financial Crisis to control systemic risk and change financial sector behavior; (2) strict data protection rules reflecting European cultural concerns about dominant actors in the data processing field; (3) the facilitation of open banking to enhance competition in banking and particularly payments; and (4) a legislative framework for digital identification imposed to further the European Single Market"*.They have also stated that together these four unrelated pillars will create an ecosystem targets to balance between efficiency, systemic risk, data security and privacy and customer protection.

RegTech

RegTech, also known as Regulatory Technologies, a newly emerging term, is the management of regulatory processes through technology with the financial sector. It is a new and vibrant dimension of FinTech. In 2015, the word "RegTech" was proposed by the United Kingdom's Financial Conduct Authority (FCA) (Narang, 2021). Financial Stability Board, (2017) has defined RegTech as, "RegTech is any range of applications of FinTech for regulatory and compliance requirements and reporting by regulated financial institutions". As per World Bank (2017), RegTech is a technology which is used for the purpose of regulatory monitoring, reporting and compliance for the betterment of the finance industry. The aim of RegTech companies to find out solutions that address the regulatory compliance issues with the help of technological innovation. According to Arner, Barberis, & Buckley (2018), RegTech is the use of information technology, which deals with regulation, monitoring, reporting and compliance. Clarke (2020) has defined RegTech as "*means technological applications in support of the activities of regulators, of regulatees, and/or of entities that are intended to beneficiaries of regulatory activities*". RegTech is mainly focused on the digitalization of regulatory reporting and compliances which facilitates enormous cost savings for not only the financial sector but for the regulators as well. Bayramoğlu (2021) has stated in his study that the main purpose of RegTech is to find technological solutions which will help FinTech to eradicate deficiencies and reduce financial risks. Ko (2019) in his book has defined RegTech as a category of FinTech. Larsen & Gilani (2017) has stated RegTech, as a subgroup of FinTech, a solution providing technology to those sectors involved in financial activities to ensure the regulatory compliances. Institute of International Finance (2016) has defined RegTech as, "the use of new technologies to solve regulatory and compliance requirements more effectively and efficiently". Big Data Analytics (BD), Artificial Intelligence (AI), Natural Language Processing (NPL), Robotic Process Automation (RPA), Distributed ledger technology (DLT), Artificial Intelligence (AI), Cloud Computing (CC), Machine Learning (ML), Application programming interface (API), etc. are examples of few emerging digital technologies that has enable RegTech solutions to encounter the increasing demands of the regulatory processes.

Based on the development initiatives taken by the parties Colaert, V. (2021) has divided the RegTech in three type, namely, i) To facilitate compliance, RegTech tools developed or acquired by the financial institutions – 'Compliance RegTech'; ii) Alongwith compliance RegTech tools developed by the supervisors for supervision and/or enforcement – 'Supervisory RegTech; and iii) Machine-readable and/or executable regulation provided by the regulators – 'Regulatory RegTech'. This 'Supervisory RegTech' was again termed as 'SupTech' by Chirulli, P. (2021) in a study where a paradigm shift was highlighted in terms of use of technology in the relationship between regulation and supervision in financial sector.

Financial Conduct Authority (2016) has outlined four themes of RegTech evolutions:

- Efficiency and collaboration;
- Integration, standards and understanding;
- Predict, learn and simplify; and
- New directions.

Methodology

This paper attempts to establish a strong theoretical overview of the promise and potential of the RegTech for the wider financial ecosystem based on existing academic research and also publicly available practice-oriented insights from industry sources.

The different Phases of RegTech

Table 1: Different phases of RegTech

RegTech 1.0	**RegTech 2.0**	**RegTech 3.0**
- Period from1960-2008 - Focused mainly on internal risk management and monitoring - Driven by large institutions	- Started after the Global Financial Crisis and is the phase we are in today - Mainly driven by the Financial market - Focused on solutions for compliance, reporting and processes with the new technology available to KnowYour Data	- The future - Technology as a tool - Rethinking the regulatory environment - All sectors working together - From Know Your Customer

Adapted from Johansson, E. L. L. I. N. O. R., Sutinen, K. O. N. S. T. A., Lassila, J. U. L. I. U. S., Lang, V. A. L. T. E. R., Martikainen, M. I. N. N. A., & Lehner, O. M. (2019). Regtech-a necessary tool to keep up with compliance and regulatory changes. ACRN Journal of Finance and Risk Perspectives, Special Issue Digital Accounting, 8, 71-85.

RegTech vs FinTech

There are number of authors who have depicted RegTech as a subcategory of FinTech. Again another set of authors have suggested RegTech as a new phenomenon altogether. Nedelchev (2020) in his study enumerated the fundamental differences between FinTech and RegTech. The Basel Committee on Banking Supervisionhas defined FinTechas, "*Technologically enabled financial innovation that results in new business models, applications, processes, or products with an associated material effect on financial markets, institutions, and the provision of financial services*" (Vivek, Rakesh, Walimbe & Mohanty, 2020).

FinTech cannot act of its own. RegTech as a regulatory body can monitor and regulate FinTech institutions (Dubey, Sonar & Mohanty, 2020). They have also stated the importance of RegTech and FinTech work in tandem. As mentioned by them, "*RegTech regulates the way FinTech acts*".

Technological disruption and its application in the financial sector in the form of technology enabled financial services have raised a major concern related to cyber security threats worldwide. RegTech came up with the game changing solutions to these concerns for both consumers as well as for the institutions(Piri, 2018).

For effective and appropriate use of Reg Tech the quality and efficiency of financial regulators is of utmost importance. Not only technological advancement and its application but the organization and people are also equally important for effective and proper utilization of RegTech (Yang & Tsang, 2018).

Application of RegTech in Bank and other Financial Institutions (FIs)

Post Global Financial Crisis 2008 a paramount increase in financial regulations and regulatory changes has been observed. New regulations such as Basel III, GDPR, PSD2, MiFID II, BCBS 239, etc, came into picture. To address this regulatory and compliance burden along with the rapid development of the financial industry RegTech has emerged as a solution by creating new and effective technological solutions for compliance and regulation Johansson, *et al*. (2019). Becker, Merz & Buchkremer (2020) has mentioned that the probable benefits of RegTech innovations are significant in case of bank and other FIs.They have also stated that efficient use of RegTech applications has helped the banks and other FIs to increase their risk and compliance management undertakings through digitalization. The report published by theInstitute of International Finance (2016) has identified the technological and scientific innovations such as machine learning, robotics, artificial intelligence, cryptography, biometrics, blockchain, other distributed ledgers, application programming interfaces (APIs), Shared utility functions, cloud applications, etc. which will facilitate RegTech to increase the efficiency and effectiveness of FIs to comply with financial regulations. This report has also identified few areas related to compliance and regulatory reporting where development of RegTech can contribute significantly, such as:

- For capital and liquidity reporting – ‘Risk data integration’;
- For stress testing and risk management – ‘Modeling, scenario analysis and forecasting’;
- To recognize money laundering and terrorism financing by automated interpretation of transactions– ‘Real-time monitoring payments transactions’;
- For use of automated identification solutions, especially for KYC regulations – ‘Identification of clients and legal persons ‘;
- For analysis of qualitative information related to individuals as a part of customer protection processes – ‘Monitoring a financial institution’s internal culture and behavior’;
- Automating the tasks to ensure compliance and increase the speed and efficiency of trading – ‘Trading in financial markets’;
- Automated interpretation of regulations applying to a financial institution – ‘Identifying new regulations’.

Von Solms (2021) in his study referred RegTech as an ‘emerging technology’ which can assist bank’s regulatory management process to a great extent by integrating Information Technology and Digital Innovations. They have also suggested that RegTech can be incorporated in banks’ Treasury Department to create a smart Treasury function to support regulatory reporting demands and strategic treasury management activity through digital transformation.

In a recent study Dubey, Sonar & Mohanty (2020) has highlighted the necessity of the cashless transactions and also of contactless banking, endowed by electronic money and mobile banking, during current global health pandemic, COVID-19. RegTech is a new relationship between banks and banking regulation which can facilitate the regulatory compliance obligations (Nedelchev, 2020).

In case of banking and financial sector Government play an important role as a key regulator, whereas the technological advancement and application of the same in regulatory compliance private enterprises are the main flag bearers. Hence a model consisting of proper mix of public-private partnership is crucial for proper utilization and supervision of RegTech as a subfield of FinTech. It is the need of the hour to regulate the financial markets. With the incorporation of FinTech though the market efficiency has increased but to mitigate the risk in a sandbox environment the governance structure of financial market testing should be needed.

Freij, Å. (2020) in his study on a global set of 550 providers to understand what support Regtech solutions provide, has stated that business managers are concerned about the conflict in terms of introducing new products in the market and the burden of regulatory requirements. This study has also mentioned that the current RegTech industry is more focussed on internal and operational tasks rather than external and analytical activities.

IBM, Tata, Apple, Amazon, and Alibaba and many new start-ups has continuously working on alternative financial techniques, such as crowd funding, P2P (peer to peer) lending and robo-advisory services to address challenges and create opportunities across the financial sector (Arner, Barberis&Buckey, 2016).

Key challenges with RegTech

If financial institutions do not manage to confirm consistent compliance the focal objectives of financial regulation targets to uphold market stability, market integrity and investor protection far from being reached (Colaert, 2018). Technologies do not function on its own. As technology operates based on the programming written by human rather machine hence accountability is a big challenge. Sub-optimal outcomes due to lack of context based judgement by the machine also become key hindrances in the success of RegTech.

Due to shadow banking and greater interlocking within the financial industry the rise in systematic risk has been observed across entire FinTech industry. As a result for regulators there will be a continuous challenge of monitoring and improving the existing regulations which demands new and complex regulatory requirements.

Enriques, (2017) has suggested four key challenges financial regulators face in a FinTech/RegTech-dominated world are,

- their human resources,
- their internal governance,
- their cyber security risk, and
- their core operations goals of preventing, catching and punishing misbehaviour

Conclusion

The use of information technology in regulation prompts a shift of the regulatory standard. The paradigm shift in the banking and other financial institutions as a result of technological disruption has increased efficiency and reduced risk with the help of the tools of the future, FinTech and RegTech. Though RegTech is comparatively new concept but it acts as a subset of FinTech to construct automated systems to assist compliance with the law. Emergence of RegTech has changed the traditional way of ensuring compliance by various financial institutions. Lower cost, effective and efficient compliance, flexibility, easy reporting, security, analytics, accurate information, real time data, etc. made RegTech to be considered as an independent sector. It is just the beginning, still long way to go with the advent of more technological advancement such as cloud computing, blockchain, machine learning, big data, data mining, data analytics, etc.to encounter all regulatory demands obligatory in the financial world to make compliance easier and more responsive. A proper cohesiveness of technological advancement, human intervention and supervisory control not only effectively, but also efficiently, flexibly and adaptively in terms of private-public partnership can lead RegTech to bring a radical change in the banking and financial sector in the near future. A proper balance between innovation, financial stability and consumer protection is of utmost important in RegTech.

The balance of proactive regulatory management and accomplishing efficient compliance should be the main focus of RegTech providers, financial services firms, regulators, and researchers in future to provide extensive benefits for the customers. Regulatory Sandbox approach can bring the necessary balance between freedom to innovate in FinTech and necessary consumer protections(Sangwan, Prakash and Singh, 2020). The probable benefits of RegTech innovations are extensive. By using RegTech applications efficiently Banks and other FIs can improve their risk and compliance management activities alongwith digitalization.The success of RegTech in the coming days depends on a perfect blend of public-private organizational model of financial regulators to carry out financial regulation and supervision.

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Conflicts of Interest
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