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IMPLEMENTING REGTECH FOR FINTECH STARTUP: A SOLUTION TO OVERREGULATION IN DEVELOPING COUNTRIES

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ABSTRACT

Objective: This study aims to comprehensively analyze how the implementation of Regulatory Technology (RegTech) can be a strategic solution in overcoming the challenges of overregulation faced by FinTech startups in developing countries, which often hinder innovation and financial inclusion.

Research Design & Methods: This study adopts a qualitative approach, with the primary method being an extensive literature review of scientific journal articles, industry reports, and other relevant publications. Furthermore, it utilizes comparative case studies from various developing countries.

Findings: The research findings show that overregulation of FinTech startups in developing countries manifests itself in rigid licensing regimes, high capital requirements, overlapping oversight, high compliance costs, and data privacy and cybersecurity issues. RegTech, with its compliance automation, predictive risk management, streamlined regulatory reporting, and enhanced KYC/AML capabilities powered by AI, ML, big data, cloud computing, and blockchain, has been shown to significantly improve operational efficiency, reduce compliance costs, increase accuracy, and offer scalability and adaptability to regulatory changes. Case studies confirm RegTech's positive impact in combating financial crime and driving innovation.

Implications: This research confirms that RegTech plays a strategic role in driving FinTech growth, with policy implications including adaptive regulations, cross-sector collaboration, harmonization of standards, and investment in infrastructure and human resource development.

Contribution & Value Added: This research presents an in-depth analysis of the role of RegTech in addressing overregulation in developing countries, and offers practical policy recommendations to support a healthy and inclusive FinTech ecosystem.

Keywords: FinTech Start-up, Overregulation, Developing Countries, Regulatory Technology.

JEL codes: G28, O33, O16

Article type: research paper

INTRODUCTION

The rapid development of the financial technology (FinTech) industry in developing countries has opened up huge opportunities for financial inclusion and market efficiency, reaching millions of individuals who previously did not have access to traditional banking services (Pareek et al., 2025). However, this pace of innovation is often hampered by a phenomenon known as overregulation. Overregulation refers to regulatory frameworks that are overly restrictive, complex, outdated, or overlapping, significantly burdening FinTech startups with high compliance costs, protracted bureaucracy, and regulatory uncertainty (AllahRakha, 2023; Park, 2019). In developing countries, these challenges are exacerbated by inadequate digital infrastructure, skills gaps, and a lack of harmonization of regulatory standards across borders, all of which can hinder FinTech's full potential to drive economic growth and reduce poverty (Tanda and Schena, 2019).

For example, in Nigeria, FinTech startups face a rigid licensing regime with very high capital requirements, overlapping oversight from various agencies, and frequent regulatory changes, all of which can delay business

operations for weeks or even months (Egemonye, 2025). Over 93% of FinTech companies globally reported difficulties meeting compliance requirements, with over 60% paying compliance fines of at least \$250,000 in the past year due to a lack of adequate transaction monitoring and substandard customer due diligence (American Bankers Association, 2024). This situation creates a dilemma for regulators on how to encourage FinTech innovation for financial inclusion while maintaining consumer protection and financial system stability in a rapidly changing and often immature environment.

In the face of regulatory complexity, RegTech (Regulatory Technology) has emerged as a crucial strategic solution. RegTech is the application of advanced technologies such as artificial intelligence (AI), machine learning (ML), big data, cloud computing, and blockchain to automate and simplify regulatory compliance processes (Solms, 2021). The main objective is to help companies, especially FinTech startups, to fulfill their regulatory obligations in a more efficient, accurate, and cost-effective manner. RegTech can transform compliance from a time-consuming and costly operational burden into a competitive advantage that allows startups to focus on innovation and core business growth (Teichmann et al., 2023). By automating processes such as identity verification (KYC), Anti-Money Laundering (AML) transaction monitoring, and regulatory reporting, RegTech not only reduces the risk of fines and fraud but also speeds up customer onboarding and increases trust in the digital financial ecosystem (Kothandapani, 2024; Lange et al., 2019; Pavlidis, 2021).

This research makes a significant contribution by comprehensively analyzing how the application of RegTech can be a strategic solution to overcome the challenges of overregulation faced by FinTech startups in developing countries. Identifying specific forms of overregulation, key RegTech functions and technologies, and the benefits and challenges of adoption, this research offers relevant insights for FinTech startups, regulators, and policymakers. The study also presents case studies from various developing countries, such as Indonesia, Singapore, Malaysia, Nigeria, Rwanda, and Brazil, to provide empirical evidence and practical lessons on RegTech implementation in different regulatory contexts. Furthermore, this study formulates adaptive and collaborative policy recommendations to encourage the adoption of RegTech, which will ultimately support sustainable FinTech growth and broader financial inclusion in emerging markets.

This study was systematically structured, beginning with a Literature Review that discussed the definitions, synergies, and differences between FinTech and RegTech, as well as the issue of overregulation in developing countries. The research method used a qualitative approach through literature studies and case studies. The research findings reveal the regulatory burden faced by FinTech startups and the potential solutions offered by RegTech technology. The discussion section analyzes the benefits, challenges, and barriers to RegTech adoption in various countries. The conclusion summarizes the main findings and presents policy recommendations, concluding with a bibliography.

LITERATURE REVIEW

Definition of FinTech and RegTech: Synergy and Key Differences

FinTech (Financial Technology) is broadly defined as technology designed to improve and automate financial services (Devindya and Lutfianti, 2024). FinTech encompasses various innovations such as digital banking platforms, efficient payment processing systems, and modern investment platforms (Rahmah and Fasa, 2024). Real-world examples of FinTech applications include digital payment platforms such as Square and Payment, or expense management tools such as BILL Spend & Expense (Raharjo, 2021). The main objectives of FinTech are to expand access to capital, introduce innovative and potentially safer financial products, and fundamentally support financial inclusion and literacy for the wider community (Wijaya, 2023). FinTech looks to improve financial operations for consumers and businesses in general.

RegTech, or Regulatory Technology, is a specific subset of FinTech that focuses on using technology to help financial institutions manage regulatory and compliance processes more efficiently (Arner et al., 2016). RegTech is specifically designed to improve regulatory compliance in a more efficient manner than existing traditional methods (Wijaya, 2023). The main objective is to reduce the risk of non-compliance and improve operational efficiency in an increasingly complex regulatory environment (Teichmann et al., 2023). RegTech directly helps FinTech companies manage complex and constantly changing financial regulations (Khumairok, 2023).

Although the two are closely related, the fundamental difference lies in their scope and focus. FinTech seeks to improve financial operations for consumers and businesses in general, while RegTech specifically ensures that these operations fully comply with applicable regulatory standards (Bektenova, 2018). It is difficult to imagine a strong and sustainable FinTech ecosystem without robust RegTech solutions, and vice versa, as the two complement each other to create a safe and compliant digital financial environment (Grinberg, 2025). RegTech is not only applicable to financial institutions, but can also be applied across various other industries to help with regulatory compliance.

RegTech's role as a driver of FinTech innovation cannot be underestimated. FinTech, with its innovative nature and focus on financial inclusion, often faces significant obstacles due to regulatory complexity (Larsen and Gilani, 2017). Without an efficient solution for compliance, FinTech startups will continue to be burdened by the costs and complexities of meeting regulatory requirements (Nanda, 2024; Olaiya et al., 2024). This burden can substantially divert resources, both financial and human, from developing their core products and services. Consequently, their capacity to innovate and reach their full potential, particularly in emerging markets with unique regulatory challenges, is severely limited. Therefore, RegTech serves not only as a compliance tool but as a fundamental strategic driver for the growth and sustainability of the FinTech ecosystem, particularly in highly regulated markets. This demonstrates that investing in RegTech is an investment in FinTech's ability to innovate and thrive without excessive regulatory constraints (van Liebergen et al., 2016).

FinTech Growth in Developing Countries: Opportunities for Financial Inclusion

Developing countries offer enormous potential for financial inclusion and technological innovation. FinTech plays a crucial role in expanding financial access and providing new products and services, particularly to unbanked and underserved populations in rural areas (Adelaja et al., 2024; Singh and Sharma, 2023). In Southeast Asia, for example, demand for FinTech solutions is driven by rapid technology adoption, high mobile usage rates, and significant increases in internet penetration (UOB, 2017). This is reflected in the surge in FinTech funding in ASEAN, which has reached more than 10-fold since 2015, with a peak approaching US\$6.4 billion in 2021 (PwC Singapore, 2024). A similar phenomenon is also seen in Latin America, where the number of FinTech platforms has more than doubled in a three-year period (2018-2021), driven by innovations aimed at addressing the deep-rooted problem of financial exclusion (Aleman, 2025). In 2021, Brazil and Mexico recorded more than 300 million digital payment users and 30 million digital bank users (Bakker et al., 2023). India is also experiencing exponential FinTech growth, with online lending apps significantly increasing financial inclusion, particularly reaching previously unserved or underserved customers (Lenehan and Muralidharan, 2025). Rapid smartphone adoption in Brazil and India has shown a strong correlation with increased access to banking services for the working-age population (Vilarinhos et al., 2021; Vyas et al., 2016).

The growth of FinTech in developing countries has a significant transformative role in socio-economic aspects. This development is driven not solely by financial gain, but also by the urgent need to address the substantial financial inclusion gap (Pareek et al., 2025). Available data consistently shows that FinTech directly provides access to financial services for millions of previously underserved individuals, particularly in rural areas. The impact of this phenomenon extends beyond the financial sector itself, creating broader macroeconomic implications, such as supporting economic growth and poverty reduction. Therefore, regulatory policy frameworks must carefully consider the social and economic impacts generated by FinTech. This approach ensures that innovation can continue to serve as a catalyst for inclusion and development, rather than simply a source of risk to be managed.

The Problem of Overregulation: A Barrier to Innovation and Growth

While FinTech offers bright prospects, developing countries often face significant obstacles that hinder its full potential. These obstacles include inadequate infrastructure, inconsistent regulations, and low levels of consumer trust (Vijayagopal et al., 2024). FinTech companies in particular face significant challenges in meeting compliance requirements. Statistics show that approximately 93% of FinTech companies struggle in this area. As a result, over 60% of FinTech companies reportedly paid \$250,000 in compliance fines last year. These fines stemmed largely from inadequate transaction monitoring, inadequate customer due diligence, and failure to report suspicious activity (American Bankers Association, 2024). Overly burdensome regulations, especially in developing countries where the regulatory environment is still evolving, have the potential to stifle innovation and prevent FinTech companies from reaching their full potential.

Regulators in developing countries face a unique dilemma. They are faced with the challenge of fostering FinTech innovation to achieve financial inclusion, while simultaneously maintaining consumer protection and financial system stability in a rapidly changing and often immature environment. In the absence of adequate regulation, markets can be vulnerable to abuse, which in turn can erode public trust (Chaturvedi and Sinha, 2024). However, on the flip side, regulations that are too strict or prescriptive can stifle innovation, limiting FinTech's ability to grow and deliver significant benefits (Igbinenikaro and Adewusi, 2024). This situation creates what is known as an innovation trilemma, namely difficulties in simultaneously maintaining market integrity, providing clear guidance, and encouraging innovation (Akpukorji et al., 2024). Therefore, an adaptive, principle-based, and technology-neutral regulatory approach is essential. Such an approach is necessary to balance these conflicting objectives and effectively avoid overregulation, which is counterproductive to the growth of the FinTech sector.

METHODS

This study uses a qualitative approach with an emphasis on literature review and case studies to understand the complex dynamics of overregulation and the application of regulatory technology (RegTech) in the context of FinTech startups in developing countries. This method was chosen because it is capable of deeply exploring various nuances, contexts, and interactions between factors that influence the adoption of RegTech, as well as its impact on compliance and innovation in the digital finance sector. Literature review is a central component of this methodology, which includes the process of collecting, synthesizing, and analyzing data from a variety of relevant secondary sources, such as scientific journal articles, reports from financial institutions and international organizations, industry publications, and publicly available case studies. The selection of sources was carried out selectively based on their relevance to the topics of FinTech, RegTech, regulations in developing countries, and the challenges and benefits of their implementation, with an emphasis on indexed literature to ensure the validity of the information. The data analyzed includes definitions and characteristics of FinTech and RegTech, growth trends of FinTech in developing countries, forms of overregulation faced by startups (such as licensing regimes and compliance costs), as well as the core functions and technologies of RegTech, including AI, machine learning, big data, cloud computing, and blockchain. Additionally, this review covers the main benefits of adopting RegTech, including cost efficiency, improved accuracy, and scalability, as well as implementation challenges such as data quality, legacy system integration, skill gaps, and cybersecurity risks.

To complement the literature review, this study also applies a case study method to analyze empirical experiences of RegTech implementation in various developing countries. The selection of case studies was based on data availability and representation of diverse regulatory approaches and levels of FinTech and RegTech adoption. The countries studied include Indonesia, Singapore, and Malaysia in Southeast Asia, which reflect prescriptive, permissive, and hybrid regulatory frameworks; Nigeria and Rwanda in Africa, which face regulatory challenges but show progress in combating financial crime; Brazil in Latin America, known for its progressive regulatory framework; and India, which is experiencing rapid growth in FinTech and RegTech adoption. This case study analysis focuses on identifying best practices, specific challenges faced, and the real impact of RegTech implementation on the FinTech ecosystem in each country. Findings from the case studies are used to reinforce the results of the literature review while providing practical context for the development of RegTech policy and implementation strategies in developing countries.

RESULT

This study found that overregulation is a major obstacle to the growth of FinTech startups in developing countries. Rigid, overlapping, and costly regulations limit innovation and increase operational costs. In response, RegTech offers more efficient and adaptive technology-based solutions. To clarify these dynamics, Table 1 summarizes the main aspects of overregulation identified in the study.

Table 1. Overregulation Aspects in the FinTech Sector

Overregulation Aspects	Detailed Research Findings	Sources
1. Rigid Licensing Regime and High Capital Requirements	– FinTech companies seeking global expansion face high licensing barriers and regulatory inconsistencies between countries, hindering cross-border innovation.	(AllahRakha, 2023)
	– Many countries do not have a framework that allows for risk-based adjustments for FinTech startups.	
	– Federal and provincial regulations in Canada are not synchronized, making it difficult for new startups in the non-bank sector to enter due to high licensing costs.	(Clemons, 2021)
	– Regulatory sandboxes are only available for the securities sector, not for the entire FinTech sector.	
2. Overlapping and Fragmentation of Regulations	– The FinTech regulatory system in the US is highly fragmented, with various state and federal authorities issuing overlapping regulations.	(Clemons, 2021)
	– The lack of a single regulatory body means that startups must comply with various regulations that may conflict with each other.	
	– In the European Union, the absence of a standard legal definition for many FinTech solutions (e.g., ICOs, crowdfunding) has led to legal uncertainty and a “regulatory gray area”.	(Labancz, 2020)
3. Rapid Regulatory Changes and High Compliance Costs	– Regulatory changes in FinTech are happening very quickly, forcing startups to constantly change their business models and internal policies.	(AllahRakha, 2023)
	– Small startups do not have legal or compliance resources to keep up with these changes.	

Overregulation Aspects	Detailed Research Findings	Sources
	<ul style="list-style-type: none"> - In the US and Canada, compliance costs have risen dramatically due to regulatory complexity. FinTech faces a trade-off between innovation and compliance. 	(Kalai and Toukabri, 2024)
4. Data Privacy and Cybersecurity Issues	<ul style="list-style-type: none"> - FinTech in Saudi Arabia has difficulty choosing appropriate security controls because there are too many options in cybersecurity regulations from the monetary authorities. - Regulations do not yet consider differences in risk models between startups, resulting in disproportionate controls. 	(Alghamdi and Almadani, 2024)
	<ul style="list-style-type: none"> - The GDPR and other privacy laws complicate cross-border data processing, limiting the use of big data and AI for financial innovation. 	(AllahRakha, 2023)
	<ul style="list-style-type: none"> - The risk of data leaks and cyber attacks undermines user confidence and threatens national financial stability. 	(Bobryshev, 2023)

Overregulation for FinTech startups in developing countries manifests itself in several key forms that collectively hinder innovation and growth (Wulandari et al., 2025). Many developing countries have very rigid and inflexible licensing regimes, with strict registration and licensing requirements before FinTech startups can begin operation (Raharjo, 2021). These requirements may vary depending on the type of product offered, and often without any discretion on the part of the regulator. For example, in Nigeria, the capital requirements for a Payment Solution Service (PSS) license are 250 million Naira, and for Mobile Money Operators (MMO), they are 2 billion Naira (Adesanya, 2018). These high capital requirements make the provision of financial services very expensive and often unaffordable for many potential players in the FinTech sector, which in turn hinders innovation and financial inclusion. Additionally, bureaucracy in the approval process, such as the requirement to obtain prior approval (AIP) from the Central Bank of Nigeria (CBN) before a company can be established, can delay the start of business operations for weeks, even months (Phillips, 2019).

FinTech startups in developing countries are often regulated by different agencies, leading to overlapping and uncoordinated regulatory oversight. In Nigeria, for example, a digital lending company licensed by the CBN may also have to comply with regulations from the Federal Commission for Consumer Protection and Competition (FCCPC), including additional registration requirements (Adetoro, 2021). The lack of clarity regarding which agencies to contact for specific regulatory issues, as well as the lack of technical and managerial capacity among startups to meet various regulatory requirements, pose significant challenges (The CityUK, 2023). This situation creates regulatory fragmentation, forcing startups to allocate valuable resources to understanding and complying with multiple sets of rules that may be contradictory or redundant.

The FinTech regulatory environment in developing countries is characterized by rapid change, with regulators frequently issuing amendments and new regulations on a regular basis. Reports show a 500% increase in regulatory changes over the past decade, with new regulatory updates appearing every seven minutes (Grinberg, 2025). Many regulations require significant financial investment, leading to increased compliance costs that are difficult for many startups to absorb. Companies are estimated to spend between \$1 million and \$5 million on compliance for every \$1 billion in revenue they generate (Trebbi et al., 2023). Additionally, financial institutions report losing clients due to delays and friction arising from time-consuming KYC (Know Your Customer) and manual onboarding processes (Surachman et al., 2015).

Data privacy and cybersecurity are fundamental challenges for FinTech operations, especially since these companies handle highly sensitive customer information. Regulations such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) impose strict obligations on how data is collected, stored, and processed (Euvic IT, 2022). Non-compliance can result in significant fines and long-term reputational damage. Restrictions on the ability to use data across borders can also impact a financial institution's ability to rely on big data solutions or advanced analytics (Nanda, 2024). Additionally, FinTechs often take on more risks than traditional banks due to their innovative business models, and cyberattacks can be devastating, leading to the theft of financial assets and eroding user trust (Pascual and Natalucci, 2022).

Table 2. Comparative FinTech Regulatory Case Studies by Country

Country	Summary Case Study	Relevant Sources
Singapore	Permissive regulatory approach, focus on FinTech and AI experimentation; MAS developed the AIDA framework to support responsible innovation.	(International Monetary Fund (IMF), 2019)
Indonesia	Prescriptive regulations focused on stability and consumer protection; three OJK Circulars in 2019 introduced flexibility, examples of data-driven Islamic financing startups.	(Fitriana and Wijanarko, 2023; Gunawan, 2022)

Country	Summary Case Study	Relevant Sources
Malaysia	A hybrid regulatory framework to balance innovation and oversight; regional collaboration for cross-border legal harmonization.	(Diniyya et al., 2021)
Southeast Asia (General)	Regulatory sandboxes have been implemented in >50% of countries since 2020; the I-GFTCH regional initiative drives FinTech talent development and incubation across borders.	(Irawati et al., 2024)
Nigeria	Major challenges: expensive licensing, high bureaucracy, overlapping oversight; yet FinTech is growing fast (40% of startups & 42% of funding); RegTech is growing 40% by 2025.	(Celestin and Asamoah, 2020)
Rwanda	RegTech integration for AML & terrorist financing detection results in a 50% increase in detections, a 20% decrease in risky transactions, and a 71% false acceptance of biometrics.	(van Liebergen et al., 2016)
Brazil	Progressive regulation drives RegTech growth at 35.3%/year; Unico (digital identity platform) raises \$100 million; Pix payment system is a huge success.	(FATF, 2021; Vijayagopal et al., 2024)
India	Massive adoption of AML/KYC and digital reporting; government and RBI support; company examples: Digio, Veri5Digital, SurePass.io, Zango AI. RBI uses AI and NLP to monitor FinTech app stores	(Pascual and Natalucci, 2022; The CityUK, 2023)

RegTech as a Strategic Solution: Key Functions and Technologies

The research findings show that RegTech serves as a strategic solution to address the regulatory complexities faced by FinTech startups, particularly in developing countries. By automating various compliance processes such as reporting, risk monitoring, and auditing, RegTech significantly reduces operational burdens and minimizes the risk of human error (Packin, 2018). In terms of risk management and fraud prevention, this technology enables early detection of suspicious activity through real-time monitoring and AI-based data analysis (Kothandapani, 2024). RegTech also simplifies the regulatory reporting process by collecting and presenting data in a standardized format, increasing the speed and accuracy of reporting (Liang, 2024). In terms of Know Your Customer (KYC) and Anti Money Laundering (AML), RegTech automates identity verification and sanctions list screening efficiently (Li, 2024; Packin, 2018; Pavlidis, 2021). All of these functions are supported by the convergence of advanced technologies such as Artificial Intelligence (AI), Machine Learning (ML), Big Data, Cloud Computing, Blockchain, and Natural Language Processing (NLP), which collectively create a more predictive, adaptive, and scalable compliance system (Butler and O'Brien, 2019; El Khoury et al., 2024; Fröhlich, 2019; Olaiya et al., 2024). These findings confirm that RegTech not only improves compliance efficiency but also strengthens the foundation of innovation and sustainability in the FinTech sector.

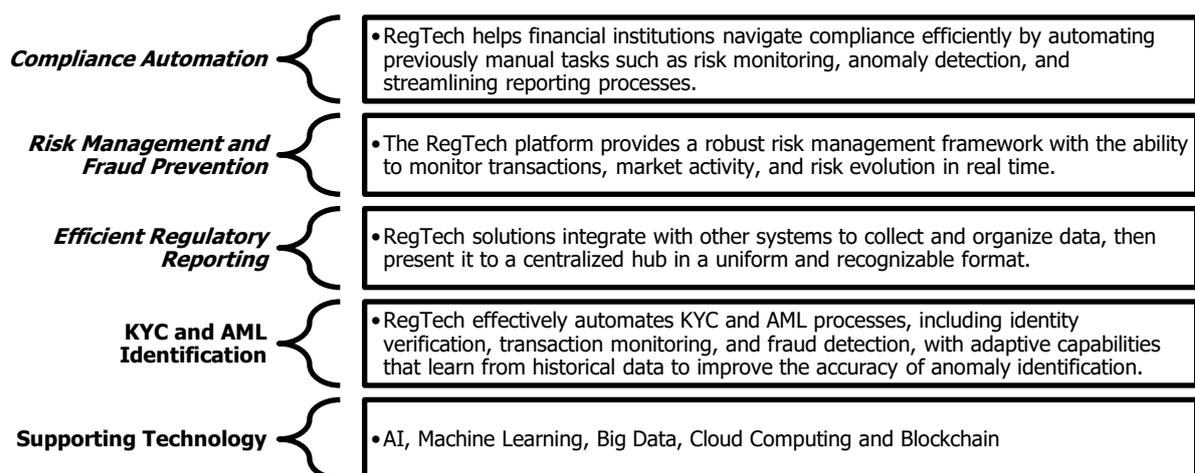


Figure 1. Core Functions of RegTech in FinTech Compliance

DISCUSSION

Benefits of Adopting RegTech for FinTech Startups

RegTech adoption provides significant strategic benefits for FinTech startups, particularly in developing countries, with contributions that go beyond mere compliance. One of the main benefits is increased operational

efficiency and reduced compliance costs, achieved through the automation of various regulatory tasks, thereby reducing dependence on manual labor and related costs (Wijaya, 2023). Solusi RegTech makes compliance more affordable for startups facing strict regulatory requirements, with reports showing that financial institutions that have adopted it have seen an average reduction in compliance costs of 25%, and in some cases as much as 30–40% (Lee, 2025; PwC Singapore, 2024). Additionally, automation of the Know Your Customer (KYC) process frees employees from time-consuming routine activities, allowing them to focus on strategic tasks with higher added value (Yadav and Bajpa, 2020). Thus, RegTech acts as a critical driver of capital efficiency, not only reducing operational burdens but also enabling the reallocation of resources towards more sustainable innovation and market expansion.

Besides cost efficiency, adopting RegTech also boosts accuracy and helps reduce the risk of human error. Manual compliance processes are inherently prone to oversights or data entry mistakes, which can lead to inaccurate reporting and potential penalties (Grinberg, 2025). Instead, RegTech technology works with consistent and reliable accuracy, especially in reporting automation, which enables fast, timely, and error-free report generation (Grinberg, 2025). This higher level of accuracy not only speeds up the audit process but also directly reduces the risk of penalties due to incorrect or incomplete reporting (American Bankers Association, 2024). RegTech also excels in terms of scalability and adaptability to regulatory dynamics. Designed to handle millions of accounts efficiently, RegTech solutions enable FinTech companies to grow without being constrained by resource-intensive manual compliance. The platform automatically updates its system in line with the latest regulatory changes, ensuring that companies remain compliant with evolving regulations. With automatic updates and real-time notifications, FinTech companies can quickly adjust their internal processes to new policies, maintaining operational continuity while minimizing the risk of non-compliance.

Furthermore, RegTech contributes to increased consumer confidence and the creation of sustainable competitive advantages for FinTech startups. With its ability to manage dynamic and varied regulatory complexities, RegTech significantly reduces business and reputational risks. Faster and more efficient KYC process automation also improves user experience, enabling instant and barrier-free access to services. Additionally, RegTech's ability to provide transparent and verifiable compliance evidence ensures a high level of accountability in company operations. By integrating compliance into the system as an integral part rather than merely an administrative requirement, RegTech transforms compliance functions into strategic value, enhancing operational efficiency while strengthening competitive positioning in the market.

Case Study on the Application of RegTech in Developing Countries

The implementation of RegTech in various developing countries shows a diversity of approaches and results achieved, providing valuable lessons for other jurisdictions.

1. Southeast Asia (Indonesia, Singapore, Malaysia)

Southeast Asia has become a significant center of FinTech innovation, driven by a large population, high mobile penetration, and growing demand for digital financial services. In this context, countries in the region have adopted various regulatory approaches to balance innovation and stability. Singapore stands out with its permissive regulatory framework, which actively encourages experimentation and growth in FinTech. The Singaporean government has made significant investments in infrastructure, talent development, and research as part of its national strategy for technological transformation, which has significantly contributed to its competitive advantage in the FinTech sector. The Monetary Authority of Singapore (MAS) is also proactively collaborating with the financial industry in the development of the Artificial Intelligence Data Analytics (AIDA) framework, demonstrating its commitment to responsible innovation.

In contrast, Indonesia adopted a more prescriptive regulatory framework, with a primary focus on financial stability and consumer protection. This approach is reflected in the strict and detailed licensing requirements for FinTech players, as well as the issuance of three OJK Circulars in 2019 to facilitate flexible adaptation of legislative solutions. An example of a FinTech startup in Indonesia is Alami, a sharia-compliant financing platform that provides in-depth data analytics to help businesses access financing from various institutions. Meanwhile, Malaysia implements a hybrid framework, which seeks to balance the need for innovation with rigorous regulatory oversight.

Malaysia and Singapore, in particular, have been working to create comprehensive FinTech regulatory frameworks, aiming to align domestic laws with neighboring countries to encourage cross-border financial activity and facilitate regional growth. Overall, regulatory sandboxes have been implemented in more than half of the countries in the region since 2020, demonstrating efforts to facilitate dialogue between regulators and businesses and encourage regulatory learning. Furthermore, initiatives such as the Integrated Global Financial Technology Capability Hub (I-GFTCH) in Bhubaneswar, India, in partnership with the Singapore-based Global Finance and Technology Network (GFTN), demonstrate regional efforts to develop a globally integrated FinTech talent and ecosystem, offering incubation, mentorship, and cross-border opportunities for startups and professionals.

2. Africa (Nigeria, Rwanda)

In Africa, the implementation of RegTech also shows interesting dynamics. Nigeria faces substantial regulatory challenges, including a rigid licensing regime, overlapping oversight from various agencies such as the Central Bank of Nigeria (CBN) and the Federal Commission for Consumer Protection and Competition (FCCPC), high capital requirements, and frequent regulatory changes. For example, the capital requirement for a Payment Solution Service (PSS) license is 250 million Naira, and for Mobile Money Operators (MMO) it is 2 billion Naira, which is considered expensive and hinders innovation. Bureaucracy in the approval process, such as the requirement to obtain prior approval (AIP) from the CBN before a company can be established, can delay the start of business operations for weeks or even months. Nevertheless, the FinTech industry in Nigeria continues to show exponential growth, holding the leading position in Africa in terms of FinTech company concentration (more than 40% of all startups in Nigeria as of August 2023) and funding volume received (42% of total technology funding in the country).

RegTech in Nigeria is expected to experience 40% growth among startups by the end of 2025, with solutions becoming increasingly popular in the areas of regulatory reporting, compliance, and AML/KYC processes. Examples of RegTech solutions in Nigeria include Codebase Technologies, which offers digital onboarding with best-in-class eKYC protocols, automated regulatory reporting, and efficient bank reporting solutions that can be integrated with legacy systems. Meanwhile, Rwanda provides a successful example of integrating FinTech and RegTech solutions to combat money laundering and terrorist financing between 2015 and 2019.¹⁷ Rwanda's proactive digital reforms resulted in a 50% increase in financial crime detection rates, a 20% decrease in high-risk transactions, and a 71% decrease in false biometric acceptance rates. This FinTech-RegTech convergence is considered a vital strategic pillar for Rwanda's national financial security.

3. Latin America (Brazil)

Latin America, particularly Brazil, is showing dynamic growth in the adoption of FinTech and RegTech, which are driven by progressive regulations. The RegTech industry in Brazil is projected to grow by 35.3% annually by 2024, reaching US\$270.36 million, and is expected to reach US\$732.95 million by 2029. Key trends driving this growth include increased adoption of automation in compliance processes, a strong focus on Anti-Money Laundering (AML), and enhanced collaboration between RegTech companies and FinTech startups. One notable example is Unico, a Brazilian digital identity platform, which successfully raised \$100 million in a Series D funding round in 2022, making it the largest RegTech transaction in Latin America that year. The Unico platform leverages Machine Learning (ML) and Artificial Intelligence (AI) technology to provide secure and efficient identity verification services, significantly aiding compliance with KYC/AML regulations. Brazil is also known as a global leader in progressive FinTech regulation and Open Finance frameworks. Their real-time payment system, Pix, is a remarkable success story, handling around 42 billion transactions in 2023 with settlements taking only a few seconds per transaction. Collaboration between RegTech companies and FinTech startups in Brazil is also on the rise, driving innovation in compliance and cybersecurity solutions, including partnerships between leading banks and CyberTech startups for AI-based fraud detection.

4. India

India has experienced exponential FinTech growth, with online lending apps significantly improving financial inclusion, particularly reaching previously unserved or underserved customers. The Indian government is actively promoting the digitization of regulatory and compliance obligations, as evidenced by its push for online GST returns, which opens up huge opportunities for RegTech players. RegTech in India is expected to continue to grow, driven by an increase in digital transactions following demonetization, which has led to increased use of RegTech solutions in KYC and AML, as well as the emergence of new RegTech companies. Several leading private banks in India have implemented regulatory technologies such as blockchain, AI, and robotic process automation (RPA) in the areas of KYC and AML. Examples of RegTech companies in India include Digio. in, which provides digital solutions for paperless transactions, eSign, eKYC, and Aadhaar-based eNACH; Novel Patterns, which specializes in big data and AI for business operations and insights; Veri5Digital, which offers identity verification and digital onboarding solutions, including Video KYC; and SurePass.io, which provides APIs for real-time corporate user onboarding. Additionally, startups such as Zango AI offer full-stack regulatory intelligence platforms that combine AI with deep legal reasoning to help financial institutions remain compliant and audit-ready, with modules such as Horizon Scanning for 24/7 regulatory monitoring and Obligation Mapping to identify compliance gaps. The Reserve Bank of India (RBI) has also collaborated in the development of an intelligent platform that utilizes web scraping, AI, ML, and NLP to identify and flag suspicious FinTech applications in app stores, enhancing regulatory oversight and consumer protection. Initiatives such as the Integrated Global Financial Technology Capability Hub (I-GFTCH) in Bhubaneswar, a partnership between the Government of Odisha and the Singapore-based Global

Finance & Technology Network (GFTN), also aim to develop future-ready FinTech talent and ecosystems, offering incubation, mentorship, and cross-border opportunities.

Challenges of RegTech Adoption in Developing Countries

Although RegTech offers great strategic potential, its adoption in developing countries still faces a number of complex challenges. One of the main obstacles is data quality and the difficulty of integrating with legacy systems. RegTech requires high-quality, standardized data, but the lack of harmonization in data definitions and formats often hinders the effectiveness of risk aggregation. Additionally, the process of integrating RegTech technology with outdated legacy systems is often costly and complex due to architectural incompatibilities.

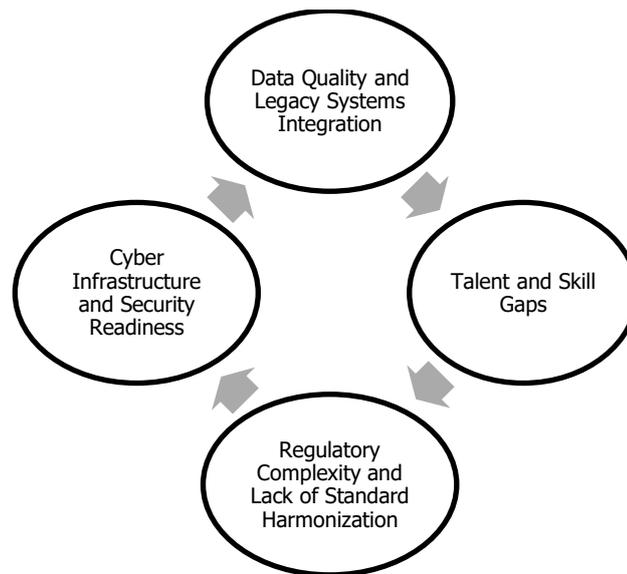


Figure 2. RegTech Adoption Challenges Framework

The next challenge is the talent and skills gap. Many financial institutions and regulators in developing countries do not yet have sufficient human resources capacity to understand and operate RegTech technology optimally (Asian Development Bank, 2022). A lack of technical expertise, particularly among compliance professionals, creates the risk of misinterpretation and inconsistent implementation (Nanda, 2024).

On the other side, the complexity of regulations and the lack of harmonization of standards are also major obstacles. The regulatory landscape in regions such as Southeast Asia is highly diverse and constantly changing, making it difficult for compliance teams to manage differences in AML frameworks between countries (Egemonye, 2025; Lee, 2025). Cultural, linguistic, and ethical factors compound the gap in understanding regulations, while the lack of uniform technical and legal standards slows down the cross-border adoption of RegTech (Nanda, 2024).

Finally, the readiness of digital infrastructure and cybersecurity issues are also fundamental challenges. Many developing countries still face infrastructure limitations, including low internet penetration and poor network quality in remote areas (Fintechnews Africa, 2023). Additionally, the use of advanced technologies such as cloud and AI in RegTech can open up new potential risks, including cyber attacks and data manipulation, especially if security management is not yet optimal (Asian Development Bank, 2022).

CONCLUSION

Overregulation poses a significant structural challenge for FinTech startups in developing countries, manifesting itself in the form of rigid licensing regimes, high capital requirements, overlapping regulatory oversight, costly compliance fees, and increasingly complex data privacy and cybersecurity issues. These conditions collectively hinder innovation, increase operational burdens, and slow down the growth of startups that should be adaptive and agile. In facing these challenges, Regulatory Technology (RegTech) has emerged as a strategic solution that offers automation of compliance processes, predictive risk management, efficient regulatory reporting, and significant improvements in identity verification (KYC) and anti-money laundering (AML) processes. This solution is made possible through the use of cutting-edge technologies such as artificial intelligence (AI), machine learning (ML), big data, cloud computing, and blockchain. Case studies in Rwanda, Brazil, and India show that the adoption of RegTech can improve operational efficiency, reduce compliance costs, and build broader consumer trust. However, the adoption of RegTech still faces various obstacles, such as inadequate data quality, limitations in integration with legacy systems, a shortage of skilled personnel, the complexity of dynamic regulations, and uneven

digital infrastructure in developing countries. Nevertheless, the future prospects for RegTech are very promising, with the global market projected to grow to USD 60.77 billion by 2030, up from USD 12.82 billion in 2023, reflecting a compound annual growth rate (CAGR) of 24.9%. In Brazil alone, the RegTech industry is expected to grow to USD 732.95 million by 2029. Future trends include deeper adoption of AI, real-time regulatory monitoring, closer collaboration between regulators and industry, and the emergence of embedded compliance as an integral feature in FinTech applications. The implications of these developments suggest that the adoption of inclusive and adaptive RegTech is not only important for improving efficiency and compliance but also serves as a key catalyst in driving the growth of a sustainable and responsible FinTech ecosystem in developing countries.

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