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Regulatory Outlook in Fintech: A Review

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A B S T R A C T

The rapid expansion of financial technology (fintech) has transformed the financial services industry by significantly enhancing accessibility, efficiency, and innovation. Fintech's significance lies in its capacity to democratize financial services for the unbanked population, reduce costs, and enhance the overall user experience. Nevertheless, the substantial growth of fintech also poses notable regulatory obstacles. Regulatory outlook has played a crucial role in the rise of fintech and continues to impact its reach and implications. This study aims to comprehensively review and analyze the rapid changes in fintech, identifying key trends, challenges, and opportunities for regulators and fintech companies. This paper offers a detailed understanding of how regulatory frameworks adapt to technological advancements, the impact of these regulations on innovation and competition, and strategic insights for stakeholders to navigate the regulatory environment effectively. By closely examining and anticipating regulatory developments, our discussion will enable fintech firms to innovate responsibly, ensuring their products and services meet legal standards and consumer protection requirements. A well-balanced regulatory framework can nurture a flourishing fintech ecosystem while safeguarding the public's interests. Achieving this equilibrium necessitates continual collaboration between regulators and industry stakeholders, a critical factor in adapting to technological advancements and evolving market conditions.

Keywords: Fintech, Regulation, Innovation, Framework Policy and Review

1. Introduction

The rise of Financial Technology, or fintech, has revolutionized the financial services industry, enhancing accessibility, efficiency, and innovation. Fintech surrounds various applications, from mobile banking and online lending to blockchain and cryptocurrencies. Its importance lies in its ability to democratize financial services, reduce costs, and improve the user experience. However, the rapid growth of fintech also presents significant regulatory challenges. Regulation has contributed to the emergence of fintech and continues to affect its geography and implications (Arner et al., 2016). Effective regulation is essential to mitigate risks without stifling innovation. A balanced regulatory framework can foster a thriving fintech ecosystem while safeguarding public interests (Arner et al., 2017; Saha et al.,2024). This balance requires ongoing collaboration between regulators and industry stakeholders to adapt to technological advancements and evolving market conditions.

As technology develops faster, people take advantage of legal holes, and rules worldwide are sometimes different. This makes it harder for laws to keep fintech from growing too quickly. Financial technology is changing faster than regulators can keep up, allowing companies in this field to take advantage of gaps in the law (Buchak et al., 2018). According to Pozsar et al. (2013), when fintech companies operate in areas with fewer rules, regulatory arbitrage is terrible for customer safety and the economy's security. Different foreign rules make the playing field less level and management less effective (Jagtiani & Lemieux, 2019). To get around these problems, ensure strict control, look out for consumers' best interests, and keep the economy safe, fintech needs solid and consistent laws that can be changed to fit new technologies.

A balanced regulatory framework is essential to foster fintech innovation while mitigating associated risks. Key regulations should include stringent cybersecurity protocols to protect consumer data and ensure system integrity. Comprehensive know-your-customer (KYC) and anti-money laundering (AML) regulations are crucial to preventing fraud and financial crimes (Navaretti et al., 2018). Regulatory sandboxes, which allow fintech firms to test new products under a regulator's supervision, encourage innovation by providing a controlled environment for experimentation (Zetzsche et al., 2017). Clear digital assets and cryptocurrency guidelines can also provide legal certainty and enhance market stability (Arner et al., 2017). Collaboration between regulators and industry stakeholders is vital for adaptive regulation that evolves with technological advancements. These measures collectively ensure a secure and innovative fintech ecosystem.

This paper has contributed to tracking the regulatory implications of fintech. First, our research on the regulatory outlook of fintech significantly contributes to the finance literature by providing a comprehensive understanding of the evolving legal landscape, which is essential for sustainable innovation. By closely examining and anticipating regulatory developments, our discussion will enable fintech firms to innovate responsibly, ensuring their products and services meet legal standards and consumer protection requirements. Moreover, this study has developed a deep understanding of regulatory trends, allowing fintech companies to mitigate risks, avoid legal pitfalls, and build consumer trust, fostering a balanced growth environment prioritizing technological advancement and regulatory compliance.

2. Methodology

In this comprehensive study, we adopt a narrative approach to thoroughly assess the existing literature on the regulatory concerns for fintech applications. This method allowed us to critically evaluate and categorize the significance and outcomes of the study, thereby adding a layer of depth and novelty to our research. Boell & Cecez-Kecmanovic (2015) highlighted the value of employing a narrative approach to the literature review, emphasizing that it enables researchers to exercise more excellent judgment in classifying and critically evaluating the significance and outcomes of the study. Our rigorous review process involved sourcing relevant peer-reviewed literature from open-access journals and highly reputable indexes such as Scopus and Web of Science. To ensure the utmost relevance, we carefully selected journals that closely corresponded to the regular advancement in fintech developments, factors affecting fintech revelations, regulatory trends, and forthcoming regulatory frameworks.

3. Fintech and Regulatory Ecosystem

The advent of financial technology, or fintech, has marked one of the most significant shifts in the financial sector since the invention of electronic banking. The fintech ecosystem encompasses various applications, from mobile payments to blockchain and cryptocurrency, peer-to-peer lending, and robo-advisors, aiming to enhance financial services. Besides, it is also grabbing increasing numbers of market participants across diverse segments like digital payments, wealth management, retail banking, crowdfunding, lending, capital market, and insurance (Lee et al.,2018). The rapid adoption of digital platforms has forced banks to rethink their strategies and embrace digital transformation to remain competitive. Fintech’s essence lies in its innovative approach to delivering financial services, characterized by increased efficiency, accessibility, and disruption of traditional financial systems (Gomber et al., 2017).

Fintech operates through various mechanisms, primarily leveraging the internet, mobile devices, and blockchain technology. Currently, blockchain and cryptocurrencies represent the most revolutionary aspects of fintech, offering decentralized and transparent alternatives to conventional banking systems. Peer-to-peer (P2P) lending and crowdfunding platforms are other significant aspects of fintech, connecting borrowers directly with lenders or investors without the need for traditional financial intermediaries. These platforms utilize algorithms to assess creditworthiness and facilitate loan agreements, often resulting in lower interest rates and faster approval processes(Balyuk, 2019). At its core, fintech leverages cutting-edge technology to make financial services more efficient, accessible, and user-friendly. The essence of fintech lies in its ability to democratize financial services, breaking down barriers that have historically excluded large portions of the population from accessing banking, investment, and insurance products. Fintech has the potential to provide financial services to underbanked populations, thereby promoting financial inclusion (Philippon, 2016). This is particularly evident in developing countries, where mobile banking services have significantly reduced the number of unbanked individuals (Saha et al.,2024).

Fintech can negatively impact markets, consumers, and societies broadly through risks related to cybersecurity, data privacy, and financial market integrity, among others. Consequently, when considering how to create a suitable balance between innovation and risk in the Fintech ecosystem, policymakers and regulators must adopt a range of balanced approaches to developing regulation and governance that maximize Fintech's benefits while mitigating and minimizing its potential negative impacts. Therefore, this policy framework can guide policymakers and regulators in that endeavor (Ahammed & Sabuj, 2018).

-**Define the objective, understand the market, and identify stakeholders**: The outline requires a deliberate, coordinated, and collaborative approach involving multiple stakeholders, including the lead, coordinating, consultation, and implementation stakeholders. Regulators should thoroughly research the target market, including customer needs, existing gaps, and competitive landscape. Under the lead stakeholder's direction, authorities can initiate the fintech regulation development process.

-**Design Infrastructure, compare key unique values, and build the draft:** By this stage, regulatory bodies can now identify the vital substantive pillars upon which they will evaluate and compare the risks and benefits. While this will vary across countries due to differing needs, visions, and development levels, the existing policy suggested that regulation should consider building out three critical elements for a thriving fintech ecosystem that promotes financial inclusion and sustainable development more broadly: (1) infrastructure; (2) regulation and governance, and (3) the broader ecosystem.

-**Implement, test, monitor, and improve:** In this final stage, the policy framework experts should outline the process for fintech companies to achieve the desired results, compare the deviation, address the regulatory limitation, and improve the existing work actions.

4. Regulatory Drivers in Fintech

Driven by the extraordinary evolution and ubiquity of disruptive technologies and demands for superior customer experience at reduced transaction costs, fintech companies have greatly proliferated around the globe (Zarrouk et al., 2021). For instance, the number of Fintech companies globally increased from approximately 12,000 in 2018 to 30,000 in 2024 (Statista, 2024). The emergence of fintech startups globally, each with its unique value proposition, has remained the same in a homogenous ratio (Kowalewski & Pisany, 2023). Instead, these startups, driven by customers' unmet demands, have been instrumental in shaping the growth story of the Fintech industry globally (Haddad & Hornuf, 2019).

4.1 Technological Drivers

The emergence of newer technology is a motivator for fostering newer innovation and encouraging people to stay highly enthusiastic about the potential change or benefit that technology will bring up (Schindler, 2017). The evolution of digital payment technology has brought Fintech's attention to regulators. In addition, emerging digital technologies such as AI, machine learning, blockchain, and Cloud computing have offered superior quality and reduced costs of the service provided by the fintech startups compared to the traditional finance industry and are in authority for boosting the industry's massive growth. In addition, regulators consider convenience, such as easing payment processing, reducing fraudulent activities, the utility of saving users' money, and promoting financial inclusion, to be the unique selling proposition of prominent fintech startups around the world (Siddiqui & Rivera, 2022). Haddad and Hornuf (2019) stated that while bringing the latest technological innovations into the market opens the door for new business models to emerge and disrupt the traditional fintech industry, this trend has brought challenges to supervisory financial authorities around the world

4.2 Economics Drivers

The economic drivers are significant and pivotal in supporting the tremendous growth rate that fintech has been experiencing in recent years. The effect of economic drivers in promoting fintech growth can be categorized by economics classification (Frost, 2020).

In the case of developed economies, the underbanked population, which mostly remains excluded from traditional banking services due to higher costs, is moving towards adopting fintech services. Regulators perceived the existence of fintech as more just being aggressive than the traditional banking system. However, the banking system actively promotes the formation of new fintech companies to cater to changing customers' needs and promote efficiency in the industry (Saha et al.,2024). This understanding of economic drivers in fintech's growth is crucial for researchers, economists, and professionals in finance and technology. It provides a comprehensive view of market dynamics and the factors driving the fintech revolution.

In contrast to developed economies, fintech has been promising financial inclusion to the unbanked population of developing economies and standing as a source of competition to the traditional banking industry. The unmet demand for financial services among the population that traditional banks have failed to provide creates the need for new fintech service providers. For instance, the Asia-Pacific region is expected to outperform the USA as the leading fintech industry by 2030 with an astonishing CAGR of 27% (Ahn & Cho, 2019). This extraordinary growth rate is possible as most of the population in Asia-Pacific regions still has remained without access to the traditional banking system. Again, the greater the difficulty is in putting relevant regulations in place since developing and emerging countries have yet to develop fintech regulations at full length.

5. Fintech-Bank or Non-Bank: A Regulatory Paradox

5.1 Shadow Banking

Beyond the controlled world of traditional banks, there is a business called "shadow banking," which includes fintech loans and other financial middlemen that are not banks. These companies use regulatory arbitrage to work with fewer restrictions by taking advantage of gaps in the law. Buchak et al. (2018) state that this approach promotes new ideas but risks the system. The rules that govern shadow banking are complicated and are constantly changing. A big problem is that less strict control could damage the whole system. The significant things being worked on are protecting customer interests, keeping data safe, being open, and reducing risks. Standardized credit risk assessment processes lower the chance of failures, which helps keep the economy stable (Jagtiani & Lemieux, 2019). One part of consumer safety tactics that helps fintech companies gain trust is having good ways to deal with issues. Capital and cash flow are essential for financial stability because they help fintech lenders handle bad economic times (Claessens et al., 2012). The fact that fintech is digital has led to worries about data protection and rules for hacking. To keep customers' trust and fight hacking, customer data must be kept safe from breaches (Thakor, 2019). International regulatory cooperation is needed to make sure that standards are the same across countries.

5.2 Third-party Application

Third-party applications like fintech lenders and payment processors face continuously changing regulations. These policies promote innovation, financial stability, consumer protection, and data security. Third-party applications need regulatory licenses to function. This provides minimal financial and operational health (Zavolokina et al., 2017). Regulators demand capital and liquidity to guarantee that these firms can absorb losses and pay commitments. These policies avoid bankruptcy and stabilize the financial system (Arner et al., 2015). Regulations require comprehensive disclosure of terms, fees, and dangers to prevent financial product deception. Transparency builds trust and informed decision-making (Jagtiani & Lemieux, 2019). Anti-money laundering (AML) and Know Your Customers (KYC) requirements require third-party applications to authenticate user identities and monitor transactions for suspicious activities. These safeguards prevent fraud and money laundering (Arner et al., 2015). Third-party applications may test new goods and services in a controlled environment under regulatory oversight, balancing innovation and risk management (Bromberg et al., 2017).

5.3 BigTech Entrance

The fintech sector encompasses three main sectors: lending, payment services, and investment management, with payment services being the most widespread (Tanda & Schena, 2019). Prominent technology giants like Amazon, Google, Apple, and Meta are progressively venturing into the financial services industry via partnerships with established banks or by creating innovative solutions. These collaborations use the regulatory compliance and trust that are linked to banks. Goldman Sachs and Apple collaborated to develop the Apple Card, a digital credit card seamlessly connected with Apple Pay and Apple Wallet (Financial Times, 2019). This partnership demonstrates how large technology companies may use conventional banks' regulatory frameworks and knowledge to enhance their financial services. Google requested a license from Lithuania for its subsidiary, Google Payments, to provide financial services throughout Europe (Seputyte & Kahn, 2018). Ensuring adherence to regulatory requirements is paramount for extensive technology businesses venturing into the fintech industry, as it helps minimize potential hazards and establish consumer confidence. Many technology companies may engage in financial services innovation by forming partnerships with banks or obtaining relevant licenses, ensuring compliance with regulatory requirements (Islam et al.,2024).

6. Fintech: A Regularity Concern

As the fintech industry rapidly evolves, regulatory frameworks struggle to keep pace, leading to inconsistencies and gaps in oversight across jurisdictions. The lack of harmonized regulations exacerbates cross-border complexities, hindering market access and fostering regulatory arbitrage. Addressing these failures necessitates collaborative efforts among regulators, industry stakeholders, and policymakers to develop agile, adaptable regulatory frameworks that balance innovation facilitation with risk mitigation and consumer safeguards. Fintech innovation thrives on agility and adaptability, often outpacing the development of regulatory frameworks. Traditional financial regulations were designed for brick-and-mortar institutions, struggling to accommodate the rapid evolution of digital financial services. This discord between innovation and regulation creates a regulatory gap, leaving Fintech firms operating in a gray area susceptible to regulatory scrutiny and uncertainty (Catalini & Gans, 2016).

Cross-border operations amplify regulatory challenges for Fintech firms. Varying regulatory approaches across jurisdictions creates compliance complexities and regulatory arbitrage opportunities. For instance, a fintech firm operating in multiple countries must navigate diverse regulatory requirements, leading to compliance burdens and increased operational costs (Arner et al., 2015). Moreover, conflicts between national regulatory authorities often hinder seamless cross-border fintech services, stalling innovation and market expansion (Gupta & Gans, 2020). Regulatory failures exacerbate innovation disruption in the fintech sector. Unclear regulatory guidelines and enforcement mechanisms deter Fintech investment and innovation. Firms may opt for conservative strategies, focusing on regulatory compliance rather than innovation, stifling technological advancements (Claessens et al., 2018; Sabuj et al.,2019). Moreover, regulatory uncertainties deter collaboration between fintech startups and traditional financial institutions, hindering the development of synergistic partnerships that could drive innovation (Bouri et al., 2021). The regulatory crackdown on cryptocurrency exchanges exemplifies the challenges of cross-border Fintech regulation. Divergent regulatory approaches towards cryptocurrencies and Initial Coin Offerings (ICOs) have created regulatory arbitrage opportunities, leading to market fragmentation and investor uncertainty (Zetzsche et al., 2017). The lack of coordinated regulatory frameworks inhibits the growth of legitimate Fintech innovations, deterring investor confidence and impeding market development.

7. Regulatory Tools and Policies

Many academic researchers and professionals have argued over the multifaceted application of fintech and highlighted potential vulnerabilities that need to be well addressed with concrete guidelines and a high degree of supervision and compliance. According to Buckley's (2017) research, financial regulators must develop new regulations that balance the benefits of innovation and economic progress and the need for financial stability and consumer protection.

7.1 Regulatory tools

As the fintech industry's growth is a hot topic worldwide, fintech regulation is necessary for market stability, integrity, and customer protection (Jayoung et al., 2020). However, heavy regulations limit innovation, make it impossible to provide customer satisfaction, and prevent companies from advancing in a competitive market. Fintech faces many regulatory challenges; thus, new regulatory frameworks are developed to fit new technologies. A regulatory tool encourages innovation in the fintech industry, and this tool is applied as an international practice for the development of this sector. Country-specific regulatory frameworks generally regulate fintech firms, but most use regulatory arbitrage for development. Under this framework, neutrality is considered an important principle, which states that given the same risk, regulation does not favor one entity over another. Fintech regulation is widely used in developed countries because it primarily relies on industry experts and academics. In contrast, developing countries aim to increase financial inclusion or involvement in international organizations to gain benefits (WB and CCAF, 2019).

Regulatory sandbox: Regulatory sandboxes are considered a 'safe space" where firms can innovate new products, services, and business models without bearing the regulatory burden for a specific period. It allows for testing innovations under real-world market scenarios for a specific timeframe with the involvement of predefined real customers. According to Jayoung (2020), a significant capital investment is necessary in the early stages of development in the fintech industry. In addition, it also says the new fintech industry reduces its legal and institutional risks by adopting a flexible business model. The government also provides business-friendly regulations and plays a vital role in supporting the new fintech industry (Yun et al.,2019). To test innovation in the market with real customers under restrictive circumstances and observation by the supervisory body, the UK launched the first regulatory sandbox for Fintech companies in 2016 (Buchanan & Cao, 2018).

RegTech: The purpose is to increase the internal risk management system, reduce the cost of compliance, and follow regulatory compliance. RegTech helps the industry with compliance and reporting with the regulation and assists regulators in developing better regulations and supervision for the fintech industry (Arner et al., 2015). RegTech focuses on increasing regulatory compliance in fintech using an automated routine system and precipitating alertness for inconsistencies. RegTech has paid attention to effective reporting and compliance using data analytics tools, cloud computing, and machine learning (ML). Jagtiani and Lemieux (2016) indicate that allowing advanced technology in fintech business models gives them an excellent chance to capture market share, and community banks face challenges in competing with them. In this case, Anagnostopoulos (2018) conclude that the RegTech ecosystem allows direct collaboration or partnership between incumbent banks and disruptor fintech through acquisition or joint ventures. The pressure on regulators to shift their focus from policing human behavior to regulating and overseeing algorithmic/electronic processes has increased due to the growing use of technology in finance. This rapid development of fintech has also fueled the need for RegTech (Ernst & Young, 2016). Such changes could significantly impact behavior, products, financial industry practices, distribution channels, and potential regulatory responses.

7.2 Technological Policy

Technological changes have created a dominant position in the market but have brought potential risks to customers' data privacy, cybersecurity, integrity, and financial stability. Cybersecurity in fintech is fundamental since it helps organizations protect their data management systems and information security. According to Pascu (2017), data security violations increased from 19% to 24% during 2016–17. As a result, 78% of the Fintech industry increased their cybersecurity budgets by up to 58% in 2016. Many countries, including the United States, the United Kingdom, Singapore, and France, have established cyber security centers to combat cyberattacks (Ehrentraud et al., 2020). Digital Financial Service (DFS) refers to financial services operated via the internet and mobile devices, including online banking, digital payment tools such as mobile money and digital wallets, and peer-to-peer lending and remittance services. Low-cost, effective communication channels via websites and mobile banking create lucrative opportunities for new entrants and make the industry more attractive to customers. Artificial intelligence and Machine Learning (ML) provide an automated service to the customer without human intervention, control fraudulent transactions, and ensure data security. However, besides the potential benefits, AI and ML incorporate several risks and need several policy implications to protect the industry. Although AI responds quickly through the robot advisor, the company needs more consistency and operational challenges to ensure customer satisfaction. Individual identity verification and giving open access to the customer sometimes face trouble due to security purposes. System integrity must be better for data safety and soundness in financial evaluation. In addition to this network vulnerability, website issues sometimes make it impossible to recover critical information, resulting in a specific problem or loss of customer satisfaction in this area. To ensure data integrity and address customer problems, a system review by experts is necessary (SARITA 2012).

Technological advancement allows the fintech industry to operate under cloud computing systems that allow users to access their necessary resources over the internet. However, this system's data security risk is a significant concern because identity theft and data breaches have recently become prevalent. Hackers can break the system and steal the valuation data from the server. It is complicated to ensure data security in the digital world, so fintech is always in danger of losing security. Policymakers have set guidance and a regulatory framework to protect the fintech industry from these potential threats. They establish standards that protect individuals and businesses from cyber risk while allowing them to exercise potential benefits. Failure to control unauthorized users and system disturbances must be solved by using a technical specialization in cloud service providers, changing operating software, successfully monitoring user activities, and implementing IT software.

7.2 Monetary policy

The fintech industry's growth increases competition in the financial markets. It causes the market to react to changes in interest rates more quickly; central bank decisions on monetary policy influence fintech firms' financing expenses and capital costs. Lower interest rates encourage investment and borrowing, which is advantageous for capital raising in fintech businesses. On the other hand, increased interest rates might make borrowing more expensive, influencing the development and success of fintech companies. However, the impact of virtual currencies on monetary policy transmission largely depends on the extent to which businesses and households embrace them. These virtual assets also effectively control money supply and demand in the market (Mumetz & Smith,2020). In their paper, they conclude that lower interest rates increase the demand for money and boost the economy's production, and low-price levels stimulate economic activity, which raises money demand.

Fintech innovation drives the finance industry toward shadow banking or peer-to-peer lending, focusing on market stability and monetary policy transmission from the perspective of fintech innovation. Due to the emergence of advanced technology, digitalization, and big data analysis techniques, fintech has already widened its range from financial inclusion to many diverse financial systems. The ability of central banks to implement monetary policy controls the money supply system in the financial industry. The critical challenge of the Fintech industry is to focus on financial innovation by adjusting regulations and considering the corresponding risk simultaneously. The Fintech industry continues to supply the economy with credit and liquid capital. Thus, policymakers need to design monetary policy within a regulatory environment. Customer protection policy, data privacy, and risk management procedures can indirectly shape fintech's monetary policy. An effective monetary policy reduces the risk associated with fintech activities and ensures financial stability in the fintech industry.

7.3 Prudential policy

According to Allen et al. (2021), all potential fintech industry customers must have reviewed the fundamental requirements under KYC (know your customer) to inhibit money laundering. Customers' identity verification through biometric authentication and digital identity verification is necessary to protect fintech against crime. Furthermore, reporting suspicious activities, customers' due diligence, and monitoring regular activities are essential ALM policies to protect the fintech industry from illegal activities. Fintech provides a wide range of services and has developed an emerging market. Organizations manage their adverse situations by analyzing databases and offering available products to their target customers (Boot, 2021). The increase in customer data on a large scale requires the government to set standards for data collection, storage, and use. An international data standard is also needed to protect data security when jurisdictions use data to benefit from cross-border data. Also, data infrastructure policy ensures data availability on the market so that no single firm can take control of the market. This policy also needs to consider data exchange and interconnection between different jurisdictions.

Moreover, the drastic improvement of the fintech industry is the ability to deal with information from multiple sources like social networking channels and different media. Relying on soft information creates business risks and needs continuous customer protection monitoring; thus, FinTech needs a customer protection policy. As necessary for customer protection policy, currently, fintech operators efficiently manage complex information and focus on safe and standardized assets through digitalization. Traditional businesses exercise tight control over their clients' data, but electronic payment on fintech gives customers important information on various online services; thus, it has a risk of cybercrime. So, many fraudulent services offer customers new services and low-cost solutions through online transactions and try to get access to user accounts. Policymakers now provide various security systems to protect customer data. Ensuring supervision and monitoring is essential for customer loyalty and fintech sustainability.

It is interesting to see how traditional financial institutions and fintech platforms have worked together and benefited from each other's strengths. This collaboration is nothing less than a financial revolution that has the potential to connect underserved market consumers to the main financial stream (AIS, 2018). Regulators should be proactive and develop a safety net to mitigate these risks and tune the regulation between over-regulated and under-regulated, which promotes an innovation environment, considers public interest, and allows continuous dialogue between national and international financial intermediaries. Fintech rules should strike a delicate balance between safeguarding consumers and ensuring the stability of the financial industry. At the same time, these regulations must encourage and reward Fintech innovations that have the potential to transform the industry for the better. Only by finding this balance can we ensure that fintech continues to evolve and thrive in a way that benefits everyone. It is interesting to watch out for the fact that COVID-19 has given us a glimpse of how fintech has adapted to vulnerabilities. Fintech has become a strong contender for facilitating financial flows even if it faces a recessionary environment. Such vulnerabilities have strengthened the financial stability of expanding the core business of fintech. It promotes the discussion of the growing confidence of customers in fintech but is often titled a cycle. To maintain the same flow, fintech must dive deeper into individual behavioral and resilience sentiments in crisis. Regulators should consider social trust and perception of benefits to evaluate fintech’s ethical intention to penetrate the market simultaneously rather than define its impact as a cyclical adoption.

8. Conclusion, Limitations, and Future Studies

Fintech marks a significant shift in the financial sector, integrating technology into financial services to improve consumer use and delivery. Fintech's essence lies in its innovative approach to delivering financial services, characterized by increased efficiency, accessibility, and disruption of traditional systems. It democratizes financial services, breaking down barriers that have historically excluded large portions of the population from accessing banking, investment, and insurance products. Fintech operates through various mechanisms, primarily leveraging the internet, mobile devices, and blockchain technology. Policymakers and regulators must adopt a range of balanced approaches to develop regulation and governance that maximize the benefits of Fintech while mitigating its potential negative impacts.

Regulatory failures in the fintech sector, particularly regarding cross-border operations, pose significant challenges to innovation and market stability. The discord between fintech innovation and traditional regulatory frameworks exacerbates compliance burdens, stifles investment, and undermines market confidence. Addressing these regulatory challenges requires coordinated efforts among national and international regulatory authorities to develop agile regulatory frameworks that foster innovation while safeguarding financial stability—failure to do so risks hampering fintech's transformative potential and perpetuating regulatory arbitrage and market fragmentation.

The practice of regulatory arbitrage, where financial institutions seek to take advantage of differences in regulatory requirements across jurisdictions, further complicates oversight and control. Balancing the need for financial system growth and innovation with the imperative of maintaining systemic security is a significant challenge in these evolving systems. This balance is particularly important in protecting consumers, promoting financial inclusion, reducing systemic risks, and ensuring financial data security. The emergence of Fintech and BigTech players disrupt established financial structures, necessitating robust and adaptive regulatory frameworks to address both current and future risks. As regulatory frameworks for fintech continue to evolve, there is a focus on instituting more stringent regulations without unduly impeding market entry and stifling innovation. This delicate balancing act is particularly crucial in emerging economies, where enhanced financial access and efficiency can have profoundly positive impacts. Regulatory authorities in many jurisdictions have taken proactive steps, such as creating regulatory sandboxes and deploying regulatory technology (RegTech) solutions, to foster innovation while managing associated risks prudently.

This study has limitations since we excluded some relevant studies that could have provided insight into early regulatory development, and fintech regulation is still evolving and multidisciplinary; the findings need to be linked with other disciplines. Additionally, we did not explore the complex structures of Fintech or follow any hypothesis validation methodology. We suggest exploring regulatory optics in fintech crimes and cross-country collaboration of fintech regulation for future suggestions.

References

Ahammed, A., & Sabuj,S.(2018). Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh*. Journal of Economics and Business, Vol.1, No.4*, 555-563. https://doi.org/10.31014/aior.1992.01.04.49

Ahn, K., & Cho, J. S. (2019). Major concerns of FinTech (Financial Technology) services in the Korean market. *Journal of Business and Retail Management Research*, *14*(01).

AIS, D. (2018). Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh*. Journal of Economics and Business, 1(4)*, 555–563. https://doi.org/10.31014/aior.1992.01.04.49

Allen, F., Gu, X., & Jagtiani, J. (2021). A survey of fintech research and policy discussion. *Review of Corporate Finance, 1*, 259-339.

Anagnostopoulos, I. (2018). Fintech and regtech: Impact on regulators and banks*. Journal of Economics and Business*, 100, 7-25.

Arner, B., Buckley, & J., N. (2015). The Evolution of Fintech: A New Post-Crisis Paradigm? University of Hong Kong Faculty of Law Research.

Arner, D. W., Barberies, J. N., & Buckley, R. P. (2015). The Evolution of Fintech: A New Post-Crisis Paradigm. *Georgetown Journal of International Law, 47*(4), 1271-1319.

Arner, D. W., Barberies, J. N., & Buckley, R. P. (2017). FinTech, RegTech, and the Reconceptualization of Financial Regulation. *Northwestern Journal of International Law & Business.*

Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of Fintech: A new post-crisis paradigm. Geo. J. Int'l L., 47, 1271.

Arner, D., Barberis, J., & Buckley, R. (2016). The evolution of fintech: A new post-crisis paradigm? (*Vol. 47*). Georgetown Journal of International Law.

Balyuk, T. (2019). Financial Innovation and Borrowers: Evidence from Peer-to-Peer Lending. *Rotman School of Management*.

Boot, A., Hoffmann, P., Laeven, L., & Ratnovski, L. (2021). Fintech: What's old, what's new? *Journal of financial stability*, *53*, 100836.

Bouri, A., Gupta, R., & Tiwari, A. K. (2021). Blockchain and fintech: An overview, challenges, and future perspectives. *International Review of Financial Analysis.*

Bromberg, L., Godwin, A., & Ramsay, I. (2017). Fintech sandboxes: Achieving a balance between regulation and innovation. *Journal of Banking and Finance Law and Practice*, *28*(4), 314-336.

Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2018). FinTech, regulatory arbitrage, and the rise of shadow banks. Retrieved from https://www.nber.org/papers/w23288

Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2018). Fintech, regulatory arbitrage, and the rise of shadow banks. *Journal of Financial Economics*, *130*(3), 453-483. https://doi.org/10.1016/j.jfineco.2018.03.011

Buchanan, B., & Cao, C. (2018). Quo Vadis?: A Comparison of the Fintech Revolution in China and the West.

Catalini, C., & Gans, J. S. (2016). Some Simple Economics of the Blockchain. *National Bureau of Economic Research.*

Claessens, S., Frost, J., Turner, G., & Zhuang, J. (2018). Fintech credit markets around the world: Size, drivers, and policy issues. *BIS Quarterly Review, September.*

Claessens, S., Ghosh, S. R., & Mihet, R. (2012). Macro-prudential policies to mitigate financial system vulnerabilities. International Monetary Fund Working Papers. https://doi.org/10.5089/9781475502654.001

Ehrentraud, J., Ocampo, D. G., Garzoni, L., & Piccolo, M. (2020). Policy responses to fintech: A cross-country overview.

Ernst, & Young (2016). UK FinTech census: The voice of FinTech, HM treasury. EY and Innovate Financehttp://www.ey.com/Publication/vwLUAssets/EY-UK-FinTechCensus-2017/$FILE/EY-UK-FinTech-Census-2017

Financial Times. (2019). Apple Card: Goldman Sachs is the bank behind Apple's new credit card. Retrieved from https://www.ft.com/content/44d1f4de-4f87-11e9-b401-8d9ef1626294

Frost, J. (2020). The economic forces driving fintech adoption across countries. *Basel: BIS.*

Gomber, P., Koch, J., A., & Siering. (2017). Digital Finance and FinTech: Current Research and Future Research Directions. *Journal of Business Economics, 87*, 537-580.

Gupta, A. K., & Gans, J. S. (2020). *Competition Policy for Fintech. In The Oxford Handbook of Fintech and Digital Finance.* Oxford University Press.

Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. *Small business economics*, *53*(1), 81-105.

Islam, J., Saha, S., Hasan, M., Mahmud, A., & Jannat, M. (2024, April). Cognitive Modelling of Bankruptcy Risk: A Comparative Analysis of Machine Learning Models to Predict the Bankruptcy. *In 2024 12th International Symposium on Digital Forensics and Security (ISDFS)* (pp. 1-6). IEEE. https://doi.org/10.1109/ISDFS60797.2024.10527269

Jagtiani, J., & Lemieux, C. (2016). Small business lending after the financial crisis: A new competitive landscape for community banks. *Economic perspectives*, *40*(3), 1-30.

Jagtiani, J., & Lemieux, C. (2019). The roles of alternative data and machine learning in FinTech lending. Financial Management, 48(4), 953-975. doi:10.1111/fima.12295

Jagtiani, J., & Lemieux, C. (2019). The roles of alternative data and machine learning in fintech lending: Evidence from the LendingClub consumer platform. *Federal Reserve Bank of Philadelphia* Working Papers. https://doi.org/10.21799/frbp.wp.2018.15

Kowalewski, O., & Pisany, P. (2023). The rise of fintech: A cross-country perspective. *Technovation*, *122*, 102642.

Lee, I., Shin, & J., Y. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons, 61*(1), 35-46.

Mumtaz, M. Z., & Smith, Z. A. (2020). Empirical examination of the role of fintech in monetary policy. *Pacific Economic Review*, *25*(5), 620-640.

Navaretti, G. B., Calzolari, G., & Pozzolo, A. F. (2018). FinTech and Banking. Friends or Foes? *European Economy*.

Pascu, L. (2017, December 22). Financial services industry among top targets of cyberattacks. Retrieved April 6, 2018, from https://securityboulevard.com/2017/12/financial-services-industry-among-top-targets-ofcyberattacks/

Philippon, T. (2016). The FinTech Opportunity. *National Bureau of Economic Research.*

Pozsar, Z., Adrian, T., Ashcraft, A., & Boesky, H. (2013). Shadow banking. *Federal Reserve Bank of New York Economic Policy Review*, *19*(2), 1-16.

Sabuj, S., Arif, A., & Momotaz, B. (2019). Audit Expectation Gap: Empirical Evidence from Bangladesh, SSRG. *International Journal of Economics and Management Studies*, *6*(5), 32-36. https://doi.org/10.14445/23939125/IJEMS-V6I5P106

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. (2024). Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions. *International Journal of Economics, Business and Management Research*, 8(4),174-193. https:// doi.org/10.51505/IJEBMR.2024.8412

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions.

Saha, S., Hasan, A. R., Islam, K. R., & Priom, M. A. I. (2024). Sustainable Development Goals (SDGs) practices and firms' financial performance: Moderating role of country governance. *Green Finance*, *6*(1), 162-198. https://doi.org/10.3934/GF.2024007

Saha, S., Hasan, A. R., Mahmud, A., Ahmed, N., Parvin, N., & Karmakar, H. (2024). Cryptocurrency and financial crimes: A bibliometric analysis and future research agenda. *Multidisciplinary Reviews*, *7*(8), 2024168-2024168. https://doi.org/10.31893/multirev.2024168

Schindler, J. W. (2017). FinTech and financial innovation: Drivers and depth.

Seputyte, M., & Kahn, M. (2018). Google gets E-Money license in Lithuania to expand fintech. *Bloomberg.* Retrieved from https://www.bloomberg.com/news/articles/2018-12-21/google-gets-e-money-license-in-lithuania-to-expand-fintech

Siddiqui, Z., & Rivera, C. A. (2022). FINTECH AND FINTECH ECOSYSTEM: A REVIEW OF LITERATURE. Risk Governance & Control: Financial Markets & Institutions, 12(1).

Statista (2024). Number of fintechs worldwide from 2018 to 2024, by region. Statista.com. Available at: https://www.statista.com/statistics/893954/number-fintech-startups-by-region/[Accessed at 11 June 2024]

Tanda, A., & Schena, C. M. (2019). FinTech, BigTech and banks: Digitalisation and its impact on banking business models. *Journal of Risk and Financial Management*, *12*(3), 111. https://doi.org/10.3390/jrfm12030111

Thakor, A. V. (2019). Fintech and banking: What do we know? *Journal of Financial Intermediation*, *41*, 100833. https://doi.org/10.1016/j.jfi.2019.100833

World Bank and CCAF (2019) Regulating alternative finance: Results from a global regulator survey. *Cambridge Centre for Alternative Finance*. Available at: https://www.jbs.cam.ac.uk/faculty-research/centres/

Yun, J. J., & Liu, Z. (2019). Micro-and macro-dynamics of open innovation with a quadruple-helix model. *Sustainability*, *11*(12), 3301.

Zarrouk, H., El Ghak, T., & Bakhouche, A. (2021). Exploring economic and technological determinants of FinTech startups' success and growth in the United Arab Emirates. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 50.

Zavolokina, L., Dolata, M., & Schwabe, G. (2017). FinTech – What's in a name? A systematic review of the term. Proceedings of the 38th International Conference on Information Systems (ICIS 2017), 1-19.

Zetzsche, D. A., Buckley, R. P., Arner, D. W., & Barberies, J. N. (2017). Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation. *Fordham Journal of Corporate & Financial Law.*

Zetzsche, D. A., Buckley, R. P., Arner, D. W., & Barberis, D. N. (2017). The ICO gold rush: It's a scam, it's a bubble, it's a super challenge for regulators. *The University of Hong Kong Faculty of Law Research Paper, (2017/035)*