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Triparty Tradeoff between Fintech, Financial Inclusion and Financial Stability

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Abstract: Rapid increase in Financial Technology (Fintech) has drastically changed global financial landscape that is now acting as a powerful enabler for allowing access to financial products and services and expanding financial inclusion for unbanked and marginalized population (Afjal, 2023). This rapid acceleration of digital technologies are introducing a very critical paradox, as such unregulated expansion of digital finance increases systemic risks and vulnerabilities that incluse rise in the Non-Performing Loans (NPL), digital bank runs and cyber and financial risks (Jain et al., 2023). Addressing this seperated literature that is treating these perspectives in isolation, this conceptual paper is theoretically developing an integrated framework that is exploring the complex relationship between inclusion-stability nexus (Cihak et al., 2012). Exploring the innovation-growth and innovation-fragility perspectives, this study is placing fintech as a dual force system (Fung et al., 2020). This proposed framework positioning systemic risk as a mediating variable where financial inclusion can decrease the risk via diversification of deposits or can also increase it via unregulated credit expansion and increase in NPLs (Anton & Nucu, 2024). Moreover, this paper also explores the transition of financial inclusion to financial stability or instability is dictated via the moderating variables such as adaptive regulatory frameworks, market discipline, institutional quality, and digital financial literacy (Hosen et al., 2025; Khémiri et al., 2024). This work concludes that to achieve a balance between inclusion-stability that is guided via fintech, requires regulators to adopt adaptive regulations, for fostering economic growth without the sacrifice of deteriorating of the financial system (Fung et al., 2020).

Keywords: fintech, financial inclusion, systemic risk, financial stability, financial instability, digital finance.

1. Introduction

1.1 Background

Financial landscape of today's century has been greatly transformed with the emergence of financial technologies also called as Fintech, which includes the usage and application of innovations such as artificial intelligence (AI), Data Analytics, and mobile computing of financial services (Arner et al., 2020). Fintech is now serving as a great bridge for financial inclusion, allowing access of formal financial products and services to the populations that were earlier excluded as marginalized farmers, rural artisans, women, elderly people, and micro, medium and small enterprises (Singer et al., 2018). Finding a way around the limitations of the older traditional financial structures and removing of entry barriers such as high transaction costs, these fintech platforms allows the unbanked or underbanked population to have their participation into the economic growth, also aligning with the poverty reduction globally and standing with the sustainable development goals (Ozili, 2018; Sant'Anna & Figueiredo,

2024). From the other side, this technology led evolution is also coming with a very critical paradox. This rapid and difficult to scale expansion of such digital technologies, while also reducing the barriers for entry effectively, at the same time it is also bringing with it many risk exposures that can hinder financial stability (Fung et al., 2020). Inclusion of individuals with very low or absence of a credit history into the formal financial system can greatly increase the chances of increasing non-performing loans, over-indebtedness, and fragility into the system (Yue et al., 2022). High speed with smoothness in transactions and digital lending can multiply volatility in the market and can also amplify various risks and it's exposures (Beck et al., 2016a). Adding to this topic, the core mechanism that drives the inclusion may itself leads to financial instability if left unchecked without proper regulatory mechanisms (Sahay et al., 2015).

1.2 Problem Statement

The critical issue is that the acceleration of such financial technologies are that these fast-paced services with not enough regulated products outwit the traditional risk mitigation protocols and supervisions. As these fintech platforms are rapidly serving to higher risk segment of population, the existing traditional based credit assessment protocols and designs are being disrupted, bringing new concepts of liquidity, operational and cyber security risks (Chaudhry et al., 2022; Zheng et al., 2023). This overlooked synergy is creating a very volatile system the goal of inclusive financial system is competing with maintaining the stability in the economy itself (Cihak et al., 2012).

1.3 Literature Gap

Even with such a huge number of work examining fintech, current literature only treats financial inclusion and stability as different parallel concepts. Various research often emphasize the socio economic and development benefits of inclusion (Cull et al., 2014) or totally isolate the threats that are caused by such financial technologies (Lee et al., 2021) without exploration of their blended intersection. There exists a theoretical gap related to the nonlinear relationship between financial inclusion and stability where fintech is the enabler of such an ecosystem, specifically how does technologically induced inclusion changes systemic risks (Damane & Ho, 2024; Sant'Anna & Figueiredo, 2024). Literature lacks an integrated theoretical framework that evaluates such a triparty environment.

1.4 Objectives of this Study

Addressing the mentioned theoretical gap, this paper tries to accomplish these objectives

a. Developing a conceptual framework that outlines the structural elements via which Fintech creates financial inclusion.
b. Identifying and analyzing the route via which the rapid adoption of these digital services changes the traditional risk profiles.
c. Robust examination of the inclusion-stability nexus finding out how these forces are interacting and creating conflict within the digital systems.
d. Identification the moderating variables that shows whether fintech is stabilizing or disrupting the systemic stability.

1.5 Research Questions

This paper is being guided via these questions.

a. How Fintech can create financial inclusion among underserved segments?
b. What are the mechanisms that are allowing fintech to change the traditional credit risk and lending regulation?
c. How the ever-scaling fintech does influences financial stability?
d. What is the relationship between financial inclusion and stability in a fintech led ecosystem?
e. Which are the moderating factors that determine whether fintech is acting as a stabilizer or destabilising the system?

1.6 Contribution of this study

This work contributes to the academics by building a bridge over the separated literature on finance and banking regulation. By restoring the relationships between innovation, growth, and fragility perspectives, this framework is providing policymakers and financial institutions with a better understanding of the trade-offs under di-fi. Finally, this study aims to aid the design of regulatory strategies which can foster financial inclusion with maintaining financial stability.

2. Mechanisms driving Financial Inclusion via Fintech

Fintech finds an alternative ways from the traditional issues of banking by leveraging digital infrastructures to reach the previously excluded population (Barajas et al., 2020; World Bank & IFC, 2022). Earlier, geographical issues, high costs, and complicated norms has created various barriers that prevents marginalised and underserved population from accessing formal financial systems (Sant'Anna & Figueiredo, 2024). Via digital onboarding, usage of biometrics, and mobile systems, fintech has greatly reduced these traditional barriers, allowing immediate and frictionless access to vital financial services (IFC, 2025). One of the primary factor driving this inclusion is mobile money which allows their users to perform basic financial transactions such as saving, access of credit, transfer of money etc via cellular networks only on their handset devices (Ha et al., 2025). M-Pesa type platforms are creating a revolution by overriding the need for visiting or needing a physical bank branches, helping in the marginalized and undeserved population to be formally included into the financial system (Barajas et al., 2020; Sanga & Aziakpono, 2023). Over and above these digital platforms such as P2P lending and e-commerce are acting as enablers that can include activities of consumers and MSMEs also (IFC, 2025). Latest digital disruptions such as blockchain and distributed ledger technology (DLT) is also multiplying the inclusion by decentralizing the transactions and reducing the middle element's reliance and helping in having a low cost, and secure cross border transactions (Carè et al., 2025).

Over and above the facilitation of access of financial products and services, fintech also moulds the structure of credit scoring and assessment of risks. Older credit models rely largely on physical collateral and properly maintained credit history, resulting into exclusion of segments of units that do not have a credit score and low-income borrowers (Sanga & Aziakpono, 2023; World Bank & IFC, 2022) Fintech helps in mitigating this information gap via usage of alternative data storage such as mobile payment usage patterns, utility payments, and digital transaction records (O'Hanlon & Chishti, 2020). By analysing such huge data via AI, data analytics, Machine Learning, and Big Data analytics, these lenders using fintech can generate a predictive score for their credit history for these marginalised population (Kerse et al., 2024). This advancement in technology aids a shift in the financial intermediation, helping to move from a physical collateral to a cash flow and behavioural based underwriting (ADB, 2022; IFC, 2025). Ultimately, the economic benefit of expanding financial services at the bottom of hierarchy is led by he fintech's unmatched cost efficiency. The proper deployment of cloud computing, back-office processes and application programming interfaces (APIs) enables these fintech firms to operate with very limited infrastructures. As the cost of producing digital transactions is zero. it is becoming highly profitable for such fintech using financial institutions to process and disburse micro loans and micro insurance. With this, the innovations is not only breaking the traditional barriers to entry but also lowering the costs of these financial institutions (Carè et al., 2025).

3. Structural dynamics of financial system risks

3.1 Determinants of Credit Risk and Incidences of Loan Defaults

Structural formation of earlier unbanked and underserved segment into the formal financial system changes the overall profiles of the system for credit risk. Fintech is significantly increasing the process of lending, mostly relying on the alternative scoring methods and it's less rigid lending regulations which can lead to bargain credit delivery (Claessens et al., 2018; Merton & Thakor, 2019; Murinde et al., 2022). As these digitally granted loans are not collateralized much for the marginalized segments, such individuals or business carries a bit lower credit scores with a higher chance of them defaulting compared to the customers with a traditional banking system (Choudhary & Thenmozhi, 2024). Addition to this, when the smoothness of credit delivery via these fintech platforms increases consumption, it increases an individual's risk of getting into debt traps, resulting into a higher non-performing loan (NPL) (Yue et al., 2022). Activity with such an unregulated expansion of inclusion tends to results in taking risk more than one's own capacity, over borrowing, and exposing the banking sector to more vulnerabilities (Boyd & De Nicoló, 2005; Phan & Pham, 2025a).

3.2 Dynamism of Liquidity Risks in Digital Ecosystems

With credit deterioration, fintech is also introducing unknown liquidity risks into the formal financial system. Digital financial services have allowed faster, easier and beyond border transfers, leading to the expansion of the change of faster and large-scale withdrawals from the financial institutions (RBI, 2024). The Silicon Valley collapse of 2023 has served a great example of a digital bank run where the tech-based customers used digital platforms to withdraw funds at faster speed, which led to an instant cash reserve draining leading to large failures in a very short period (Banna, 2025). Over and above with such alternative lending models, the liquidity is being concentrated among a very small number of users so during the times of market stress, higher rates of utilization can be seen which can trigger liquidity exhaustion, amplifying the financial stability (Aramonte et al., 2021; IMF, 2022a).

3.3 Technological Implications and Cyber Vulnerabilities

Relying on such digital infrastructures essentially exposes the financial system to multiple new technology and operational related threats. As both the traditional and digital financial institutions centers to fintech, they become more exposed to cyber threats that can lead to activities that can disrupt the systemic infrastructures and can also lead to exposure of sensitive data (Kandasamy et al., 2020; Vijayagopal et al., 2024a). Such mismanagement of financial data and frequent cyber security issues shows the critical threat to the user's privacy and systemic reliance on these platforms (Foguesatto et al., 2024; Khan et al., 2021; Najaf et al., 2021). The heavy dependence of these fintech platforms and banks relying on third party services such as cloud computing and APIs leads to highly concentrated failure points. Cyber-attacks or collapse of such third-party infrastructures can also lead to domino effect on the operational failures up to the level of systemic risks (Vuković et al., 2024).

3.4 Mechanics of Financial Contagion and Systemic Risk Spillovers

Integrating fintech into the financial system enables a very highly connected networks that goes beyond the national borders, changing the speed and path of financial contagion (Foguesatto et al., 2024). Research shows that spillover of risks from fintech firms towards traditional financial institutions has positive relationship with systemic risks in the financial domain (Al-Majali et al., 2025; Sant'Anna & Figueiredo, 2024). As various fintech platforms are operating in a bit less regulated environment, this deep connection is creating a sort of regulatory arbitrage that is shifting the financial activities moving away from the rigorous oversight and risking the stability of the whole financial system (Sahay et al., 2015; Sant'Anna & Figueiredo, 2024). Addition to this, the failure of a single important digital infrastructure or a big fintech firm can start a spillover effect that can lead to severe disequilibrium in the financial domain (Mutanda & Nomlala, 2025).

3.5 Theoretical Elucidation guided by present Literature

Theoretically these dynamics can be understood properly via the innovation-fragility point that says while these financial innovations can boost market and drive economic growth, they are at the same time amplifying the market volatility and increasing contagion risks (Beck et al., 2016b; Fung et al., 2020). This perspective is also sustained by the intense pressure created by these fintech firms forces incumbent banks in liberalizing their lending standards and to take more risks to keep their

market share, leading to systemic instability (Boyd & De Nicoló, 2005; Phan & Pham, 2025b). Thus, the Institutional Asymmetry theory warns that the mechanisms that is designed to democratize finance and create inclusion, is weaking the regulation and acting as the center point for instability.

4. Conceptual Framework for the Inclusion-Stability Trade-off

4.1 Innovation-Growth v/s Innovation-Fragility

To theoretically restore positive relations of the conflicting factors of digital finance, this framework is helping to put fintech as a dual force that is characterized via stabilizing as well as destabilizing the economic channels (Fung et al., 2020). Theoretical foundation of this model is based on the contrast of innovation-growth and innovation-fragility paradigms (Sant'Anna & Figueiredo, 2024) On one hand fintech is acting as a stabilizer by reducing systemic risks. It is expanding the access to the financial markets for marginalised and underserved population via new technologies such as big data, low costs and de-fi transactions (Fung et al., 2020; Hua et al., 2023). And on another hand fintech is somewhere destabilizing the economy also by introducing various risks. Rapid adoption of technologies increases the connectedness among systems, creating dependency on third party platforms such as cloud providers and also allows algorithmic high-speed activities resulting in increased contagion and other risks in the financial system (Al-Majali et al., 2025; Chaudhry et al., 2022).

4.2 Fintech and Financial Inclusion

Fintech adoption is acting as a vital catalyst. Digitization of financial products and services is acting as a mechanism that bypasses the traditional barriers, leading to the expansion of financial inclusion (Arner et al., 2020). By lowering costs, these digital platforms are integrating marginalized population and MSMEs into the formal financial system, creating expansion of both the access and usage of credit, saving and payment instruments (Sanga & Aziakpono, 2023; Sant'Anna & Figueiredo, 2024).

4.3 Systemic Risk as the Mediator

This framework is positioning that neither fintech nor financial inclusion is directly influencing financial stability. Their relation is being mediated via systemic risk. It is defined as the aggregation of credit, liquidity, and other vulnerabilities that can threaten the financial system, that is serving as the channel that is determines whether financial inclusion leads to stability or deteriorate it (Al-Majali et al., 2025; Zheng et al., 2023; Zhukevych & Rozheliuk, 2018).

Mediation via Systemic risk happens via opposite ways:

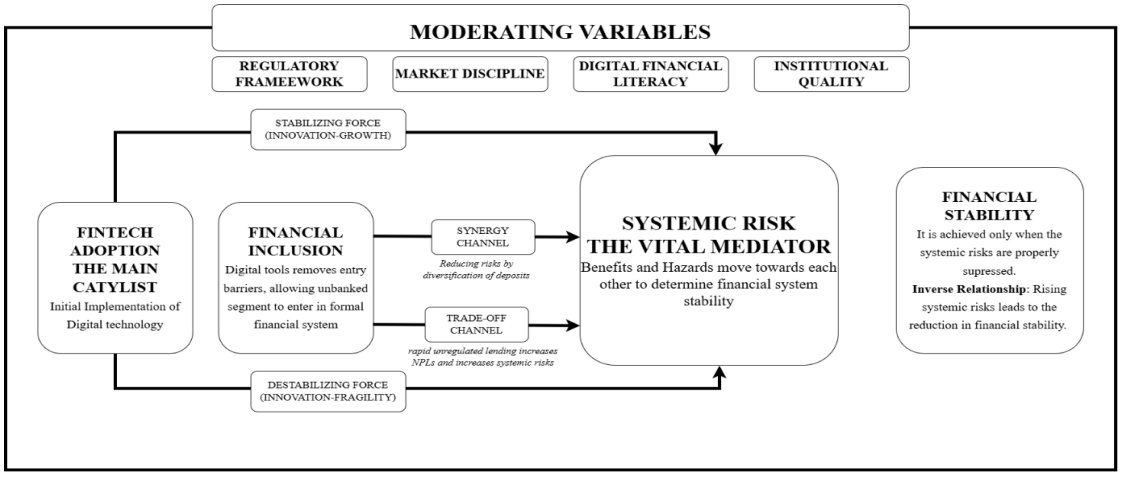
A. Synergy pathway, i.e., Reduction of Risks:

As financial inclusion happens, banks and these digital platforms gets ample amount of low-cost retail deposits from the previously excluded unbanked population (AFI, 2025; Cihak et al., 2012). This helps in broadening the depositors base that helps in diversifying the loan portfolios, reducing the reliance on external funding with higher risks. Via this channel, financial inclusion is decreasing the systemic risks, acting as an economic shock absorber that is reinforcing the financial stability.

B. Trade-Off pathway, i.e., Amplification of Risk

The rapid tech-based expansion of digital finance to population that are vulnerable introduces ample of information gaps and hazards (Anton & Nucu, 2024; Sant'Anna & Figueiredo, 2024). When financial inclusion is happening through fast, unregulated lending, it leads to an increase in the NPLs and exposes households and firms getting into over-indebtedness (Barik & Pradhan, 2021; Foguesatto et al., 2024). Under this channel, unregulated financial inclusion is increasing systemic risks, resulting in the worsening of financial stability (Cihak et al., 2012; Koudalo & Toure, 2023).

Inclusion-Stability Nexus



Source: Author's own creation, from the innovation-fragility perspective and inclusion-stability Nexus

The theoretical relationship of inclusion and stability in a fintech led ecosystem is nonlinear and dependent on the regime it exists on (Anton & Nucu, 2024). Adoption of fintech can lead to a chain reaction, accelerating financial inclusion that changes the system risk profiles. If the forces of stabilization (diversification of deposits, cost reduction, and transparency) are stronger than the forces destabilizing the economy (deterioration of credit, cyber and other vulnerabilities, and lack of regulation) then the risk is suppressed and economy achieves financial stability. Considering that the inclusion is happening via predatory lending and improper risk measurement, the risks multiplies and results in the destabilization of the economy (Sant'Anna & Figueiredo, 2024).

5. Moderating Variables

This conceptual framework has established that the impact of fintech led inclusion on systemic risks is not determined, it is based on the external environment in which these technology operates. This transition from inclusion to either stability or fragility is mediated via various factors, frameworks and regulation, market dynamics, digital financial literacy and institutional credibility.

5.1 Regulation and Supervision

The vital moderating factor that balances the effect of between innovation-growth and innovation-fragility is regulatory oversight and supervision. Rigid and less flexible regulations can restrict fintech platforms entry, creating limited financial inclusion (Vives, 2019). Contrasting to that, an absence of a proper regulation creates rapid expansion, creating unregulated lending and increases exposure to financial instability (Anton & Nucu, 2024; Cihak et al., 2012). For the successful moderation of this converse relationship, present literature often guides to follow Adaptive Finance Regulation (AFR), which is a dynamic perspective that guides technological pacing via various experiments (Vijayagopal et al., 2024b). A vital implementation of this is the "regulatory sandbox" that allows these fintech firms to test their innovations in a closed environment that directly reduces systemic exposureto risks while providing safer inclusion (Fung et al., 2020). Moreover, the integration of Regulation Technology (RegTech) and Supervisory Technology (SupTech) allows the regulates to automate the decisions for monitoring, that helps in maintaining the systemic oversight without disturbing the financial inclusion (Arner et al., 2020).

5.2 Market Discipline

With formal regulations, the market discipline is acting as a moderating variable that is governing the risk behaviors of fintech firms and traditional banks. Market Discipline refers to the pressures and stress shown by the market participants like depositors, investors, and creditors who are monitoring the financial institutions and can give them punish for taking excessive risks or by asking for higher premiums for excessive risks . In the developing digital economies, where the formal institutions may be lacking the required technological capacity, the marker discipline somewhere compensates for the supervisory requirement by enforcing external limitations that is keeping the digital firms perform in a limited risk space (Saheruddin & Soedarmono, 2022). Allowing transparency and higher standard of corporate governance, the market discipline does not allow the uncontrolled expansion of digital finance, thus, promising that the fintech led inclusion leads to financial stability instead of systemic instability (Al-Majali et al., 2025; Safiullah & Paramati, 2024; Yudaruddin et al., 2024).

5.3 Digital Financial Literacy

On consumer side, digital financial literacy acts as a vital component of cognitive moderation tool. inclusion of finance via digital applications are bringing previously excluded populations into the digital markets (Liu & Zhang, 2021; Panos & Wilson, 2020). Without a proper financial literacy, these new market players are more inclined towards excessive consumption and purchasing debt, more exposed towards financial frauds and problem of over-indebtedness. Low digital financial literacy are shifting the fintech adoption for the innovation-fragility outcome, leading to increase in the lending rates, and generate financial instability. But if such digital financial inclusion is guided via digital financial literacy, then the users are more prone to take prudent financial decisions, calculate risk return properly, and are less susceptible to get included into a financial fraud, resulting into a safer inclusion (Ha et al., 2025; Tandilino et al., 2025; Yang et al., 2023). Thus, financial literacy is moderating the relationship by acting as a shield ensuring the access to finance results into systemic strength.

5.4 Institutional Quality

The larger macroeconomic environment that is captured via the institutional quality is moderating the successes of such inclusion-stability nexus. Institutional quality refers to the laws, enforcement, control of corruption, and it's government effectiveness (Balutel, 2020; Ofoeda et al., 2023). Institutional theory says that the sustainability of these technology based financial innovations depends upon the capacity of the governance of the underlying regulatory institutions (North, 1990; Phan & Pham, 2025b). Various evidence demonstrates threshold effect where strong institutional quality exists, the formal system greatly process the new deposits and reduces information asymmetry, allowing the financial inclusion to properly promote systemic stability (Ahamed & Mallick, 2019; Sebai et al., 2025; Talbi & Sebai, 2025). In economies where this institutional quality is weak, corruptions exists, legal enforcement is poor, expansion of financial inclusion creates moral hazards, and improper allocation of capital can greatly increase systemic risks (Nugrohowati & Shidiqie, 2025). Thus, institutional quality is acting as a moderator showing whether the integration of population into the financial system improves or worsen it.

6. Conclusion

Rapid multiplication of fintech in financial system has precisely shaped the financial landscape, giving a very critical paradox for regulators and financial institutions. As it is explained in this work, digital finance is acting as a catalyst for financial inclusion, has structurally taken apart the traditional barriers for entry via mobile money, digital platforms and algorithmic credit scoring (Atellu & Muriu, 2022; Barajas et al., 2020). Still this less controlled synergy of unbanked segment entering into the formal financial system has totally reshaped the perspectives of how a system looks at risks. The aggressive of digital lending along with the seamless smooth transactions and relying on third party infrastructures has brought with them various risks and vulnerabilities (Chaudhry et al., 2022; IMF, 2022b). This conceptual paper is establishing and putting fintech as a dual channel system which has its capacity to create inclusive growth but also its linkage to amplify financial instability. Theoretically this work is bridging the separated discourses of developmental finance and systemic regulations by combining innovation-growth and innovation-fragility together (Beck et al., 2016b; Sant'Anna & Figueiredo, 2024). By putting systemic risks as a mediator, this framework is showing that the relationship between inclusion and stability is not rigidly linear but a rather very complex, flexible and regime dependent element (Anton & Nucu, 2024). This framework puts in front the Institutional Asymmetry theory by showing that the blends (risk reduction via diversification of deposits(and the trade-offs (increase in NPLs) of financial inclusion are dictated by the external environment (Cihak et al., 2012). From a practical perspective, these findings shows that to achieve a stable and sustainable inclusion-stability nexus, an evolution is necessary in the regulatory supervision. Policymakers should move away from the rigid traditional regulations to an adaptive finance regulations (AFR) (Vijayagopal et al., 2024b; Yuan, 2021). This adaptive regulation such as regulatory sandboxes enables the institutions to pilot test their products and services (Arner et al., 2020). Moreover, these regulatory authorities should deploy RegTech and SupTech for monitoring algorithmic data and mitigate risks and vulnerabilities (Sanga & Aziakpono, 2023). At last, the promotion of digital financial literacy is vital to protect new entrants from getting into debt traps, financial frauds, leading to transform risk exposed borrowers to a safer economic participants (Atellu & Muriu, 2022).

6.1 Justification of Research Objectives

This paper has systematically satisfied the objectives of this study via these steps: The objective of explaining how fintech systematically enables financial inclusion by detailing the various roles of mobile networks, alternative credit scoring, and cost-efficient scaling in providing access to marginalized and unbanked population. The objective to find the pathways of alternate risk profiles was also fulfilled when this paper critically examined how digital credit worsens the credit, increases liquidity crisis and introduces various risks and vulnerabilities. The objective of developing a comprehensive model was achieved by integrating the synergy trade-off pathway and introduction of systemic risk as a mediating variable, this framework systematically and structurally conceptualized fintech as a dual channel system. Final objective was achieved by the specific mapping of how regulatory framework, market discipline and fintech environments moves towards stability or instability.

6.2 Future Scope

Knowing the ever changing and flexible nature of Fintech, future works must rigorously validate the non-linear perspectives of inclusion and stability nexus that is shown in the framework, empirically? Employment of robust econometric models such as Panel Smooth Transition Regression (PSTR) to identify the exact point at which the inclusion stopis being a threat to systemic stability in emerging economies. Additionally, works can isolate specific technologies such as Decentralised-Finance (DeFi), Central Bank Digital Currencies (CBDC), and Artificial Intelligence (AI) to calculate their roles in economic stability. Cross country comparison can be done in order to study institutional quality that are necessary to prepare context specific regulations for the fintech era.

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