

**Pakistan's Cryptocurrency Regulatory Framework:
Safeguarding Data, Consumers, and Financial Stability through
Global Blockchain Best Practices**



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Dedication

I dedicate this thesis to everyone from whom I've learned a single word.

Acknowledgement

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Your support, patience and cheers during my late night and early morning work was my actual encouragement to complete my work. Your companionship is a gift of Allah Almighty for me.

Sheikh Azfar Amin

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ABSTRACT

Our ways of working and living have been potentially transformed by the blockchain technology, and Pakistan is no exception. In this study, we explore how blockchain can improve financial inclusion in Pakistan, resultantly access to financial services is easier and reducing transaction costs.

This study unveils hidden challenges to address including but not limited to ambiguous regulations, infrastructure limitations, public awareness issues pertaining to blockchain technology. This research proposed an extension of Legal Framework Theory (LFT) into the development of Virtual Currency Legal Framework Theory (VCLFT). The innovation of VCLFT is influenced from the scholarly work carried out under LFT.

The key recommendation in the research comprising upon the principles for establishing a clear regulatory framework for stakeholders, policy makers and regulators. It further emphasizes the requirement for establishment of framework and infrastructure that is supportive to such framework. The need for harnessing the opportunities in blockchain to adopt financial inclusion of financial growth in Pakistan are highlighted.

The research will open further avenues to carry out future research towards adoption of blockchain and its potential in Pakistan.

Keywords: Cryptocurrency Regulation, Blockchain Adoption, Financial Inclusion, Digital Payment Systems, Financial Technology Innovation, Virtual Currency Legal Framework, Traditional Method, Harnessing, Harmonization, Policy Recommendations, Jurisdictional Control, Data Security, Eco System

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CHAPTER # 1

INTRODUCTION

Digital currencies have reshaped the discussions regarding money, payments and financial regulations. Throughout the world, central banks, financial regulators, and policy making authorities are finding out ways to integrate the innovations and integrate them with the financial systems in vogue. The digital currencies are still finding out their space in Pakistan and its financial system. The central bank in Pakistan i.e. State Bank of Pakistan (SBP) has announced ban on transactions in cryptocurrencies. Realizing the need, the recent enactment of Virtual Assets Ordinance is aiming to form a regulatory body Pakistan Virtual Assets Regulatory Authority (PVARA) as a regulator and overseer. The ordinance provides a regulatory framework acknowledging digital space in Pakistan. PVARA is entrusted with the responsibility to ensure financial integrity and protect investors. Additionally, exploring the option to issue a Central Bank Digital Currency (CBDC) in Pakistan is reflecting a policy shift. Placement of Pakistan by tracing the existing global frameworks, review thereof, lessons learnt, options to design local conditions from lessons learnt while considering ethical and legal concerns in juxtaposition.

1.1 Global Policy Frameworks

1.1.1 FATF Standards

The first ever fine line has been drawn by the Financial Action Task Force (FATF) to define principles for adopting regulations pertaining to digital assets. In 2019 FATF has expressed its guidance for Virtual Assets Service Providers (VASPs) which was first updated in 2021 and then in 2024. The additional obligations are imposed therein for digital currency platforms regarding Anti-Money Laundering (AML) and Counter Terrorist Financing (CFT). Regulatory framework adopted in EU, Japan and Singapore mandated the FATF ‘travel rule’ for cross-border exchange of customer information. Inclusion of Pakistan in FATF’s “grey list” has sensitized the local regulatory framework for compliance gap. Unregulated crypto assets may expose Pakistan to additional international scrutiny.

1.1.2 Comparative Approaches

So far EU's Markets in Crypto Assets (MiCA) regulations (2023) are considered as exhaustive regulatory framework in vogue. It provide licenses, mandatory requirements for stable coin issuers and quality standards for exchanges. The United Kingdom has adopted central regime whereby Financial Conduct Authority (FCA) is responsible disclosing consumer risks. The United States has relied on segmented by relying on enforcement through Securities and Exchange Commission (SEC) and Commodity Future Trading Commission (CFTC). On the other hand License base approach is adopted by the Monetary Authority in Singapore through Payment Services Act to apprehend money laundering. Virtual Asset Regulatory Authority (VARA) is the authorized body in the UAE to deal with the virtual assets¹. The framework adopted by the South Korea provide consumer protection and exchange licensing².

Nutshell, no universal framework is adopted for combating AML/CFT compliance ensuring safeguards for consumer and market integrity.

1.2 Stable coins, CBDCs, and Financial Stability

Pegging of fiat currencies to stable coins and/or digital tokens are the focus of ongoing debates for financial stability. The investors are used to withdraw their investments even on the minute doubt regarding inadequacy of reserves³. As per Dionysopoulos, the transparency in reserves may reduce down the volatility and continuous risks. Similarly Hui⁴ emphasized the requirement for healthy peg stabilization techniques.

¹ Von Hafe, F., Wagle, Y., Guede-Fernández, F., Giordano, A. P., Silva, L., & Azevedo, S. (2025). Legal frameworks for blockchain applications: a comparative study with implications for innovation in Europe. *Frontiers in Blockchain*, 8:1655230. DOI: 10.3389/fbloc.2025.1655230.

² W. Jon, (2025). Mapping South Korea's digital asset regulatory landscape. *Asia Pacific Financial Review*, 11(2), 129-154. <https://doi.org/10.1016/j.clsr.2025.106140>

³ Ma, Y. (2025). Stablecoin runs. National Bureau of Economic Research Working Paper Series, No. w33882. https://www.nber.org/system/files/working_papers/w33882/w33882.pdf

⁴ Hui, C. H. (2025). Stablecoin price dynamics under a peg-stabilising mechanism (RePEc:eee:jimfin:v:152:y:2025:i:c:s0261560625000154) by Hui, Cho-Hoi & Wong, Andrew & Lo, Chi-Fai <https://ideas.repec.org/a/eee/jimfin/v152y2025ics0261560625000154.html>

Pakistan remains fragile in terms financial stability, thus any stable-coin adoption without stringent regulatory check may expose to risks.

The monetary policy strengthening transmission, effective payment and extended financial inclusion regarded Central Bank Digital Currencies (CBDCs) as effective tool. The central banks of emerging markets pursue CBDC's for broadening their access to secure payment infrastructures, as per report, 2022 of the Bank for International Settlements. IMF acknowledges the reduced financial costs and support of macroeconomic stabilization through CBDCs in its studies 2023, 2024a and 2024b. Same studies has generated an alert that poorly designed CBDCs will resulted into systemic risks and may resulted into disintegration of banks due to limited deposits and dual banking system in the jurisdiction. Careful design calibration of CBDCs may offer higher benefits in Pakistan due to priority in policy for financial inclusion.

For strengthening monetary policy transmission, efficient payment and financial stability, the properly designed CBDCs have the ability to support, as advised by the International Monetary Fund (IMF)⁵. Furthermore the IMF⁶ has warned that though the CBDCs have the ability to strengthen the option for financial inclusion however, the jurisdiction wherein the banking system is already disintegrated or dual banking system in terms of Islamic or conventional banking is adopted, such inclusion of CBDCs may expose the systemic risks. The shift of deposits from banks to CBDCs may weaken the financial intermediaries. Until proper calibration with the financial system in vogue, the financial inclusion of CBDCs in Pakistan must be avoided keeping in view the fragile financial position. Although, such inclusion may support economic growth, but still risks are higher.

1.3 Consumer Protection and Market Integrity

The foremost impediment in adoption of digital currency is the trust deficit of consumer. As per centralized exchanges, the consistent risk pertaining to solvency and

⁵ International Monetary Fund. (2024). Central Bank Digital Currencies and Financial Stability: Balance Sheet Analysis and Policy Choices. IMF Working Paper WP/24/226. Washington, DC: IMF. Available at: <https://www.elibrary.imf.org/view/journals/001/2024/226/article-A001-en.xml>

⁶ International Monetary Fund. (2023). Monetary Policy Implications of Central Bank Digital Currencies: Perspectives on Jurisdictions with Conventional and Islamic Banking Systems. IMF Working Paper WP/23/60. Washington, DC: IMF.

transparency is noted. Safeguarding depositors, the declared proof of solvency mechanisms are necessary as argued by Vidal Tomás⁷. Similarly, the policy brief⁸ of Royal United Services Institute (RUSI) has highlighted a caution regarding Virtual Assets Service Providers (VASPs) operating outside the jurisdiction of the specific regulators or their approach, which can exploit the weak supervision over cross border transactions and exposing them to high risks to effective supervision and recovery of asset.

Pakistan is lacking in effective consumer protection laws particularly in crypto assets trading which increases the risks of scams and frauds. The financial inclusion may be compromised in absence of strong regulatory safeguards and for want of financial literacy.

1.4 Pakistan's Regulatory Trajectory

The need for regulating the digital assets was sensitized in Pakistan in 2018 when the State Bank of Pakistan (SBP) has prohibited banks and financial institutions from dealing in virtual currencies through a circular No. 03/2018. The digital token are not recognized as legal tender by the SBP. The Securities and Exchange Commission of Pakistan (SECP) has clarified the position highlighting risks in platforms trading in digital assets. It further recommends need for compliance of AML/CFT and recommend licensing and governance of virtual assets. Financial system in Pakistan has evolved from time to time in struggle with capital markets by relying on bank dominated intermediaries. The limited financial inclusion, compromised governance and external pressures are making the innovative regulatory struggles more complex as compared to advance economies.

Billions of transactions are recorded in Fintech sector of Pakistan which is widening day by day. As per Financial Inclusion Survey 2022 by Karandaaz, mobile money

⁷ Vidal-Tomás, D. (2024). Centralised Exchanges & Proof-of-Solvency: The Guardians of Trust. SSRN Working Paper. DOI:10.2139/ssrn.4761565.

⁸ Making a Sectoral Virtual Asset Risk Assessment: Challenges and Approaches. RUSI Policy Brief (2024). <https://www.rusi.org/explore-our-research/publications/policy-briefs/making-sectoral-virtual-asset-risk-assessment-challenges-and-approaches>

accounts are driving the digital payments. For want of regulatory framework in block-chain based services, the surge in growth of Fintech sector is observed.

The Virtual Asset Ordinance is enacted as ever first step towards the implementation of organized framework. Pakistan Virtual Asset Regulatory Authority (PVARA) is established. It introduces licensing requirements, supervision of regulator and compliances of FATF standards. It is recognized as first comprehensive framework regulating virtual assets. The Ordinance is, however lacking in providing cross border enforcement, resolution of dispute and protection of consumer⁹.

Compliance of FATF standards during 2018 to 2022 during struggle to take an exit from grey list, Pakistan has learned a lesson for need to adopt policy reforms and to address the deficiencies in AML/CFT. Though Pakistan has successfully shifted from grey to white list in 2022, but the adoption of sustainable compliance mechanism are still required particularly for virtual assets.

The annual foreign remittances of Pakistan are exceeding USD 30 billion. People use informal intermediaries incurring high costs. It make an incentive for Pakistan to explore virtual or digital framework. The average remittance costs remained above 6% as per World Bank in 2023. The regulated digital currencies of CBDCs can reduce the financial costs. The other prime incentive is enhanced transparency which may be associated with adoption of block-chain based transactions.

The SBP has planned a pilot project for financial inclusion of CBDCs considering it as a tool for efficient payment system. The technical readiness and financial inclusion concerns still exists. Though these issues are concerned globally, however considering institutional constraints under existing laws in Pakistan, risks are much higher. Pakistan need to shift from prohibition to restriction and then limited legislation under the guidelines and compliance requirements of FATF keeping in view the local priorities for payments, modernization, harmonizing remittances between conventional channels and digitals forums is making the entire regulatory process complex.

⁹ Kalanauri, M. Z. I. (2025). Regulating Digital Finance: A Critical Analysis of Pakistan's Virtual Assets Ordinance 2025. *International Journal for Electronic Crime Investigation*, 9(1). DOI: 10.54692/ijeci.2025.0901/250

The public in Pakistan is least interested in financial institution despite regulatory framework. The cryptocurrencies are attracting their space at a low pace. According to Gallup Pakistan Poll 2023, less than 20% of the sample size opted to adopt digital currencies. The key concerns remain fraud, volatility and religious concerns. Such perceptions may hinder to adopt consumer protection measures in absence of clear regulations.

1.5 Data Protection and Ethical Concerns

The existing data protection frameworks are not compatible with transparency in blockchain technology. GDPR's adopted by EU recognizes an individual's "right to be forgotten". Personal Data Protection Bill (2023) may articulate such right¹⁰. To find out a middle ground, the technical solutions consisting of hybrid framework comprising upon blockchain and advanced technologies providing privacy may be developed and implemented¹¹.

The religious acceptability and general public perception are other ethical concern. Religious scholars often question the admissibility of cryptocurrencies under Islamic Shariah. However the speculative risks can be mitigated through regulations. The decisive role in adoption of effective regulatory framework is dependent upon the trust of masses in financial institutions and social perception.

1.6 Synthesis and Gaps

Under existing literature, compliance of AML/CFT, consumer protection measures and financial stability are the global best practices. The adoption of balanced regulation in EU and Singapore reflects innovation for financial inclusion and trust. For Pakistan, key gaps remain:

¹⁰ Zafar, A. (2025). Reconciling blockchain technology and data protection laws: regulatory challenges, technical solutions, and practical pathways. *Journal of Cybersecurity*, 11(1), tyaf002. DOI: 10.1093/cybsec/tyaf002

¹¹ Mandinyanya, G., & Malele, V. (2025). A Hybrid Framework for Enhancing Privacy in Blockchain-Based Personal Data Sharing using Off-Chain Storage and Zero-Knowledge

- (i) Regulatory clarity: The Virtual Assets Ordinance 2025 provides a starting point but needs refinement on enforcement and consumer safeguards.
- (ii) Financial stability: Stablecoin risks and CBDC design must be carefully managed in a fragile macroeconomic environment.
- (iii) Data protection and ethics: Integration with privacy laws and Shariah principles is still underdeveloped.
- (iv) Empirical evidence: There is limited data on public perception, awareness, and trust in digital currencies in Pakistan.

The above gaps aligning the research questions and provide a guidance regarding principles to formulate policy framework, financial and legal implications.

1.7 Evolution of Cryptocurrencies and Blockchain Technology

The evolution of cryptocurrencies as well as blockchain technology has reshaped the global financial system. The new paradigms regarding security, trust and transactions are introduced. The entire process is clubbed with history and types of cryptocurrencies, blockchain platforms, global adoption trends, players and stakeholders.

1.8 History of Cryptocurrencies

In 1980, the DigiCash was introduced by David Chaum¹² whereby a cryptographic electronic money system was developed. However, it wasn't until the launch of Bitcoin in 2009 by Satoshi Nakamoto that cryptocurrencies gained widespread attention. Bitcoin's success spawned a wave of alternative cryptocurrencies, including Litecoin, Ethereum, and others.

1.9 Types of Cryptocurrencies

Bitcoin is the first and most widely recognized cryptocurrency, Bitcoin is a decentralized, peer to peer digital currency. A purely peer to peer version of electronic

¹² Chaum, D. (1983). Blind Signatures for Untraceable Payments. In: Chaum, D., Rivest, R.L., Sherman, A.T. (eds) *Advances in Cryptology*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4757-0602-4_18

cash would allow online payments. They are to be sent directly from one party to another without the burdens of going through a financial institution¹³.

Altcoins are alternative cryptocurrencies, such as Litecoin, Ethereum, and Monero, offer distinct features and use cases¹⁴. Other types include tokens i.e. the Digital assets issued on existing blockchain platforms, such as Ethereum's ERC-20 tokens and finally the Stablecoins. The Stablecoins are cryptocurrencies pegged to traditional currencies or commodities, designed to maintain price stability.

1.10 Types of Blockchain Platforms

The Blockchain platforms are *firstly*, Public Blockchains which are decentralized, open source platforms, such as Bitcoin and Ethereum. *Secondly*, Private Blockchains containing Centralized, permissioned platforms, often used for enterprise applications. *Thirdly*, Hybrid Blockchains combining public and private blockchain features and *finally*, Sidechains having Separate blockchain platforms connected to a main blockchain.

1.11 Global Cryptocurrency Adoption Trends

Traditional financial institutions and investment firms are increasingly investing in cryptocurrencies, driving growth in the market. Crypto is treating as financial product under the Payment of Services Act (PSA) and Financial Instruments and Exchange Act (FIEA) in Japan making the regulatory framework as evolving. KYC rules and investor protection measures make it comprehensive and compliant to AML. The Distributed Ledger Technology (DLT) Act of Switzerland is permissive and innovation friendly. It provide clear guidelines for crypto services via Financial Market Supervisory Authority (FINMA). Zug is known as "Crypto Valley". Switzerland has attracted many blockchain startups and has a stable market. On the other hand, the regulatory framework of Singapore is Progressive and pragmatic, with the Monetary Authority of Singapore (MAS) using a risk based approach under the Payment Services Act (PSA) to license digital payment token services. Growing acceptance of cryptocurrencies as

¹³ Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Available at SSRN 3440802.

¹⁴ <https://cryptodeep.ru/doc/paper.pdf>

payment methods need establishment of Decentralized finance (DeFi) platforms, enabling lending, borrowing, and trading¹⁵.

1.12 Key Players and Stakeholders

Platforms for buying, selling, and trading cryptocurrencies, such as Binance, Coinbase, and Kraken are the key exchanges dealing in crypto assets. Other stakeholders are miners that validating transactions and securing blockchain networks, Wallet provider companies offering cryptocurrency storage and management solutions. Companies and individuals building blockchain applications and infrastructure i.e. blockchain developers are the key players which are required by Government agencies for overseeing cryptocurrency regulation and oversight.

The evolution of cryptocurrencies and blockchain technology has been marked by rapid innovation and growing adoption.

¹⁵ World Economic Forum. (2022). Blockchain and Cryptocurrency: A Survey of Global Adoption

CHAPTER # 2

LITERATURE REVIEW/THEORETICAL FRAMEWORK

2.1 Regulatory Frameworks for Cryptocurrencies

The continuously evolving nature of cryptocurrencies makes their regulation a “changing task”. The popular growth of digital assets requires the government and regulatory bodies to supervise the evolving market. The theoretical framework under global regulatory approaches and proposed regulations of Pakistan will find its traces in this chapter.

2.2 Research Philosophy

Knowledge as an outcome of empirical observation, deductive reasoning and theoretical study is recognized as epistemological foundation of this study which is rooted in pragmatic paradigm. This research adopts a mixed method design, integrating both collection of qualitative data and quantitative data collection and analysis methods by providing a detailed understanding of the research. The researcher’s integration with investigation, personal experiences, confronted assumptions and verified interpretation are embodied in this paradigm

The jurisprudential traces of this study leading towards the foundations laid down by the prominent legal scholar Roscoe Pound (1870-1964), the Dean of Harvard Law School. The Legal Framework Theory (LFT) as articulated by Pound, the law as an instrument of social engineering. Core purpose is to coordinate and reconcile the adversaries with minimal fraction. This research proposes an extension of Legal Framework Theory (LFT) into the development of Virtual Currency Legal Framework Theory (VCLFT). The innovation of VCLFT is influenced from the scholarly work carried out under LFT. The study proposed the principles for the settlement of regulatory framework to address the challenges associated to virtual currency, regulations and governance. The proposed evolution of regular legal framework theory necessitates the extended VCLFT whereby the harmonization amongst virtual or crypto currencies with financial system is required.

The integration of legal norms with technology-aware mechanism to ensure security, transparency and societal protection within the digital financial ecosystem. The emerging nature of research requires the evolution of LFT into VCLFT to address the complex nature of virtual currency regulations.

The methodologies used, strategies applied, analytical techniques used and data sources employed enabled the deep understanding of the research topic. It is admitted that the topic and evolving nature of knowledge claimed makes its findings as a contribution of future scholarly work and ignites the thrust for further inquiry and examination of evolving field.

2.3 Global Regulatory Approaches

Regulating the cryptocurrencies remains a distinct tasks among different countries. Few global regulatory approaches are:

- 2.3.1 Financial Action Task Force (FATF) is an intergovernmental body that set out standards for anti-money laundering (AML) and combating the financing of terrorism (CFT). Virtual Assets Service providers (VASPs) were included by the FATF in its guidance 2021¹⁶.
2. 3.2 A concrete step was adopted by EU to regulate cryptocurrencies with Fifth Anti Money Laundering Directive¹⁷ (5AMLD) as well as proposed Market in Crypto-Assets Regulations (MiCA). Since December, 2024¹⁸ MiCA regulation were approved by the EU Parliament and have been applicable since then.
2. 3.3 The segmented regulatory framework regulating the cryptocurrencies in the United States are comprised of Commodity Future Trading Commission (CFTC)¹⁹, Securities and Exchange Commission (SEC) and Financial Crimes Enforcement Network (FinCEN²⁰).

¹⁶ <https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Guidance-rba-virtual-assets-2021.html>

¹⁷ <https://eur-lex.europa.eu/eli/dir/2018/843/oj/eng>

¹⁸ <https://www.legalnodes.com/article/mica-regulation-explained>

¹⁹ <https://www.cftc.gov/>

²⁰ <https://www.fincen.gov/>

- 2.3.4 Singapore has taken a proactive approach to regulating cryptocurrencies, with the Monetary Authority of Singapore (MAS) issuing guidelines²¹ and regulations for VASPs.
2. 3.5 United Arab Emirates (UAE) has established a regulatory framework for cryptocurrencies, with the Central Bank of the UAE issuing guidelines for VASPs²².

2.4 Pakistan's Regulatory Environment

Pakistan's regulatory environment for cryptocurrencies is still evolving. The State Bank of Pakistan (SBP) has issued circulars and notifications related to cryptocurrencies, including a ban on cryptocurrency trading in 2018. No formal lifting of such ban is communicated by the SBP. Rather, an intimation to initiate prosecution against the Persons using Virtual Currencies/Coins/Tokens for the purpose of transferring value outside Pakistan is published through public notice²³. However, on May 30, 2025 the SBP has clarified that the advisory was done to protect its regulated entities and their customers from the risks emanating due to the absence of legal and regulatory framework for VAs in the country and not being illegal²⁴. After promulgation of the Virtual Assets Ordinance, 2025, Pakistan Virtual Assets Regulatory Authority (PVARA) is Pakistan's independent federal regulator for virtual assets. It is mandated to ensure that virtual asset activities operate within a safe, secure, and transparent environment that aligns with both international standards and Pakistan's national interests. PVARA will license, supervise, and enforce compliance for virtual asset service providers that will operate in or from Pakistan²⁵.

²¹ https://www.mas.gov.sg/-/media/MAS/Regulations-and-Financial-Stability/Regulatory-and-Supervisory-Framework/Anti_Money-Laundering_Countering-the-Financing-of-Terrorism/Guidelines-to-PSN02-on-Prevention-of-Money-Laundering-and-Countering-the-Financing-of-Terrorism--DPT.pdf

²² <https://cms-lawnow.com/en/regzone/articles/2024/09/uae-sca-issues-new-guidelines-on-the-regulation-of-virtual-assets-and-vasps>

²³ <https://www.sbp.org.pk/warnings/pdf/2018/PBNT-VC.pdf>

²⁴ <https://www.sbp.org.pk/press/2025/Pr-30-May-2025.pdf>

²⁵ <https://www.pvara.gov.pk/>

2.5 Challenges and Gaps in Regulation

Despite efforts to regulate cryptocurrencies, there are still significant challenges and gaps in regulation, including lack of clarity which is making it difficult for businesses to comply. Similarly, cryptocurrencies operate globally, making it challenging for regulators to enforce laws and regulations. The innovation need continues change and upgradation of regulations. Regulators must balance the need to foster innovation with the need to protect consumers and prevent illicit activities. The regulation in vogue in different countries are not synchronized with each other. Resultantly the jurisdiction issues are making it difficult to regulate the blockchain based networks.

2.6 Comparison of Regulatory Frameworks

Evolving regulatory frameworks for cryptocurrencies and different approached by different countries is challenge. Same is the case with Pakistan whereby wherein an effort is being made to establish a regulatory framework for cryptocurrencies. It is necessary for the organizations and businesses to stay informed and adapt changing regulations. The difference of adoption of fragmented and comprehensive approached by different countries resulted in varied regulations in different jurisdictions.

2.7 Data Protection and Consumer Safeguards

The key concerns in cryptocurrencies and blockchain technology is data protection and safeguarding consumer. It is thus essential to understand the existing laws and regulation regarding data protection and consumer protection. The best practices for safeguarding the personal data and complexities annexed with digital assets are required to be highlighted and adopted.

2.7.1 Data Protection Laws and Regulations

The core subject to data protection laws and regulations are to ensure data privacy and organizational responsibility. The key regulations include:

- a) The EU's general data protection regulation²⁶ (GDPR) is recognized as all-inclusive data protection regulation which sets a high standard for data protection. It obligates organizations to adopt and carry out robust data protection measures, acquire express consent from individuals and provide transparency about data processing.
- b) Personal Data Protection Bill²⁷ of Pakistan intended to regulate the processing and collection of personal data and use thereof. It obligates the concerns to adopt and implement measures to protect data by obtaining consent and provide transparency of data processing.

2.7.2 Consumer Protection Measures

The prime concern of the consumer protection measures is to ensure consumer's interests and provide treatment with all due fairness.

The recognized measures include:

- (i) Dispute Resolution
- (ii) Fair treatment.
- (iii) Complaints Handling.
- (iv) Transparency and disclosure

The Financial Ombudsman Services (FOS) in UK provides a forum to the consumers for dispute resolution with financial institutions including fiscal matters as well as cryptocurrencies. In Singapore, Cryptocurrency Exchanges Association (CSEA) provides a dispute resolution forum in matters connected with the cryptocurrencies. In Pakistan, no specific forum is available and dealing in cryptocurrencies was mostly considered illegal until the clarification by the SBP in the Senate of Pakistan.

²⁶ <https://gdpr-info.eu/>

²⁷

<https://moitt.gov.pk/SiteImage/Misc/files/Final%20Draft%20Personal%20Data%20Protection%20Bill%20May%202023.pdf>

Through the implementation of consumer protection measures organizations will be able to acquire consumer trust and confidence. The consumers will be able to feel fair treatment regarding issues with cryptocurrency dealings.

2.7.3 Best Practices for Data Protection and Consumer Safeguards

For personal data protection, and consumer interests, organizations should adopt exhaustive techniques for data protection. Such measures may include encryption, permissible access and backup of data. Express consent by individuals before collection and to process their data. Ensure transparency about data processing and provide that individual an access to their data, train employees on data protection and consumer safeguards. The encryption of data and access controls may be adopted to ensure protection of data and to ensure interest of the consumer.

2.7.4 Blockchain and Data Protection Challenges

With the evolution of blockchain technology, new challenges are surfaced for data protection. An immutable format of data is stored by the blockchain technology, and it is difficult to erase or correct data. Decentralization makes it difficult to ensure data protection. Anonymity makes it challenging to find out individuals and ensuring data protection. Smart contracting without data protection can invite data protection risks.

The digital ecosystem driven by advanced technology and changing regulatory requirements is evolving the need of data protection and consumer safeguard. These emerging trends in this space include

a) For detection and prevention of data breaches, AI (Artificial Intelligence) and ML (Machine Learning) are being used. The framework behind the AI is stored in the blockchain based record. It improves data integrity. The recommendation provided by AI enhanced consumer's trust. Using blockchain to store and distribute AI models provides an audit trail, and pairing blockchain and AI can enhance data security²⁸.

²⁸ <https://www.ibm.com/think/topics/blockchain-ai>

Similarly ML can help to investigate the integration of blockchain for the detection of anomalous transactions in the blockchain network²⁹.

(b) Blockchain based Data Protection technology is being explored for its potential to enhance data protection. Transparent and secure data storage can be provided through blockchain based system, enabling organizations to protect sensitive data and compliance of regulations.

(c) Authentication through biometric methods including facial recognition and fingerprint imaging, is becoming increasingly popular as a means of securing data and preventing unauthorized access. Subburaj proposes a novel system, a Blockchain based Distributed Biometric Authentication System (DBAS), to address vulnerabilities in existing biometric authentication methods³⁰.

(d) Zero Trust Security models are gaining traction, assuming that all users and devices, whether inside or outside the network, are potential threats. A cryptocurrency exchange may adopt Zero Trust Security to safeguard its user accounts and wallets. Multi factor authentication and least privilege access minimized the risk of unauthorized access.

(e) Avoiding data breaches and detection thereof may be carried out through Data Loss Prevention (DLP) Solutions. These solution can identify classified data and restrict its transmission outside the authorized network. Such solutions may protect data either static or in motion or in use. Enhancement in data protection by providing immutable and perfect system for tracing and validating data access is possible through blockchain. Such protection is possible for both static and data in motion.

(f) the evolution of clouds in computing necessitates the adoption of cloud security measures. Organizations opt to move their applications and data on cloud.

²⁹ <https://doi.org/10.3390/computers14070247>

³⁰ Subburaj, T. *et al.* (2025). Biometric Authentication with Blockchain: A Secure and User-Friendly Approach. In: Reddy, V.S., Prasad, V.K., Wang, J., Rao Dasari, N.M. (eds) Intelligent Systems and Sustainable Computing. ICISCC 2024. Smart Innovation, Systems and Technologies, vol 417. Springer, Singapore. https://doi.org/10.1007/978-981-97-8355-7_44

(g) Increasing trends of connecting devices with internet is making Internet of Things as a major security concern. Device authentication, encryption are used to protect such devices and data.

(h) To comply with regulatory requirements, the Regulatory Technology (RegTech) are adopted by the organization that can automate the regulatory compliance and conduct monitoring and reporting requirements.

AI and ML are increasingly used in Pakistan for detection and prevention of data breaches by organizations in general and financial sector in particular. Such use is reflecting emerging trend of data protection and safeguarding consumer interest. Furthermore blockchain technology is rapidly used for enhanced data protection and regulatory compliance requirements. Multiple techniques are implemented to prevent unauthorized access including facial recognition, fingerprint scanning and biometric authentication. Placement of data and application on cloud is made possible only due to developed importance of cloud security.

Trending suggest the leading growth in data protection and consumer safeguard market in Pakistan whereby the organization will be able to protect the sensitive data with perfection and ensure regulatory compliances. The data protection bill obligates the organizations to handle the personal data with care and in more responsible manner under the regulatory compliance. Though the bill is at its inception, however it will ensure the international best practices and standards for safeguarding the consumer interest.

The data protection and consumer safeguard are recognized as critical concerns in cryptocurrencies and blockchain technology. The organizations are giving priority to the data protection for confidence building in digital economy.

2.8 Financial Stability and Cryptocurrencies

The financial systems are the backbone of economic stability. The evolution of cryptocurrencies raises threats for traditional financial systems with digital assets. Thus it is necessary to find out the risk and opportunities clubbed with the cryptocurrencies.

The development of regulatory frameworks is essential for financial stability. Exploring the role of CBDCs in maintaining financial stability is at its provisional stage.

2.9 Financial Stability Risks and Opportunities

Risks for financial stability associated with the cryptocurrencies include:

- i. Prices of cryptocurrency are highly unstable. Thus potential losses to customers makes the financial markets unstable.
- ii. Being unregulated activity, cryptocurrencies are exposed to illegal activities like money laundering and terrorist financing.
- iii. Financial systems and cryptocurrencies are interconnected. Panic in one area may shift the shock in other area which will create systemic risk.

Opportunities for financial stability associated with the cryptocurrencies include:

- i. The financial services will be available to underserved populations as the cryptocurrencies can promote such financial inclusions.
- ii. Efficacious, cost effective and expeditious settlements are possible through cryptocurrencies.
- iii. Cryptocurrency driven new financial products and services can emerge.

Feeling threats from the digital assets, the traditional financial systems have raised concerns about financial stability in Pakistan. Citing concerns about money laundering and terrorist financing, the SBP has adopted cautious approach. The potential of cryptocurrencies to promote financial inclusion, its volatility is a risk to economic stability particularly for want of regulations. SBP has issued a warning to the financial institutions from dealing in cryptocurrencies highlighting risks and consumer protection³¹. It is thus necessary to evaluate the risks and opportunities associated with the cryptocurrencies and adopt a clear regulatory framework to mitigate risks.

³¹ <https://www.sbp.org.pk/warnings/pdf/2018/PBNT-VC.pdf>

2.10 Regulatory Frameworks for Financial Stability

Frameworks regulating financial stability are aiming to mitigate risks associated with cryptocurrencies as well as innovation and financial inclusion:

2.10.1 Financial Stability Board³² (FSB): It provides guidelines for financial stability issues on cryptocurrencies.

2.10.2 International Monetary Fund³³ (IMF): It provides guidance on financial stability on cryptocurrencies including risks and opportunities associated with the CBDCs.

2.10.3 Basel Committee on Banking Supervision³⁴ (BCBS): Prudential regulations for banks are of supreme importance. It provides guidance to the bank on prudential regulations for cryptocurrencies exposure.

2.10.4 State Bank of Pakistan³⁵ (SBP): The prime regulator of the banks in Pakistan, the SBP is actively engaged in development of regulatory framework with alongside regulators for cryptocurrencies. The international standards and global best practices are being adopted. The prime concern of SBP regulatory framework is to balance the innovation and financial inclusion by mitigating the risks.

2.11 Best Practices for Financial Stability

Best practices for financial stability are:

- (i) Risk assessment studies to identify and mitigate the risks involves in financial inclusion of cryptocurrencies.
- (ii) Ensure compliance of regulatory requirements.
- (iii) Introduced capital requirements for absorption of losses.
- (iv) Implementation of monitoring and reporting systems for tracking cryptocurrency transactions.

³² <https://www.fsb.org/>

³³ <https://www.imf.org/en/home>

³⁴ <https://www.bis.org/bcbs/index.htm>

³⁵ <https://www.sbp.org.pk/index.html>

2.12 CBDCs and Financial Stability

The digital currencies issued by the central bank are called CBDCs which can contribute to financial stability:

Benefits: efficient financial transactions, costs reduction and expeditious settlement are possible through CBDCs. It improves financial inclusion by providing services to deserving masses. It may act as additional tool for development of monetary policy by the central bank.

Risks: Being product of central bank, the commercial banks will cease to act as intermediaries. It may create systemic risk unless designed and implemented properly under a regulator.

The CBDCs are at early stage in Pakistan. The SBP is eager to launch its CBDC. A contract between SBP and Soramitsu is inked whereby a leading Japanese blockchain technology company will develop a CBDC to launch a pilot in the end of 2025³⁶. The ongoing research by SBP will highlight the prospects of financial inclusion of CBDCs, cybersecurity threats, data privacy issues and effective monetary policy. This will include the risks associated with the financial inclusion of CBDCs including possibility of disruption to the existing financial system. A close working with the international organizations including IMF will enable the development to comprehensive framework which is secure, stable and competitive. However the compatibility of such framework will remain an issue until the adoption of uniform regulatory framework by all regulators.

2.13 Financial inclusion and Impacts in Pakistan by Cryptocurrencies

The cryptocurrencies can have both positive and negative impacts significantly on financial inclusion of cryptocurrencies.

³⁶ <https://profit.pakistantoday.com.pk/2025/08/12/sbp-partners-with-soramitsu-to-pilot-digital-pakistani-rupee-in-2025>

Positive impacts: Cryptocurrencies can provide access to financial services for underserved populations, including those in remote areas with limited banking infrastructure. The reduction in transactional costs can make the financial services affordable for every individual. It can advance awareness and financial literacy enabling individuals for taking financial decision with precision.

Negative impacts: access through smart phones and gadgets, internet and specialized literacy is creating impediments for the low income class for adoption of cryptocurrency. The financial risk associated with cryptocurrencies due to price volatility exposed the individuals with limited resources. The regulatory framework in vogue by the SBP can limit the growth of cryptocurrencies and their prospects for robust financial inclusion.

Nutshell, the risks and opportunities associated with the cryptocurrencies make it a unique product. For mitigating risks and promoting innovation and financial inclusion, regulatory frameworks plays a pivotal role. The role of CBDCs is also meaningful in maintaining financial stability. However careful designing and implementation may avoid risks.

2.14 Regulatory Guidelines

The existing regulatory guidelines regarding cryptocurrencies in Pakistan are:

State Bank of Pakistan (SBP): the SBP has stated that cryptocurrencies are not legal tender in Pakistan.

Securities and Exchange Commission of Pakistan (SECP): SECP has warned the investor in cryptocurrencies about the risks associated with them.

Federal Board of Revenue (FBR): The recognition of cryptocurrencies for taxation is still awaited. However the FBR is actively consulting with experts and stakeholders to

introduce comprehensive legislation in a forthcoming Finance Bill to formalize the regulation and taxation of virtual assets^{37 38}.

Pakistan Telecommunication Authority (PTA): the prime role of PTA is technical and advisory. Recently PTA has developed a policy regulating use of VPN through registered applications.

Pakistan Virtual Assets Regulatory Authority (PVARA): PVARA is the ever first regulatory authority in Pakistan for issuance of licenses to Virtual Assets Service Providers (VASPs). It enforces AML/CFT standards for protection of customers and development of regulatory sandbox in line with the standards prescribed by the international bodies like FATF,

2.15 Framework for collaboration between stakeholders

An effective regulatory collaboration between the stakeholders is necessary for oversight of cryptocurrency industry. The collaborative framework should include:

Regulatory bodies: Finance ministry, Ministry of IT, PVARA, PTA, SBP, FBR and SECP may jointly form a body to regulate the cryptocurrency industry.

Industry associations: a representative body of the cryptocurrency industry should be formed and consulted in the process.

Consumers: consumer awareness campaigns for educating them and protect them from the risks are required to be implemented.

It is difficult to bring all on one page while addressing the issue of framing regulations for cryptocurrencies in Pakistan. A framework to is required to bring all stakeholders together i.e. regulatory bodies, industry experts and consumer. The SBP, FBR and SECP must work together, share ideas and address challenges associated to cryptocurrencies as a team. Inviting industry associations like Blockchain association can bring expertise on table. It will enhance the data protection and educate the

³⁷ <https://profit.pakistantoday.com.pk/2025/10/15/fbr-begins-consultation-to-regulate-and-tax-cryptocurrency-in-pakistan/#:~:text=This%20the%20FTO%20argued%2C%20points,to%20broaden%20Pakistan's%20tax%20base>

³⁸ <https://thedailypec.com/fbr-moves-to-regulate-cryptocurrency-in-pakistan/#:~:text=The%20Federal%20Board%20of%20Revenue,neglect%20and%20inattention%E2%80%9D%20by%20authorities>

consumers about the associated risks and benefits. A fair innovative and secure regulatory environment is required to address all issues.

2.16 Consumer Protection and Financial Security Measures

Stability and veracity of cryptocurrency market is dependent on the consumer protection and financial security. The most illicit threat to the industry is AML. The Crypto exchanges and the wallets should adopt KYC formats to prevent AML/CFT. An automated regulatory compliance mechanism may be devised for such adoption. Additionally, educating consumers about risks and benefits must be included in all proposed formats of financial inclusion.

The measures to keep Cryptocurrency market safe and secure is Pakistan include verified users identities by exchanges and wallets. It will help to identify the suspicious activities which are subject to AML/CFT. The placement of systems for detection of suspicious transaction is required. Educating people enabling to take smart decision is the foremost requirement. It will build a confidence amongst the consumers and investors which will create healthy and secure environment for all involved in crypto space.

2.17 Recommendations for Pakistan

Analysis of forgoing, the recommendations for Pakistan are as follows:

2.17.1 Establish a clear regulatory framework: Establishment of clear regulatory framework for cryptocurrencies is the need of time. It must include guidelines for consumer protection, imposition of tax and financial security.

2.17.2 Improve infrastructure: A public private partnership based infrastructure may be developed. It may include technology and internet penetration to ease cryptocurrency adoption.

2.17.3 Increase awareness and education: Awareness campaigns should be carried out to educate people. It will enable the public to understand the adopt cryptocurrencies.

2.17.4 Encourage innovation: Innovations in the cryptocurrency industry and development of new digital products and services should be encouraged by the government.

2.17.5 International Cooperation: Global operations of cryptocurrencies make it a unique product without limitation of borders. An international cooperation is required to track and trace cross border transaction and prevent money laundering.

2.17.6 Fast-paced nature: The cryptocurrencies are continuously evolving at a fast pace. An inclusive approach while framing regulation is required that may cover the future needs.

In conclusion, for a stable and integrated cryptocurrency market, a comprehensive regulatory framework is required in Pakistan. It is only possible when all stakeholders, regulatory bodies, government and industry specialist shall work together to establish an innovative framework promoting consumer protection and financial security with financial inclusion.

CHAPTER # 3

RESEARCH METHODOLOGY

3.1 Data Analysis and Findings

The qualitative data analysis and quantitative data analysis will help to find answers of the research questions and recommendation. This chapter will present the findings of data analysis.

3.2 Qualitative Data Analysis

The semi-structured interviews of blockchain experts, blockchain developers and stakeholders were conducted. The various themes related to adoption of blockchain-based network and financial inclusion in Pakistan are identified:

3.2.1 Blockchain potential: Majority of the respondents admit that the blockchain has the potential of financial inclusion in Pakistan. Respondents admit that such inclusion will reduce transaction costs on one hand and will increase access to financial services on the other hand.

3.2.2 Regulatory Challenges: All respondents highlighted the non-availability of regulatory framework in Pakistan for cryptocurrencies. The challenges faced by the regulators include a lack of understanding of the crypto regime and unclear guidelines for framing regulations,

3.2.3 Infrastructure Challenges: Respondents observed the poor infrastructure, internet penetration and technology as a major challenge to blockchain adoption in Pakistan.

3.3 Quantitative Data Analysis

It involves statistical data analysis from non-user and blockchain users. Sindh High Court in its judgments have unanimously accepted the need for establishment of regulatory framework for financial inclusion in Pakistan. The analysis examined the relationship between blockchain adoption and financial inclusion:

3.3.1 Blockchain adoption: The results showed that blockchain adoption is still in its early stages in Pakistan, with only 20% of respondents indicating that they have used blockchain based services.

3.3.2 Financial inclusion: The results showed that blockchain adoption is positively correlated with financial inclusion, with blockchain users more likely to have access to financial services and use digital payments.

3.3.3 Judicial Oversight: The High Court has directed to set up a committee to find out the solution to allow cryptocurrency business³⁹ to be chaired by Deputy Governor, State Bank of Pakistan which also comprised the Secretary or Additional Secretary, Ministry of Finance, Chairman SECP or any senior officer, Chairman PTA or any senior officer, Secretary or any senior officer, Ministry of Information and Technology, Director General, Financial Monitoring Unit (FMU), State Bank of Pakistan and the petitioner Mr. Waqar Zaka, who is seeking to open crypto currency business in Pakistan⁴⁰.

3.4 Findings and Discussion

The findings of the study suggest that blockchain technology has an ability to improve financial system in Pakistan, but several challenges need to be addressed which include *firstly*, clear regulatory framework to support blockchain adoption and ensure consumer protection. *Secondly*, improvement of infrastructure, including internet penetration and technology, to support blockchain adoption. *Finally*, the awareness campaigns to educate the people and to increase understanding regarding adoption of blockchain is needed.

3.5 Implications for Pakistan

The implications for Pakistan highlighted in this study are:

3.5.1 Policy Development: To ensure the consumer protection and to support blockchain adoption, the government should develop a clear regulatory framework.

³⁹ 2022 M L D 1134

⁴⁰ 2022 C L D 652

3.5.2 Infrastructure Investment: Investment by the Government and private sector for infrastructure development including internet penetration and technology is required to support blockchain adoption.

3.5.3 Awareness and Education: Implementation of education campaign and awareness campaigns should be implemented for enhanced understanding of blockchain adoption.

This mean that Government of Pakistan shall create clear rules to expand and adopt blockchain side by side keeping consumers safe. Special programs may be launched for blockchain startups to take off. It should be done under a regulator assuring people to know what to expect while using blockchain based services. We must invest in better internet access, developing digital skills and develop platforms wherein the people can use blockchain based financial services. It can be done by setting up hubs to support entrepreneurs. A timely and effective execution of proposals will make the blockchain as a game changer for Pakistan.

In conclusion, the research suggest that Pakistan has the ability to adopt blockchain technology for its financial inclusion in Pakistan. Several challenges need to be addressed for such adoption including development of clear regulatory framework, infrastructure development and campaigns.

CHAPTER # 4

DATA ANALYSIS/RESULT/FINDINGS

4.1 Blockchain Governance Frameworks

Governance framework for blockchain provide a complete solution starting from problem identification tasks, proposed solutions, recommendations processes, decision making, rules formulation, development stages and implementation mechanism for blockchain. The decentralized models governing Bitcoin etc, are dependent on community participation and consensus. However centralized governance models are dependent upon the unity of authority or organization. On the other hand the Hybrid models used both centralized and decentralized governance models.

The blockchain development and its governance framework remained crucial in Pakistan. The adoption and implementation of blockchain technology is the focused area however the suitable model is yet to be unveiled. Only a well-designed model comprises a well-structured decision making body, set of rules, prescribing standards for such development and implementation by addressing all perceived challenges and securities is required to be framed. Establishing and implementing such model can create an innovative and growth-oriented environment for blockchain development and to ensure secure and integrity of blockchain based system.

4.2 Best Practices for Blockchain Development

Transformation of various sectors like healthcare, finance, governance and even industries is possible by adopting blockchain technology. Being critical in nature, a careful consideration is required for the successful implementation by adopting best practices and lessons learned from the implemented models. This chapter will find out global blockchain best practices, successful governance models, frameworks and case studies including lessons for Pakistan.

Global blockchain best practices and blockchain development are:

- a. **Define clear goals and objectives:** Clearly define the purpose and scope of the blockchain project.
- b. **Choosing platform:** Every project require a suitable blockchain based platform keeping in view the requirements of the project.
- c. **Design for scalability:** Design the blockchain architecture to scale and accommodate growing demands.
- d. **Ensure security:** Apply strong security procedures to safeguard the blockchain and its data.
- d. **Test and validate:** Thoroughly test and validate the blockchain solution before deployment.

4.3 Case Studies of Successful Blockchain Implementations

Valuable insights and lessons are the byproduct of every successful blockchain model. IBM's and Maersk TradeLens is a blockchain centered platform for global business, improving efficiency and reducing costs. Though the Maersk discontinued the TradeLens in 2022 but the fact remains that the platform was successful but operational issues of Maersk were not compatible. JP Morgan's Quorum is another blockchain based platform for cross border payments and securities settlement. In 2025, JPMorgan Completes First Blockchain Based Private Fund Transaction Amid Tokenization Push⁴¹. Estonia's e-Health is a blockchain based platform for healthcare data management and exchange. Furthermore, Singapore's Project Ubin is a blockchain based platform for cross border payments and securities settlement. AXA's Fizzy blockchain based insurance product provides automatic payouts for flight delays, improving customer experience and reducing claims handling costs. AXA is Reinventing Insurance with Cloud, AI & Blockchain Innovation⁴².

⁴¹ https://ca.finance.yahoo.com/news/jpmorgan-completes-first-blockchain-based-160610833.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAlM6NLwL1137_zXMC0ZeliHYWvo4m-vn80c1E6G6n9L_dw_L5TGLEDLyZJ1kEP4IHJkIJ0loJ620TEEn2pQKaoQ4qhBTx-9gm0f2c-hRlfVsHwKJ6FLd9x0YUiy6ncD6l-eBNvjVV02YCF3wul7KwivImY8X5gr6zZ3qnsDF6qhC

⁴² <https://www.linkedin.com/pulse/investigating-digital-hybrid-transformation-how-axa-cloud-impgaard-0lfaf>

4.4 Lessons for Pakistan

Pakistan can learn from global blockchain best practices and successful implementations. Pakistan should develop a clear blockchain strategy. Establish a clear strategy and roadmap for blockchain adoption and implementation. Investment through Public private partnership in blockchain infrastructure. To support applications and cases, develop a complete blockchain infrastructure. Establish collaboration between academia and users for implementation and innovation of blockchain models. Focus on skill and talent development, execution of plans and governance thereof. The globally existing blockchain models, governance frameworks and implementations have valuable insights for Pakistan. Pakistan can harness the blockchain technology potential by adopting the best practices. Development of clear strategy and investment in infrastructure will lead towards economic growth and innovation.

4.5 Research Design

To investigate research problem, the quantitative and qualitative both approaches are used. Considering various financial and systemic implications, the current state of affairs is examined through the descriptive and exploratory designs. It will explore the impact on financial inclusion in Pakistan.

Qualitative approach: The qualitative approach is influenced with the semi-structured and informal interviews of industry experts, stake holders, investors, decision makers and financial experts comprising upon their opinion on blockchain adoption and financial inclusion.

Quantitative approach: The quantitative approach is influenced with the data collected from the survey of judicial decisions, survey conducted amongst blockchain users and non-users. The examination of their relationship between financial inclusion and blockchain adoption

The mixed method approach provide and valuable understanding on the blockchain adoption and financial inclusion in Pakistan. The experts help us to explore and analyze opportunities for Pakistan and challenges in adoption thereof.

The mixed method approach gives us a complete picture by putting all pieces of puzzles together in an organized manner for better understanding of current situation and future needs.

4.6 Data Collection Methods

The data is collected by employing primary and secondary data sources. Primary data is collected from the industry experts and blockchain developers. The investors and digital service providers are other sources of primary data. Secondary data is collected by review of existing literature, reports, proposed statutory instruments, Acts of Parliament and data on blockchain adoption and financial inclusion in Pakistan. Purposive sampling technique is used to select participants for the interviews, and random sampling is used to select respondents for the survey. The review of judicial decision so far announced by the higher courts is an added method of collection.

4.7 Data Analysis Techniques

The thematic analysis is used to analyze the qualitative data from the interviews, identifying themes and patterns related to blockchain adoption and financial inclusion. Statistical analysis is used to analyze the quantitative data from the survey, examining the relationship between blockchain adoption and financial inclusion.

4.8 Limitations and Scope

The limitations and scope of the study include:

4.8.1 Geographical scope: The study is limited to Pakistan, and the findings may not be generalizable to other countries.

4.8.2 Sample size: Due to non-availability of Crypto experts and for want of regulatory acceptance, the stakeholders and experts remained reluctant to express their views and opted to remain anonymous. Thus the sample size is limited, and the results may not be representative of the entire population.

4.8.3 Data Availability: The data may be incomplete which is relied in the study, however due to limited availability of data, the study is on ongoing project.

4.8.4 Time Constraint: The research is based on the study conducted within limited time frame. Resultantly the reality may differ than the current situation on ground.

The research uses a mixed methods approach, i.e. combination of qualitative data and quantitative data to examine current state of blockchain adoption and its impact on financial inclusion in Pakistan.

CHAPTER # 5

CONCLUSION AND RECOMMENDATIONS

This study aimed to examine the current state of blockchain adoption and its impact on financial inclusion in Pakistan. The research used a mixed methods approach, i.e. qualitative data and quantitative data for complete understanding. This chapter summarizes the main findings, provides policy recommendations, and suggests future research directions.

While finding out the globally effective policy frameworks in adopting digital currencies in general and cryptocurrencies in particular, it is observed that El Salvador is the only state, that recognized the Bitcoin as legal tender and to date the same acceptance has already been withdrawn. Thus no effective policy framework is in vogue.

Pakistan can tailor its policy frameworks to ensure national level security, financial stability, and public trust in the manner as discussed above. In this way the ethical and legal implications of digital currency adoption in Pakistan may be addressed

5.1 Summary of Findings

The study found that blockchain technology has the ability to improve financial inclusion in Pakistan, particularly in terms of increasing access to the financial service industry and reducing cost of transaction. The following are the challenges that may need attention:

- 5.1.1 Regulatory Challenges:** There are no clear regulations for blockchain adoption and implementation in Pakistan.
- 5.1.2 Infrastructure Challenges:** Limited resources, internet penetration and technology is a challenge for development of infrastructure.
- 5.1.3 Awareness and education:** lack of awareness and digital education is a challenge towards understanding and adoption of blockchain based systems.

5.2 Policy Recommendations

The following are the policy recommendations based on the above findings:

- a. **Establishment of Regulatory Framework:** Consumer protection and financial security are the area to be strictly addressed. It is possible through establishment of a clear and comprehensive regulatory framework.
- b. **Improved infrastructure:** The investment in infrastructure is mandated to support blockchain adoption. Supplemental investment is required in internet penetration and technology.
- c. **Awareness and Education:** The educational campaigns and increasing awareness in public should be carried out.
- d. **Encourage innovation:** The government should encourage innovation in the blockchain industry, including the development of new products and services.
- e. **Conversion Mechanism:** Government should create the regulatory framework and finalize a system for the conversion of cryptocurrency to Pakistani Rupee as all businesses must accept the same as legal tender unless they do not have access to the technology needed to process the transactions.
- f. **Remove Anonymity:** The custodial and non-custodial wallets to park cryptocurrency may be introduced through exchange houses under the control of regulatory body recording transactions.
- g. **Jurisdictional Control:** The trading between the exchanges houses or the traders or holders of cryptocurrency within Pakistan may be allowed under relax regulatory framework. However transaction of cryptocurrency outside the territorial jurisdiction may be allowed with treaty states only those accepting and synchronizing their regulatory framework with Pakistan.
- h. **Foreigner Holder:** The foreigners intended to trade and hold cryptocurrency in Pakistan may be allowed subject to regulatory control and parking the crypto assets within Pakistan. That too subject to taxation.

To implement the policy recommendations, the Pakistani government can take the following practical steps:

- a. The academia, regulatory bodies, blockchain developers, industry experts are tasked in group to develop a clear regulatory framework for blockchain

technology and financial security including guidelines for data and consumer protection.

- b. The blockchain based services may be burdened with tax after financial inclusion for robust economic growth.
- c. Budgeted funds must be provided for infrastructure development, internet penetration and blockchain adoption. The public private partnership methods maybe adopted to support and explore resources and expertise.
- d. Incentive are provided to the students, stakeholders, startups and established businesses compelling them to adopt blockchain technology.
- e. Innovative ideas and services must be incentivized with tax breaks and fixed regimes attracting the attention of public.

5.3 Future Research Directions

The future research direction may include the inclusion of blockchain based system in industry specific like health, education, transport etc. Financial inclusion and associated risks along with ways to mitigate them is needs to study out independently.

The policy directions provided in the study will help the policy makers to implement a robust policy framework with ease of blockchain adoption and financial inclusion in Pakistan.

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