ANALYZING THE INFLUENCE OF FINTECH AND BLOCKCHAIN ON SUSTAINABLE GROWTH IN BANKING AND FINANCIAL SERVICES WITHIN THE GREEN ECONOMY

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Abstract

In an era of technological advancement, the global banking and financial services sector is undergoing a significant transformation, aligning with the principles of the green economy. This shift is propelled by the rapid expansion of technology, widespread internet accessibility, and the ubiquity of mobile devices. Within this context, financial technology (FinTech) and blockchain have emerged as pivotal tools driving the evolution of digital banking services. This research delves into the nuanced effects of FinTech and blockchain technologies on the landscape of digital banking and financial services within the framework of the green economy. Employing a methical approach, 220 customers spanning diverse banking sectors participated in the study through structured questionnaires and a random sampling methodology. The core aim was to assess the influence of FinTech and blockchain distributed ledger technology on the enduring growth of banking and financial services within the context of the green economy. The findings underscore a substantial and discernible impact of these technologies on sustainable growth within the banking and financial services realm, particularly concerning variables such as gender, residential locality, age, marital status, education level, and banking institution type. However, no significant disparity was observed with respect to the occupation group of customers.

Keywords: *Fintech, Blockchain Technology, Banking sector, Financial Services.*

1. INTRODUCTION

The banking, financial, and insurance sectors have experienced a profound impact from FinTech, a field with wide-ranging and promising applications, aligning with the principles of the green economy. This transformation has led to heightened efficiency, transparency, and security in

business operations within the context of sustainable growth. Among FinTech innovations, blockchain has garnered substantial attention and investment due to its cutting-edge applications, particularly in fostering a more environmentally sustainable economy. It addresses pivotal challenges in online transactions and trust, gaining widespread acceptance and development. Blockchain not only resolves these issues but also enhances the process by making it more accessible, secure, and efficient (Sinha, 2017).

Historically, concerns about security and privacy have constrained online business transactions. While significant research has been dedicated to addressing these issues, recent developments have introduced intermediaries to ensure secure transaction completion. Nevertheless, there were still vulnerabilities to online business due to the exposure of private and financial data to potential breaches. Blockchain technology emerged as a protocol promising advanced solutions to these challenges and more a few years ago. Initially conceived as an electronic payment system for digital currency transactions (bitcoin), recognition of its potential beyond cryptocurrency prompted heightened interest in the technology. Recognizing its cutting-edge potential and capabilities, financial institutions and businesses have made substantial investments in this technology.

At its core, blockchain is a system that leverages the Internet of Things (IoT) to facilitate encrypted transactions without the need for centralized authority, thereby promoting sustainability in financial transactions (Sahu et al., 2023). This enables transparency through independent ledgers. While blockchain holds potential for diverse industries, its promise in the financial sector for FinTech applications is particularly significant in the context of the green economy. The innovation facilitates higher business efficiency with augmented security, robustness, and enhanced visibility, resulting in significantly reduced transaction and operational costs, especially for banks (Sahu et al., 2021; Khatwani et al., 2023).

Gartner (2021) asserts that the use of blockchain technology by FinTech firms is inevitable, and it will play a pivotal role in advancing sustainability within the financial industry. Decentralized finance has been earmarked as an "innovative trigger" area, signifying considerable attention and potential for technological advancement in the context of the green economy. Compared to traditional solutions, blockchain-based FinTech solutions can provide financial services at lower costs and with a higher accessibility standard, thereby contributing to a more sustainable financial ecosystem (Dorfleitner and Braun, 2019).

Blockchain technology has the capacity to deliver traceable, secure, and decentralized storage, prompting substantial industry investment, further supporting the transition towards a green economy. It currently covers a wide array of sectors, including health, internet, security, data privacy, supply chain, nuclear industry, counterfeit goods, and more. Among these, FinTech emerges as a particularly compelling sector with substantial potential for driving sustainability within the green economy.

As blockchain technology becomes more prevalent, financial practices, including banking and trade, have evolved to align with more environmentally conscious practices. Established financial institutions are making significant investments in FinTech startups and organizations to leverage innovation and gain a competitive edge in the context of the green economy (Romanova and Kudinska, 2016).

Motivated by the growth of the FinTech sector and the imperative of sustainability within the green economy, traditional financial institutions are enhancing their blockchain infrastructure to tap into the FinTech services market. While there has been extensive research on the technical application and use of blockchains and distributed ledger technologies for financial services, a systematic comparison of blockchain platforms remains lacking. Existing studies have provided theoretical overviews of FinTech platforms and adoption strategies (Ng et al., 2022), examined digital finance from functional perspectives (Gomber et al., 2017), and delved into regulatory challenges and FinTech advancements (Cai et al., 2022).

In contrast, our study aims to elucidate blockchain-based applications for the FinTech industry within the framework of the green economy, specifically focusing on how blockchains can enhance the delivery of sustainable financial services by FinTech companies to individuals and enterprises. We examine the various approaches companies adopt in using blockchain to achieve their objectives, thereby contributing to the advancement of the green economy.

Given its heightened security, stability, and operational effectiveness compared to traditional financial services, FinTech organizations are transitioning towards blockchain-based financial services, contributing to a more sustainable financial ecosystem within the green economy. Here are some key attributes of blockchain:
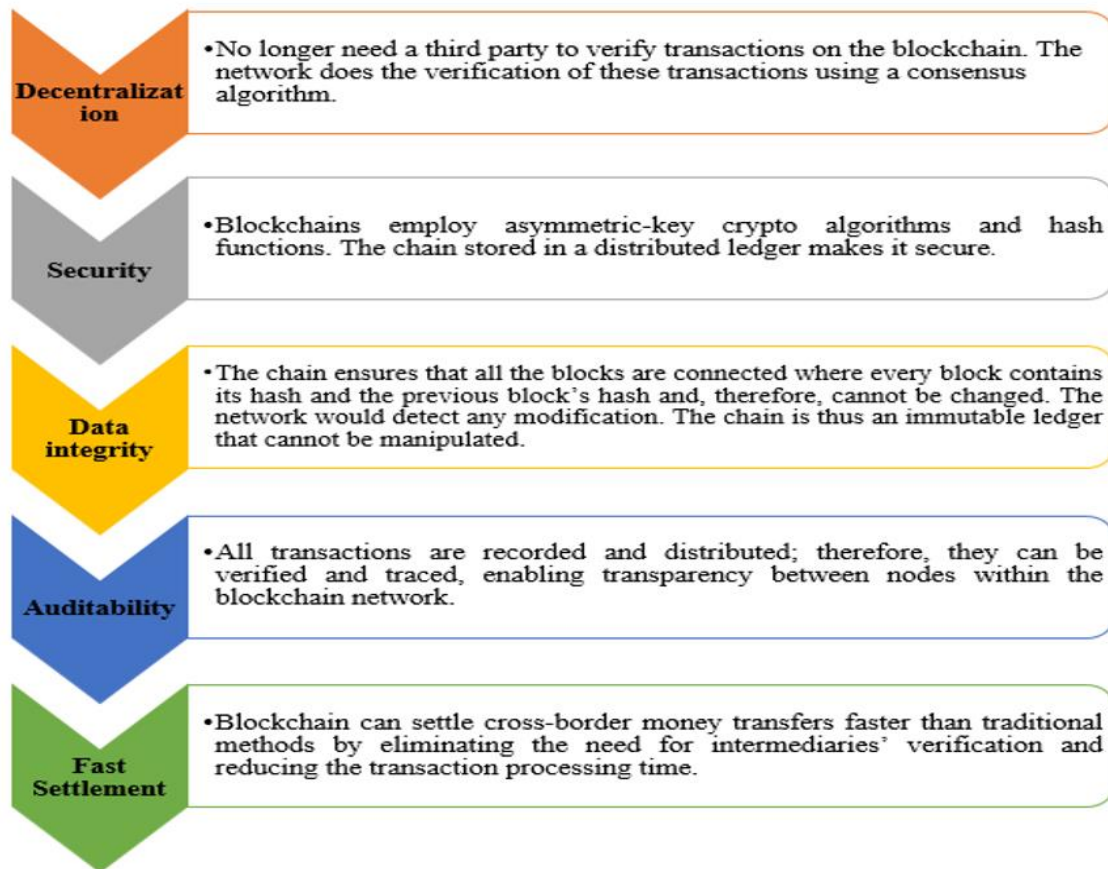

Figure 1: Properties of Blockchain

The subsequent portion of the article is structured in the following manner. Section 2 provides an overview of the current literature concerning financial technology in the banking sector, as well as the influence of FinTech on customer perceptions. Section 3 delineates the formulation of hypotheses. The research methodology employed for the envisioned study, encompassing data collection and analysis, is elucidated in Section 4. Section 5 is dedicated to the analysis and discussion of the obtained results. Finally, the concluding remarks and potential avenues for future research are deliberated in the concluding section.

2. REVIEW OF LITERATURE

Chang et al. (2020) conducted a qualitative study and interviewed 16 experts to examine the impact of FinTech and Blockchain in the financial industry. The study identified common knowledge hiding in Blockchain and analyzed the rationale behind it using the TPB approach. Four propositions were developed as a result of the experts' advice and success criteria for overcoming barriers to blockchain adoption. The essay makes recommendations on how financial institutions should handle knowledge exchange and adapt to this new technology. Khatwani et al. (2023) aimed to evaluate technological advancements in the BFSI sector globally and assess their merits and shortcomings using a literature review and prior knowledge from reputable sources. The study found that banks are looking to speed up digital transformation and utilize AI to reduce costs, automate processes, and extract personal information. Thakor (2020) reviewed the literature on fintech and its interaction with banking, including innovations in payment systems, credit markets, and insurance with Blockchain-assisted smart contracts playing a role. Renduchintala et al. (2022) offered a thorough overview of pertinent bitcoin Finance deployments, a criticism of every sector, and an explanation of how each attempt to integrate helps researchers and FinTech organisations solve difficulties. By describing the uses of blockchain technology and distributed ledger technology (DLT) for fintech, the paper points to the future of financial solutions. By concentrating on the modernization processes in banking and financial services. Kumari and Devi (2022) investigated the involvement of financial technology and bitcoin technologies in digitized financial services and banking. The study demonstrates that FinTech and blockchain have a significant impact on trends in digitalization. Dalbah (2020) investigated the impact of FinTech on the financial service banking industry and recommended financial institutions adapt to digital trends and shift from product-based to customer-based models. Drescher (2017) believes that the openness and absence of central control in Blockchain may limit its adoption, and Andolfatto (2018) asserts that the lack of legal and user recognition is a significant limitation. Nevertheless, Blockchain has a comparative advantage in supporting decentralized autonomous organizations (DAOs).

3. RESEARCH METHODOLOGY

In this study, the researcher used a research design that combines both descriptive and exploratory methods, with a particular emphasis on understanding their implications within the context of the green economy. Due to limited available data on the topic, the researcher opted for an exploratory approach to obtain a deeper understanding of the subject and its potential impact on sustainable financial practices. The study aims to evaluate how fintech and blockchain distributed ledger technology, when integrated thoughtfully, can influence the sustainable growth of banking and financial services in the framework of the green economy. The researcher collected data using

random sampling, a form of probability sampling, and used both primary and secondary sources. Primary data was collected through structured questionnaires and interviews with convenience sample respondents from various categories, seeking insights into their perspectives on sustainable financial practices. Out of the 250 questionnaires distributed randomly, 220 were completed and included in the analysis, ensuring a robust representation of opinions. Incomplete surveys were excluded. Secondary data sources included research papers and journals, with a specific focus on studies exploring the intersection of financial technology, blockchain, and sustainable practices within the green economy.

4. RESEARCH HYPOTHESIS

The following hypothesis has been formulated to ascertain whether there is a significant effect of fintech and blockchain distributed ledger technology on the sustainable growth of banking and financial services;

H_{01}: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to different demographic group of Customers.

H_{A1}: There is significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to different demographic group of Customers.

Sub Hypothesis:

$H_{01.1}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to gender group of Customers.

$H_{01.2}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to area of residence group of Customers.

$H_{01.3}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to age group of emoployess.

$H_{01.4}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to marital status group of Customers.

$H_{01.5}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to occupation group of Customers.

$H_{01.6}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to education group of Customers.

$H_{01.7}$: There is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to type of bank group of Customers.

Table 1: Demographic description of the Respondents

Demographic Variable	Classification	Frequency	Percent
Gender	Male	115	52.3
	Female	105	47.7
	Total	220	100.0
Area of residence	Urban	155	70.5
	Rural	65	29.5
	Total	220	100.0
Age	Up to 20	6	2.7
	20 - 40	137	62.3
	40 - 60	41	18.6
	Above 60	36	16.4
	Total	220	100.0
Marital status	Married	98	44.5
	Unmarried	79	35.9
	Divorced	25	11.4
	Widowed	18	8.2
	Total	220	100.0
Occupation	Professional	38	17.3
	Govt. employee	23	10.5
	Private employee	35	15.9
	Businessman	23	10.5
	Other	101	45.9
	Total	220	100.0
Education	Schooling	23	10.5
	Under Graduate	58	26.4
	Post Graduate	21	9.5
	Other	118	53.6
	Total	220	100.0
Type of bank	Public	32	14.5
	Private	40	18.2
	Both	148	67.3
	Total	220	100.0

Table-1 displays that a total of 220 participants were selected for the study, with 115 being male and 105 being female. The sample consisted of 155 individuals from urban areas and 65 from rural areas. The age groups were distributed as follows: 6 participants were aged up to 20, 137 were aged between 20-40, 41 were aged between 40-60, and 36 were above 40. The marital status of the customers showed that 98 were married, 79 were unmarried, 25 were divorced, and 18 were widowed. The participants were employed in various occupations, including professionals, government employees, private employees, businessmen, and others, with 38, 23, 35, 23, and 101 respondents, respectively. The education levels of the respondents were classified as schooling, undergraduate (UG), postgraduate (PG), and other, with 23, 58, 21, and 118 respondents, respectively. In terms of bank accounts, 32 participants had accounts in public sector banks, 40 had accounts in private sector banks, and 148 had accounts in both public and private sectors.

Table 2: Descriptive statistics table

Group Statistics					
Demographic Variable		**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Gender	Male	115	3.9019	.46977	.04381
	Female	105	3.9224	.46080	.04497
Area of Residence	Urban	155	3.9143	.48008	.03856
	Rural	65	3.9055	.42878	.05318

The presented table displays descriptive statistics related to the impact of fintech and blockchain distributed ledger technology on the sustainable growth of banking and financial services, concerning the gender and area of residence of customers. According to the data presented in the table, it is apparent that the gender group of customers has the highest average value.

Table 3: Independent sample t-test

Independent Samples Test										
Demographic Variable		**Levene's Test for Equality of Variances**		**t-test for Equality of Means**						
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
									Lower	**Upper**
Gender	Equal variances assumed	.124	.025	-.328	218	.044	-.02059	.06283	-.14443	.10325
	Equal variances not assumed			-.328	216.871	.043	-.02059	.06278	-.14432	.10315
Area of Residence	Equal variances assumed	.093	.032	.128	218	.008	.00879	.06880	-.12681	.14440
	Equal variances not assumed			.134	133.631	.004	.00879	.06569	-.12114	.13872

The presented table shows the results of an Independent Sample t-test, which is used to determine if there is a significant difference between the two groups. A significance value of less than 0.05 indicates that the null hypothesis can be rejected, while a value greater than 0.05 means the null hypothesis is accepted. For both gender and area of residence groups, the significance value is less than 0.05, so the null hypothesis is rejected. Therefore, it can be concluded that fintech and blockchain distributed ledger technology have a significant impact on the sustainable growth of banking and financial services in relation to both gender and area of residence groups of customers.

Table 4: Descriptive statistics table

Descriptive Statistics					
Demographic Variable	N	Minimum	Maximum	Mean	Std. Deviation
Age	220	1	4	2.49	.797
Marital Status	220	1	4	1.83	.928
Occupation	220	1	5	3.57	1.555
Education	220	1	4	3.06	1.104
Type of Bank	220	1	3	2.52	.73664

The table displayed above presents the ANOVA findings for the influence of fintech and blockchain distributed ledger technology on the sustainable expansion of banking and financial services in relation to different demographic categories of customers. The data indicates that the occupation group of customers has the greatest mean value and standard deviation.

Table 5: ANOVA Table

ANOVA						
Demographic Variable		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	6.689	17	.393	.601	.002
	Within Groups	132.270	202	.655		
	Total	138.959	219			
Marital Status	Between Groups	14.511	17	.854	.989	.004
	Within Groups	174.266	202	.863		
	Total	188.777	219			
Occupation	Between Groups	38.661	17	2.274	.935	.233
	Within Groups	491.176	202	2.432		
	Total	529.836	219			
Education	Between Groups	15.595	17	.917	.737	.033
	Within Groups	251.514	202	1.245		
	Total	267.109	219			
Type of Bank	Between Groups	8.624	17	.507	.930	.040
	Within Groups	110.212	202	.546		
	Total	118.836	219			

The ANOVA results presented in the table above were utilized to test the hypothesis regarding the impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services across various demographic groups of customers. The data indicates that the majority of respondents are in agreement with the impact, while a few are in disagreement. If the significance level is below 0.05, the alternative hypothesis is supported. Conversely, if the significance level is above 0.05, the null hypothesis is supported, and the alternative hypothesis is rejected.

- The null hypothesis can be rejected as the significance value is below 0.05, which indicates that there is a significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to age, marital status, education, and type of bank across different demographic groups of customers.

- However, the null hypothesis cannot be rejected as the significance threshold is above 0.05, indicating that there is no significant impact of fintech and blockchain distributed ledger technology on sustainable growth of banking and financial services with respect to the occupation group of customers.

5. CONCLUSION

This study delves into the intersection of blockchain technology, fintech, and the banking and finance industry within the framework of the green economy. According to the analysis, banks and other financial institutions are undergoing significant transformations to align with the advancements in digital technology, thereby contributing to more sustainable financial practices. FinTech, bolstered by blockchain technology, is poised to revolutionize investment standards by providing customers with enhanced information, underpinned by the principles of the green economy. This integration holds the potential to offer a markedly more efficient alternative to traditional banking, one that prioritizes equity and decentralization while promoting environmental sustainability.

This study serves to raise awareness about the burgeoning blockchain-based FinTech community, which facilitates cost-effective currency transfers with a focus on high security, reliability, and adherence to green economy principles. It also enhances transparency and validity of banking records, reduces error handling and reconciliation, and lowers the risk of fraud. The essay underscores that transitioning traditional banks into the digital banking sphere necessitates advancements in technology, collaborative efforts, and prudent financial resource management, all of which are integral aspects of sustainable growth within the banking and financial services industry. The sector's pursuit of cutting-edge technology aligns with the evolving consumer expectations and the growing demand for environmentally conscious financial practices.

The report indicates that fintech innovations will have a transformative impact on both financial and business services, with blockchain technology poised to play a pivotal role in driving sustainability within the banking and finance industry. While challenges still exist with blockchain technology, it is regarded as a beacon of progress in the banking and finance sector, complementing rather than competing with cryptocurrencies or central banks. As a result, blockchain technology holds a promising future in shaping the trajectory of sustainable banking and finance practices within the green economy.

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