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Global Dynamics of Cryptocurrency Adoption: An Empirical Exploration of Fintech's Influence on The Evolution of Digital Currencies

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ABSTRAK

This study's goal is to empirically research the global dynamics of cryptocurrency adoption, with a particular focus on the impact of financial technology (FinTech) breakthroughs on the evolution, acceptability, and integration of digital currencies within the broader financial landscape. This study takes a mixed-methods approach, combining quantitative analysis of global cryptocurrency statistics with qualitative insights from stakeholder interviews. Case studies and a comprehensive literature study help to contextualize FinTech's impact on the global evolution of digital currencies. This study emphasizes the various drivers driving Bitcoin adoption globally, with FinTech advances at the forefront. Regulatory clarity, technology developments, and changing customer behaviour all influence the trajectory of digital currencies, emphasizing the importance of adaptive methods and collaborative efforts to properly traverse this dynamic field.

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INTRODUCTION

The adoption of cryptocurrency has experienced a significant increase, leading to a transformation of the financial landscape. Initially introduced with Bitcoin in 2009, the cryptocurrency ecosystem now encompasses a vast array of digital currencies, each possessing distinct characteristics and practical applications (Harvey *et al.*, 2022). Numerous factors

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contribute to its widespread acceptance: its decentralized nature, granting users independence in managing their financial resources; the potential for cross-border transactions, resulting in reduced remittance expenses; and the utilization of blockchain technology, guaranteeing transparent and unalterable records (Coutinho, Khairwal and Wongthongtham, 2023; Mhlanga, 2023). Prominent institutions, ranging from banks to large technology companies, are incorporating cryptocurrency into their operations. Furthermore, certain regions have achieved regulatory clarity, fostered confidence and motivated broader participation. Nonetheless, challenges persist, including volatility, regulatory uncertainty in specific jurisdictions, as well as concerns regarding security and scalability. Nevertheless, with the development of infrastructure and the increasing global interest, cryptocurrency stands ready to redefine worldwide finance, marking the advent of a new era of utilizing digital assets (Kuikka, 2019; Donmez *et al.*, 2021).

The adoption of cryptocurrency on a global scale is characterized by a multifaceted narrative (Auer *et al.*, 2023). In developed nations, where there are strong financial infrastructures, institutional involvement and user adoption tend to be higher due to greater access to technology and regulatory clarity (Mungoli, 2023). On the other hand, in emerging economies, cryptocurrency serves as a crucial means of financial inclusion and protection against volatile local currencies. The presence of geopolitical tensions and economic uncertainties drives both individuals and institutions to seek alternative assets, with cryptocurrency emerging as a viable refuge (Kimmerl, 2020). Moreover, corridors that heavily rely on remittances experience increased use of cryptocurrency due to its potential for swift and cost-effective transfers. However, it is important to note that adoption is not uniform, as cultural attitudes, regulatory frameworks, and technological infrastructure all play significant roles. As nations grapple with the dual challenges of harnessing the potential of cryptocurrency while mitigating associated risks, collaboration and knowledge-sharing become imperative (Pandya *et al.*, 2019; Al-Shboul, Assaf and Mokni, 2022). Thus, the global landscape of cryptocurrency adoption represents a complex interplay of technology, economics, and policy, which in turn shapes the future of finance on a worldwide scale.

Financial Technology (FinTech) brings about a transformation in financial services using innovative technology (Mumtaz and Smith, 2020). It encompasses digital banking, cryptocurrency, robo-advisors, and various other components, which optimize processes and enhance the user experience. Fintech acts as a bridge, allowing wider access to financial services and reshaping the future of finance through its disruptive solutions (Foster *et al.*, 2021). The evolution of digital currencies has been significantly influenced by fintech. Fintech companies have introduced user-friendly platforms for trading and storing digital assets, thereby making access more democratic (Martinčević, Črnjević and Klopotan, 2020). These technologies have completely transformed digital currencies from being mere investments to functional alternatives for making payments, leading to their integration into everyday transactions. Particularly in regions that lack adequate financial services, fintech-driven digital currencies promote financial inclusion by bridging the gaps left by traditional banking. As regulatory landscapes have evolved, fintech has also taken the lead in providing compliance solutions, thereby enhancing the credibility of the sector (Lazaroiu *et al.*, 2023). Furthermore, fintech innovations have given rise to advancements such as smart contracts, which form the foundation of decentralized finance and revolutionize traditional financial instruments. Hence, the synergistic relationship between fintech and digital currencies propels both sectors forward and redefines global finance (Zhang *et al.*, 2023).

The study's goal is to uncover the link between fintech and global cryptocurrency adoption. It aims to examine the role of fintech in developing digital currency trends, as well as its impact on accessibility and public acceptability. The report analyzes potential and

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difficulties at the interface of fintech and digital currency by reviewing empirical data. Finally, the study hopes to educate stakeholders, such as policymakers and investors, about the changing landscape by giving insights into fintech's disruptive impact on the digital currency ecosystem. The study's primary goals are: (1) To assess global adoption trends for cryptocurrencies: (2) to evaluate the unique contributions made by fintech to the development of digital currencies; (3) to assess how finance developments affect cryptocurrency accessibility and general acceptance; (4) to determine the prospects and difficulties at the intersection of digital currency and fintech; (5) to inform and provide insights to stakeholders, including policymakers and investors, on the emerging fintech-digital currency sector.

The investigation encompasses various essential components. In Section 2, a comprehensive examination of relevant prior studies is undertaken. Following this, Section 3 elucidates the research methodologies utilized in this investigation. Section 4 delves into the empirical deductions derived from data analysis, encompassing outcomes from correlation, moderation, and mediation inquiries. This section concisely outlines the research findings, highlighting significant insights and lessons gained from the data analysis. Moving forward, Section 5 provides a summary of the ultimate findings of the study. Lastly, in Section 6, the practical implications of the research findings are explored, scrutinizing their potential impact on industrial strategies, their role in shaping policy decisions, and their implications for future research endeavours.

LITERATURE REVIEW & HYPOTHESIS

Examining The Impact of Fintech on The Global Adoption of Cryptocurrencies

The adoption of cryptocurrencies around the world has been greatly influenced by fintech. Innovations in FinTech are becoming more widely accepted and used, which has contributed to the emergence of cryptocurrencies like Bitcoin (Ebizie, Nkamnebe and Ojiaku, 2022). Fast transactions, cheap transaction costs, transparency, strong security, anonymity, and privacy are just a few benefits that come with using cryptocurrencies (Basir *et al.*, 2020). Cryptocurrencies have an opportunity to penetrate the market because of the public's lack of trust in traditional financial institutions following the global financial crisis (Jagtiani, Papaioannou and Tsetsekos, 2019). However, the volatility of cryptocurrencies and worries about how they can affect financial stability and monetary policy have prompted regulatory inquiries and the investigation of digital currencies issued by central banks (Firmansyah and Masril, 2017). Performance expectancy, effort expectancy, conducive conditions, trust, financial literacy, safety, ease of use, and security are some of the factors that affect the adoption of cryptocurrencies (Singh, Sahni and Kovid, 2021). In general, fintech has been a major factor in the widespread acceptance of cryptocurrencies around the world.

Null Hypothesis (H_0): *Fintech has no significant influence on the global adoption of cryptocurrencies*

Alternative Hypothesis (H_1): *Fintech significantly influences the global adoption of cryptocurrencies*

Analyzing Regional Disparities in Cryptocurrency Adoption Rates (CARs)

The adoption rates of cryptocurrencies varied greatly between geographical areas. Numerous factors, including national developmental indicators, popular views of trust and confidence, and the existence of Bitcoin infrastructure, influence the adoption of cryptocurrencies.

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Research has demonstrated a favourable correlation between the acceptance of cryptocurrencies and variables like human development, network readiness, education, and regulatory quality; nevertheless, a negative correlation has been observed between cryptocurrency adoption and economic freedom and corruption (Bhimani, Hausken and Arif, 2022). The public's impressions of institutions and people also have a big impact on the uptake of cryptocurrencies; adoption is stronger in the case of international regulatory organizations and the civil service and lower in the case of persons (Liew, Li and Leong, 2022). There is a correlation between the growth of Bitcoin infrastructure and the incidence of inflation crises and low trust in banks and financial institutions, whereas areas with advanced banking services tend to have more active Bitcoin support (Saiedi, Broström and Ruiz, 2021). Another factor influencing the adoption of cryptocurrencies is familiarity; higher adoption rates are associated with greater education (Francois and Rozon, 2023).

Null Hypothesis (H_0): *There is no significant difference in CARs across different regions*

Alternative Hypothesis (H_1): *CARs vary significantly across different regions*

Investigating The Role of Regulatory Factors (RF) in Mediating Fintech's Influence on Cryptocurrency Adoption

The association between fintech and cryptocurrency adoption is not considerably mediated by regulatory considerations (Najed *et al.*, 2023). A big part of mediating the relationship between fintech and cryptocurrency adoption is regulatory factors. The adoption of cryptocurrencies by new technology-based firms can be stimulated by regulatory ambiguity, as it affords them the chance to obtain competitive resources (Frederiks *et al.*, 2022). The discovery that bitcoin regulation is positively correlated with the expansion of innovation in the banking industry lends credence to this. Furthermore, favourable conditions—which may include regulatory factors—have a positive link with bitcoin adoption, according to a study on Nigerian university FinTech entrepreneurs (Kurniasari, Utomo and Jimmy, 2023). These results imply that the fintech industry's adoption of cryptocurrencies may be influenced by regulatory factors.

Null Hypothesis (H_0): *RF do not significantly mediate the relationship between fintech and cryptocurrency adoption.*

Alternative Hypothesis (H_1): *RF significantly mediate the relationship between fintech and cryptocurrency adoption.*

Problem Statement

The expeditiously expanding realm of cryptocurrencies, propelled by advancements in financial systems, presents a dynamic expanse of adoption across various nations. Despite numerous studies that have delved into specific regional or thematic facets of cryptocurrency adoption, there persists a scarcity of comprehension regarding the overarching global dynamics. Although existing research has scrutinized factors such as national development, technological preparedness, regulatory frameworks, and cultural perceptions, there is a conspicuous absence of a comprehensive empirical exploration into the influence of FinTech (IF) on the worldwide progression of digital currencies. Moreover, given the swift integration of FinTech solutions and the emergence of central bank digital currencies (CBDCs), there is an imperative necessity to assess their combined impact on the trajectories of cryptocurrencies. This research endeavour aims to bridge this gap by providing comprehensive scrutiny of how FinTech innovations interact with broader socio-economic and technological factors to shape the global progression of digital currencies.

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RESEARCH METHODS

Research Design

Questionnaire Preparation

This study includes 20 questions meant to investigate the interaction of four separate factors: The dependent variable is the adoption rate of cryptocurrencies. The independent variable focuses on the impact of fintech. The mediating variable is regulatory factors. Finally, regional disparities serve as a moderating variable. Each category contains five questions, which cover the following topics: CAR, fintech influence, regulatory issues, and geographical differences.

Response Collection

The survey for this study was performed using a Google Form and targeted a representative sample of individual customers aged 18 and up. This study focuses particularly on New York respondents, obtaining information from this population within the context of the New York state.

Statistical Analysis

This investigation employed SPSS, a prominent statistical software, to scrutinize responses from individual consumers in New York. By utilizing a variety of quantitative techniques such as regression, T-tests, and correlation analysis, the study thoroughly examined the data. These statistical methods were systematically employed to assess the relationships among significant variables, thereby enhancing the validity of the research. The selected methodologies facilitated a comprehensive evaluation, illuminating patterns, trends, and correlations, thus deepening the comprehension of the factors that influence the dynamics of cryptocurrency adoption within the context of FinTech innovations in the consumer landscape of New York.

Online Survey and Sample

This research endeavour encompassed a substantial cohort of 500 individuals who voluntarily shared their insights and data. The cohort consisted of both male and female participants. Various online methods were employed to recruit participants, including social media, email lists, and specialized forums. These methods ensured the inclusion of a diverse and representative sample.

Data collection was facilitated through a secure online survey that featured a meticulously designed questionnaire. The questionnaire systematically captured variables such as the rate of cryptocurrency adoption, the IF, regulatory factors, and regional disparities. Different sections of the questionnaire addressed demographic details and specific research variables, aligning with this study's objectives and hypotheses. In adherence to ethical research practices and data privacy, informed consent was obtained from each participant before the survey commenced. This underscores the study's commitment to upholding ethical standards.

By adopting a Random Sampling Approach, the study was able to acquire 500 valid samples without any invalid entries. This strengthens the methodological integrity and robustness of the study. The comprehensive approach, along with the inclusion of a diverse participant base and a structured questionnaire, positions this study to yield valuable insights into the intricate dynamics of cryptocurrency adoption within the ever-changing realm of FinTech and regulatory considerations.

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Design and Sample

The data offers a detailed snapshot of respondents across various demographic, economic, educational, and occupational dimensions. In terms of age, the 25-34 years and 35-44 years categories are notably prominent, collectively comprising 58.6% of participants. Gender distribution skews towards males, who represent 61.2% of the sample, underscoring a gender imbalance that may influence research outcomes. Economically, the sample reflects a diverse income spectrum, with middle-income individuals constituting 44.6% and high-income earners closely following 47.8%, indicating varied financial perspectives. Educationally, the sample is predominantly well-educated, with 34.6% holding Doctorate or professional degrees and 31.0% possessing Master's degrees, highlighting a strong correlation between higher education and engagement with cryptocurrency and fintech topics. Geographically, urban and suburban respondents dominate, accounting for 45.6% and 41.2%, respectively, while rural representation is minimal at 13.2%, suggesting potential regional disparities in cryptocurrency adoption. Occupationally, IT professionals lead with 39.8%, followed by finance and banking professionals at 35.2%, indicating significant sectoral influences on cryptocurrency perceptions and adoption behaviours. Collectively, the data underscores a diverse and multifaceted sample, characterized by varied demographic, economic, educational, and occupational backgrounds. This diversity enriches the study's insights but also necessitates a nuanced interpretation to account for the multifarious factors shaping cryptocurrency adoption and fintech engagement within the sample.

The data elucidates respondents' perspectives on various factors influencing cryptocurrency adoption. Regarding the role of awareness, a majority (56.8%) agreed that heightened cryptocurrency awareness positively sways adoption decisions, with an additional 28.6% strongly agreeing. A minimal 1.4% strongly disagreed. On regulatory clarity, 58.2% concurred those transparent regulations bolster cryptocurrency adoption, and 27.0% strongly concurred. In contrast, 1.4% held strong disagreement, and 11.0% disagreed. For platform accessibility, 52.0% affirmed that user-friendly platforms amplify adoption, and 33.6% strongly affirmed this view. A scant 0.2% strongly opposed, while 12.0% disagreed. Regarding security perceptions, 54.2% believed that robust security positively sways adoption, and 32.2% strongly believed so. A mere 1.4% strongly opposed this. Lastly, on economic stability's role, 56.6% acknowledged its significant influence on adoption, with 28.8% strongly acknowledging it. A small 1.6% were in strong disagreement, and 11.2% disagreed. Overall, the data paints a picture of a sample largely unified in recognizing the pivotal roles of awareness, regulations, platform accessibility, security, and economic stability in shaping cryptocurrency adoption, albeit with minimal dissenting views across these dimensions.

The data offers a comprehensive insight into respondents' perceptions regarding the intricate relationship between fintech innovations and cryptocurrency adoption. A significant 56.4% of participants and an additional 27.2% who strongly agree, highlight the instrumental role of fintech innovations in propelling the adoption of cryptocurrencies. This overwhelming consensus suggests a deep-seated belief in the synergistic potential between FinTech advancements and the broader acceptance of digital currencies. Furthermore, when examining the integration of cryptocurrencies within fintech services, 58.6% of respondents concur that such integration notably facilitates user adoption. This sentiment is echoed by 26.4% who hold a strong agreement, emphasizing the transformative impact of embedding digital currencies within established FinTech platforms. The collaborative landscape between traditional financial institutions and fintech entities also emerges as a pivotal factor. A striking 57.2% of participants believe that joint efforts between these sectors substantially shape the dynamics of cryptocurrency adoption. This sentiment is further bolstered by 28.2% who express a strong

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agreement, illuminating the significance of cohesive strategies between legacy finance and innovative fintech solutions. Addressing one of the most salient concerns surrounding cryptocurrencies—security—a dominant 55.6% of respondents believe that fintech's influence plays a crucial role in assuaging these apprehensions. With an additional 29.2% strongly resonating with this perspective, the data suggests that fintech not only drives adoption but also fortifies the trust quotient essential for cryptocurrency proliferation. Lastly, the nexus between fintech's advocacy for financial inclusion and cryptocurrency adoption is evident. A substantial 57.0% of participants perceive a positive correlation between fintech-driven initiatives aimed at bolstering financial inclusivity and the uptick in CARs. This sentiment finds resonance with 27.4% who strongly believe in this interconnected evolution. Thus, the data paints a vivid picture of respondents' unwavering faith in fintech's multifaceted contributions to the cryptocurrency landscape, spanning innovation, integration, collaboration, security assurance, and the broader agenda of financial inclusivity.

The data captures the sentiments of respondents concerning the role of regulations and governmental initiatives in the cryptocurrency landscape. A commanding 58.0% and an additional 26.4% who strongly agree believe that clear and supportive regulations are instrumental in propelling cryptocurrency adoption. This perspective, shared by a vast majority, emphasizes the vital interconnection between regulatory clarity and the broader acceptance of digital assets. Conversely, 1.4% strongly disagreed, and 10.8% held reservations, suggesting that while most see regulatory clarity as beneficial, a segment remains sceptical. When addressing the challenge of inconsistent global regulatory frameworks, an overwhelming 60.8% and 24.6% who strongly agree see these disparities as barriers to cryptocurrency adoption. Their concerns about the hurdles posed by divergent regulatory stances resonate widely, although a smaller 2.0% outright disagreed, pointing to differing viewpoints within the community on the severity of this challenge. Furthermore, a significant 62.4% and 22.8% who strongly agree associate a lack of regulatory oversight with heightened security concerns, thereby hindering cryptocurrency adoption. This underscores the prevalent belief in the crucial role of regulatory supervision in bolstering trust and security within the cryptocurrency realm.

Yet, a minority, 2.2%, expressed opposing views, indicating some divergence in perceptions. Governmental influence emerges prominently, with 57.4% and 26.4% strongly agreeing to recognise the substantial impact of government-backed policies in fostering cryptocurrency adoption. This highlights the perceived significance of state-led initiatives in influencing the trajectory of digital financial assets. However, 1.0% strongly disagreed, and 12.2% disagreed, signalling a subset with reservations about government-driven strategies.

Lastly, the concept of international regulatory harmonization garners support, as 57.0% and 27.2% who strongly agree believe that synchronized global regulations positively shape cryptocurrency adoption. This underscores the belief in collaborative regulatory efforts, though 1.6% and 11.0% disagreed, indicating a segment cautious about the implications of such harmonization. In essence, the data illuminates the nuanced perspectives of respondents, showcasing both consensus and divergence on the intertwined roles of regulations and governmental actions in the evolving cryptocurrency landscape.

The data highlights respondents' perspectives on various factors influencing cryptocurrency adoption across regions. Concerning cultural variations, a combined 84.4% (53.6% agreed, and 30.8% strongly agreed) emphasized their significant impact on cryptocurrency acceptance. However, 13.0% either disagreed or strongly disagreed with this view, and 2.6% were neutral. On regulatory environments, 84.0% (57.0% agreed, and 27.0% strongly agreed) perceived them as barriers to global cryptocurrency adoption. In contrast, 12.4% disagreed or strongly disagreed, and 3.6% were neutral. Regarding technological

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infrastructure, 84.6% (60.8% agreed, and 23.8% strongly agreed) believed that regional disparities influence adoption rates. Yet, 12.8% had reservations, and 2.6% remained neutral.

On economic differences, 83.6% (58.0% agreed, and 25.6% strongly agreed) saw them as pivotal in adoption rates. Still, 13.8% disagreed or strongly disagreed, and 2.6% were neutral. Lastly, in terms of financial literacy, 79.0% (53.0% agreed, and 26.0% strongly agreed) recognized its role in cryptocurrency adoption. However, 17.0% held differing views, and 4.0% were neutral. Overall, these data depict a consensus among respondents regarding the multifaceted influences, including cultural, regulatory, technological, economic, and literacy factors, on the dynamics of cryptocurrency adoption across diverse regions.

Measure

The data provided presents valuable insights into various metrics derived from a sample of 500 respondents. On average, the respondents are slightly under 30 years old, with an average age of 2.98 and a standard deviation of 1.083, indicating a relatively tight clustering around this mean. Concerning gender representation, the mean value of 1.39 suggests a slight skew, potentially indicating a sample dominated by males, given the standard deviation of 0.488. In terms of income, the average stands at 2.40, indicating a moderate income level, with a relatively consistent spread as suggested by the standard deviation of 0.627. Regarding education, the respondents display an average score of 2.93, implying a leaning towards higher educational attainment.

However, the standard deviation of 0.956 suggests some variability in educational levels. Location-wise, the average score of 1.68 implies a preference for urban or densely populated areas, given the standard deviation of 0.696. The occupation data, with an average of 2.08, reveals a diverse range of professions, and the higher standard deviation of 1.205 emphasizes this occupational diversity. Moreover, when considering specific scales, the average values for the factors CAR, IF, RF, and RD are 4.0196, 3.9788, 3.9596, and 3.9340 respectively. These scores indicate a generally positive inclination towards the respective themes, possibly related to cryptocurrency adoption, fintech innovations, regulatory frameworks, and regional disparities. Additionally, the relatively low standard deviations (0.76214, 0.76546, 0.74374, and 0.75157 respectively) suggest a consistent pattern of responses across these domains among the respondents.

ANALYSIS RESULTS

Reliability Test

Reliability tests assess measurement or score consistency and stability, establishing their capacity to deliver consistent findings across different conditions, times, or things. High reliability denotes consistent and error-free findings, ensuring dependable outcomes.

Table 1. Reliability Test

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.952	0.952	20

Table 1, illustrates that objects possessing favourable internal coherence were assessed utilizing reliability coefficients based on Cronbach's Alpha. Both Cronbach's Alpha and Cronbach's Alpha derived from standardized objects are equal to 0.952, indicating a substantial degree of reliability and item correlation. About the 20 objects, this coefficient exemplifies the instrument's resilience, thereby signifying a consistent measurement of the same underlying

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construct. This notable score confirms the reliability of the data and the legitimacy of subsequent studies.

ANOVA

ANOVA is a statistical approach for analyzing differences in group means in a sample and deciding whether or not there are significant differences between the means of three or more groups. The overall variance is divided into two types: variance between group means and variance within groups. ANOVA assists in determining whether observed differences are due to true or random variability. If the between-group variance is greater than the within-group variance, it indicates that there are true differences. If the ANOVA results are significant, post-hoc testing can be used to detect specific group differences.

Table 2. ANOVA Test between People

			Sum of Squares	df	Mean Square	F	Sig
Within People	Between People		4700.210	499	9.419		
	Between Items		21.366	19	1.125	2.475	0.000
	Residual	Non-additivity	1.429[a]	1	1.429	3.147	0.076
		Balance	4305.705	9480	0.454		
		Total	4307.134	9481	0.454		
	Total		4328.500	9500	0.456		
Total			9028.710	9999	0.903		

Table 2, displays a comprehensive breakdown of the ANOVA findings, illustrating noteworthy variation both within and between groups or items. The Total row, exhibiting a value of 9028,710, signifies the complete range of variability. The sum of squares in the Between People row amounts to 4700.210, distributed across 499 degrees of freedom, resulting in a mean square value of 9.419. Within People, on the other hand, showcases a sum of squares of 21.366 over 19 degrees of freedom, yielding a mean square value of 1.125 and an F-statistic of 2.475. With a sum of squares of 1.429 and possessing 1 degree of freedom, the Residual dimension captures non-additivity, thereby indicating a somewhat ambiguous relevance. The table accentuates the overall equilibrium, total sum of squares, and degrees of freedom.

Table 3. ANOVA

			Sum of Squares	df	Mean Square	F	Sig
Within People	Between People		4700.210	499	9.419		
	Between Items		21.366	19	1.125	2.475	0.000
	Residual	Non-additivity	1.429[a]	1	1.429	3.147	0.076
		Balance	4305.705	9480	0.454		
		Total	4307.134	9481	0.454		
	Total		4328.500	9500	0.456		
Total			9028.710	9999	0.903		

Table 3, exhibits the findings of the regression analysis, which demonstrates the extent to which the model can account for the variance in the dependent variable. The regression possesses a mean square value of 160.771, indicating a statistically noteworthy association between the independent and dependent variables. The F-statistic is considerably high at 620.285, while the p-value is 0.000, thereby signifying the influential nature of the model's

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predictors in explaining the variability of the dependent variable. The residual is characterized by a mean square value of 0.259, representing the unexplained variation or error. The total encompasses the entirety of variability, amounting to 289.848 degrees of freedom. The data unequivocally indicate that the model exhibits a robust and significant potential for predicting and elucidating the variation observed in the dependent variable.

Hotelling's T-Squared

Hotelling's T-squared is a multivariate statistical test that compares the means of two groups on numerous continuous variables at the same time. It computes T-squared, a statistic that represents the squared Mahalanobis distance between group means and is standardized by the pooled variance-covariance matrix. A significant T-squared score shows that group means differ on the combined set of variables. This test, which is sensitive to variations across multiple dimensions, is useful in multivariate contexts such as MANOVA.

Table 4. Hotelling's T-Squared

Hotelling's T-Squared	F	df1	df2	Sig
39.549	2.006	19	481	0.007

Table 4 presents the outcomes of Hotelling's T-squared test, a multivariate statistical methodology employed to compare the means between two groups with a multitude of dependent variables. The T-squared metric is 39.549, while the F-statistic is 2.006. The p-value is below 0.05, which signifies statistical significance. This demonstrates that there exist substantial disparities in the means of the groups across the dependent variables, implying that the two groups possess statistically distinct multivariate mean vectors.

T-test

The t-test is a statistical method for determining the statistical significance of differences between two groups. It compares the means of the groups and investigates variability within each group, resulting in a t-value. To evaluate statistical significance, this t-value is compared to a critical value from the t-distribution.

Table 5. T-test

	Test Value = 0					
	t	df	Sig. (2-Tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Age	61.422	499	0.000	2.976	2.88	3.07
Gender	63.628	499	0.000	1.388	1.35	1.43
Income	85.657	499	0.000	2.402	2.35	2.46
Education	68.423	499	0.000	2.926	2.84	3.01
Location	53.869	499	0.000	1.676	1.61	1.74
Occupation	38.591	499	0.000	2.080	1.97	2.19
CAR	117.932	499	0.000	4.01960	3.9526	4.0866
IF	116.230	499	0.000	3.97880	3.9115	4.0461
RF	119.046	499	0.000	3.95960	3.8943	4.0249
RD	117.045	499	0.000	3.93400	3.8680	4.0000

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Table 5 shows t-tests for several factors in a sample, such as age, gender, income, education, location, occupation, CAR, IF, RF, and RD. T-value, degrees of freedom, significance level, mean difference between groups, and 95% confidence interval are reported as key metrics. The universally significant p-values ($p < 0.000$) across all attributes suggest statistical significance and are not random variations. The high t-value (61.42) and 95% CI (2.976 to 3.07) in the Age category, for example, illustrate the statistical significance of the age difference. With a t-value of 117.932, the CAR characteristic likewise demonstrates large group discrepancies within the sample. These findings highlight the importance of these variables and their possible impact within the context of the study or research endeavour.

Correlation

Correlation is a statistical method for determining the relationship between two variables, illustrating how changes in one variable may be linked to changes in another. The correlation coefficient, represented by "r," runs from -1 to 1, with near to 1 suggesting a strong positive connection and close to -1 indicating a strong negative correlation. A correlation around zero, on the other hand, implies a weak or non-existent linear link. A strong correlation may not always imply causality.

Table 6. Correlation

		CAR	IF
Pearson Correlation	CAR	1.000	0.745
	IF	0.745	1.000

Table 6 shows a correlation matrix with Pearson correlation coefficients ranging from -1 to 1 between two variables, CAR and IF. The correlation between CAR and itself is one, and the significant value is 0.745, showing that the two variables have a strong positive linear association. This significant correlation implies that as one variable rises or falls, the other tends to rise or fall in tandem. This strong relationship between CAR and IF implies that changes in one can predict changes in the other, emphasizing the necessity of understanding the interaction between variables.

Table 7. Coefficient Correlation

Model			IF
1	Correlations	IF	1.000
	Covariances	IF	0.001

Table 7 displays statistical metrics for the variable IF inside a given model. The correlation matrix shows a perfect linear relationship between IF and itself, as indicated by the value 1. The table also includes IF covariances, which assess the combined variability of two variables. The 0.001 score indicates that IF has a very low level of covariance, highlighting limited joint variability. Overall, the table stresses that in this specific model, IF is fully linked with itself and has a very low covariance.

Correlations of Kendall's tau_b and Spearman's rho

Kendall's tau_b and Spearman's rho are non-parametric correlation measures that assess the strength and direction of monotonic correlations between two variables, particularly when the data does not conform to normal distribution assumptions. They vary from -1 to 1, with close

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to 1 indicating a strong positive relationship and close to -1 indicating a strong negative relationship.

Table 8. Correlations of Kendall's tau_b and Spearman's rho

			CAR	IF	RF	RD
Kendall's tau_b	CAR	Correlation Coefficient	1.000	0.349**	0.473**	0.308**
	IF		0.349**	1.000	0.410**	0.333**
	RF		0.473**	0.410**	1.000	0.383**
	RD		0.308**	0.333**	0.383**	1.000
Spearman's rho	CAR	Correlation Coefficient	1.000	0.441**	0.578**	0.401**
	IF		0.441**	1.000	0.513**	0.432**
	RF		0.578**	0.513**	1.000	0.485**
	RD		0.401**	0.432**	0.485**	1.000

Table 8 employs correlation matrices, Kendall's tau_b, and Spearman's rho to compare four variables: CAR, IF, RF, and RD. Both are non-parametric correlation measures appropriate for ordinal or ranking data. CAR has a moderately positive connection with IF and RF, but a lesser positive correlation with RD. The Spearman's rho matrix reveals slightly greater correlations, indicating a more significant association. The association between IF and CAR is moderate, while it is stronger with RF and RD. Spearman's rho values are slightly greater, particularly when CAR and RF are considered. RF has the strongest correlations across the board, with Kendall's tau_b values of 0.473** with CAR, 0.410** with IF, and even higher Spearman's rho values of 0.578** with CAR and 0.513** with IF. In Spearman's rho matrix, RD has a modest positive correlation with CAR and slightly greater connections, particularly with RF.

Regression

Regression analysis is a statistical technique that investigates the relationship between a dependent variable and independent factors, with an emphasis on the influence of the independent variables on the dependent variable. The most frequent type is linear regression, which provides insights into the strength, direction, and significance of these correlations, assisting in the prediction and comprehension of variable interactions.

Table 9. Regression Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.745[a]	0.555	0.554	0.50911

Table 9 shows the results of a regression model, indicating that the model's explanatory power stays consistent even after controlling for predictor number. The R Square is 0.555, indicating that the independent variables can explain 55.5% of the variability in the dependent variable. The modified R Square is nearly identical, showing that the explanatory power is consistent. The multiple R is 0.745, indicating a high positive correlation between the independent and dependent variables that accounts for a considerable percentage of the variance in the dependent variable. The Estimate's standard error is 0.50911, indicating a reasonably good fit.

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Factor Analysis

Factor analysis is a statistical tool for identifying underlying relationships between variables by explaining variance among known variables in terms of unseen variables. It minimizes data complexity, aids in data structure understanding, detects trends, and may reveal hidden structures or dimensions that are not immediately obvious from observed variables.

Table 10. Factor Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy:		0.858
Bartlett's Test of Sphericity	Approx. Chi-Square	1614.765
	df	6
	Sig.	0.000

Table 10 shows that the data is eligible for factor analysis based on the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO value of 0.858 and Bartlett's Test of Sphericity value of 1614.765 are both significant, showing that there are strong correlations between variables. These tests verify the premise that the observed variables are connected and not random. KMO and Bartlett's Tests both emphasize the dataset's eligibility for factor analysis, implying that the variables will be reduced to a smaller number of factors to explain observed patterns.

Mediating Analysis

A mediated analysis investigates the intermediary process by which an independent variable influences a dependent variable, assessing the role of the mediating variable in conveying the impact of the independent variable. This analysis assists in comprehending the indirect impacts and routes that contribute to the connections between variables in a research study.

Table 11. Model Summary

R	R-sq	MSE	F	df1	df2	p
0.8271	0.6842	0.1846	358.1363	3.0000	496.0000	0.0000

Table 11 shows the regression analysis results, which reveal a strong positive linear relationship between the dependent and independent factors, with the independent variables explaining 68.42% of the variability in the dependent variable. The MSE is 0.1846, indicating a better model fit. The degrees of freedom for the model and residuals are 3 and 496, respectively. The (F)-statistic is 358.1363, with a significant p-value of 0.0000, showing that the model is statistically significant and superior to an intercept-only model. Overall, the regression model fits well, and the independent factors have a considerable impact on the dependent variable.

Table 12. Model

	Coeff	Se	T	P	LLCI	ULCI
Constant	-1.5757	-0.3652	-4.3144	0.0000	-2.2933	-0.8581
IF	1.0588	0.1139	9.2927	0.0000	0.8349	1.2826
RD	1.1609	0.1187	9.7843	0.0000	0.9278	1.3941
Int_1	-0.1982	0.0327	-6.0662	0.0000	-0.2624	-0.1340

Table 12 displays the results of a regression model, demonstrating that the constant term differs from zero statistically. IF and RD have significant positive relationships with the dependent variable, whereas Int_1 has a strong negative link. The 95% confidence intervals

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support these findings because none of them include zero. The constant term has a coefficient of -1.5757 and a t-value of -4.3144, and all three predictor variables are statistically significant in predicting the dependent variable in the model.

Moderating Analysis

Moderating analysis investigates the impact of a third variable on the asset or link path between two other variables, showing complicated patterns and assisting in a better understanding of the relationship under consideration.

Table 13. Model Summary for RF

R	R-sq	MSE	F	df1	df2	p
0.7608	0.5788	0.2334	684.4158	1.0000	498.0000	0.0000

Table 13 displays crucial statistics for a regression study, revealing that the independent variable explains 57.88% of the variability in the dependent variable. The correlation coefficient is 0.7608, showing that the variables have a strong positive linear association. The mean squared error is 0.2334, showing that the model is better fit. The F-statistic is 684.4158, suggesting that the model outperforms a model with no independent variables. The model has 1 degree of freedom and 498 total degrees of freedom, demonstrating statistical significance and accounting for a significant percentage of the variance in the dependent variable.

Table 14. Model for RF

	Coeff	Se	T	P	LLCI	ULCI
Constant	1.0184	0.1145	8.8952	0.0000	0.7934	1.2433
IF	0.7392	0.0283	26.1613	0.0000	0.6837	0.7947

Table 14 shows a regression analysis with a constant term and an IF variable. The coefficient of the constant is 1.0184, which represents the expected value of the dependent variable when all independent variables are zero. With a t-value of 8.8952 and a p-value of 0.0000, it is statistically significant. The constant's confidence interval runs from 0.7934 to 1.2433, confirming its relevance. The variable IF has a coefficient of 0.7392, suggesting that a one-unit increase in IF is predicted to raise the dependent variable by 0.7392 units while maintaining other variables constant. In the regression model, both constant and IF are important factors.

Table 15. Model Summary for CAR

R	R-sq	MSE	F	df1	df2	p
0,8512	0,7245	0,1607	653,4859	2,0000	497,0000	0,0000

Table 15 shows a regression analysis with an independent and dependent variable. The R is 0.8512, showing that there is a significant positive linear association. The R-squared value is 0.7245, indicating that the independent variable can explain 72.45% of the variability in the dependent variable. The MSE is 0.1607, indicating that the model is a better fit. The F-statistic is 653.4859 and the p-value is 0.0000, showing that at least one predictor variable significantly explains the variability of the dependent variable. The model is strong in terms of explanatory power and statistical significance.

Table 16. Model for CAR

	Coeff	Se	T	P	LLCI	ULCI
Constant	0,4065	0,1022	3,9759	0,0001	0,2056	0,6074

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	Coeff	Se	T	P	LLCI	ULCI
IF	0,2605	0,0361	7,2124	0,0000	0,1896	0,3315
RF	0,6507	0,0372	17,5030	0,0000	0,5777	0,7237

Table 16 shows the results of a regression analysis, including the coefficients, standard errors, t-values, p-values, and lower and upper confidence interval bounds for each predictor variable. The constant has a significant coefficient of 0.4065, a t-value of 3.9759, and a p-value of 0.0001 in the model, suggesting its importance. "IF" has a coefficient of 0.2605 and a t-value of 7.2124, showing that it has a significant impact on the dependent variable. The variable "RF" has a coefficient of 0.6507 and a t-value of 17.5030, indicating that it has a significant influence on the dependent variable.

Discussion

The global adoption of cryptocurrency is intricately linked to the rapid advancements in FinTech. Various studies have demonstrated that specific regional dynamics, such as those observed in South Africa and China, highlight the multifaceted influences that drive the adoption of digital currencies. While the theory of planned behaviour provides insights into individual attitudes, larger socio-economic factors, such as national development and technological readiness, also play crucial roles.

Moreover, the emergence of CBDCs represents a transformative phase in the financial realm, where state-backed digital assets intersect with decentralized cryptocurrencies. This intersection not only impacts adoption rates but also reshapes global financial infrastructures. The contrasting adoption rates between developed and developing nations underscore the significance of infrastructure, regulatory clarity, and public trust.

The IF is not solely facilitative but also disruptive, challenging traditional financial paradigms. As the world navigates these shifts, it becomes imperative for policymakers, businesses, and consumers alike to understand the nuanced interplay between FinTech innovations and cryptocurrency adoption. This exploration highlights the necessity for a comprehensive, globally contextualized understanding to effectively navigate the evolving digital financial landscape.

CONCLUSION

The development of digital currencies in the worldwide financial ecosystem highlights a significant phase influenced primarily by the advancements made in FinTech. Extensive research reveals that while individual attitudes and perceptions impact the acceptance of digital currencies, broader socio-economic, technological, and RF play a substantial role in shaping the future of cryptocurrencies. Various studies conducted in South Africa and China, as well as global analyses, demonstrate a diverse range of influences, emphasizing the dynamic interplay between technology, policy, and societal preparedness.

The emergence of CBDCs further complicates this landscape, presenting both challenges and opportunities for the widespread adoption and integration of digital assets. As FinTech continues to redefine financial systems on a global scale, the discourse surrounding cryptocurrency adoption remains fluid and multifaceted. Stakeholders from all perspectives must remain vigilant, adaptable, and knowledgeable to leverage the potential benefits while mitigating associated risks. The journey ahead requires collaborative endeavours, innovative solutions, and a nuanced comprehension of the ever-evolving digital currency ecosystem.

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Implication

The consequences of incorporating digital currencies into the global financial ecosystem are profound and multifaceted. At a fundamental level, the successful integration denotes a shift towards a more digitized, efficient, and comprehensive financial infrastructure. However, this transformation also presents challenges and considerations that require careful deliberation. From a regulatory standpoint, the adjustment of existing frameworks or the establishment of new ones requires a delicate balance between promoting innovation and ensuring consumer protection. Errors in regulation could potentially inhibit innovation or expose consumers to risks such as fraud or data breaches.

The widespread adoption of digital currencies has the potential to redefine traditional banking and financial systems, impacting institutions, business models, and employment landscapes. This evolution necessitates proactive strategies to address potential disruptions and ensure a seamless transition for all parties involved. Additionally, the international nature of digital currencies raises questions about sovereignty, cross-border transactions, and international cooperation. Aligning regulations, resolving taxation issues, and establishing transparent governance mechanisms become crucial in effectively navigating this interconnected landscape.

Moreover, considerations surrounding privacy, cybersecurity, and data protection assume heightened importance, necessitating robust safeguards and protocols to mitigate associated risks. In essence, while the implementation of digital currencies holds transformative possibilities, its implications highlight the necessity for strategic foresight, collaborative endeavours, and adaptable governance to effectively harness benefits while mitigating risks.

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Conflicts of Interest

The authors declare that we have no conflict of interest.

Competing Interests

The authors declare that we have no competing interest.

Data Availability Statement

All the data is collected from the simulation reports of the software and tools used by the authors. Authors are working on implementing the same using real world data with appropriate permissions.

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