

Cryptocurrency Adoption and Macroeconomic Dynamics

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Abstract

This study examines the relationship between investments in cryptocurrencies and macroeconomic factors in five regions in India - Delhi NCR, Bengaluru, Mumbai, Pune, and Rajasthan — using Structural Equation Modeling (SEM). A mixed-methods approach was employed, in which primary data were collected from 214 cryptocurrency investors to understand their perceptions of investing in cryptocurrencies among individuals, along with secondary data from national economic standards. Based on the study, it is established that adopting virtual currencies within the financial systems opened diverse economic opportunities in India. The findings of this paper will provide policymakers, investors, and academic institutions with information on how these new-age money-like instruments operate within the context of conventional historical economic structures while highlighting the possibilities for a paradigm shift in different aspects of this area.

Keywords: Cryptocurrency, Structural Equation Modeling, Financial Price Index, Investment Behavior.

Introduction

Cryptocurrency, a revolutionary invention in the financial sector, has been shifting global economic paradigms. India, being the largest beneficiary of digital resource development, is now heavily employing and integrating cryptocurrencies. To stimulate progressive and innovative advancements in the financial sector, five regions in India, such as Delhi NCR, Bengaluru, Mumbai, Pune, and Rajasthan, are attracting investment in cryptocurrency. Contemporary new-generation digital currencies, such as Bitcoin, Ethereum, and Tether, are not only restructuring the traditional banking industry but are also adopting a novel approach to financial and economic liberation and globalization (Sajjan et al., 2024). Therefore, the uncoupling of new forms of digital currencies from established financial systems by implementing encrypted, distributed ledger technologies, such as blockchain, has offered a new gateway, along with potential risks. The features of decentralization can facilitate faster, cheaper, and more transparent financial transactions with cryptocurrencies (Farrell et al., 2016; Bouri

et al., 2017). However, the fact that these assets rise and fall like shares in virtual space, and the fact that their regulatory aspect is not clearly defined as legal or otherwise, are two prohibitive factors that prevent them from being widely accepted (Atkinson & Messy, 2012; Hilgert et al., 2003). This duality has given rise to a research gap due to a lack of appreciation for the relationship between cryptocurrency and macroeconomics, to ascertain the degree of impact on growth or imbalance in regions with the highest number of cryptocurrency investors in India.

This paper reveals that conventional indicators of economic growth, including GDP, inflation rate, and unemployment rates, are becoming increasingly sensitive to movements in cryptocurrency prices (Lusardi & Mitchell, 2011; Chu et al., 2017). The following trends demonstrate how policymaking remains crucial for enabling parties to access the benefits of digital currency while mitigating associated risks (Oishi et al., 1999). These advancements in technology and accessibility have also contributed to the promotion of financial inclusion in India. The above developments have further contributed to the emergence of new business models, changes in payment systems, and the introduction of other related financial tools for individuals facing financial constraints (Hilgert et al., 2003; Lusardi, 2008). However, it is crucial to understand the relationship between the macroeconomic environment and cryptocurrency investments to assess the long-term impact of these investments on currency stability within regions and countries (Farrell et al., 2016).

This research primarily explores a less-explored relationship between total investment in cryptocurrencies and key macroeconomic variables in India. Driven by the need for quantitative research, this paper employs Structural Equation Modeling (SEM) to test hypotheses and gain an empirical understanding of how effective cryptocurrencies are bringing about change. Consequently, the study aims to develop a practical guide for policymakers, investors, and scholars on how to balance growth and stability in the regional economy, given that the digital finance environment remains relatively new to the world economy (Baker & Nofsinger, 2011).

The paper is structured as follows: Section 3 presents the

Literature Review, Section 4 outlines the Research Methodology employed in this study, Section 5 discusses the Evaluation and Results, and finally, Section 6 provides the discussion and conclusion.

Research Problem

In recent years, cryptocurrencies have been widely adopted in India; thus, an in-depth evaluation of the impacts of these cryptocurrencies is required in the wake of the regulatory framework. Nonetheless, BTC, ETH, and Tether, as digital currencies within the global financial system, can influence GDP, inflation, employment, unemployment rates, and the financial stress index (Bouri et al., 2017; Farrell et al., 2016). However, research on this influence remains very limited. Blockchain-based cryptocurrencies are promising, facilitating faster and more economical transactions that broaden access to formal financial services for individuals, particularly those in rural and unbanked populations (Hilgert et al., 2003; Lusardi, 2008). However, due to their significant variability and the absence of an efficient system to control cryptosystems, they pose a high-level threat to the soundness of the financial system and investors' confidence (Atkinson & Messy, 2012). This duality has given rise to a research gap due to a lack of appreciation for the relationship between cryptocurrency and macroeconomics, aiming to ascertain the degree of impact on growth or imbalance in the Indian economy.

Experts have attributed previous research to show that cryptocurrencies build innovative exchange mechanisms, which might lead to the development of modern civilization (Chu et al., 2017; Lusardi & Mitchell, 2011). The analysis of cryptocurrency institutions within the macroeconomic context of India remains poorly documented in academic literature. India has developed its regulatory framework for the sector by creating both innovative laws and necessary regulations to stop fraud and protect consumer rights (Oishi et al., 1999).

Given these dynamics, this study addresses the following research questions:

1. Investigating the perceptions of cryptocurrency investors in five regions of India.
2. How does the lack of clear regulatory frameworks affect

the adoption and use of cryptocurrencies?

3. What challenges does this pose for consumer protection, financial inclusion, and economic stability?

The findings of this study will be policy-relevant for governmental agencies, investors, and academics as they elucidate the economic benefits and challenges associated with cryptocurrencies. Thus, it will help expand knowledge about the appropriate use of digital currencies for furthering economic development, as well as for the inclusion and stability of the financial industry (Farrell et al., 2016; Lusardi, 2008).

Literature Review

A review of the impact of cryptocurrency on Indian economic performance and investor actions reveals that the subject shows great promise, notably since the Supreme Court eased cryptocurrency restrictions in 2020. India now has new possibilities to use cryptocurrencies for enhancing financial services that target underbanked populations. The system's success has given rise to significant regulatory issues and risks of improper use throughout its operation. Cryptocurrencies, including Bitcoin and Ethereum, according to Sharma (2021), demonstrate why these assets exhibit high volatility, as they are highly appealing due to their nature. The author suggests that India is likely to adopt cryptocurrencies based on the development of legislation to regulate these assets, despite increasing cryptocurrency awareness among its citizens. The proposed framework needs to enable such possibilities while maintaining complete security for managing and controlling the economic value of cryptocurrencies. Lacking proper legislation allows for unauthorized control, manipulation, and financial fraud, which cancels out all the positive economic effects of cryptocurrencies.

Using deep learning-based PLS-SEM and ANN, Abbasi et al. (2021) investigated the factors that drive Malaysian users to adopt cryptocurrencies. The researchers applied their two-stage SEM-ANN method to achieve better results than traditional single-stage SEM-ANN approaches, as it analyzed both structured and unstructured relationships between constructs. This study expands the UTAUT2 framework by integrating trust and personal

innovativeness and subsequently determines that trust is the key factor driving users to adopt cryptocurrency. Research investigates how developing countries, particularly Malaysia, adopt cryptocurrencies, as this enhances the technology adoption literature and theoretical and methodological approaches.

A meta-analysis conducted by Bommer et al. (2021) evaluates the impact strength of various elements that lead users to adopt cryptocurrencies. Users' cryptocurrency adoption intentions are influenced by seven major factors, which include attitude toward behavior, performance expectancy, and price value, followed by effort expectancy and social influence, and finally facilitating conditions and perceived behavioral control. Research reveals that attitude toward behavior, performance expectancy, and price value serve as the key factors that drive adoption prediction. The analysis demonstrates that a country's development status and economic stability influence six distinct moderating effects between these relationships. Real-life cryptocurrency implementations have received assessments, while researchers have proposed improvements through enhanced user experiences, attractive values, and reduced transaction fees. The study acknowledges that current research requires further examination of how merchants utilize cryptocurrencies, as well as the impact of economic circumstances on these practices. Studying these gaps would enhance the understanding of how cryptocurrency gains market acceptance.

Examining the impact of cryptocurrency on the Indian economy, Panigrahi (2023) analyzes the issues related to cryptocurrencies and their effects on the Indian economy using cointegration techniques. In contrast, investments in cryptocurrencies are highly destabilizing for the financial system, with a 1% increase in cryptocurrencies appearing to decrease financial stability by nearly 5 percentage points. The contribution of cryptocurrencies to economic growth is almost negligible. The study also reveals that exchange rate and inflation risks create financial risk, and there is a long-term positive correlation between economic growth and financial stability. As previous works have suggested that exchange rate fluctuations harm financial stability, this

study demonstrates that exchange rate volatility and economic policy uncertainty are significantly detrimental to financial stability. Additionally, the study identifies aggressive monetary policy, capital flows, and global disturbances as posing greater threats to India's financial structure and economic growth. In conclusion, the paper emphasizes that cryptocurrencies should be regulated while considering the risks they pose to the financial system.

Rajdev et al. (2024) build upon the existing Technology Acceptance Model to categorize the factors that lead to the acceptance and adoption of cryptocurrencies. The study targeted investors of financially listed firms, and a structured questionnaire was administered to 269 participants across Gujarat, with a mix of investors and non-investors. Regarding the hypotheses, the analysis reveals that social influence, perceived trust, and perceived ease of use are significant factors in determining the intention to use cryptocurrencies. On the other hand, perceived usefulness and regulatory support did not have a significant predictive ability for usage. As such, this paper offers valuable insights into the role of social factors and trust in cryptocurrency adoption, which could be beneficial for service providers and policymakers seeking to promote cryptocurrency adoption in developing nations. The study emphasizes the importance of aligning strategies, particularly in addressing the social influence and trust factors that affect the acceptance of cryptocurrency.

Sebastião and Godinho (2021) utilize previous concepts to examine the forecast accuracy of Bitcoin, Ethereum, and Litecoin, as well as their trading performance, through multiple machine learning algorithms. The paper evaluates the accuracy and trading performance of Bitcoin, as well as Ethereum and Litecoin, using various machine learning methods. The paper utilizes random forest and support vector machines as machine learning techniques. Modern developments in the theory of rational expectations maintain a tradition that incorporates cryptocurrencies with established macroeconomic models. Asimakopoulous et al. (2019) present a DSGE model which assesses the intersection of cryptocurrencies. This proposal establishes a definition of cryptocurrency as a type of currency not

produced by governments. This model incorporates both government money and monthly statistical records from 2013 to 2019 to perform Bayesian analysis. The examination indicates that people show a preference for exchanging between government money and cryptocurrency, as well as an inverse relationship between cryptocurrency and economic shock indicators. The research findings indicate that cryptocurrency demand shocks have an impact on but not on the same level as the impact from government currency demand shocks. The impact of a cryptocurrency demand shock on the economy remains less significant when compared to the effects generated by government currency demand shocks. The study demonstrates how cryptocurrency functions as a form of economic activity, providing valuable insights into its relationship with the broader economy.

Sagheer et al. (2022) utilize the Technology Acceptance Model (TAM) to examine the factors influencing cryptocurrency adoption. They examined how awareness of technology influences the investigation process. A study investigates cryptocurrency adoption intention from the users' standpoint based on their perceived usefulness, perceived ease of use, and perceived risk. The study confirms that perceived elements function as intermediaries between technology awareness and cryptocurrency adoption. The research demonstrates that government support helps control the relationships outlined within the study. The strength of support from government authorities positively influences how people intend to behave after considering these factors. The research utilizes Structural Equation Modeling to verify the direct and indirect effects of perceived usefulness, ease of use, and risk factors on behavioral intention. These findings suggest that while technologically driven awareness is central to adoption, policy support enhances its efficiency. This research indicates that effective supportive policies should be implemented immediately. Strategies designed for financial institutions and policymakers will increase their acceptance of digital currencies.

Sharma et al. (2021) assess the global spread of cryptocurrency using Google Trends data series and Google Trends country interest points, in conjunction with

Bitcoin Node Network performance indicators and software download trends, to track adoption patterns. They concluded that cryptocurrency markets are more actively searched and adopted in developed countries than in developing ones. Several nations and parts of the world have established both explicit and implicit boundaries on cryptocurrency usage. Despite the limitations on cryptocurrency usage, many tech-savvy nations, such as the United States, Canada, Ukraine, and members of the European Union, have fully adopted this innovation. The analysis confirms that cryptocurrency functions as both an exchange mechanism and an investment platform, coexisting alongside traditional currencies and stocks. This segmentation highlights the key development points that occurred during the history of research on decentralized digital currencies, emphasizing the particular significance of Bitcoin following its emergence in 2008. Additionally, the study points to the emergence of various other decentralized digital currencies over the years, alongside advancements in blockchain technology. The authors conclude that while cryptocurrencies currently face challenges that affect their immediate popularity, they are likely to have a significant influence on the global financial system and may drive changes in world trade and the traditional role of currencies.

William Isaksson (2021) examines speculation and fluctuations inherent in the cryptocurrency market. The analysis of market characteristics includes Bitcoin, along with Ethereum and other virtual currencies, and their expanding market presence and growing quantity. Cryptocurrencies stand out due to their unstable values and unclear market information, which creates challenges for studying the relationships between cryptocurrencies and Nasdaq 100 stock assets. The research examines the potential for portfolio diversification using cryptocurrencies and assesses the effectiveness of various portfolios across different market conditions. While diversified crypto assets tend to have correlated price movements with varying magnitudes, their inherent volatility complicates achieving diversification through crypto alone. Although cryptocurrencies can enhance portfolio Sharpe ratios, their extreme volatility often offsets these advantages. The study raises questions about market

stability and future investment opportunities as the cryptocurrency sector continues to evolve.

DeVries (2023) offers insights into Bitcoin's potential to disrupt the financial system. He recognizes Bitcoin as the first widely adopted cryptocurrency and discusses its ability to challenge traditional payment systems. Bitcoin's limited supply of 21 million coins theoretically reduces inflationary pressures. The analysis highlights trends in transactions, user acceptance, and global adoption while examining regulatory challenges, scalability issues, and risks, including hacking. Despite these risks, DeVries underscores Bitcoin's potential to revolutionize financial systems by enabling secure, decentralized, and inflation-resistant transactions.

Research Methodology

Questionnaire design

The study's survey was designed to collect as much information as possible regarding the investment made in digital money and the perceived impact on the economy. The survey consists of 40 questions, grouped into several parts. The first section, which includes demographic questions, consists of eight questions that gather information on name, age, gender, educational background, occupation, employment category, annual income, and state of residence. Secondly, there are eight investment questions regarding previous investments in cryptocurrencies, the level of knowledge about different types of cryptocurrencies, whether such assets can be considered long-term investments, and the share of such investments in an individual's overall investment portfolio. It also measures participants' perceptions of the risks associated with investing in cryptocurrencies, whether they have attended or participated in seminars or workshops related to cryptocurrency investments, and whether they consult an expert for anything related to cryptocurrencies or how often they check the market before investing in them. Thirdly, eight questions investigate the perceptions about cryptocurrencies. The questions focus on the participants' confidence level in understanding cryptocurrencies and blockchain technologies, their opinions about the adequacy of the current legal and regulatory framework in India for cryptocurrencies, and their level of security concerns when

investing in cryptocurrencies. Moreover, the questionnaire addresses the perception of the potential application of cryptocurrencies in the financial sphere, the profits they can bring, their stability as an investment tool, their feasibility as a hedge against traditional investments, and, finally, the awareness of the security threats associated with investing in cryptocurrencies. In the subsection on the impacts on macroeconomic variables, views were sought through eight questions. These questions assess participants' awareness of the effect of cryptocurrency investments on inflation, economic growth, and employment. The section also focuses on views regarding the need for specific taxation policies to be implemented for cryptocurrencies, issues related to the environmental impact of cryptocurrency mining, and the potential for cryptocurrencies to encourage high-risk trading.

Additionally, people were asked about the place and importance of investment, especially cryptocurrencies, in the current financial volatility and erosion of tax revenues for governments. Finally, the regulation and future outlook section consists of 8 questions that aim to determine the respondents' attitudes towards calls for a higher degree of regulation of cryptocurrency use and their perceptions of the government's active participation in regulating digital currencies. It also mentions the level of legal certainty that would help increase trust in cryptocurrency investments and respondents' confidence in the future of cryptocurrencies in India. Moreover, it examines opinions on financial inclusion as a beneficial consequence of cryptocurrencies, the consequences of no regulation leading to scams, and the impact of regulation on the investor market. They were also asked whether cryptocurrencies should be regulated to protect investor interests.

Sampling and data collection

To conduct this research, respondents were selected from five regions with the highest cryptocurrency investments. These regions are Delhi NCR, Bengaluru, Mumbai, Pune, and Rajasthan. This survey was done from December 2023 to February 2024. This study uses a convenience sampling method due to its exploratory nature. However, while random sampling differs significantly from convenience

sampling, careful selection under convenience sampling can produce samples that are comparable to those obtained through randomness. Two hundred thirty questionnaires were distributed, and out of these, 214 were returned with complete data, yielding a response rate of 93%.

A total of 214 responses were received from the five regions, as follows: Delhi NCR had 37 respondents, Bengaluru had 47 respondents (17.3%), Mumbai had 39 respondents, Pune had 56 respondents, and Rajasthan had 35 respondents who participated in the survey. This balanced representation ensures comprehensive coverage and allows for comparison between different parts of India during the research period conducted here, which spanned several months, enabling the acquisition of a general picture.

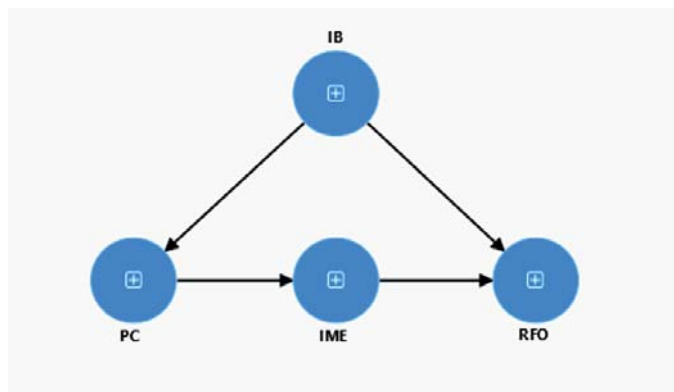
Besides the questionnaire data, secondary data were used from different national economic indicators. These provide macroeconomic context for primary data, allowing for a more comprehensive analysis of how cryptocurrency investments impact the economy. India's unemployment rate is one of the secondary datasets used in this study. Also included are the Financial Stress Index, Consumer Price Index (CPI), energy consumption, GDP growth rates, and inflation levels, among other key indicators, as well as market trends for well-known cryptocurrencies such as Bitcoin, Ethereum, and Tether. All these secondary datasets were sourced from reliable providers, including but not limited to the Asia Regional Integration Center (ARIC), Macrotrends.net, Investing.com, and Statista, ensuring that quality standards in gathering information during this research process were met with utmost rigor.

Measurement

The data collected in the first section were collected through multiple-choice questions. And in the second section of the study, they were summed up on a five-point Likert scale. Following the same pattern, the responses to these items were rated on a scale of 1 to 5, with 1 standing for "Strongly Disagree" and 5 standing for "Strongly Agree." Regarding the reliability analysis, Cronbach's alpha decision criterion was used to assess the Cronbach's alpha for each factor. The explanatory factor analysis revealed that the factor loadings of the items ranged from

0.520 to 0.864. The reliability coefficients of the factors were slightly above 0.770 using Cronbach's alpha. The Cronbach's alpha values are given for all factors. Besides the factor loadings of the items, the goodness of fit indices of the confirmatory factor analysis are presented in the tables. For testing the hypothesis, correlation and structural equation modeling (SEM) have been used.

Figure 1: Conceptual model developed to describe the relationship between Investment Behavior, Perceptions of Cryptocurrency, Impact of Macroeconomics and Regulation and Future Outlook



The main hypothesis of the study is:

H11: Investment Behaviour (IB) significantly influences Regulation and Future Outlook (RFO).

H21: Investment Behaviour (IB) significantly influences the Perception of Cryptocurrency (PC).

H31: Perception of Cryptocurrency (PC) significantly influences the Impact of Macroeconomics (IME).

H41: Impact of Macroeconomics (IME) significantly influences Regulation and Future Outlook (RFO).

Analysis and Result

The basic Profile of survey respondents

The research involved 214 participants, randomly selected from five regions: Delhi NCR, Bengaluru, Mumbai, Pune, and Rajasthan. The breakdown of demographics provides valuable insights into the composition of the respondents. The most common age group among participants was 18–24 years, constituting 35.05%, followed by the 25–34 years age group at 19.16%. A smaller proportion of participants were aged 35–44 (15.42%) and 45–54 (14.95%), while the percentage of those aged 55–64 and 65+ was comparatively lower, at 13.55% and 0.93%, respectively. The "Below 18" category accounted for only 0.93%, showing minimal participation from this age group. Gender-wise, most of the respondents were male (64.49%), while females constituted 35.51% of the sample. Regarding educational qualifications, the largest portion of participants held a Master's degree (29.44%), followed by those with a Bachelor's degree (27.57%). Other qualifications contributed 22.90%, while a smaller percentage of respondents had doctoral degrees (10.28%), high school education or below (9.35%), or Higher Secondary/Pre-University qualifications (0.47%). In terms of annual income, more than half of the participants (60.28%) reported earning less than ₹5,00,000 per year. Around 19.63% earned between ₹5,00,000 and ₹10,00,000, while 15.89% earned ₹10,00,000–₹20,00,000, and only 4.21% reported earning above ₹20,00,000 annually.

Table 1: Descriptive Statistics

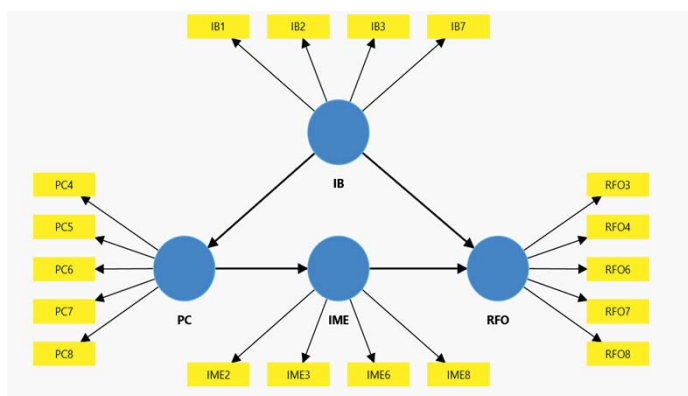
Age	Frequency	Percent
Below 18	2	0.93
18-24	75	35.05
25-34	41	19.16
35-44	33	15.42
45-54	32	14.95
55-64	29	13.55
65 and above	2	0.93
Gender		
Female	76	35.51
Male	138	64.49

Age	Frequency	Percent
Educational Qualification		
High School or below	20	9.35
Higher Secondary/Pre-University	1	0.47
Bachelor's Degree	59	27.57
Doctoral Degree	22	10.28
Master's Degree	63	29.44
Other	49	22.90
Annual Income		
₹10,00,000 - ₹20,00,000	34	15.89
₹5,00,000 - ₹10,00,000	42	19.63
Above ₹20,00,000	9	4.21
Below ₹5,00,000	129	60.28

Source: Primary data

Structural Equation Modelling

Figure 2: Measurement Model



The measurement model in SEM defines the relation of hidden theoretical variables with measurable and observable signals. In this particular research, those latent constructs are Investment Behaviour (IB), Perceptions of Cryptocurrency (PC), Impact of Macroeconomics (IME), as well as Regulatory and Future Outlook (RFO). Each of these constructs is labeled in the diagram with several indicators for each construct.

Table 2: Measurement Model Evaluation

Factor	Items	Factor loadings	Cronbach's Alpha	Average Variance Extracted (AVE)	Composite reliability (rho_a)	Composite reliability (rho_c)
Investment Behaviour	IB1	0.614	0.702	0.512	0.656	0.563
	IB2	0.565				
	IB3	0.523				
	IB7	0.721				
Impact of Macroeconomic Variables	IME2	0.737	0.736	0.723	0.748	0.723
	IME3	0.706				
	IME6	0.639				
	IME8	0.512				
Perception of cryptocurrency	PC4	0.544	0.731	0.612	0.745	0.734
	PC5	0.662				
	PC6	0.563				
	PC7	0.708				
	PC8	0.594				

Factor	Items	Factor loadings	Cronbach's Alpha	Average Variance Extracted (AVE)	Composite reliability (rho_a)	Composite reliability (rho_c)
Regulation and Future Outlook	RFO3	0.534	0.873	0.587	0.883	0.876
	RFO4	0.725				
	RFO6	0.804				
	RFO7	0.864				
	RFO8	0.785				

Source: Authors' calculation

Investment Behavior (IB)

Four constructs, namely IB1, IB2, IB3, and IB7, are used in the estimation of investment behavior. The factor loadings associated with these indicators amount to 0.614, 0.565, 0.523 and 0.721, respectively. Finally, it is possible to state that the reliability analysis of the items in the sample has been satisfactory, as evidenced by Cronbach's Alpha of 0.702 in Investment Behavior. The Average Variance Extracted (AVE) with the value of 0.512 shows that all items will reflect the investment behavior construct, though the Composite Reliability measures, particularly rho_c (0.563) and rho_a (0.656), suggest only a moderate internal consistency.

Impact of Macroeconomic Variables (IME)

The impact perceived by individuals on cryptocurrencies through IME can be measured using four indicators: IME2, IME3, IME6, and IME8, where their factor loadings are respectively equal to 0.737, 0.706, 0.639, and 0.512. Cronbach's Alpha for IME shows good internal consistency, with a value of 0.736, while AVE is high at 0.723, indicating that these items consistently measure the macroeconomic variable impacts on digital currencies. Its Composite Reliability (rho_a) equals 0.748 coupled with rho_c being also 0.723 indicates strong internal consistency and reliability.

Perceptions of Cryptocurrency (PC)

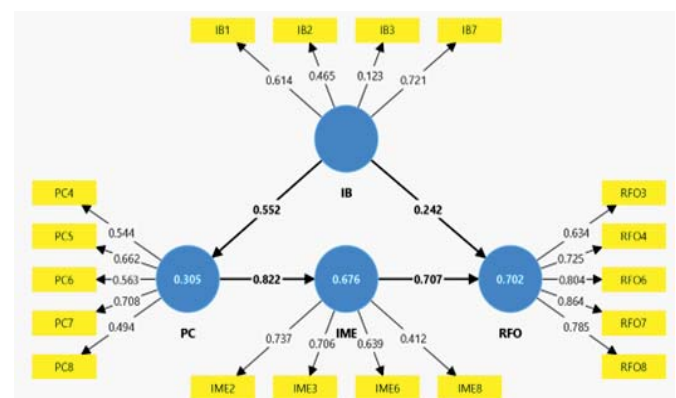
There are five indicators, PC4, PC5, PC6, PC7, and PC8, which were used to assess general attitudes towards or beliefs about any cryptocurrency. The factor loadings for these indicators are as follows: 0.544, 0.662, 0.563, 0.708 and 0.594. Cronbach's Alpha value is 0.731 indicating acceptable internal reliability while AVE = 0.612 and Composite Reliability (rho_a) = 0.745 with rho_c = 0.734,

suggesting that this measurement tools may be used to measure the construct consistently in different samples.

Regulatory and Future Outlook (RFO)

The regulatory environment, coupled with future outlooks on digital currencies, was measured using five indicators, namely RFO3, RFO4, RFO6, RFO7, and RFO8, which had factor loadings of 0.534, 0.725, 0.804, 0.864, and 0.785, respectively. Cronbach's Alpha for this scale is high, i.e., $\alpha = 0.873$, thus indicating excellent reliability or internal consistency. The AVE is 0.587, and Composite Reliability (rho_a) is 0.883, with rho_c also equal to 0.876.

Figure 3: Structure model showing the relationship between Investment Behavior, Perceptions of Cryptocurrency, Impact of Macroeconomics and Regulation & future Outlook



The evaluation of the measurement model yields that each indicator reliably measures its respective construct. Factor loadings, composite reliability, and the average variance extracted, which meet the required levels, provide the basis for a strong structural model testing. Indicators IB1, IB2, IB3, and IB7 have been found to show acceptable loadings

but moderate internal consistency. IME2, IME3, IME6, and IME8 exhibit high loadings, alongside strong internal consistency, and are reliable measurements. PC4, PC5, PC6, PC7, and PC8 demonstrate good factor loadings and reliability, ensuring a valid measurement of this construct. RFO3, RFO, RFO6 as well as RFO7 depict high factor loadings, excellent internal consistency, in addition to reliable measurement. This implies that Investment Behaviour (IB), Perceptions of Cryptocurrency (PC),

Impact of Macroeconomics (IME), and Regulatory and Future Outlooks on Digital Currencies (RFO) are accurately measured, which allows for further investigation into their relationships within a structural model.

The hypothesized path is used in the structural model Figure 3, to test the relationships between the latent constructs. In this study, the structural model examines how IB influences PC, RFO, and IME, and how PC influences IME, and how IME influences RFO.

Table 3: Summary of hypothesis testing

Hypothesis	Parameter estimates	Standard errors	T values	P values	Decision
H2 ₁ : IB -> PC	0.279	0.082	3.417	0.001	Significant
H3 ₁ : IB -> RFO	0.207	0.075	2.748	0.007	Significant
H4 ₁ : IME -> RFO	0.545	0.083	6.567	0.000	Significant
H5 ₁ : PC -> IME	1.031	0.181	5.692	0.000	Significant

Source: Authors' compilation

Table 3 provides the summary of Hypothesis Testing by showing Parameter estimates, Standard errors, T values and P-values. The path coefficient between IB and PC is 0.279, with a standard error of 0.082, a T-value of 3.417, and a p-value of 0.001, indicating that the path is statistically significant. The hypothesis can therefore be confirmed, suggesting that perceptions about cryptocurrency are highly determined by investment behavior. The path coefficient from IB to RFO is 0.207 with the standard error of 0.075, co-effT value = 2.748 and p-Value = 0.007: that is, its level of significance is statistically significant. The hypothesis is thus proven right implying that regulatory and future outlook are determined by investment behavior. The path coefficient from IME to RFO is 0.545 and Standard Error is 0.083, T-value = 6.567, P = 0.000 (significant at 0% level). The hypothesis can be supported in this regard, suggesting that macroeconomic factors can significantly change regulatory and future outlooks. We have a path

coefficient of 1.03 between PC and IME, with a standard error of 0.181, a T-value of 5.692, and a p-value of 0.000 (significant). In light of these findings, the hypothesis is therefore supported, meaning that the perceived impact of macroeconomic factors may be influenced by the perception of cryptocurrencies.

According to these structural model findings, Investment Behavior significantly affects Perceptions of Cryptocurrency as well as Regulatory and Future Outlook for the same. Additionally, Perceptions of Cryptocurrency significantly impact the impact of Macroeconomics, while the Impact of Macroeconomic Factors also affects regulatory and Future Outlooks. These results thus confirm our proposed relationships and offer valuable insights into investment attitudes towards digital assets, such as Bitcoin, in relation to economic indicators like the inflation rate or interest rates, among others, which might dictate financial market stability within different countries.

Table 4: Squared multiple correlations (R²)

Construct	R-square	R-square adjusted
IME	0.676	0.674
PC	0.305	0.302
RFO	0.702	0.699

Source: Authors' compilation

The values of R-square show how much of the variance on the dependent variable is explained by the variance of the independent variable in the model. The R^2 and adjusted R^2 for each of the constructs is presented in Table 4. According to the current analysis, the R-squared value is 0.676, indicating that 67.6% of the variation in IME is explained by PC. For similar reasons, the adjusted R-square of 0.674 is slightly less as it takes count of predictors in this model.

The second one shows that, in delivering a 30.5% variance, IB has an R-squared of 0.305 and an adjusted R-squared of 0.302, although the latter adjusts for the number of predictors. The third one shows that, of all factors that may have caused it, such as IME or PC, RFO was most significantly affected by IB and IME, as its r-squared value was established to be 0.702.

Table 5: Model fit indices for the structural model

Model fit indices	Model results
Chi-square	899.999
RMSEA	0.0466
GFI	0.924
AGFI	0.587
SRMR	0.093
NFI	0.893
TLI	0.964
CFI	0.977

Source: Authors' calculation

The goodness-of-fit of the structural model was assessed using various fit indices. Table 5 provides the model fit indices and their corresponding values.

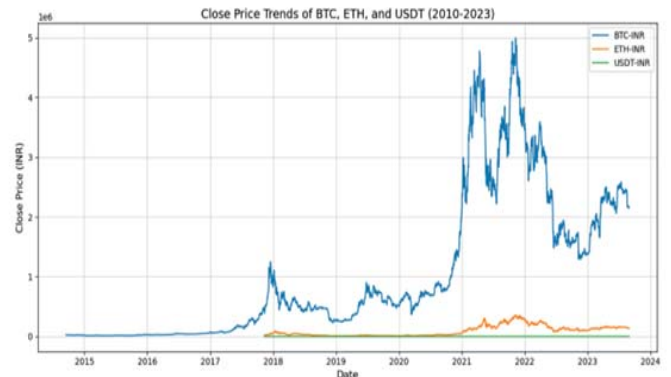
The chi-square value is 899.999. The lower the chi-square value compared to degrees of freedom, the better the fit; however, this statistic is easily influenced by sample size. RMSEA value is 0.0466, which is less than the recommended threshold of 0.05, indicating a good fit. GFI value of 0.924 suggests a good fit as values over 0.90 are acceptable; AGFI at 0.587 means that there are still some things that could be worked on since it falls below 0.90 which would be desirable; SRMR = 0.093 but is not great and needs to improve more; NFI = 0.893 close to acceptable (0.90); TLI = 0.964 well above recommended (0.90); CFI = 0.977 exceeds recommended (0.90).

Trend Analysis

Figure 4 illustrates the closing price trends of three important cryptocurrencies— Bitcoin (BTC), Ethereum (ETH), and Tether (USDT)—from 2014 to 2023. Bitcoin has had a fascinating journey; in 2014, it closed at approximately Rs. 21,487.97, but by 2016, it had risen to an average of Rs. 38,200. A significant surge followed this in

2017. It maintained its upward trajectory consistently throughout the whole of the next year as well. However, this was small compared to the highest remarkable hike noted to date, which occurred in 2021, when it closed at approximately Rs. 49,94,456. The figure has been declining progressively from there, with the next couple of years witnessing an even more significant decline; It is Rs 34,57,991.50 as on the year-end of 31st March 2022 and then plunged more to Rs 23,01,461 by the end of the financial year 2023, which shows that it is starting to find a stable phase from period of volatility.

Figure 4: Closing Price Trends of Bitcoin, Ethereum and Tether



Comparing Ethereum to Bitcoin, one can state that the former has more stable and more easily predictable rate ranges. Originally the closing price in 2017 of it was Rs.48,302.27, the price increased over the years and touched the level of Rs. 1,71,132 by 2023 but considerably smaller than Bitcoin; ETH, however, marched upwards every month and thereby building up the market reputation for their technologies and possible applications bearing in mind implementation factors within almost every sector worldwide due to Blockchain age. From Figure 4, one can

notice that Tether (USDT) is relatively more stable in price than other cryptocurrencies, such as Ethereum or Bitcoin (BTC). Tether began at a price of about Rs. 64.61, then rising to roughly 71.28 rupees in 2019. Thereafter, it continued to increase steadily, reaching approximately Rs 74.53 by 2021. The year ended, as shown by the graphs, with closing prices around Rs. 82.71 for the year 2023. This is demonstrated on the graph by a horizontal line, which shows that USDT's price remains relatively stable over time, rather than fluctuating significantly.

Table 6: Descriptive Statistics

Cryptocurrency	Mean	Median	Minimum	Maximum	Standard deviation
BTC	1039515	543151	11058.42	4994456	1212306
ETH	91013.41	48581.68	6067.16	355703.53	86503.07
USDT	74.03	73.73	62.81	83.21	4.93

Source: Authors' own compilation

Bitcoin's average closing price was at Rs. 10,39,515, meaning that the end value has always been nearly over a million rupees for years now. However, the median of Rs. 5,43,151, which doesn't consider extreme values and wild price swings, is much lower. This wide gap between means and medians illustrates the significant volatility of bitcoin prices, with some years experiencing huge spikes in its value, ranging from a minimum of Rs. 11,058.42 to an astonishing high of Rs. 49,94,456. The standard deviation is also very high (Rs. 12,12,306), indicating that this cryptocurrency can be unpredictable at times when it comes to its pricing. Statistics about Tether (USDT) present different numbers, though: on average, each day Tether closes at around Rs. 74.03, which is not too far from its middle value of approximately Rs. 73.73, indicating that these closing prices are symmetrical about the center tendency. The minimum closing price is Rs. 62.81, while the maximum is Rs. 83.21. With a standard deviation of only 4.93 rupees, it seems Tether's closing prices have shown minimal variation over time. The average closing price for Ethereum stands at Rs. 91,013, while its median value is Rs. 48,581.68. The difference between these two can be attributed to periods where there was deviation from the fixed value which would distort averages. The lowest

price being Rs. 6,067.16 and the maximum being Rs. 3,55,703, along with a high standard deviation of Rs. 86,503.07, indicates that Ethereum has had significant volatility compared to other stablecoins.

Discussion and Conclusion

Discussion

Semantics suggest that useful perceptions and awareness, combined with ease of use and proper government regulations, significantly influence the adoption levels of cryptocurrencies. Research evidence suggests that digital currencies are gaining increased adoption among users due to their user-friendly platforms and perceived benefits, which align with technology acceptance frameworks (Shahzad et al., 2024).

The research provided evidence of expanding cryptocurrency knowledge, primarily affecting young, technology-oriented individuals residing in urban areas. Youth who live in metropolitan areas tend to be receptive to different financial systems, including those that offer elevated income potential and autonomous management functions. The acceptance rate of cryptocurrencies depends heavily on user awareness and digital literacy, as informed users are more likely to make informed investment

decisions once they understand the cryptocurrency system and its associated risks. (Cristi et al., 2023).

The factor of ease of use proved to be vital in the process. Mobile apps have been simplified, and exchange platforms have lowered the barriers, allowing more users to enter this space. Basic platform features enabled accessibility for beginners who lack experience in advanced technology practices when participating in cryptocurrency investment. However, the volatility and complexity of the cryptocurrency market still present challenges for new entrants. (Kayani & Hasan, 2024).

The study highlights the significant impact of government regulations on the cryptocurrency industry. People had divided feelings about government regulation because regulation could establish legitimacy for cryptocurrency, yet strict policies might slow innovation and decrease participation within the cryptocurrency industry. Undetermined legal framework conditions continue to decrease both investor confidence and market stability in the area.

Users demonstrate high adoption intentions because they believe cryptocurrency systems help them increase transaction speed, minimize costs, and provide new investment opportunities. The modern investment field, enhanced by cryptocurrency, enables users to make both financial investments and participate in a decentralized monetary system, where they gain enhanced control and visibility (Ullah, S., 2025).

This analysis confirms that adopting cryptocurrency embraces multiple conditional factors, including individual behavior and institutional and technological aspects. Comprehending these adoption dynamics remains essential for authorities, as well as developers and investors who operate in or wish to enter the digital finance market (Kala et al., 2023).

Conclusion

This study aimed to conduct a detailed survey on the key factors associated with cryptocurrency adoption in five regions with a large number of cryptocurrency investors. The findings of this study are significant. Here, there was growing interest in digital assets from the region's

population (especially the youth and the middle-income group), which reflected a shift in the digitization of behavior as a result of technological access, aspiration of economic growth, and a more general changing attitude towards decentralized finance.

In this context, one of the central conclusions is the importance of perceived usefulness and ease of use. With the advancement of cryptocurrency platforms becoming easier to use, new people enter this world each day as the barrier to entry continues to shrink and technology becomes less of an explanation needed. In addition to this, peer groups, online communities, and social media influences on making financial decisions are also significant, as we are in the era of FOMO (Fear of Missing Out), which often drives rapid adoption trends.

Moreover, the research also shows major anti-adoption barriers. A significant hurdle to overcome is regulatory uncertainty, which discourages long-term investment in such projects and hinders potential users from taking a risk. Crypto gains also face high tax rates that are even more complex due to the imposition of these taxes. These concerns highlight the need to strike a balance between regulation and innovation while ensuring user safety and transparency.

Another aspect is the positive side of cryptocurrency, making it easier to bring the masses on board for financial inclusion. Blockchain-based financial tools serve as an alternative to traditional banking in areas where access to traditional banking is limited. A well-intentioned policy intervention could turn digital currencies into an instrument of economic empowerment for rural and so-called underserved people.

The findings of this study suggest that India will become a vibrant market for digital assets, provided that awareness, education, and regulatory clarity continue to grow. Future research should aim to understand how user behavior in rural areas influences visits, evaluate the impact of government interventions, and examine how cryptocurrency adoption affects the broader macroeconomic dynamics of India.

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