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Research Article

Evaluation of Bitcoin Investment Viability in Mozambique: Opportunities and Risks in an Emerging Market

Cláudio Massingarela[1], Rabeca Cuna[1], Alberto Daniel[1], Filipe Mahaluca[2, *]

[1]Department of Management, Economics, and Finance, Higher Institute of Transport and Communications (ISUTC), Maputo, Mozambique

[2]Scientific Research Center, Higher Institute of Accounting and Auditing of Mozambique (ISCAM), Maputo, Mozambique

Abstract

This study examines the viability of Bitcoin investment in Maputo, Mozambique, within the context of the growing global adoption of cryptocurrencies. The research highlights the advantages of Bitcoin, such as lower transaction fees and the elimination of financial intermediaries, offering greater efficiency and flexibility for merchants and investors. The blockchain technology underlying Bitcoin provides security and privacy in transactions, making them resistant to fraud. However, Bitcoin's high volatility presents a significant challenge, particularly in unregulated markets like Mozambique, where the lack of a clear regulatory framework limits wider adoption. Using a mixed-method approach, quantitative data were collected from 23 Bitcoin investors through structured questionnaires, and qualitative data were gathered from semi-structured interviews with three investors and a financial analyst. Statistical analysis, conducted using R software, included tests such as Chi-Square, Student's t-test, Mann-Whitney U, Pearson correlation, logistic regression, and factor analysis to understand the investment patterns and motivations of investors. The results revealed no significant association between gender and Bitcoin investment recommendations, although education level showed a marginally significant relationship, indicating that individuals with higher financial literacy are more likely to recommend Bitcoin. The analysis also found no significant differences in investment returns between men and women, suggesting that investment strategy plays a more crucial role. Risk-seeking investors achieved substantially higher returns, reflecting the speculative nature of Bitcoin. The study's limitations include the small sample size and the lack of specific cryptocurrency regulations in Mozambique, which restrict the generalizability of the findings. Recommendations include promoting financial education programs on cryptocurrencies, considering the legalization and regulation of Bitcoin by the Central Bank of Mozambique, increasing the banking sector's involvement in cryptocurrency discussions, and expanding research on Bitcoin volatility and returns. These actions could contribute to a more secure and informed investment environment in Mozambique.

Keywords

Bitcoin, Investment, Mozambique, Cryptocurrency, Emerging Markets

[*]Corresponding author: mahaluca@gmail.com (Filipe Mahaluca)

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1. Introduction

The widespread adoption of digital technologies and currencies has introduced a new dynamic to the economic landscape, offering new ways for individuals to conduct transactions and generate income. In this context, Bitcoin has emerged as one of the most promising innovations in the virtual world, perceived by many as an investment opportunity with significant future appreciation potential.

Bitcoin trading has become increasingly popular and widespread globally [1]. The digital currency offers several advantages to merchants, including lower transaction fees compared to traditional payment methods such as credit cards, as well as the elimination of financial intermediaries, which can result in greater efficiency and cost reduction [2, 3]. The decentralized nature of Bitcoin also provides greater freedom and flexibility in transactions, allowing merchants to accept payments from anywhere in the world without geographic or bureaucratic restrictions [4, 5].

Another key aspect of Bitcoin commerce is the security provided by blockchain technology, which underpins the cryptocurrency [6]. Blockchain is a public ledger of all Bitcoin transactions ever made, immutable and transparent [7]. This means that Bitcoin transactions are highly secure and resistant to fraud, as each transaction is verified and permanently recorded on the blockchain [8]. Furthermore, user privacy is protected since transactions are not linked to personal identities [9].

Bitcoin investment has attracted the attention of investors and companies worldwide, driven by its rapid appreciation and profit potential [10]. Major companies like Tesla and MicroStrategy have acquired large amounts of Bitcoin as part of their investment strategies, while individual investors seek to capitalize on the profit opportunities offered by the cryptocurrency [11, 12].

The global expansion of Bitcoin has been impressive, with more countries and companies recognizing its value as a store of value and medium of exchange [13]. The cryptocurrency is seen as a safe asset amid global economic instability, attracting investors seeking protection against inflation and the devaluation of traditional currencies [14]. Additionally, the infrastructure and services related to Bitcoin, such as exchanges and digital wallets, have developed rapidly, making cryptocurrency more accessible and usable in various countries [15].

The acceptance and legalization of Bitcoin have advanced significantly in several regions of the world. In Europe, Germany recognizes Bitcoin as a legal form of payment, allowing individuals and businesses to use it for commercial transactions [16]. In Asia, Japan pioneered the legalization of Bitcoin as a payment method, encouraging the adoption and integration of cryptocurrency into the country's financial market [17]. In the Americas, El Salvador made headlines as the first country to adopt Bitcoin as legal tender, allowing its use in commercial transactions and promoting financial inclusion [18].

In Africa, countries such as Nigeria, Mauritius, and South Africa are becoming hubs for cryptocurrency adoption, with a growing number of merchants and consumers using Bitcoin for transactions [19]. The United Arab Emirates, particularly Dubai, is positioning itself as a financial innovation hub, enabling the use of Bitcoin on various e-commerce platforms [20]. These examples demonstrate how Bitcoin's acceptance and legalization are expanding globally, providing new opportunities for commerce and investment in different markets worldwide.

However, despite its advantages, Bitcoin commerce still faces challenges such as the cryptocurrency's price volatility, which can affect merchants' profitability [21]. The price fluctuation of Bitcoin can lead to significant gains, but also substantial losses for investors [22]. Additionally, the lack of clear regulation in some countries can create legal uncertainties and hinder broader cryptocurrency adoption.

Nonetheless, with increasing acceptance and ongoing improvements in infrastructure and regulation, Bitcoin commerce has the potential to become a significant part of the global economic landscape, offering benefits for both merchants and consumers. Bitcoin continues to attract attention and interest from investors worldwide, driving its rapid expansion and integration into global financial markets.

In Mozambique, Bitcoin has gained attention as an innovative alternative in the financial sector, especially among younger, tech-savvy individuals. Despite the lack of specific cryptocurrency regulation by the Central Bank, many Mozambicans are exploring Bitcoin as an investment and means of exchange, drawn by the potential for high returns and the convenience of digital transactions. However, Bitcoin's volatility and the absence of a clear regulatory framework present significant challenges, limiting wider adoption among the general population.

The growing interest in Bitcoin in Mozambique is also reflected in the emergence of online communities and cryptocurrency-focused events, where enthusiasts and investors share knowledge and experiences. Additionally, some local merchants are beginning to accept Bitcoin as a form of payment, despite its value fluctuations and regulatory uncertainty. As the country's digital infrastructure develops and knowledge of cryptocurrencies expands, Bitcoin's potential use in Mozambique could grow, bringing new economic and financial opportunities to citizens.

Due to its high volatility, it is difficult to guarantee expected returns, which causes caution among Mozambican economic agents regarding investment in this cryptocurrency. Its recent performance history has not yet allowed for a comprehensive study on its viability as an investment class in a portfolio, despite its potential low correlation with other financial assets.

The aim of this research is to assess the viability of Bitcoin

investment in Mozambique, particularly among citizens in the City of Maputo. The relevance of this study lies in the need to provide an in-depth analysis of the risks and benefits of this cryptocurrency in a local context, where volatility and lack of regulation may affect investors' decision-making. By filling the existing gap in the literature on Bitcoin's performance in Mozambique, this research will contribute to a better understanding of the cryptocurrency's economic impact and the development of appropriate policies for its safe and effective use in the country.

2. Literature Review

2.1. Bitcoin as Currency: A New Perspective

The emergence of Bitcoin in 2009 marked a revolution in the global financial system, offering an alternative to traditional currencies by introducing the concept of decentralized digital money. Unlike conventional currencies, which are controlled by central banks, Bitcoin operates on a peer-to-peer network without intermediaries or government regulation [23]. This cryptocurrency challenges traditional definitions of money, as it functions both as a medium of exchange and a speculative investment asset, attracting investors seeking high returns.

Traditionally, money is defined as a widely accepted asset used for purchasing goods and services, regulated by monetary authorities such as the Bank of Mozambique, which oversees the use of the metical. However, Bitcoin operates without a central authority, raising questions about its legitimacy and applicability in established economies [2]. While Bitcoin offers advantages over fiat currencies, such as the ability to conduct global transactions without intermediaries, it also presents challenges for adoption in local markets like Mozambique, where regulation is still in its infancy.

The classical functions of money—medium of exchange, unit of account, and store of value—are maintained in Bitcoin, albeit in an innovative way. It facilitates instant, secure global transactions, allows for price comparison between goods and services, and can be used as a store of value, though its volatility limits this function in traditional markets [3]. Bitcoin's ability to operate without a central authority also makes it a unique case in the study of currencies and global financial markets.

While demand for traditional currency increases with economic growth and the need for transactions, Bitcoin's demand has been driven both by commercial transactions and its potential as a speculative investment [4]. Its volatile nature, with dramatic price spikes, makes it attractive to short-term investors, though it also carries significant risks. The lack of regulation and limited acceptance in some countries, including Mozambique, pose significant challenges to its adoption as a universal currency.

2.2. Blockchain and Bitcoin: A Digital Transformation

Blockchain technology, introduced alongside Bitcoin, is one of the most disruptive innovations in the financial and technology sectors. It functions as a distributed ledger, where all Bitcoin transactions are recorded immutably and transparently. Each block in the blockchain contains a record of transactions validated by a network of computers, eliminating the need for intermediaries [6]. The decentralization and security provided by blockchain make it a groundbreaking advancement in the evolution of digital currencies.

Bitcoin, as the first and most well-known application of blockchain, is often described as "digital gold" due to its limited supply and emerging role as a store of value. The decentralization of Bitcoin, where anyone can participate in the validation of transactions (mining), is crucial to its secure operation, independent of governments or central banks [7]. The mining process not only validates transactions but also ensures that the network remains secure and efficient, even without governmental or central bank intervention.

Blockchain and Bitcoin offer significant advantages for global financial transactions, such as cost reduction and increased security, making them a viable option for those seeking alternatives to traditional financial systems [1]. However, Bitcoin's integration into global commerce and financial systems still faces significant barriers, including government resistance and market volatility. These issues make the future of Bitcoin, both as a currency and as a technology, a central topic in contemporary financial literature.

2.3. Bitcoin: Uma Análise Abrangente

The role of Bitcoin as a store of value has been hotly debated in financial literature. Many analysts highlight its potential as a hedge against inflation, given its capped supply of 21 million units [10]. In periods of economic instability, Bitcoin has been viewed as a means of preserving wealth, functioning similarly to gold. However, others see it as a high-risk, speculative asset characterized by significant price swings and unpredictability.

Unlike traditional currencies, Bitcoin is not influenced by monetary policies or interest rates, making it independent of governmental interventions. However, this independence also makes it vulnerable to extreme value fluctuations, limiting its usefulness as a stable store of value. Studies suggest that while Bitcoin has shown resilience to market shocks, its inherent volatility makes it more of a speculative asset than a conventional store of value [13].

Regulatory acceptance of Bitcoin varies greatly around the world. In Mozambique, Bitcoin use is still in its early stages, with the Bank of Mozambique warning about associated risks such as its potential for illicit activities [20]. In contrast, countries like Japan and the United States have more developed regulations, treating Bitcoin as a legal asset. These reg-

ulatory differences directly impact risk perception and investment opportunities in cryptocurrencies.

2.4. Bitcoin Volatility and the Mozambican Market

Bitcoin's volatility is one of its most defining characteristics, and this has direct implications for investors in Mozambique and elsewhere. The extreme price variation of the cryptocurrency means that investors can make significant profits in a short time but are also exposed to substantial losses. This volatility makes Bitcoin a risky choice for more conservative investors, as highlighted in recent studies [22].

In Mozambique, the Bitcoin market is still emerging, with few investors exploring the asset as an alternative to traditional investments. While there are opportunities for those willing to take risks, the lack of clear regulation and limited infrastructure for Bitcoin transactions in the country create significant barriers to wider adoption [19]. As a result, Bitcoin's growth potential in Mozambique depends on future developments in regulation and financial education about cryptocurrencies.

Studies show that despite its volatility, Bitcoin has demonstrated an overall upward trend in value, making it attractive for long-term investors [14]. However, in Mozambique, where financial literacy about cryptocurrencies remains low, there is a high risk associated with Bitcoin investment. Transactions are often conducted through unregulated exchanges, increasing exposure to fraud and other financial risks.

Thus, while Bitcoin offers opportunities for portfolio diversification and inflation protection, its volatility and regulatory challenges should be considered by investors in Mozambique. Further development of infrastructure and cryptocurrency policies in the country will be essential to increasing the safety and viability of Bitcoin investment in the local context.

3. Methodology

3.1. Research Design

This study employed a mixed-methods approach, combining both quantitative and qualitative techniques to assess the viability of Bitcoin investment in Maputo, Mozambique. The research was exploratory and descriptive in nature, utilizing a cross-sectional design where data were collected at a single point in time. The primary objective was to understand the motivations of Bitcoin investors and to evaluate the risks and benefits associated with this type of investment.

3.2. Population and Sample

The research employed a mixed-methods approach, integrating both exploratory and descriptive elements. The target population comprised Bitcoin investors in the City of Maputo, whose exact number could not be determined due to a lack of available data. Consequently, non-probability sampling was utilised, incorporating accidental and snowball sampling techniques.

The target population consisted of Bitcoin investors in Maputo. However, due to the lack of official data on the number of cryptocurrency investors in the country, a non-probability sampling method was used, combining convenience and snowball sampling techniques. The final sample included 23 investors who completed a structured questionnaire. Additionally, semi-structured interviews were conducted with three investors and one financial analyst, all of whom volunteered from the original sample.

3.3. Data Collection Instruments

Two primary data collection instruments were employed:

Structured Questionnaire: This was designed to capture quantitative data and was divided into sections to gather sociodemographic information (gender, age, education level) as well as investment patterns, amounts invested, and returns obtained. The questionnaire was distributed electronically via social media platforms.

Semi-Structured Interviews: These were conducted to collect deeper qualitative insights from investors and one financial analyst regarding the viability of Bitcoin investment. The interviews, averaging 20 minutes in length, were recorded and transcribed for subsequent content analysis. The interviews explored motivations for investing and the long-term viability of Bitcoin from the participants' perspectives.

3.4. Data Analysis

Quantitative data were analyzed using R software (v: 4.1.1), a powerful tool for statistical analysis. The following statistical techniques were applied:

1. Chi-Square Test: Used to assess the association between categorical variables such as gender, education level, and Bitcoin investment recommendations.
2. Student's t-Test: Applied to compare the average investment returns between male and female investors.
3. Mann-Whitney U Test: Used to compare the returns of conservative and risk-seeking investors.
4. Pearson Correlation: Investigated the relationship between the amount invested and the returns obtained.
5. Logistic Regression: Modeled to predict Bitcoin investment recommendations based on variables such as gender, age, education, amount invested, and returns.
6. Linear Discriminant Analysis: Used to classify investors based on their Bitcoin investment recommendations.
7. Factor Analysis: Identified the variables that contributed most to latent factors related to investment behavior.

A significance level of 5% ($\alpha = 0.05$) was applied to all statistical tests. A p-value below 0.05 was considered statis-

tically significant. However, it is important to note that the relatively small sample size and the non-probability sampling method may limit the generalizability of the findings to the broader population of Bitcoin investors in Mozambique.

Despite these limitations, the combination of quantitative and qualitative analyses provided a comprehensive assessment of the viability of Bitcoin investment in Maputo, highlighting both statistical trends and the personal experiences of the investors.

3.5. Ethical Considerations

This research adhered to ethical principles to ensure the protection and respect of the participants involved:

1. Informed Consent: All participants were informed about the purpose of the study, the procedures involved, and the voluntary nature of their participation. Participants were asked to read and sign an informed consent form before completing the questionnaire or participating in the interviews. The form also clarified that participants could withdraw from the study at any time without any consequences.
2. Anonymity and Confidentiality: To protect the privacy of the participants, data were collected anonymously without the inclusion of personally identifiable information. Both quantitative and qualitative data were stored securely, accessible only to the researchers. In the analysis and presentation of the results, data were aggregated to ensure that no participant could be identified.
3. Transparency: Participants were informed about the purpose of the research, potential benefits, risks, and how the results would be used. It was assured that the data would be used solely for academic and scientific purposes and would not be shared with third parties without prior consent.
4. Conflict of Interest Protection: The research was not sponsored by any cryptocurrency-related companies, ensuring that the findings remained impartial and free from commercial or financial bias.

4. Results

4.1. Qualitative Data

The qualitative data were obtained through semi-structured interviews with four participants, aimed at addressing the central questions of the research: (1) What are the reasons that motivate the citizens of Maputo to invest in Bitcoin? (2) From the perspective of investors in Maputo, to what extent is it viable to invest in Bitcoin? The interviewees unanimously stated that they invest in Bitcoin as a source of income, highlighting the potential for gains and the desire for a second source of income. Regarding the viability of the investment, all agreed that it is viable but over the long term, emphasizing the importance of deepening market knowledge and making a significant investment due to the cryptocurrency's volatility.

The data analysis revealed that the interviewees recommend adopting Bitcoin as a source of income, provided it is accompanied by proper education and prior knowledge about the cryptocurrency. However, the Investment Analyst does not recommend investing more than 10% of one's capital in Bitcoin, stressing the need to consider the risk associated with cryptocurrency investments. These results indicate a positive outlook among investors toward Bitcoin, emphasizing the importance of knowledge and a long-term approach to ensure the viability of the investment.

4.2. Association Between Investment Recommendations, Gender, Education Level, and Age Group

The Chi-Square Test was applied to verify the association between gender, education level, and age group with the recommendation of Bitcoin investment. Table 1 summarizes the results of these associations.

Regarding gender, the table shows that 52.17% of men recommend Bitcoin investment, while 17.39% of women do so. However, the results indicate that this difference is not statistically significant, with a test statistic of 1.03 and a p-value of 0.31. Since the p-value is greater than 0.05, we cannot reject the null hypothesis, meaning there is no significant association between gender and the recommendation of Bitcoin investment. These results suggest that, although men seem more likely to recommend Bitcoin, this difference could be explained by random factors.

Concerning education level, the test showed that 60.87% of investors with higher education recommend Bitcoin, while only 8.7% of those with secondary education do so. However, the analysis revealed a test statistic of 2.98 and a p-value of 0.084, indicating that, although there is an apparent difference, the relationship is not statistically significant at the 5% level. Nevertheless, this p-value suggests a marginally significant relationship, which may indicate a potential association that would need to be confirmed with a larger sample.

In terms of age group, the proportions of Bitcoin recommendation vary across the different age ranges. In the 19-25 age group, 26% of investors recommend Bitcoin, while in the 26-30 and 31-35 age groups, the recommendations are 22% and 17%, respectively. In the 36-40 age group, only 4% recommend the investment. However, the test statistic of 4.66 and the p-value of 0.199 indicate that there is no significant association between age group and investment recommendation. This suggests that age alone is not a determining factor for recommending Bitcoin as an investment.

This analysis shows that, despite the observed variations in investment recommendations based on gender, education level, and age, none of these variables showed a statistically significant association with Bitcoin investment recommendation, although the education level displayed a marginally significant relationship.

Table 1. Association Between Investment Recommendations, Gender, Education Level, and Age Group.

Gender	Investment Recommendations			Test-value	
	N (%) Yes	N (%) No	N (%) Total	Chi-Sqare	p-value
Male	12 (52.17)	3 (13.04)	15 (65.2)	1.03	0.31
Women	4 (17.39)	4 (17.39)	8 (34.8)		
Education					
Higher	14 (60.87)	3 (13.04)	17 (0.74)	2.98	0.084
Secondary	2 (0.09)	4 (0.17)	6 (0.26)		
Age (year)					
19-25	6 (0.26)	2 (0.09)	8 (34.8)		
26-30	5 (0.22)	1 (0.04)	6 (0.26)		
31-35	4 (17.39)	1 (0.04)	5 (0.22)	4.66	0.199
36-40	1 (0.04)	3 (13.04)	4 (17.39)		
Total	16 (69.6)	7 (30.4)	23 (100)		

4.3. Gender Comparison of Bitcoin Investment Returns Using Student's t-test

The t-test was conducted to compare the average returns obtained by men and women who invest in Bitcoin. As shown in Table 2, men, on average, achieved slightly higher returns (15,000 MZN) compared to women (12,000 MZN), with a t-statistic of 1.46. However, the p-value of 0.16 indicates that this difference is not statistically significant. Therefore, there is no evidence that the investor's gender influences the returns from Bitcoin investments. This finding suggests that the performance of Bitcoin investors is likely influenced by other factors, such as investment strategy, rather than gender.

Table 2. Student's t-test: Returns of Men vs Women.

Gender	Average Return (MZN)			T-student	p-value
	n	Mean	Standard deviation		
Male	15	15.000,00	5.000,00	1.46	0.16
Woman	8	12.000,00	4.000,00		

4.4. Comparison of Returns Between Conservative and Risk-Seeking Bitcoin Investors Using the Mann-Whitney U Test

The Mann-Whitney U test was used to compare the returns of conservative investors (who invested up to 10,000 MZN) and risk-seeking investors (who invested more than 100,000 MZN). As shown in Table 3, the results reveal a significant difference in returns, with risk-seeking investors achieving significantly higher average returns (50,000 MZN) compared to conservative investors (8,000 MZN). The p-value of 0.01 indicates that this difference is statistically significant. This finding reinforces that investors with a higher risk appetite tend to achieve greater returns, although this is likely due to assuming proportionally higher risks.

Table 3. Mann-Whitney U Test Comparing Returns of Conservative vs. Risk-Seeking Investors.

Gender	Average Return (MZN)			Mann-Whitney U Test	p-value
	n	Mean	Standard deviation		
Conservative	17	8.000,00	2.000,00	0.0	0.01
Risk-Seeking Investors	2	50.000,00	10.000,00		

4.5. Analysis of the Relationship Between Amount Invested and Return Obtained in Bitcoin Investments

The Pearson correlation analysis was conducted to investigate the relationship between the amount invested and the return obtained. As shown in Table 4, with a correlation coefficient of -0.20 and a p-value of 0.37, the analysis indicates that there is no significant correlation between the amount invested and the return obtained. These results suggest that, although it may seem intuitive that larger investments could result in higher returns, it was not possible to establish a significant linear relationship between these variables within the context of this research.

Table 4. Pearson Correlation Between Amount Invested and Return Obtained in Bitcoin Investments.

Amount Invested (MZN)	Return Obtained (MZN)	Correlation Coefficient (R)	p-value
30.000,00	20.000,00		
45,000.00	25,000.00	-0.20	0.37
10,000.00	8,000.00		

4.6. Analysis of the Relationship Between Amount Invested and Return Obtained in Bitcoin Investments

Logistic regression was used to predict whether an investor would recommend Bitcoin investment based on variables such as gender, age, education, amount invested, and return obtained. As shown in Table 5, the model's coefficients indicate that age has a positive influence on the recommendation (coefficient of 0.0366), while return obtained has a slightly negative effect (-0.00009). Gender, education, and amount invested appear to have little influence. With an accuracy of 43%, the model shows limited performance, suggesting that the studied variables may not be sufficient to accurately predict investment recommendations. Subjective and external factors, not captured by the data, might be influencing this decision.

Table 5. Logistic Regression Model for Predicting Investment Recommendation Based on Investor Characteristics.

Variable	Coefficient	Accuracy
Gender	-0.0061	
Ager	0.0366	
Education	0.0022	43%
Amount Invested	0.00002	
Return Obtained	-0.00009	

4.7. Challenges in Classifying Bitcoin Investment Recommendations Using Linear Discriminant Analysis

Linear discriminant analysis was used to distinguish between investors who recommend Bitcoin and those who do not. As shown in Table 6, with an accuracy of 43%, the analysis demonstrated that the model struggled to correctly classify the investors. The precision and recall metrics further indicate that the model is not effective at confidently predicting who will recommend Bitcoin investment, likely because the data used do not provide clear discrimination between the groups. This suggests that additional variables or more data may be necessary to improve the accuracy of this analysis.

Table 6. *Linear Discriminant Analysis: Prediction of Recommendation.*

Category	Precision	Recall	F1-Score	Accuracy
Do Not Recommend	67%	40%	50%	43%
Recommend	25%	50%	35%	

4.8. Identifying Key Determinants of Bitcoin Investment Behavior Through Factor Analysis

Factor analysis was conducted to identify the variables that contribute the most to latent factors in the data. As shown in Table 7, the amount invested had the largest contribution to the first factor, with a coefficient of 0.7072, suggesting that this variable is crucial in explaining the variance observed in the data. Age had the largest contribution to the second factor, with a coefficient of 0.3011. The analysis reveals that the amount invested and age are the primary underlying determinants of Bitcoin investment behavior, while other variables, such as gender and education, have less impact.

Table 7. *Factor Analysis: Contribution of Variables to Factors.*

Category	Factor 1	Factor 2
Gender	-0.5009	-0.3606
Age	0.3011	-0.5151
Education	0.1587	0.0034
Amount Invested	0.7072	-0.0450
Return Obtained	-0.0511	-0.1625

5. Discussion

The findings of this study reflect trends observed in recent research on cryptocurrency investment behavior and the viability of Bitcoin as an investment asset. The analysis of the association between investment recommendations, gender, education level, and age group, which did not show statistical significance in the Chi-Square test, aligns with prior studies that suggest external factors, often behavioral, may influence investment decisions.

Recent studies indicate that gender is becoming less relevant in cryptocurrency investment decisions. Alonso et al. highlight that the democratization of access to the cryptocurrency market through online trading platforms and financial apps is making investments more accessible to both men and women [24]. This growing involvement of women in digital finance might explain why gender was not a clear determinant in Bitcoin investment recommendations in this study.

Furthermore, James and Menzies reinforce that the profile of cryptocurrency investors is diversifying as the market matures [25]. Bitcoin, previously dominated by male investors, is increasingly being adopted by women, driven by growing confidence in financial knowledge. This shift is consistent with the study's findings, where gender did not significantly influence investment recommendations.

However, education level showed a marginally significant relationship with investment recommendations (p-value of 0.084), suggesting that higher education may play an important role. Studies like Thind and Ray emphasize that financial literacy is crucial in enabling individuals to make informed decisions about digital asset investments [26]. Financial education and confidence in understanding cryptocurrencies may therefore be more influential than gender in investment decisions, highlighting the need for more educational programs for investors.

The analysis of investment returns between men and women, using the Student's t-test, did not reveal statistically significant differences, which is consistent with the findings of Sukumaran et al., who also found no significant relationship between gender and cryptocurrency investment returns [27]. This suggests that investment strategy plays a more prominent role in performance than gender, making demographic characteristics less relevant in the volatile cryptocurrency market.

However, various studies indicate that men are more likely to invest in cryptocurrencies than women. Research shows that less than 10% of consumers are willing to invest, with male interest being more than double that of women [28]. Additionally, women's lower financial literacy regarding cryptocurrencies contributes to a reduced interest in investing and a diminished perception of the economic potential of digital assets [29]. Sudzina et al. findings further highlight this gender gap, suggesting that women tend to invest less and perceive lower economic potential compared to men [30]. These results indicate that, although there is no

statistical difference in returns, cultural and educational factors may influence the willingness to invest in cryptocurrencies.

The comparison between conservative and risk-seeking investors using the Mann-Whitney U test revealed a statistically significant difference in returns, with risk-seeking investors earning substantially higher returns. This finding supports existing literature, such as Pruser, which demonstrates that cryptocurrency investors often engage in high-risk behavior to maximize returns, albeit with greater volatility and uncertainty [31].

The Pearson correlation analysis between amount invested and returns found no significant relationship. While it might be intuitive to expect that larger investments yield higher returns, the results did not indicate a linear relationship between these variables. Doumenis et al. suggest that extreme volatility in cryptocurrencies may prevent a clear correlation between the amount invested and returns, a conclusion that aligns with the findings of this research [32].

Additionally, the logistic regression indicated that variables such as age and returns had little influence on investment recommendations, with an accuracy of only 43%. This result is consistent with Tandon et al., who highlight the role of social media and external influences in shaping cryptocurrency investment decisions, suggesting that subjective or external factors may have a greater impact on recommendations [33].

Finally, the linear discriminant analysis proved ineffective in classifying investors by their investment recommendations, reinforcing the need for additional data or variables to improve the model's accuracy. The factor analysis showed that amount invested and age were the most influential variables in latent factors related to Bitcoin investment behavior. These results suggest that the amount invested and age are the primary determinants of investment behavior, while gender and education have a smaller impact.

These findings emphasize the importance of considering multiple factors, such as financial education and risk tolerance, to better understand cryptocurrency investment decisions and promote a more inclusive and informed market.

6. Conclusions, Limitations, and Recommendations

6.1. Conclusions

This study aimed to evaluate the viability of Bitcoin investment in the city of Maputo, Mozambique, by analyzing the motivations of investors and the potential returns based on quantitative and qualitative data. The findings indicate that, while there is a growing interest in Bitcoin among local investors, the investment is heavily influenced by the cryptocurrency's volatility and the lack of specific regulation in the country.

Quantitative analysis revealed no significant association between gender and the recommendation of Bitcoin investment, aligning with recent studies that suggest the profile of cryptocurrency investors is diversifying. However, there was a marginally significant relationship between education level and investment recommendations, indicating that individuals with higher financial literacy are more inclined to view Bitcoin favorably.

Furthermore, the analysis of investment returns found no significant differences between the returns of men and women, reinforcing the idea that performance in Bitcoin investment is more related to strategy than demographic factors. However, the comparison between conservative and risk-seeking investors showed that the latter tend to achieve significantly higher returns, reflecting the speculative nature of the cryptocurrency market.

Overall, the results suggest that, while Bitcoin can be a viable investment option for certain investor profiles in Maputo, there is an urgent need for greater financial education and clear regulation to mitigate the risks associated with its volatility and the lack of investor protection.

6.2. Limitations

This research faced several limitations that should be considered when interpreting the results:

Small and Non-Probabilistic Sample: The sample size (23 investors) was relatively small and non-probabilistic, which limits the generalization of the findings to the broader population of Bitcoin investors in Mozambique. Additionally, the anonymity of cryptocurrency transactions made it difficult to access data on the target population, further limiting the representativeness of the sample.

Bitcoin's Volatility: Bitcoin's highly volatile nature may have influenced the perceptions and reported outcomes of the investors during the data collection period. As Bitcoin prices fluctuate drastically over short periods, the returns observed may not reflect consistent patterns over time.

Lack of Local Regulation: The absence of a clear regulatory framework for cryptocurrencies in Mozambique was a significant limitation. The lack of formal guidelines and a centralized regulatory body affects investor protection and may have influenced responses, particularly regarding trust in the security of Bitcoin as an investment.

Self-Reported Data: Both the quantitative and qualitative data relied on self-reported information from participants, which introduces the potential for response bias or inaccuracies, especially regarding financial returns from Bitcoin investments.

Generalizability of Results: Given these limitations, the results of this study should be interpreted cautiously, particularly concerning their applicability to other contexts or countries. Mozambique has a unique socio-economic environment, and the challenges faced by local investors may not be directly comparable to regions with more established cryptocurrency regulations.

6.3. Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the understanding and management of Bitcoin investment in Mozambique:

Promote Financial Education on Cryptocurrencies: Community organizations and institutions with expertise in Bitcoin should provide seminars, workshops, and forums to share knowledge and experiences regarding the viability of Bitcoin investment as a source of income. Given the scarcity of information about Bitcoin, widespread educational initiatives can help potential investors make informed decisions.

Consider Legalization and Regulation of Bitcoin: While this study did not focus on the legal aspects of cryptocurrency, it is recommended that the Central Bank of Mozambique consider the legal status of Bitcoin. By establishing clear regulations, investors would have recourse in cases of fraud or legal disputes, providing greater security and confidence in the market.

Encourage Banking Sector Involvement: The banking sector should engage in discussions regarding the use of cryptocurrencies, as banks are often intermediaries in acquiring Bitcoin through digital platforms. Their perspective on the potential risks and benefits of cryptocurrency could play a crucial role in shaping public opinion and regulatory policies.

Expand Research on Bitcoin Volatility: Future research should expand the sample size and geographic scope to provide a more comprehensive analysis of the risks and potential returns associated with Bitcoin investment in Mozambique. Comparing Bitcoin's performance with traditional investments, such as stocks, could also provide valuable insights for investors.

By addressing these recommendations, Mozambique can foster a more informed and secure environment for cryptocurrency investment, balancing the potential benefits of Bitcoin with the necessary safeguards to protect investors.

Author Contributions

Cláudio Massingarela: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Software, Writing – original draft

Rabeca Cuna: Data curation, Formal Analysis, Funding acquisition, Methodology, Supervision, Validation, Writing – original draft

Alberto Daniel: Formal Analysis, Funding acquisition, Methodology, Validation

Filipe Mahaluca: Formal Analysis, Methodology, Software, Validation, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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