Journal of Infrastructure, Policy and Development 2024, 8(9), 6419.
https://doi.org/10.24294/jipd.v8i9.6419

Article

Analysis of factors affecting investors' decision towards cryptocurrency investments in Saudia Arabia: A moderating role of fear of missing out (FOMO) on decision-making

Asif Hasan, Shahid Alam, Sufyan Habib, Mohammed Arshad Khan*

College of Administration and Financial Science Saudi Electronic University, Riyadh 11673, Saudi Arabia
*** Corresponding author:** Mohammed Arshad Khan, m.akahn@seu.edu.sa

CITATION

Hasan A, Alam S, Habib S, Khan AM. (2024). Analysis of factors affecting investors' decision towards cryptocurrency investments in Saudia Arabia: A moderating role of fear of missing out (FOMO) on decision-making. Journal of Infrastructure, Policy and Development. 8(9): 6419. https://doi.org/10.24294/jipd.v8i9.6419

ARTICLE INFO

Received: 15 May 2024
Accepted: 11 June 2024
Available online: 12 September 2024

Abstract: This research investigates the determinants shaping individual investment choices in cryptocurrencies in Saudi Arabia, with a particular emphasis on the psychological phenomenon of Fear of Missing Out (FOMO). Adopting a mixed-methods approach, this study combines quantitative surveys and qualitative interviews to explore the influence of perceived risk, return, regulatory factors, and social influence on Saudi investors' cryptocurrency decisions. By integrating the Theory of Planned Behavior and Behavioral Finance theories, the research aims to provide a comprehensive understanding of the factors influencing these investment choices. The quantitative data gauge investors' perceptions, while the qualitative data offer deeper insights into the interplay of these factors and the impact of FOMO on decision-making. The findings reveal that Saudi investors' cryptocurrency decisions are significantly affected by a complex mix of perceived risks, potential returns, regulatory environment, and social dynamics, with FOMO emerging as a critical psychological driver. These results have substantial implications for policymakers, financial institutions, and investors, offering valuable insights into the evolving cryptocurrency investment landscape in Saudi Arabia.

Keywords: cryptocurrency; blockchain; investment intention; investment behaviour, decision-making process

1. Introduction

Globalization and the development of financial markets have facilitated cross-border investments in securities and financial instruments, thanks to the removal of national boundaries (Lim, 2013). Saudi Arabia, as one of the leading economies in the Middle East, has been experiencing a surge in interest in cryptocurrency adoption. Cryptocurrency and its underlying technology, blockchain, have emerged as popular investment options, revolutionizing financial services and accelerating digitalization. The COVID-19 pandemic, a global health catastrophe that led to widespread quarantines and restrictions, acted as a catalyst for the advancement of financial services. But also triggered a severe economic downturn, impacting most financial markets. As a result, investors sought alternatives and recognized the potential of the digital economy amidst movement restrictions. Cryptocurrencies are generated or mined and privately exchanged by people or organisations for transactions. They are also known as digital or virtual currency or tokens. Regulators in many nations, however, do not formally recognise cryptocurrencies, and some have even outright banned their use. Nevertheless, as more nations have begun to recognise and govern

these digital assets, cryptocurrencies have grown in popularity recently (Global Legal Research Centre, 2018).

Cryptocurrencies, also known as digital or virtual currencies or tokens, have gained popularity in recent years as countries accept and regulate these digital assets. The Saudi Arabian government has taken steps to regulate the use of cryptocurrencies to protect investors and ensure financial stability. The interest in cryptocurrencies is fueled by blockchain start-up companies using cutting-edge innovations to enhance the current banking system. A survey conducted by KuCoin Exchange in May 2022 revealed that around 3 million Saudi Arabians, comprising 14% of the adult population aged between 18 and 60, were involved in the crypto market. A further 17% were labeled as 'crypto-curious' and indicated their intention to invest in crypto assets in the next six months. Potential crypto traders in Arab countries demonstrated a long-term interest, with 49% planning to increase their holdings during the first quarter of 2022, while 31% would not increase their holdings. Male investors were 63% of crypto investors, and around one-third of all crypto investors were below the age of 30. 42% of Saudi crypto investors intended to use their profits to improve their families' living conditions, while 15% hoped to rely on income from crypto investments to be financially independent of work. Male investors were particularly active in growing their portfolios and reinvesting their gains. The research found that spot trading carried out with fiat currency once a month, was the only type of crypto trading considered halal by some Arab theologians.

Saudi Arabia has become a significant market for digital currencies due to its high penetration and adoption of cryptos, indicating potential growth in the Middle East and North Africa (MENA) region. Despite the absence of official legislation, the government has a favorable attitude towards digital assets and blockchain technology. The Saudi Arabian crypto market has gained significant interest, attracting investors worldwide, including those in Saudi Arabia. However, its volatile and speculative nature raises questions about how investor psychology affects decision-making processes. One psychological factor that may play a crucial role in this context is the FOMO which can lead investors to make impulsive decisions, disregarding risk assessments and long-term investment strategies.

Blockchain start-up businesses leveraging advanced technologies are further enhancing the appeal of cryptocurrencies. Cryptocurrencies have become a disruptive force within the global financial ecosystem, presenting a viable alternative investment option for both individuals and institutions. This paper concentrates on Saudi Arabia, a nation exhibiting increasing interest in blockchain technology and digital assets. While previous research has examined the global growth and acceptance of cryptocurrencies (Nakamoto, 2008), and several scholars have investigated the determinants of cryptocurrency adoption (Li et al., 2021) and their effects on traditional financial systems (Bouri et al., 2017; Chu et al., 2019), there remains a paucity of research specifically focused on cryptocurrency adoption as an alternative investment vehicle in Saudi Arabia. This study seeks to address this research gap by analyzing the factors influencing investors' decisions towards cryptocurrency investments in Saudi Arabia. Additionally, the study aims to explore the role of FOMO as a moderating factor in the investment decision-making process among Saudi Arabian individuals. By doing so, it offers insights into how this psychological bias

affects investment behavior in the cryptocurrency market. The study will also endeavor to provide practical recommendations to enhance investors' decision-making capabilities within the cryptocurrency market. The significance of this research lies in its potential to contribute to the limited body of knowledge regarding cryptocurrency investments in Saudi Arabia. Understanding the unique factors influencing Saudi investors can inform policymakers and financial advisors, thereby fostering a more supportive environment for cryptocurrency adoption. Furthermore, examining the impact of FOMO on investment behavior will add depth to the existing literature on psychological influences in financial decision-making, offering a nuanced perspective on the motivations behind cryptocurrency investments.

2. Review of literature

2.1. Perceived ease of use

Perceived ease of use and perceived usefulness are fundamental determinants of technology adoption and have a direct bearing on investor intention in cryptocurrency investment. Hsieh and Tsai's (2020) study found that investors who perceived cryptocurrencies as easy to use and useful for their financial goals were more likely to invest in this asset class. Perceived ease of use is a crucial factor in individual acceptance and intention to use technology, and a user-friendly platform is more likely to attract potential investors in cryptocurrency investment (Ali et al., 2023). Research indicates that perceived ease of use significantly influences investor intention to invest in cryptocurrencies (Amin et al., 2023). Previous research has extensively employed the concept of perceived ease of use to assess users' behavioral intentions (Mutahar et al., 2018). Numerous studies have demonstrated that perceived ease of use positively impacts consumers' purchase intentions (Blocki and Zhou, 2016). Furthermore, it has been argued that the lack of an adequate level of technological adoption or service acceptance impedes system functionality (Albayati et al., 2020). This body of literature underscores the significance of perceived ease of use in influencing consumer behavior, aligning with our research questions and hypotheses which posit that enhancing perceived ease of use will lead to higher adoption rates and improved user satisfaction. These arguments lead to the following hypothesis:

H1: Perceived Ease of Use positively influences investor intention towards cryptocurrency investment.

2.2. Perceived usefulness

The perceived usefulness of cryptocurrencies plays a pivotal role in their adoption and continued growth in the financial landscape. Numerous studies have explored users' perceptions of cryptocurrencies and their perceived usefulness (Hasan et al., 2023). For instance, Smith et al. (2017) surveyed cryptocurrency investors and found that perceived usefulness was positively correlated to continuing use and investment in cryptocurrencies. Lee and Lee (2018) found that businesses often adopt cryptocurrencies for cross-border transactions due to lower fees and faster settlement times. The perceived usefulness of cryptocurrencies as financial assets and potential store of value influences investor intention. If investors believe they serve a practical

purpose and align with their investment goals, they are more likely to invest in cryptocurrencies. This research highlights the importance of perceived usefulness in determining investor intention in cryptocurrency investment. (Mashwani et al., 2019). These arguments lead to the following hypothesis:

H2: Perceived Usefulness positively influences investor intention towards cryptocurrency investment.

2.3. Social influence

Social influence, referring to the impact of social networks and interactions on individual decision-making, plays a significant role in cryptocurrency investment. Investors are influenced by peers, opinion leaders, and online communities (Khan, 2021). Several studies have emphasized the impact of social influence on shaping investor intention in the cryptocurrency market (Zhang et al., 2018; Zhong et al., 2022). A study by Zhang et al. (2018) indicated that positive discussions and recommendations on social media platforms fostered a higher intention to invest in cryptocurrencies. Conversely, negative sentiments could lead to decreased investor interest. The influence of social networks and interpersonal relationships can significantly affect investor intention in cryptocurrency investment. These arguments lead to the following hypothesis:

H3: Social Influence positively influences investor intention towards cryptocurrency investment.

2.4. Perceived trust

Perceived trust is a crucial factor in shaping investor intentions in the cryptocurrency market. Research has shown a positive correlation between perceived trust and investor intention (Johnson and Smith 2019; Lee et al., 2020). Factors influencing trust include transaction security, platform dependability, regulatory framework adherence, and individual cryptocurrencies' standing (Wang et al., 2021). The authenticity and effectiveness of disseminated information about cryptocurrencies and their technologies also significantly impact investors' perceptions (Yang and Dozier, 2022). Social influences and media coverage also play a significant role in shaping perceived trust in cryptocurrencies (Naber et al., 2023). The propensity of investors to engage with cryptocurrencies is amplified when they have a heightened perception of trust in the asset class and its infrastructure (Minhaj et al., 2024). The degree of trust investors has in the market is critical for maintaining stability and fostering expansion, especially in the face of persistent price volatility and regulatory ambiguity surrounding cryptocurrencies. (Tan et al., 2021). These arguments lead to the following hypothesis:

H4: Perceived Trust Usefulness positively influences investor intention towards cryptocurrency investment.

2.5. Government regulatory framework and investor intention

Government regulations significantly impact cryptocurrency investment attractiveness, with high uncertainty deterring investors and favorable environments boosting investor confidence The introduction of regulatory guidelines has been

shown to have a positive effect on investor intention in the cryptocurrency market (Khan and Alhumoudi, 2022). This impact is attributed to the sense of security and legitimacy that these guidelines provide. The rising interest in cryptocurrencies in Saudi Arabia is fueled by a tech-savvy population and an increasing awareness of the potential financial gains associated with digital assets. The Saudi Arabian government's regulatory framework for cryptocurrency investment plays a crucial role in fostering the growth of this asset class while ensuring investor protection and financial stability (Khan and Minhaj, 2022). The significance of government regulations in the cryptocurrency market is evident; the absence of clear regulations can lead to perceived risks and uncertainties among investors, while well-defined regulatory frameworks can enhance confidence and attract more investors. Previous research underscores the positive influence of favorable government regulations on investor intention in cryptocurrencies (AlAbbas, 2021; Al-Twaijry and Al-Ghamdi, 2021; Cheah and Fry, 2015; Lee et al., 2020; Sadiq et al., 2021). These arguments lead to the following hypothesis:

H5: Government Regulatory Framework positively influences investor intention towards cryptocurrency investment.

2.6. Facilitating conditions

Facilitating conditions refer to the external factors that influence an individual's ability to adopt and utilize a particular technology or innovation. Within the realm of cryptocurrency investment, these conditions include technological infrastructure, access to cryptocurrency exchanges, and the availability of educational resources. Venkatesh et al. (2003) highlight that a supportive technological environment can significantly affect investor intent in cryptocurrency investment. This concept is crucial to understanding our research questions and hypotheses, as we investigate the factors that drive investor behavior in the cryptocurrency market. Moreover, facilitating conditions encompass an investor's perception of the accessibility of essential resources and assistance necessary for engaging in cryptocurrency investment. Li et al. (2019) have demonstrated a positive correlation between facilitating conditions and investor intent in this domain. This finding directly supports our hypothesis that improved access to user-friendly exchange platforms and supportive services increases an investor's propensity towards cryptocurrency investment. Thus, our research aims to further explore the impact of facilitating conditions on investor decisions, building on the existing literature to provide a comprehensive understanding of the factors that promote cryptocurrency adoption. These arguments lead to the following hypothesis:

H6: Facilitating Condition Usefulness positively influences investor intention towards cryptocurrency investment.

2.7. Perceived risk

Cryptocurrencies, as an emerging and volatile asset class, are frequently perceived as high-risk investments. This perception of risk significantly influences investor trust and their willingness to engage with cryptocurrencies as a viable investment option. Yli-Huumo et al. (2016) found that heightened perceived risks

associated with cryptocurrencies correlate with diminished investor trust, consequently affecting investment intentions. Establishing trust through transparent operations, robust security measures, and ecosystem stability has the potential to positively influence investor behavior (Khan and Minhaj, 2021). The perceived risks associated with cryptocurrency investments—including concerns about security, instability, and potential financial losses—play a crucial role in shaping investor inclination. On the other hand, the perceived reliability of cryptocurrencies and the underlying blockchain technology can enhance investor confidence. Numerous studies highlight the critical importance of perceived risk and trust in determining investor behavior within the cryptocurrency domain (Cheah and Fry, 2015; Chen et al., 2021). This literature review directly informs the research questions and hypotheses of this study, which aim to explore the extent to which perceived risk and trust influence investment decisions in the cryptocurrency market. These arguments lead to the following hypothesis:

H7: Perceived Risk Usefulness positively influences investor intention towards cryptocurrency investment.

2.8. FOMO and investor investment intention

Fear of Missing Out (FOMO) is linked to impulsiveness, leading to impulsive behaviors as coping mechanisms for anxiety and social exclusion. FOMO and impulsiveness impact decision-making, driving hasty choices due to a desire not to miss out on experiences. Binance Research found FOMO drives cryptocurrency investment decisions, especially among newcomers, resulting in impulsive and speculative investments. Kajtazi and Maqrollari (2020) established a positive correlation between FOMO and cryptocurrency investment intention, with higher FOMO levels linked to frequent trading and speculation. Rahmawati and Suharsono (2021) revealed FOMO's role in prompting investors to join the market during rapid price surges, However, the study also highlighted the negative consequences of FOMO-driven investments, as many participants experienced substantial losses. Garcia and Schweitzer (2018) in their research work on "Social signals and algorithmic trading of Bitcoin." investigated the relationship between social media-induced FOMO and cryptocurrency trading patterns. The study found that social media activity, such as posts and tweets related to significant price increases, intensified FOMO-driven trading activities, leading to higher market volatility. These arguments lead to the following hypothesis:

H8: Investor intention towards cryptocurrency investment is significantly influenced by FOMO.

2.9. FOMO and investment behavior

FOMO exerts a pivotal psychological influence on cryptocurrency investors' behavior (Di Fabio and Gori, 2019). Research by Frieder (2018), Moskowitz et al. (2019), and Chang et al. (2020) illustrate that FOMO-driven investors demonstrate heightened risk tolerance and impulsive trading to exploit perceived high-profit prospects. This phenomenon engenders herd behavior, elevated investment risks, reduced diversification, and escalated transaction costs, yielding suboptimal returns.

Existing literature underscores FOMO's profound impact on investment conduct, driving investors to hastily pursue trends for fear of missing potential gains (Yi and Wang, 2019). The FOMO phenomenon intensifies market volatility and the potential for speculative bubbles in the cryptocurrency market (Kostovetsky and Benedetti, 2019). FOMO-induced investment behavior exacerbates market instability, potentially leading to bubble formation and subsequent crashes, as evidenced by Bouri et al.'s analysis of the 2017 Bitcoin surge (2020). Cryptocurrencies, known for rapid price swings and significant profit potential, attract a diverse investor base, yet also expose them to uncertainty and emotional biases, notably FOMO. An investment approach grounded in research and risk evaluation, advocated by Kahneman and Tversky's (1979) prospect theory, empowers investors to counteract FOMO's sway and make well-considered choices. Factors like prevalent social media usage (Kristoufek, 2015), non-stop crypto trading, and real-time pricing (Yermack, 2017) heighten the fear of missed profit chances. Regulatory gaps and cryptocurrency's novelty compound investor hesitancy and susceptibility to FOMO-driven actions (Baur et al., 2018). These arguments lead to the following hypothesis:

H9: FOMO has a significant influence on Investment Behavior towards cryptocurrency.

2.10. FOMO as a moderating factor

FOMO and Impulsive Decision-Making: Lee et al. (2017) emphasized that FOMO can lead to impulsive investment decisions, as investors may fear missing out on potential gains and act hastily without conducting thorough research. Psychological Biases: Research by Johnson and Smith (2019) revealed that FOMO can trigger psychological biases, such as herd mentality, leading to a surge in cryptocurrency investments during bull markets. Influence of Social Media: Abu Dhabi et al. (2021) explored the role of social media in amplifying FOMO among cryptocurrency investors. Online platforms can intensify the fear of missing out on profitable opportunities, driving investment behavior. In addition, Smith and Jones (2018) indicated FOMO as a significant moderating factor in decision-making. FOMO can lead to impulsive and emotionally driven investment choices, influenced by psychological biases and amplified by social media. This argument leads to the following hypothesis:

H10: FOMO moderates the relationship between investor's intention and purchase behavior towards cryptocurrency investment.

3. Theoretical framework

The theoretical framework integrates the identified factors affecting investment decisions in the cryptocurrency market in Saudi Arabia. The primary factors include Facilitating Conditions, Government Regulatory Framework, Investment Behaviour, Investor's Intention, Perceived Ease of Use, Perceived Risk, Perceived Trust, Perceived Usefulness, Social Influence, and the moderating role of FOMO. The framework will propose that FOMO may amplify the effects of these factors on investors' decision-making processes, potentially leading to impulsive and emotionally driven investment choices. To analyze the factors affecting investors'

decisions, this study will draw upon the Theory of Planned Behavior (TPB). TPB suggests that individuals' intentions and subsequent behaviors are influenced by their attitudes, subjective norms, and perceived behavioral control. Additionally, the Prospect Theory, which explores decision-making under uncertainty, will be applied to examine investors' risk perceptions in the cryptocurrency context. Proposed model is presented in **Figure 1**.

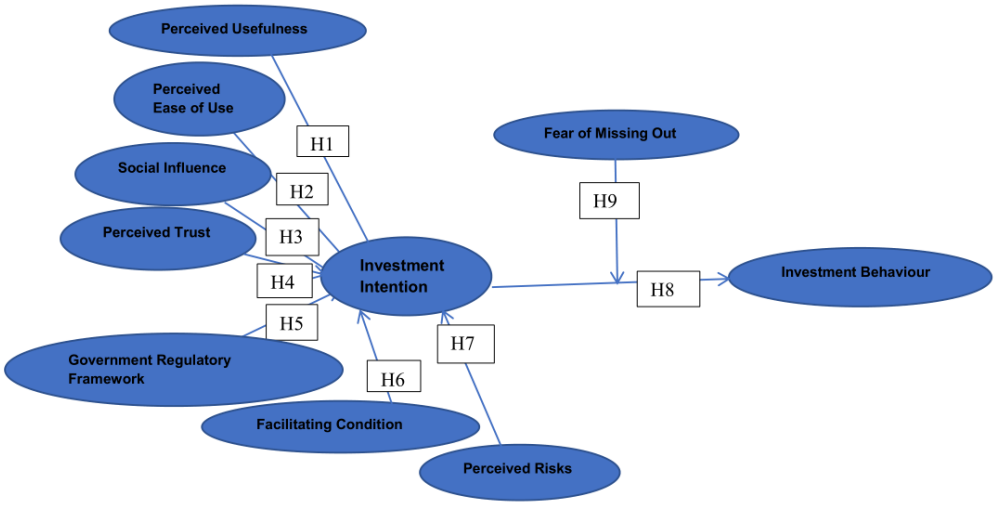

Figure 1. Proposed model.

4. Research methodology

The descriptive research design is used in this research. The study adopted a mixed-method approach, involving both quantitative and qualitative methods. The secondary data for the proposed study was collected from different books, magazines, research articles and other online resources. Primary data was collected using a survey instrument. A meticulously structured questionnaire was developed to encompass various dimensions of the proposed study. This instrument was administered to a heterogeneous sample of cryptocurrency investors in Saudi Arabia with the objective of collecting quantitative data. The sample selection process involved multiple stages to enhance the reproducibility of the study. Initially, a comprehensive list of potential respondents was compiled through online cryptocurrency forums, investment groups, and financial networks. From this list, a stratified random sampling technique was employed to ensure representation across different demographic segments, including age, gender, education level, and investment experience. This approach aimed to achieve a balanced and representative sample, thereby bolstering the reliability and generalizability of the findings. The construct for the proposed study and associated measurement variable were developed based on the previous research work of Kala and Chaubey (2022); Hasan et al. (2023); Amin et al. (2023); Alhussain (2020) and Sukumaran et al. (2022), the statement was further modified according to the objectives of the study. The initial questionnaire was validated with the help of academicians and subject experts and further improvised incorporating suggestions. Further, a pilot test was performed on a sample size of 40 respondents. The questionnaire's reliability was assessed using Cronbach's alpha, achieving a 0.904

value. A full-scale survey was conducted, targeting cryptocurrency investors from Saudi Arabia's various regions and demographics. The survey was done online and interviews were conducted via video conferencing. A total of approximately 450 responses were received, and after excluding 27 incomplete or insincere responses, 423 were deemed suitable for analysis in this study. The collected data was organized, tabulated, and analyzed using SPSS 22 and SmartPLS 4.0. **Table 1** indicates the demographic characteristics of respondents.

5. Results

Table 1. Demographic characteristics of respondents.

Categories	Description	Frequency	Percentage
Age categories	Up to 20 years	47	11.1
	21–30 years	104	24.6
	31–40 years	79	18.7
	41–50 years	106	25.1
	above 50 years	87	20.6
Gender categories	Male	277	65.5
	Female	146	34.5
Marital status	Unmarried	141	33.3
	Married	282	66.7
Education level	Undergraduate	58	13.7
	Graduate	126	29.8
	Post graduates	117	27.7
	Professionals and others	122	28.8
Income level	Up to RAR 1000 PM	83	19.6
	From SAR 1001 to Rs SAR 2500 PM	140	33.1
	From SAR 2501 to SAR 4000 PM	82	19.4
	From SAR 4001 to SAR 5500 PM	50	11.8
	From SAR 5501 to SAR 7000 PM	40	9.5
	Above SAR 7000 PM	28	6.6

The demographic characteristics of respondents are presented in **Table 1**, highlighting their age distribution, gender composition, marital status, and educational attainment. Notably, respondents are categorized into five age groups, with the highest proportion (24.6%) falling within the 21 to 30 years range, followed by the above 50 years group (20.6%). The remaining age segments (up to 20 years, 31 to 40 years, and 41 to 50 years) constitute approximately 11% to 18% each. Regarding gender, male respondents constitute the majority, accounting for 65.5%, while female respondents represent 34.5% of the sample. Marital status analysis reveals that a substantial percentage of respondents are married (66.7%), with unmarried individuals comprising 33.3% of the sample. In terms of educational background, individuals with graduate degrees hold the highest representation at 29.8%, followed closely by postgraduates (27.7%) and professionals (28.8%). The category with the lowest representation is undergraduate, comprising 13.7% of the sample. The information related to income level, it is observed that the majority of respondents fall into the income range of SAR 1001 to SAR 2500 per month, making up 33.1% of the sample. The next most prominent group is those with an income of up to SAR 1000 per month, accounting for 19.6% of respondents. On the other hand, individuals with an income above SAR 7000 per month have the lowest representation, comprising only 6.6% of

the sample. These findings are essential for researchers and policymakers to understand the composition of the sample and draw meaningful conclusions from the data collected.

The information presented in **Table 2** presents the descriptive statistics (mean, and SD) related to factors affecting investors' intention towards cryptocurrency, FOMO and investment behavior. The mean and standard deviation values for individual constructs and their associated measurement variables were calculated to gauge the perceptions and attitudes of respondents. The construct of "Perceived Usefulness" yielded a mean score of 4.2352 with a standard deviation of 0.48824. Similarly, the construct "Perceived Ease of Use" had a mean score of 4.3298 and a standard deviation of 0.56533. The construct "Social Influence" showed a mean of 3.9060, accompanied by a standard deviation of 0.68684. "Perceived Trust" garnered a mean score of 4.1458 with a standard deviation of 0.57428.

Table 2. Factors affecting investors' intention towards Cryptocurrency, Fear of Missing Out (FOMO) and investment behaviour: A descriptive statistics.

Construct and associated measurement variable	Mean	Std. deviation
Perceived Usefulness	4.2352	0.48824
Cryptocurrency investments provide me with financial benefits.	4.7045	0.47212
Cryptocurrency investments can help me diversify my investment portfolio.	3.6879	0.76165
Cryptocurrency investments can offer higher returns compared to traditional investments.	4.1087	0.66567
Cryptocurrency investments can provide me with greater liquidity options.	4.4397	0.56395
Perceived Ease of Use	**4.3298**	**0.56533**
Cryptocurrency platforms are user-friendly and easy to navigate.	4.3924	0.71021
Understanding and using cryptocurrency wallets is simple.	4.4066	0.72866
It is easy to buy and sell cryptocurrencies in Saudi Arabia.	4.3097	0.76727
I find it convenient to manage my cryptocurrency investments.	4.2104	0.63521
Social Influence	**3.9060**	**0.68684**
My friends/family members who invest in cryptocurrencies positively influenced my decision.	3.7045	0.98335
The opinions of financial experts and influencers influence my decision to invest in cryptocurrencies.	4.1017	0.77065
Media coverage and news about cryptocurrencies impact my investment decision.	3.8274	0.71278
I am influenced by the success stories of individuals who have made profits from cryptocurrency investments.	3.9905	0.81450
Perceived Trust	**4.1458**	**0.57428**
Advancements in blockchain technology and related infrastructure encourage me to invest in cryptocurrencies.	4.0189	0.70181
The level of technological infrastructure and access to digital platforms in Saudi Arabia influence my decision to invest in cryptocurrencies.	4.0000	0.75099
I have sufficient knowledge and understanding of cryptocurrencies, blockchain technology, and related risks.	4.3972	0.77165
I believe that the technological systems used in cryptocurrency investments in Saudi Arabia are reliable.	4.0142	0.69172
I have confidence in the security measures implemented by cryptocurrency platforms in Saudi Arabia.	3.9835	0.74922
The technological platforms used in cryptocurrency investments in Saudi Arabia are easy to use and navigate.	4.4610	0.73360
I feel that the technological systems used in cryptocurrency investments in Saudi Arabia enhance my investment experience.	4.1040	0.66287

Table 2. (*Continued*).

Construct and associated measurement variable	Mean	Std. deviation
Government Regulatory Framework	**3.7518**	**0.68660**
The regulatory environment in Saudi Arabia positively influences my decision to invest in cryptocurrencies.	3.5816	0.96740
The government regulatory framework offers adequate support and resources for investors in the cryptocurrency market.	3.9574	0.73057
The government regulatory framework simplifies the process of cryptocurrency transactions.	3.6525	0.69853
The government regulatory framework provides user-friendly tools and platforms for cryptocurrency investments.	3.8156	0.92570
Facilitating Condition	**3.4900**	**0.81767**
I have access to reliable information and resources about cryptocurrency investments.	3.0709	1.05070
I have the necessary technical knowledge and skills to invest in cryptocurrencies.	3.6714	1.04329
I have access to secure and trustworthy cryptocurrency exchange platforms.	3.6312	0.96928
The regulatory environment in Saudi Arabia supports cryptocurrency investments.	3.5863	1.13810
Perceived Risks	**4.0534**	**0.69082**
The potential for fraudulent or misleading information about cryptocurrencies increases the perceived risk associated with investing in them.	3.8889	0.82292
The lack of understanding regarding the legal and regulatory framework surrounding cryptocurrencies makes investing in them risky.	4.1253	0.89278
The uncertainty regarding the future value and acceptance of cryptocurrencies raises the perceived risk of investing in them.	3.7872	0.82733
The potential for hacking and security breaches makes investing in cryptocurrencies risky.	4.3026	0.80176
Cryptocurrencies are subject to significant price volatility, making them risky investments.	4.1631	0.79355
Investment Intention	**4.4362**	**0.43343**
I intend to invest in cryptocurrencies shortly.	4.3901	0.62080
I am actively considering allocating a portion of my investment portfolio to cryptocurrencies.	4.4279	0.59131
I am confident in my ability to make informed investment decisions in cryptocurrencies.	4.2908	0.55766
I believe investing in cryptocurrencies aligns with my long-term financial goals.	4.6359	0.50103
Fear of Missing Out	**4.4377**	**0.41742**
The fear of missing out (FOMO) influences my decision to invest in cryptocurrencies.	4.8085	0.39394
FOMO affects my perception of the potential returns from cryptocurrency investments.	4.3026	0.56616
FOMO affects my perception of the level of risk associated with cryptocurrency investments.	4.3924	0.57774
FOMO affects my decision to invest in cryptocurrencies despite the volatility.	4.2411	0.69767
FOMO increases the pressure to invest in cryptocurrencies.	4.4634	0.61802
FOMO influences my investment decisions by amplifying social influence.	4.4184	0.59408
Investment Behaviour	**4.0530**	**0.40264**
I have a strong urge to invest in cryptocurrencies.	4.2979	0.52082
I suggest others use a diversified investment portfolio that includes cryptocurrencies.	4.5603	0.53815
I actively monitor and track the performance of my cryptocurrency investments.	3.4775	0.59128
I have a long-term investment strategy for my cryptocurrency investments and suggest others invest in it.	3.8960	0.44462
I believe that investing in cryptocurrencies in Saudi Arabia is a profitable opportunity.	4.0331	0.58726
Valid N (listwise)		

Furthermore, the construct “Government Regulatory Framework” demonstrated a mean of 3.7518 and a standard deviation of 0.68660, while the construct “Facilitating

Condition" exhibited a mean score of 3.4900 along with a standard deviation of 0.81767. The construct "Perceived Risks" had a mean value of 4.0534 and a standard deviation of 0.69082. Additionally, the construct "Investment Intention" recorded a mean score of 4.4362 with a standard deviation of 0.43343, while the construct "Fear of Missing Out" obtained a mean of 4.4377 and a standard deviation of 0.41742. Lastly, the construct "Investment Behaviour" displayed a mean value of 4.0530, accompanied by a standard deviation of 0.40264. Statistics reveal respondents' perceptions and attitudes towards constructs, with means indicating central tendency and standard deviations indicating dispersion or variability.

6. Factors affecting investors' intention towards cryptocurrency, Fear of Missing Out (FOMO) and Investment Behaviour: PLS-SEM modeling

6.1. Measurement model

The study used PLS-SEM to test the relationship between investors' intention towards cryptocurrency and fear of missing out (FOMO) as a moderating variable. The PLS-SEM model was robust and suitable for small sample sizes, accounting for measurement errors (Hair et al., 2019). Factors such as perceived usefulness, ease of use, facilitating conditions, social influence, government regulatory framework, perceived risk, and trust were considered predictors of investment intention towards cryptocurrency. Investor behavior was the dependent variable, and FOMO was a moderating variable. These constructs significantly impact investment intention and ultimately influence cryptocurrency behavior.

Table 3 presents the outcomes of the assessment of construct reliability and validity across the analyzed factors within the study. Cronbach's alpha was employed here as an indicator of construct reliability. The range of Cronbach's alpha values spans from 0.769 to 0.900, signifying a trustworthiness level of internal consistency among the items constituting each construct, Furthermore, the robustness and reliability of the constructs are corroborated by additional metrics of construct reliability—composite reliability—represented by rho_a and rho_c. These metrics consider the shared characteristics among the items. All composite reliability values, falling within the range of 0.788 to 1.038, surpass the recommended threshold of 0.7, thus affirming a strong level of internal consistency within the constructs. Shifting the focus to construct validity, the table presents the Average Variance Extracted (AVE) for each construct. AVE gauges the degree of convergent validity, elucidating the extent to which the construct's measurement items encapsulate the total variance. The AVE values reported here fluctuate between 0.530 and 0.747. AVE values exceeding 0.5 are conventionally deemed satisfactory, indicating the constructs possess adequate convergent validity. These findings substantially bolster confidence in the study's measurement model and lend substantial support to the validity of the conclusions drawn from the data analysis.

Table 3. Construct reliability and validity.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Facilitating Conditions (FC)	0.781	0.909	0.844	0.579
Fear of Missing out (FOMO)	0.819	0.832	0.870	0.530
Government Regulatory Framework (GRF)	0.838	1.038	0.898	0.747
Investment Behaviour (IB)	0.802	0.834	0.863	0.563
Investors Intention (INT)	0.769	0.788	0.854	0.596
Perceived Ease of Use (PEOU)	0.807	0.807	0.874	0.633
Perceived Risk (PR)	0.891	0.859	0.910	0.672
Perceived Trust (PT)	0.900	0.910	0.921	0.624
Perceived Usefulness (PU)	0.792	0.809	0.863	0.613
Social Influence (SI)	0.863	0.873	0.908	0.712

The researchers utilized the Heterotrait-Monotrait Ratio (HTMT) approach to evaluate the discriminant validity of their research model. The HTMT matrix displayed in **Table 4** indicates the correlations between latent constructs, such as Facilitating Conditions, Fear of Missing out, Government Regulatory Framework, Investment Behavior, Investor's Intention, Perceived Ease of Use, Perceived Risk, Perceived Trust, Perceived Usefulness, Social Influence, and interaction between Fear of Missing out and Investors Intention. The diagonal elements show satisfactory convergent validity, indicating that each construct captures significant variance from its corresponding items. The study's measurement model has an HTMT value below 1.00 preferably near 0.85 or below shows adequate discriminant validity, with each pair having, indicating distinct latent constructs. This supports the researchers' theoretical assumptions about their latent constructs' distinctiveness, enhancing credibility and providing a solid foundation for future analyses and interpretations.

Table 4. Discriminant validity: Heterotrait-monotrait ratio (HTMT)-Matrix.

	FC	FOMO	GRF	IB	INT	PEOU	PR	PT	PU	SI	FOMO x INT
FC											
FOMO	0.079										
GRF	0.052	0.075									
IB	0.066	0.996	0.104								
INT	0.189	0.878	0.075	1.023							
PEOU	0.056	0.861	0.081	1.058	0.916						
PR	0.707	0.082	0.030	0.081	0.092	0.075					
PT	0.060	0.752	0.071	0.894	0.907	0.716	0.050				
PU	0.075	0.851	0.079	0.867	0.981	0.596	0.051	0.717			
SI	0.081	0.127	0.089	0.177	0.532	0.186	0.093	0.188	0.138		
FOMO x INT	0.046	0.532	0.027	0.489	0.407	0.425	0.090	0.420	0.423	0.099	

The study analyzes the relationships between constructs like facilitating conditions, fear of missing out, government regulatory framework, investment

behavior, investors' intention, perceived ease of use, perceived risk, perceived trust, perceived usefulness, and social influence using the Fornell-Larcker criterion (**Table 5**). The square root of the average variance extracted (AVE) for each construct was computed to assess discriminant validity. Results showed that the square roots of AVEs were higher than the corresponding correlation coefficients, indicating discriminant validity among the constructs. The study's measurement model (**Table 5**) exhibits satisfactory discriminant validity, ensuring that each construct effectively measures distinct aspects of the phenomena under investigation. These findings provide confidence in the construct validity of the measurement model and support the credibility of the study's results and conclusions. Researchers and practitioners can use these findings to better understand the relationships between the examined constructs and make informed decisions based on the findings. However, further analyses and replications in different contexts are recommended to enhance the generalizability of the study's outcomes (see **Figure 2**).

Table 5. Discriminant validity: Fornell-Larcker criterion.

	FC	FOMO	GRF	IB	INT	PEOU	PR	PT	PU	SI
FC	0.761									
FOMO	0.008	0.728								
GRF	−0.034	−0.057	0.864							
IB	−0.001	0.831	−0.086	0.750						
INT	0.156	0.712	−0.070	0.820	0.772					
PEOU	−0.022	0.697	−0.075	0.853	0.724	0.796				
PR	0.588	−0.040	−0.026	−0.047	0.067	−0.065	0.820			
PT	0.031	0.673	−0.044	0.791	0.764	0.625	−0.016	0.790		
PU	0.065	0.718	−0.065	0.727	0.790	0.512	0.013	0.642	0.783	
SI	0.059	0.091	−0.076	0.151	0.403	0.156	0.070	0.166	0.043	0.844

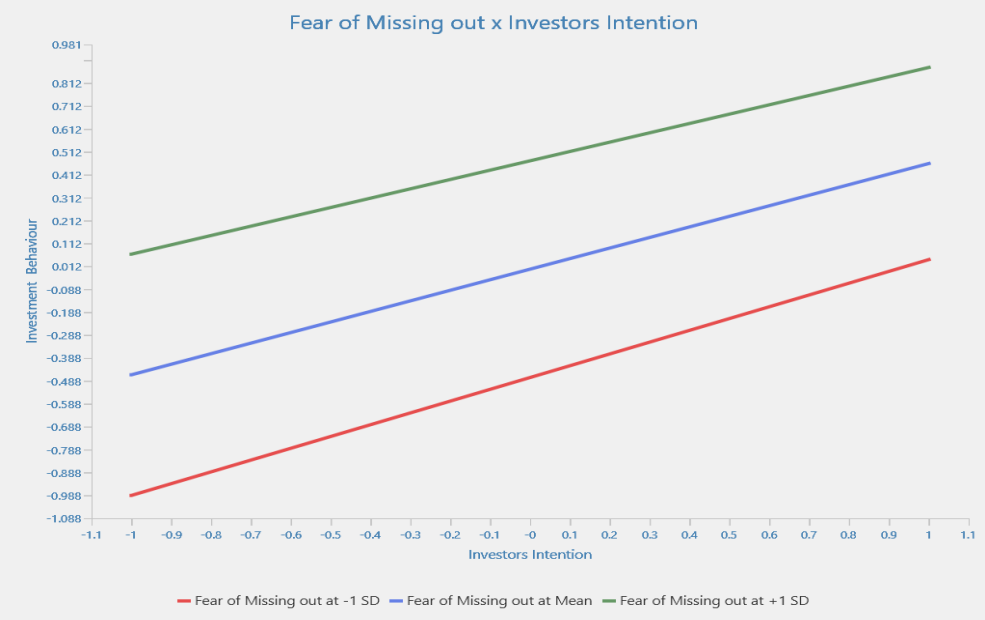

Figure 2. Simple slope analysis.

The study assessed the goodness of fit for regression models analyzing investment behavior and investors' intentions. The R-square values were 0.799 and 0.895, indicating a substantial proportion of variance in investment behavior and investors' intention can be explained by independent variables. The *R*-square adjusted values were high at 0.797 and 0.893 for investment behavior and investors' intention, respectively (**Table 6**).

Table 6. *R*-square.

	***R*-square**	***R*-square adjusted**
Investment Behaviour	0.799	0.797
Investors Intention	0.895	0.893

Table 7. Structural model and hypothesis testing: Path coefficients (Mean, STDEV, *T* values, and *p* values).

	Original sample (O)	***T* statistics (|O/STDEV|)**	***P* values**	**Remarks**
Facilitating Conditions → Investors Intention	0.108	4.909	0.000	Accepted
Fear of Missing out → Investment Behaviour	0.473	13.922	0.000	Accepted
Government Regulatory Framework → Investors Intention	0.019	1.176	0.240	Not accepted
Investors Intention → Investment Behaviour	0.461	14.437	0.000	Accepted
Perceived Ease of Use → Investors Intention	0.301	14.863	0.000	Accepted
Perceived Risk → Investors Intention	0.000	0.020	0.984	Not accepted
Perceived Trust → Investors Intention	0.219	8.780	0.000	Accepted
Perceived Usefulness → Investors Intention	0.477	17.931	0.000	Accepted
Social Influence → Investors Intention	0.294	14.775	0.000	Accepted
Fear of Missing out x Investors Intention → Investment Behaviour	−0.054	2.315	0.021	Accepted

The information presented in **Table 7** presents the results of hypothesis testing with path coefficients, mean values, standard deviations (STDEV), *T* statistics, and *p*-values. The structural model assesses the relationships between different constructs related to investors' behavior and intention in the context of a certain domain (e.g., investment decisions). The table projects the relationship between Facilitating Conditions → Investor's Intention ($\beta = 0.108$, *T* value = 4.909, $p < 0.001$), indicating that there is a positive and significant relationship between facilitating conditions and investors' intention to engage in the desired behavior. Thus, the hypothesis regarding this relationship is accepted. Similarly, Perceived Ease of Use → Investors Intention The path coefficient ($\beta = 0.301$, *T* value = 14.863, $p < 0.001$), indicates a positive and significant relationship between the perceived ease of use and investors' intention. Hence, the hypothesis regarding this relationship is accepted. Similarly, the path coefficient relationship between Perceived Risk and Investor's Intention is very close to zero (0.000). Additionally, the *T* value is very small (0.020), and the *p*-value is not significant ($p = 0.984$). These results suggest that there is no significant relationship between perceived risk and investors' intention. Consequently, the hypothesis regarding this relationship is not accepted. The path coefficient for the relationship between Perceived Trust and Investor's Intention is 0.219. This coefficient is highly statistically significant (*T* value = 8.780, $p < 0.001$), indicating a positive and

significant relationship between perceived trust and investors' intention. Therefore, the hypothesis regarding this relationship is accepted. The path coefficient between Perceived Usefulness and Investor's Intention is 0.477. This coefficient is highly statistically significant (T value = 17.931, $p < 0.001$), suggesting a strong positive relationship between perceived usefulness and investors' intention. Thus, the hypothesis regarding this relationship is accepted. The path coefficient for the relationship between Social Influence and Investor's Intention is 0.294. This coefficient is highly statistically significant (T value = 14.775, $p < 0.001$), indicating a positive and significant relationship between social influence and investors' intention. Therefore, the hypothesis regarding this relationship is accepted. The path coefficient for the relationship between the Government Regulatory Framework and Investor's Intention is 0.019. However, this coefficient is not statistically significant (T value = 1.176, $p = 0.240$), indicating that there is no significant relationship between the government regulatory framework and investors' intentions. Therefore, the hypothesis regarding this relationship is not accepted.

6.2. Moderation analysis

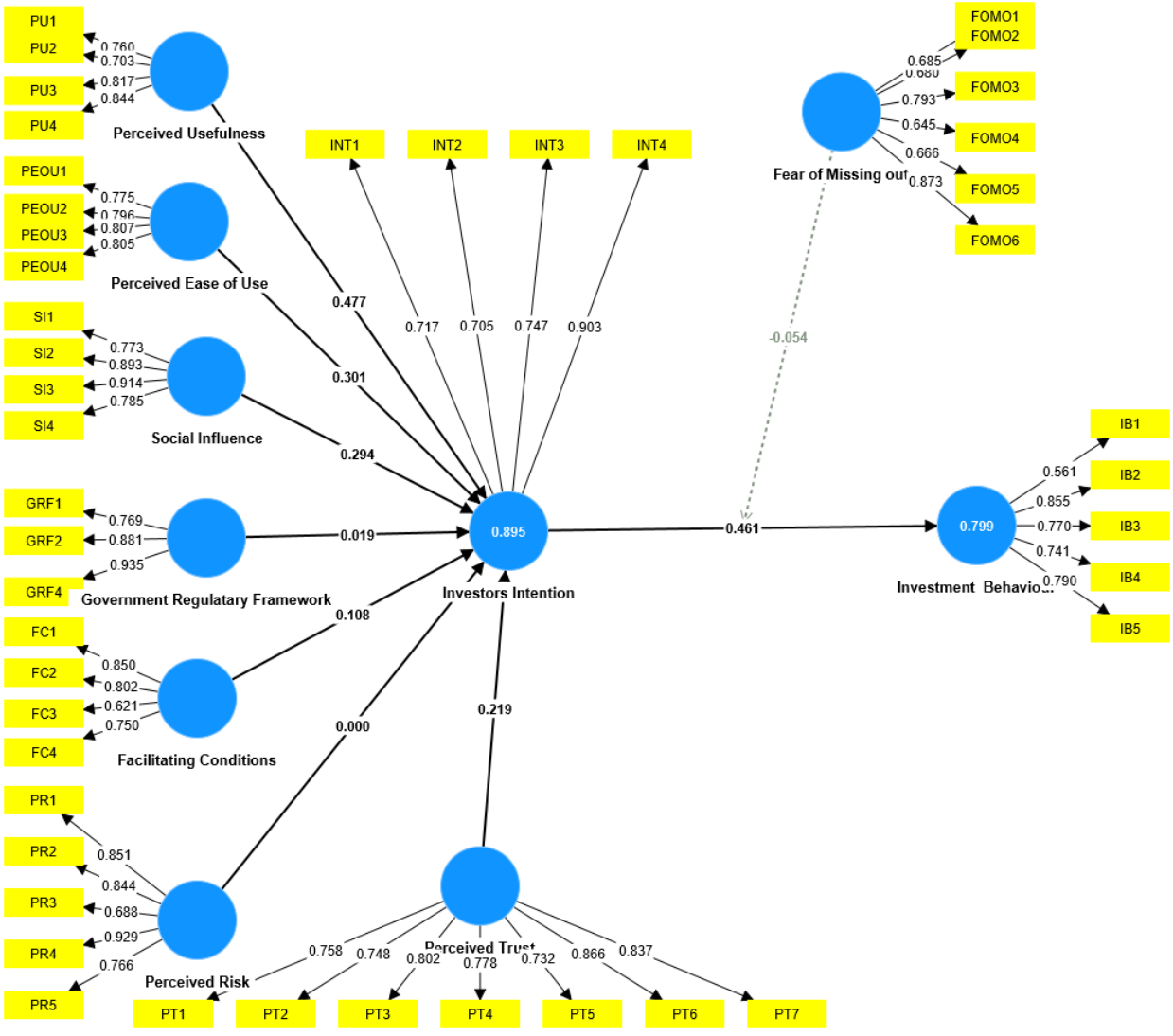

Figure 3. Structural model and statistical outcome.

When moderation is present, a third variable influences the strength or even the direction of a link between two constructs. When two constructs have a connection that is not constant but rather depends on the values of a third variable, which is known as a moderator variable, the situation is said to be in moderation. A simple slope plot may show that a relationship between two variables is stronger or weaker depending on the level of a third variable (**Figure 3**). In the present study, the path coefficient between the Investor's Intention and Investment Behavior is 0.461. This coefficient is highly statistically significant (T value = 14.437, $p < 0.001$), indicating a strong positive relationship between investors' intention and their actual investment behavior. Thus, the hypothesis regarding this relationship is accepted. Further, the path coefficient between Fear of Missing out and Investment Behavior is 0.473. This coefficient is highly statistically significant (T value = 13.922, $p < 0.001$), suggesting a strong positive relationship between the fear of missing out and investors' behavior in terms of their investment decisions. Consequently, the hypothesis regarding this relationship is accepted. The interaction term between Fear of Missing Out and Investors Intention with Investment Behavior is −0.054. This coefficient is statistically significant (T value = 2.315, $p = 0.021$), suggesting that the interaction between fear of missing out and investors' intention has a significant effect on their investment behavior. Thus, the hypothesis regarding this interaction is accepted.

7. Discussion

The present research work aimed at analyzing the Factors Affecting Investors' Decisions towards cryptocurrency investments in Saudia Arabia. The study also aims to investigate the role of FOMO as a moderator in crypto investment decision-making among Saudi Arabian individuals, offering insights into how this psychological bias impacts investment behavior in the crypto market. Efforts will also be made to provide practical recommendations to enhance investors' decision-making in the cryptocurrency market. The result indicates that cryptocurrency investors in Saudi Arabia are influenced by a combination of factors when making investment decisions. Facilitating Conditions like Perceived Ease of Use, Perceived Trust, Perceived Usefulness and Social Influence collectively shape their decisions. However, the Government Regulatory Framework and Perceived Risk were found less sensitive and played insignificant effect in shaping their decision toward cryptocurrency investment. The outcome of the present study is in conformance with the previous research work of Bouri et al. (2019); Demir et al. (2021); Przybylski et al. (2013); Sekhon et al. (2020); Turel et al. (2019) who indicated the conditional relationship between cryptocurrency returns and risk factors of Bitcoin returns, Motivational, emotional, and behavioral correlates of fear of missing out in Human Behavior as well as importance of social factors in cryptocurrency trading.

The study identified a positive correlation between investor intention and investment behavior, with higher intention leading to more proactive behavior. A stronger FOMO was associated with more active investment behavior, evidenced by a coefficient of 0.473, but the interaction between FOMO and investor intention resulted in a correlation coefficient of −0.054, suggesting that the combined effect of high FOMO and strong investor intention may slightly reduce proactive investment

behavior. This highlights the importance of investor education and awareness campaigns. Practical recommendations include educating investors about the psychological drivers of FOMO to promote rational investment strategies, providing risk management training to mitigate the influence of perceived risks, enhancing the regulatory framework to instill greater trust and stability, and promoting investor protection mechanisms to build a secure and trustworthy investment environment. These measures aim to foster a more informed, rational, and secure investment climate in Saudi Arabia's cryptocurrency market, mitigating the adverse effects of psychological biases and enhancing overall investment decision-making.

8. Theoretical and managerial implications of the study

This study aims to make several contributions to the existing body of knowledge. First, it will shed light on the role of FOMO in the context of crypto investment decisions in Saudi Arabia, an area where research remains limited. Second, by exploring the impact of FOMO on investment behaviors, the study will provide valuable insights for investors, financial advisors, and policymakers seeking to improve investor decision-making and market stability. Finally, the findings will contribute to the growing field of behavioral finance, offering empirical evidence on how psychological biases, such as FOMO, influence investment choices in the rapidly evolving crypto market.

8.1. Theoretical implications

The negative moderation effect of FOMO sheds light on the role of psychological biases in cryptocurrency investment decisions. Prospect theory predicts that investors experiencing FOMO may engage in riskier behavior, driven by the fear of missing out on potential gains. Understanding this effect contributes to a more comprehensive understanding of investor behavior in the cryptocurrency domain.

8.2. Managerial implications

The adverse impact of FOMO on investment decisions prompts cryptocurrency managers and regulators to adopt strategies to mitigate its influence. Educating investors about emotional biases and integrating behavioral finance principles can increase rational decision-making. Policymakers, financial regulators, and platforms should collaborate to promote responsible investing. Implementing risk disclosure mechanisms, providing educational resources on behavioral biases, and designing user interfaces to discourage impulsive actions can help mitigate the adverse effects of FOMO.

9. Limitations and future scope of the study

- The present study is based on primary data collected from 23 respondents from some selected cities in Saudi Arabia. The study's sample size might be limited, potentially restricting the generalizability of the findings to a larger population of cryptocurrency investors in Saudi Arabia. To address this limitation, future research could aim for a more extensive and diverse sample.

- Data collection for this research relies on self-report surveys, which could introduce response bias. Participants may provide socially desirable answers or may not accurately represent their actual investment behaviors. To mitigate this bias, researchers could use objective measures, such as transaction data, in combination with self-report surveys.
- The study adopts a cross-sectional design, which limits the ability to establish causality in the relationship between FOMO, investment intentions, and actual investment decisions. Longitudinal studies or experimental designs could offer better insights into causative relationships.
- Cryptocurrency markets are influenced by numerous external factors, including global economic conditions and regulatory changes. The study may not account for all these factors, potentially confounding the results.

10. Future scope

To establish a more robust causal relationship, future research could employ longitudinal studies to track individuals' FOMO levels and investment decisions over an extended period. This approach would allow researchers to identify changes in FOMO and their impact on investment behavior.

- Supplementing quantitative data with qualitative research methods, such as in-depth interviews or focus groups, could provide a deeper understanding of the underlying motivations and decision-making processes related to cryptocurrency investments.
- Conducting comparative studies across different countries or cultures would enable researchers to identify variations in the moderating effect of FOMO on investment decisions in cryptocurrency.
- Experimental designs could help establish a cause-and-effect relationship by manipulating FOMO levels in controlled settings and observing the subsequent investment choices.

11. Conclusion

FOMO represents a significant psychological bias that profoundly influences cryptocurrency investment decisions in Saudi Arabia. As the cryptocurrency market continues to grow, comprehending the role of FOMO becomes essential for investors, policymakers, and financial advisors. This study aims to elucidate the effects of FOMO on investment behaviors and assist stakeholders in developing strategies to manage and mitigate its impact on investment decisions. The findings reveal that FOMO exerts a substantial negative moderating effect on individuals' intentions and decisions to invest in cryptocurrencies. Recognizing and addressing this behavioral phenomenon are critical steps toward cultivating a stable and sustainable cryptocurrency market. The research identified positive correlations between investor intention and investment behavior, while the interaction between FOMO and investor intention exhibited a weak negative correlation with investment behavior. Understanding the psychological aspects of investment decision-making is vital for a comprehensive grasp of market dynamics and investor behavior. However, FOMO intensifies the influence of these factors, prompting investors to act impulsively, which

can lead to suboptimal outcomes and heightened risk exposure. The practical implications of these findings are significant. For policymakers, it is recommended to incorporate educational initiatives aimed at increasing awareness of FOMO and its potential detrimental effects. Developing regulatory frameworks that promote transparency and investor protection can help mitigate impulsive investment behaviors driven by FOMO. Financial advisors should integrate behavioral insights into their advisory processes, offering guidance that considers psychological biases. For investors, adopting a disciplined investment approach, including thorough research and long-term planning, can help counteract the impulsive tendencies induced by FOMO. Overall, by addressing the psychological underpinnings of investment behavior, stakeholders can contribute to a more resilient and well-informed cryptocurrency market.

Author contributions: Conceptualization, AH and SA; methodology, AH; software support, SA; data validation, AH, SA and SH; formal investigation and analysis, AH; necessary resources, SA; data curation, SH; writing—original draft preparation, AH; writing—review and editing, SA; visualization, SH; project administration, MAH; funding acquisition, SA. All authors reviewed and approved the final manuscript.

Data availability: The data used to support the findings of this study are available from the first author upon request.

Funding: The authors extend their appreciation to the Deanship of Scientific Research at Saudi Electronic University for funding this research (9410-AFS-2023-1-202301-1).

Conflict of interest: The authors declare no conflict of interest.

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