

# Intuitive Decision-Making in the GCC Cryptocurrency Market

Marwan M. Abdeldayem\*, Mohammed Y. Abo Keir and Saeed H. Aldulaimi

Business Administration Department, Collage of Administrative Sciences, Applied Science University (ASU), Manama, Kingdom of Bahrain

Received: 5 Oct. 2023, Revised: 20 Oct. 2023; Accepted: 15 Oct. 2023

Published online: 1 Nov. 2023

**Abstract:** The aim of this study is to investigate the phenomenon of intuitive decision-making in the GCC cryptocurrency market using both secondary data and primary data. In this paper, we explore how investors in the GCC cryptocurrency market use intuition to make decisions. The study collected 310 daily observations of the five most well-known cryptocurrencies, the GCC stock market indices, the VIX, and gold between January 1, 2022, and January 1, 2023, using data from the coin market cap and data streams. The study also adopted Hensman and Sadler-Smith's typology of intuitive and contextual "signaling" and conducted extensive semi-structured interviews with 18 experienced investors from Bahrain, Saudi Arabia, and the United Arab Emirates and self-reported cognitive tests with 12 participants. It finds that Bitcoin is the most popular and volatile cryptocurrency, while Ripple is the least popular and least volatile. Bahraini investors are more likely to rely on instinct than investors from Saudi Arabia and the UAE. Investors should consider the volatility and average value of cryptocurrencies when making investment decisions, and be aware of their preferred cognitive thinking style.

**Keywords:** Decision making; Behavioral Finance; Intuition, Cryptocurrency Market, Bitcoin, GCC.

## 1 Introduction

Intuition can be defined as a "gut feeling," "hunch," or "vibes" that result from unconscious, associationistic cognitive and affective processes. These processes produce quick, comprehensive assessments whose validity depends on the interaction of the task environment and the individual's characteristics (Jean, 2008; Amidu et al., 2019). Intuition results in direct knowing without any use of conscious reasoning and comprises both cognitive and affective elements (Jasiniak, 2018; Devine & Siddiqui, 2023, p.1475). When making decisions, intuition can feel right despite one's inability to articulate a reason and can feel right despite one's awareness of the rules or knowledge used for inference (Loukil et al., 2021, p. 233). While there has been a significant amount of conceptualizing and theorizing the construct in management and behavioral finance over the last three decades, the vast majority of empirical studies have been descriptive and theoretic. Recent studies have outpaced empirical research; hence this study is needed to balance conceptual and theoretical advancement with inductively based analysis (Sadler-Smith, 2016; Hensman & Sadler-Smith, 2011).

It is impossible to halt the evolution of cryptocurrencies. Bitcoin and other Altcoins, which were created for alternative investment, are available in circulation, and many investors closely watch them as a potential revenue generator after Bitcoin's launch. In 2017, the return on Bitcoin increased by an astonishing 1358 percent (Luu Duc Huynh, 2019). Bitcoin became a "financial phenomenon" recognized as legal tender by the Chicago Board Options Exchange (CBOE) and the Chicago Mercantile Exchange (CME), and it was constantly mentioned on the internet and in social media. However, it abruptly experienced a "huge crash" that affected the entire market, causing numerous coins to start over at zero. As a result of this shock, investors worldwide are more hesitant to invest their money (Chua et al., 2023).

The cryptocurrency market is a vital sector of the global and GCC economies, and investor decisions can have significant impacts on shareholders, depositors, and the economy as a whole (Kumar & Padakandla, 2022; Ranjan et al., 2022; Chou et al., 2022). Given this context, the study aims to investigate the role of intuition in investment decision-making in the GCC cryptocurrency market. The study seeks to answer questions such as whether cryptocurrency markets in the GCC are solely driven by "hard" data ingested in sophisticated computational models of risk, capital, and credit or whether cryptocurrency investors also rely on intuition. If so, how do they use it, and what factors affect its use?

The rest of the paper is structured as follows. Section 2 reviews the literature on intuition in investment decisions. Section 3 summarizes the data collection and methodology. The findings and outcomes of the study are presented in Section 4, followed by discussions, conclusions, and recommendations in Sections 5, 6 and 7 respectively.

\*Corresponding author e-mail: [Marwan.abdeldayem@asu.edu.bh](mailto:Marwan.abdeldayem@asu.edu.bh)

## 2 Literature Review

Behavioral finance is often criticized by proponents of the neoclassical paradigm for not providing a stable rule of thumb to predict and judge financial situations consistently (Li et al., 2021). However, behavioral finance has many benefits as a descriptive model, and integrating neoclassical models that represent ideal situations with behavioral finance could enhance shareholder wealth and firm value. A new paradigm has emerged in the form of neuroscience's perspective of finance, which merges behavioral aspects of economic agents with specific brain functions to identify the causes of behavior deviations. This paradigm includes various models of behavioral finance, such as optimism, framing, disposition effect, over/under reaction, sensation seeking, anchoring and adjustment, herd behavior, representativeness, cognitive dissonance, mental accounting, and availability (Anolm et al., 2015; Wei et al., 2023).

Optimism is a personal characteristic in which managers overestimate the firm's value and performance, leading them to underestimate bad performance and downplay latent uncertainty, causing them to believe that the firm's share value is underestimated by the capital market (Ketokivi, 2019; Kim et al., 2023). Ketokivi (2019) defined optimism as a "subjective belief that favorable future events are more likely than they actually are," which creates a better-than-average effect. Heaton (1980), a pioneer in incorporating managerial optimism with corporate finance, found that managers believe in their capabilities to control firm performance, which can have severe impacts. Heaton also documented through Hanafi (2018) that optimistic managers are always committed to the firm's outcomes. The optimistic agent overestimates the probability of good things happening, and for the manager, they overestimate the higher expected returns the firm can attain. Hanafi (2018) differentiates between overconfidence and optimism by stating that overconfidence is a "risk perception bias" in which managers underestimate the riskiness of earnings, while optimism is a "growth perception bias" in which managers overestimate the growth rate of earnings. Furthermore, Hamsa & Bellundagi (2017), Al-Sabti (2023) and Cai (2023) differentiate between overconfidence and optimism, with optimism referring to the manager's belief in good outcomes and overconfidence referring to the manager's belief in their information and its precision and reality. According to the definition of optimism and the pioneer study of managerial irrationality, optimistic managers overestimate firm performance, which can affect takeover decisions and lead firms to engage in more acquisitions.

Framing refers to how individuals perceive concepts and how they impact decision-making (Hadi et al., 2018). The disposition effect is the tendency of individuals to sell shares at high prices and keep those with lower prices (Converse et al., 1986). Over/under reaction is considered the starting point of behavioral finance in battling the efficient market hypothesis, in which investors' reactions to market changes vary. The individual tends to overestimate recent information and react accordingly, while underestimating prior information in making decisions. This bias contradicts the efficient market hypothesis, which assumes that the expected residuals of a specific security are equal to zero (Bowden, 2015; Chomeya, 2010). Sensation seeking is a personality trait in which managers' increase overall firm risk by making acquisition decisions. Anchoring and adjustment refer to individuals setting a benchmark (anchor) to compare with and judge other situations, which may lead to overestimation or underestimation of events and situations (Dobson & Poels, 2020). Herd behavior appears when market agents follow other agents' trading activities, which is related to age and experience. This behavior has many motives, such as following the most experienced agents and fear of being different (Choi et al., 2014). Representativeness (law of small numbers) biases managers who expect future exchange rates using historical data, explaining why historical data is used in predicting and deciding current corporate issues. This bias is studied in risk management research, which explains deviation from the hedging policy (Candraningrat et al., 2018; Liu, 2023). Furthermore, cognitive dissonance is psychological tension that individuals experience when confronted with a contradiction between their beliefs and available information to make a decision. In this case, individuals deal with new information as a supportive tool to make a decision (Gigerenzer & Gaissmaier, 2011).

Mental accounting refers to thinking separately about one situation from another (Guo et al., 2017). Previously, Shefrin (2001) gave an example to illustrate mental accounting, where individuals use different mentalities in two situations. Shefrin compared individual choices when facing sure gains and sure losses, finding that individuals are loss averse when facing sure losses and risk averse when facing sure gains. Availability heuristic appears when individuals assess the probability of specific event occurrence based on the frequency of prior event occurrence. This bias is caused by individual ability to retrieve event occurrence and imaginability (Tversky and Kahneman, 1974). Other models include reference point and disjunction effect (Abdeldayem & Aldulaimi, 2022a&b; Lavrutich et al., 2023).

The majority of decisions are made in a risk-and-uncertainty-filled environment. In situations where risks cannot be known, other decisions must be made. Despite the extensive studies on uncertainty and many distinctions in this literature, recent researchers have defined extreme uncertainty as decisions where risks are unknown (Abdeldayem & Aldulaimi, 2021; Zhou, San & Liu, 2023). This definition of extreme uncertainty is consistent with the creation theory of uncertainty (Knight, 1921). Angel investors make decisions about investments in ideas for markets that frequently do not yet exist

and propose products and services for which there is no precedent, in situations where the degree of uncertainty is so great as to qualify as unknowable. In other words, rather than merely dealing with decision contexts where probabilities are unknown, Knight (1921) argues that angel investors deal with the kinds of "unknown unknowns" that include uncertainty and noise because there is a lot of unsystematic risk and because there are conditions of evolving certainty around systematic risk. Simply put, choosing between uncertain market solutions while also juggling inherent uncertainty about the services, products, and markets themselves is what one of the angels in our sample refers to as "chasing an invisible moving target" (Knight, 1921; Abdeldayem et al., 2021).

Although there are many theoretical ways to describe uncertainty, recent research on unknowable risks best captures the choices that investors in the cryptocurrency market should make. Experts divide risks into three categories: knowable (K), which can be given probabilities; uncertain (U), or risks that are known but cannot be quantified; and unknowable (U), in which the risks cannot be known (Huang & Pearce, 2015; Ainia & Lutfi, 2019). The majority of research on making decisions when risks are unknown has been done in behavioral finance, where researchers emphasize the distinction between uncertainty and unknowability (Abdeldayem & Sadeek, 2018; Shrotryia & Kalra, 2022). Historically, unknowable risks have attracted the most attention when associated with unfavorable outcomes, such as planes crashing into the World Trade Center towers or catastrophic weather events. However, to angel investors, especially experienced ones, unknowable risks may represent more than just unforeseen events. In this study, we explore why experienced investors in the GCC cryptocurrency believe that the only way to find the most alluring, extraordinarily profitable investments for themselves is by investing in businesses that face unknowable risks. We also discuss the impact of various factors on how they manage unknowable risks.

The advent of digital technology has gradually altered monetary systems. The digital exchange, which serves as the platform for virtual currency, is what is referred to as the "cryptocurrency market." Hence, the exchange status is available online. It is notable that the transactions have kept using cutting-edge terminology "cryptography." This work is done to secure earlier transactions, which are necessary to add to and update the electronic ledger known as a "blockchain" and to record them (Luu Duc Huynh, 2019; Rathore et al., 2022; Guiso & Zaccaria, 2023).

The digital coin that functions in the previously stated context is referred to as "cryptocurrency." Bitcoin, introduced in 2009 by Satoshi Nakamoto, is one of the coins worth mentioning. Despite detractors questioning why the price of Bitcoin increased after ten years, Bitcoin and its illustrative coins (Ethereum, Ripple, Litecoin, Stellar, etc.) have repeatedly attracted investors' attention, gradually taking the place of emerging financial assets (Luu Duc Huynh, 2019; Loukil et al., 2021; Blohm et al., 2022). However, there are concerns about the cryptocurrency market, as coin miners frequently use a lot of energy and computer memory to produce a "reward" or a brand-new coin. The coin stake can be generated in this manner without depending on wealth, making it deterministic, and the supply-demand of trading investors can be used to explain the price increase (Thewissen et al., 2022; Zhang et al., 2022).

Thus, the goal of the current study is to fill this gap, based on two complementary theories, i.e., expected utility theory and prospect theory, to demonstrate how investor cognitive bias and investor intuitive attributes influence investment decisions in the GCC cryptocurrency market. In an inefficient market like the one for cryptocurrencies, behavioral factors rooted in psychology may explain investment decisions' quality (Kinatta et al., 2021; Dolatsara et al., 2022). Investor cognitive bias includes framing, cognitive heuristics, and mental accounting, whereas investor intuitive attributes include the degree of confidence, loss aversion, and herding behavior (Abdeldayem & Aldulaimi, 2020). Investors use mental shortcuts as a coping mechanism for information processing when there is market inefficiency. Muttar et al. (2021) claim that there is more to crypto asset pricing than just the basics of investing. Due to bounded rationality, when evaluating the effectiveness of investment decisions, we herd, react emotionally, and are overly averse to loss. We also anchor to the past and the opinions of others, prioritize current information, and discount evidence that contradicts our preconceptions. Therefore, this study investigates the relationship between intuitive investor attributes, investor cognitive bias, and the quality of investment decisions in the GCC cryptocurrency market, finding that both are important predictors of investment decision quality.

### 3 Methodologies

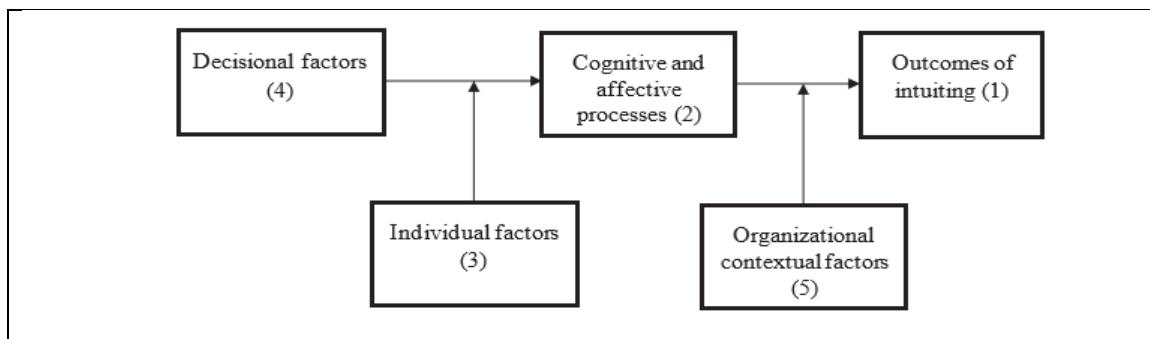
As mentioned earlier, the purpose of this study is to investigate the phenomenon of intuitive decision-making in the GCC cryptocurrency market using both secondary data and primary data.

First, from January 1, 2022, to January 1, 2023, we sampled 310 daily observations of the five most popular cryptocurrencies (Bitcoin, Ethereum, dash, monero, and ripple), the GCC stock market indices (Bahrain (BAX), Saudi Arabia (TASI), Abu Dhabi (ADI), the VIX, and gold). Data from the coin market cap and data streams were used to compile this study.

Second, there is a dearth of published qualitative research on intuition in the financial sector regarding how intuition

manifests itself in the cryptocurrency market, such as that by Hensman and Sadler-Smith (2011), Miller et al. (2013), and Wu (2022). To find a methodological fit for our overall goal, we used open-ended questions, qualitative data collection through interviews, and thematic content analyses in this study.

Our sample of respondents was chosen primarily based on seniority and years of cryptocurrency investment experience. Domain-specific experience enables decision-makers to compress learning, "chunk" information, and pattern-match (Devine & Siddiqui, 2023; Max & Uhl, 2023), and a "rule of thumb" for the acquisition of expertise is ten years of learning, practice, and experience (Bao, Meng, & Wu, 2021). We chose highly experienced decision-makers as our unit of analysis and only conducted interviews with investors who had five years or more of experience. We used a convenience sample of eighteen cryptocurrency investors, eleven of whom were men (9 from Bahrain, 5 from Saudi Arabia, and 4 from the UAE). Each participant was scheduled for a 45-minute semi-structured interview, resulting in 13.5 hours of transcription. Our sample size is comparable to that of other studies of intuitive decision making in naturalistic settings (e.g., Hensman & Sadler-Smith, 2011; Amidu et al., 2019; Abdeldayem et al., 2021; Wu, 2022). Participants had an average of seven years of experience investing in various cryptocurrencies, four years on average in the market, and two roles on average. This group of seasoned investors had a combined experience of 88 years in the cryptocurrency market. Therefore, figure 1 illustrates the theoretical framework for intuitive decision-making in the GCC cryptocurrency market. The numbers in parentheses are just for convenience and only refer to the classification system used for the content analysis (Darwish et al, 2021; Ali et al., 2022).



**Fig. 1:** The theoretical framework for intuitive decision-making in the GCC cryptocurrency market

Source: Wu (2022).

## 4 Results

The descriptive statistics of the evaluative variables are displayed in Table 1. According to our findings, among the crypto assets, Bitcoin has the highest average value and the greatest volatility in the GCC cryptocurrency market. However, RIPPLE has the lowest average value and is the least volatile compared to other crypto assets. When it comes to average value and volatility, the Saudi Arabia market index stands out among the stock market indices. The next highest average value after gold is for WTI, but when compared to gold, WTI is the most volatile throughout the GCC cryptocurrency market.

**Table 1:** Descriptive Analysis

Variable	Observations	Mean	Stand. Dev.	Min.	Max.
<b>Bitcoin</b>	310	2.534	0.615	2.322	2.707
<b>Ethereum</b>	310	1.478	0.419	1.331	1.568
<b>Dash</b>	310	1.282	0.276	1.052	1.477
<b>Monero</b>	310	1.185	0.345	0.998	1.361
<b>Ripple</b>	310	0.0818	0.131	0.0398	0.134
<b>Gold</b>	310	2.078	0.772	2.042	2.130
<b>WTI</b>	310	1.120	0.229	0.658	1.198
<b>Bahrain</b>	310	2.084	0.0533	2.011	2.119
<b>Saudi Araba</b>	310	2.572	0.081	2.483	2.612
<b>Abu Dhabi (UAE)</b>	310	2.428	0.079	2,316	2.455
<b>VIX</b>	310	0.820	0.335	0.698	1.261

## 5 Discussions

In accordance with major previous research, particularly Hensman & Sadler-Smith (2011) and Wu (2022), interviews were scheduled to last 45 minutes each and were recorded, transcribed, and analyzed using a three-stage process (Unitizing, Categorizing, and Classifying). This resulted in a total of 267 thought units (TUs). The TUs were classified into 12 sub-groups and then organized into five main categories, including: (i) "intuiting outcomes"; (ii) "cognitive and affective processes"; (iii) "individual factors"; (iv) "decisional factors"; and (v) "organizational and contextual factors," as indicated in Table 2. Below are descriptions of the findings, commentary, and examples of quotes (P1-P18, referring to participants). We summarize the results using the five categories that our interview data revealed.

**Table 2:** Summary of the content analysis

Category	Sub-category	Participants																		Total
		P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	
1. Outcome of intuiting	"Acknowledgement of intuition"	1	1	0	0	0	1	0	1	0	0	1	1	1	0	0	1	1	1	10
	"Intuitive judgment"	1	0	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	0	12
2. Cognitive and affective processes	"Basis in experience & learning"	3	1	2	4	1	0	2	1	3	2	0	5	0	2	1	1	2	1	31
	"Pattern matching"	1	0	0	1	1	2	0	1	0	0	1	0	1	1	0	1	1	0	11
	"Somatic component"	11	2	3	0	6	4	1	0	8	2	3	7	1	2	5	4	0	2	54
3. Individual factors	"Self-efficacy of decision making"	3	1	4	0	2	4	0	2	1	0	3	2	1	5	0	6	1	1	36
	"Sense of credibility"	2	0	1	1	3	1	2	1	1	2	1	0	1	3	1	2	1	0	23
	"Social aspects of intuition"	0	1	0	2	1	1	2	0	1	1	3	1	1	0	2	3	1	1	21
4. Decisional factors	"Uncertainty"	1	0	2	1	1	2	0	1	1	0	2	0	1	1	1	1	1	2	18
	"Time"	1	2	0	0	2	2	1	1	0	1	2	1	1	0	1	1	2	1	19
5. Organizational contextual factors	"Constraints"	2	1	2	0	1	1	0	0	1	2	1	1	1	0	1	2	0	0	17
	"Accountability"	1	0	0	0	1	2	1	1	0	1	0	2	1	1	1	1	1	1	15
<b>Total</b>																				<b>267</b>

Based on these findings, two general conclusions can be drawn: first, intuitions, if followed, are essentially "bets" and should be treated as hypotheses open to empirical testing and potential falsification; second, intuitions are likely to be perceived as having less validity in business organizations than rational analyses.

## 6 Conclusions

The study aimed to investigate the phenomenon of intuitive decision-making in the GCC cryptocurrency market using both secondary data and primary data. First, between January 1, 2022, and January 1, 2023, we sampled 310 daily observations of the five most well-known cryptocurrencies (Bitcoin, Ethereum, Dash, Monero, and Ripple), the GCC stock market indices (Bahrain (BAX), Saudi Arabia (TASI), Abu Dhabi (ADI), the VIX, and gold). This study was put together using data from the coin market cap and data streams. Second, the study adopted Hensman and Sadler-Smith's (2011) typology of intuitive and contextual "signaling," which was revised by Wu (2022), and conducted extensive semi-structured interviews with eighteen experienced investors from Bahrain, Saudi Arabia, and the UAE. The findings reveal that, among the crypto assets, Bitcoin has the highest average value and the greatest volatility in the GCC cryptocurrency market. However, compared to other crypto assets, RIPPLE has the lowest average value and is the least volatile. When it comes to average value and volatility, the Saudi Arabia market index stands out among the stock market indices. The next highest average value after gold is for WTI, but when compared to gold, WTI is the most volatile throughout the GCC cryptocurrency market. Furthermore, the preference for an intuitive cognitive thinking style was similar in Bahraini and Saudi cryptocurrency investors. However, Bahraini investors were more likely to rely on instinct when making investment decisions than investors from Saudi Arabia and the UAE. Therefore, it can be inferred that using intuition differs from having an intuitive disposition. In other words, while people may have a dominant or preferred cognitive thinking style, the demands of the situation or task will have an impact on how they make decisions.



## 7 Recommendations

The research recommends that future research in this crucial area of investment cognition and decision-making behavior may be guided by the study's findings. In addition, the current research provides a preliminary framework and a few additional questions that, in our opinion, merit further investigation and can guide future research. This is especially important for behavioral finance research, now that insights from social cognitive neuroscience are beginning to present a convincing picture of the psychology and neuroscience of intuition and unconscious thought in general. The current study adds to and broadens previous research and conceptual frameworks, including those of Hensman and Sadler-Smith (2011), Wu (2022), and Kinatta et al. (2021), with regard to the existence of intuition and executives' phenomenal experiences of the underlying cognitive and affective processes in organizational settings. Increasing investors' understanding of intuition, acceptance of it, and capacity to combine intuition with analysis should be the aim of behavioral finance education and training. This research broadens our current understanding of intuition in the cryptocurrency market by demonstrating, through secondary and primary data from the GCC cryptocurrency market, the existence of additional inputs, determinants, and constraints, as well as contextual and boundary factors. Understanding the nature of intuition in cryptocurrency markets and how it affects decision-making and learning more generally among investors depends on these factors.

### Conflicts of Interest Statement

*The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.*

### References

- [1] Abdeldayem, M. M., Keir, M. Y. A., & Aldulaimi, S. H. (2022). "Cultural Intelligence and Diversity in Higher Education: A Case Study from Bahrain", *Information Sciences Letters*, Vol. (11), No. (3), Pp. 925-931
- [2] Abdeldayem Marwan M and Doaa S. Sedeek (2018) "Managerial Behavior and Capital Structure Decisions; Do Overconfidence, Optimism and Risk Aversion matter?" *Asian Economic and Financial Review*, Vol. (8), No. (8), Pp. 1115-1136.
- [3] Abdeldayem Marwan M, Aldulaimi S. H. (2020) "Cryptocurrency in the GCC Economy". *International Journal of Scientific and Technology Research*, Vol. (9), No. (2), Pp. 1739-1755.
- [4] Abdeldayem Marwan M. and Aldulaimi S. H. (2020) "Investors' herd behavior related to the pandemic-risk reflected on the GCC stock markets | Psihologija stada investitora i pandemijski rizik na tržištu dionica zemalja arapskog zaljeva", *Zbornik Radova Ekonomskog Fakulteta U Rijeci: Casopis Za Ekonomsku Teoriju I Praksu*, Vol. (38), No. (2), Pp 563-584.
- [5] Abdeldayem, M., & Aldulaimi, S. (2022a). Developing an Islamic crowdfunding model: a new innovative mechanism to finance SMEs in the Middle East. *International Journal of Organizational Analysis*, (ahead-of-print).
- [6] Abdeldayem, M., & Aldulaimi, S. (2023). Entrepreneurial finance and crowdfunding in the Middle East. *International Journal of Organizational Analysis*, 31(4), 927-944.
- [7] Abdeldayem, Marwan M, Al Dulaimi, S. H. & Al Dulaimi F. H. (2021). "A qualitative approach to evaluate the reconciliation of GOLDX and OneGram in Islamic Finance" *Kvalitativui pristup procjeni promirenjs GOLDX-a i OneGram U Islamskim financijama*, *Zbornik Radova Ekonomskog Fakulteta U Rijeci: Casopis Za Ekonomsku Teoriju I Praksu*, Vol. (39), No. (1), Pp.113-134.
- [8] Abdeldayem, Marwan Mohamed and Al Dulaimi, Saeed Hameed. (2022b) "Predicting crowdfunding economic success in the Gulf Cooperation Council. *International Journal of Engineering Business Management*, Vol. (14), Pp. 1-12 .
- [9] Ainia, N.S.N. and Lutfi, L. (2019), "The influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making", *Journal of Economics, Business, and Accountancy Ventura*, Vol. 21 No. 3, pp. 401-413.
- [10] Ali, A. H., Abdullah, I. D., Aswad, A. R., Abdeldayem, M. M., & Aldulaimi, S. H. (2022, June). Human Rights and Artificial Intelligence: Evaluation of Legal Challenges and Potential Risk. In *2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETISIS)* (pp. 361-367). IEEE..

- [11] Al-Sabti, A. A. W. H. (2023). Implications for Enhancing the Financial Reporting Quality on by the Digital Revolution of Internal Control. *International Journal of Professional Business Review*, 8(4), e01381-e01381. Brought
- [12] Amidu, A. R., Boyd, D., & Gobet, F. (2019). A study of the interplay between intuition and rationality in valuation decision making. *Journal of Property Research*, 36(4), 387-418.
- [13] Anolm, O.M., Okoroafor, S.N. and Ajaero, O. (2015), "Effect of mental accounting on corporate profitability", *West African Journal of Research*, Vol. 14 No. 1, pp. 1-15
- [14] Bao, H. X., Meng, C. C., & Wu, J. (2021). Reference dependence, loss aversion and residential property development decisions. *Journal of Housing and the Built Environment*, 1-28.
- [15] Blohm, I., Antretter, T., Sirén, C., Grichnik, D., & Wincent, J. (2022). It's a people's game, isn't it?! A comparison between the investment returns of business angels and machine learning algorithms. *Entrepreneurship Theory and Practice*, 46(4), 1054-1091.
- [16] Bowden, M.P. (2015), "A model of information flows and confirmatory bias in financial markets",
- [17] Cai, C. W. (2023). A real effect across time: disclosure quality, cost of capital and profitability. *Journal of Accounting Literature*, (ahead-of-print).
- [18] Candraningrat, I.R., Salim, U., Indrawati, N.K. and Ratnawati, K. (2018), "Influence of framing information and disposition effect in decision of investment: experimental study on investor behavior at Indonesia stock exchange representative on Denpasar, Bali", *International Review of Management and Marketing*, Vol. 8 No. 3, p. 59.
- [19] Choi, S., Kariv, S., McEuler, W. and Silverman, D. (2014), "Who is (more) rational?", *American Economic*
- [20] Chaho, R. M., Aswad, A. (2021) The Cryptocurrency Legality and Environmental Challenges. [International Journal of Green Management and Business Studies](#), Vol. (1), No. (1), Pp. 50-61
- [21] Chou, J. H., Agrawal, P., & Birt, J. (2022). Accounting for crypto-assets: stakeholders' perceptions. *Studies in Economics and Finance*.
- [22] Chua, A. Y., Pal, A., & Banerjee, S. (2023). AI-enabled investment advice: Will users buy it?. *Computers in Human Behavior*, 138, 107481.
- [23] Converse, J.M., Jean McDonnell, C. and Presser, S. (1986), Survey Questions: Handcrafting the decision making", *Psychological Science*, Vol. 28 No. 4, pp. 530-543.
- [24] Darwish, S., Gomes, A. M., & Ahmed, U. (2021). Risk management strategies and impact on sustainability: the disruptive effect of Covid 19. *Academy of Strategic Management Journal*, 20, 1-19.
- [25] Devine, M. T., & Siddiqui, S. (2023). Strategic investment decisions in an oligopoly with a competitive fringe: An equilibrium problem with equilibrium constraints approach. *European Journal of Operational Research*, 306(3), 1473-1494.
- [26] Dobson, D. S., & Poels, K. (2020). Combined framing effects on attitudes and behavioral intentions toward mortgage advertisements. *International Journal of Bank Marketing*, 38(4), 961-986.
- [27] Dolatsara, H. A., Kibis, E., Caglar, M., Simsek, S., Dag, A., Dolatsara, G. A., & Delen, D. (2022). An interpretable decision-support systems for daily cryptocurrency trading. *Expert Systems with Applications*, 203, 117409.
- [28] Gigerenzer, G. and Gaissmaier, W. (2011), "Heuristic decision making", *Annual Review of Psychology*,
- [29] Guiso, L., & Zaccaria, L. (2023). From patriarchy to partnership: Gender equality and household finance. *Journal of Financial Economics*, 147(3), 573-595.
- [30] Guo, L., Trueblood, J. S., & Diederich, A. (2017). Thinking fast increases framing effects in risky decision making. *Psychological science*, 28(4), 530-543.
- [31] Hensman, A., & Sadler-Smith, E. (2011). Intuitive decision making in banking and finance. *European Management Journal*, 29(1), 51-66.
- [32] Huang, L., & Pearce, J. L. (2015). Managing the unknowable: The effectiveness of early-stage investor gut feel in entrepreneurial investment decisions. *Administrative Science Quarterly*, 60(4), 634-670.
- [33] Jasiniak, M. (2018). Intuition or Rational Investing? The Stock Investors' Behaviour and the Nominal Effect on the Example of Polish Capital Market. *Przedsiębiorczość i Zarządzanie*, 19(10.2), 355-367.

- [34] Jean, E.P. (2008), "Intuition versus analysis: strategy and experience in complex everyday problem, *Journal of Operations Management*, Vol. 65 No. 4, pp. 380-402.
- [35] Ketokivi, M. (2019). Avoiding bias and fallacy in survey research: A behavioral multilevel approach. *Journal of Operations Management*, 65(4), 380-402.
- [36] Kim, T. W., Li, J., & Pae, S. (2023). Career concerns, investment, and management forecasts. *The Accounting Review*, 98(1), 337-363.
- [37] Kinatta, M. M., Kaawaase, T. K., Munene, J. C., Nkote, I., & Nkundabanyanga, S. K. (2021). Cognitive bias, intuitive attributes and investment decision quality in commercial real estate in Uganda. *Journal of Property Investment & Finance*, 40(2), 197-219.
- [38] Knight, F. H. (1921). Cost of production and price over long and short periods. *Journal of political economy*, 29(4), 304-335.
- [39] Kumar, A. S., & Padakandla, S. R. (2022). Testing the safe-haven properties of gold and bitcoin in the backdrop of COVID-19: a wavelet quantile correlation approach. *Finance research letters*, 47, 102707.
- [40] Lavrutich, M., Hagspiel, V., & Siddiqui, A. S. (2023). Transmission investment under uncertainty: Reconciling private and public incentives. *European Journal of Operational Research*, 304(3), 1167-1188.
- [41] Li, J., Chai, L., Nordstrom, O., Tangpong, C., & Hung, K. T. (2021). Development of a Loss Aversion Scale. *Journal of Managerial Issues*, 33(1).
- [42] Liu, J., Yuan, H., & Nie, J. (2023). Electric vehicle manufacturers' decisions on investing in carbon-reduction technology under government subsidy: a Cournot game model. *IMA Journal of Management Mathematics*, 34(1), 71-100.
- [43] Loukil, S., Aloui, M., Jeribi, A., & Jarboui, A. (2021). Are digital assets backstops for GCC stock markets in COVID-19-led financial crisis?. *International Journal of Electronic Finance*, 10(4), 232-259.
- [44] Luu Duc Huynh, T. (2019). Spillover risks on cryptocurrency markets: A look from VAR-SVAR granger causality and student's t copulas. *Journal of Risk and Financial Management*, 12(2), 52.
- [45] Max, R., & Uhl, M. (2023). Moral luck in investment contexts: We consciously find unprofitable investments less moral. *PloS one*, 18(1), e0278677.
- [46] Merkle, C. (2020), "Financial loss aversion illusion", *Review of Finance*, Vol. 24 No. 2, pp. 381-413.
- [47] Miller, R., Williams, I., Allen, K., & Glasby, J. (2013). Evidence, insight, or intuition? Investment decisions in the commissioning of prevention services for older people. *Journal of Care Services Management*, 7(4), 119-127.
- [48] Muttar, A. K., Alansari, S., Aldulaimi, S., Abdeldayem, M., & AlKubaisi, M. (2021, December). New Paradigm of Behavioral Finance in Islamic Banks: the Role of Leadership to Facilitate Creative Behavior. In *2021 International Conference on Sustainable Islamic Business and Finance* (pp. 1-7). IEEE
- [49] Ranjan, S., Kayal, P., & Saraf, M. (2022). Bitcoin price prediction: A machine learning sample dimension approach. *Computational Economics*, 1-20.
- [50] Rathore, R. K., Mishra, D., Mehra, P. S., Pal, O., Hashim, A. S., Shapi'i, A. & Shutaywi, M. (2022). Real-world model for bitcoin price prediction. *Information Processing & Management*, 59(4), 102968.
- [51] Sadler-Smith, E. (2016), "The role of intuition in entrepreneurship and business venturing decisions", scale", *Journal of Managerial Issues*, Vol. 33 No. 1.
- [52] Shefrin, H. (2001). Behavioral corporate finance. *Journal of applied corporate finance*, 14(3), 113-126.
- [53] Shrotryia, V. K., & Kalra, H. (2022). Herding in the crypto market: a diagnosis of heavy distribution tails. *Review of Behavioral Finance*, 14(5), 566-587.
- [54] Thewissen, J., Thewissen, J., Torsin, W., & Arslan-Ayaydin, Ö. (2022). Linguistic errors and investment decisions: the case of ICO white papers. *The European Journal of Finance*, 1-43.
- [55] Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *science*, 185(4157), 1124-1131.
- [56] Wu, H. (2022). Intuition in investment decision-making across cultures. *Journal of Behavioral Finance*, 23(1), 106-122.



- [57] Zhang, S., Aerts, W., Zhang, D., & Chen, Z. (2022). Positive tone and initial coin offering. *Accounting & Finance*, 62(2), 2237-2266..
- [58] Zhou, J., San, O. T., & Liu, Y. (2023). Design and Implementation of Enterprise Financial Decision Support System Based on Business Intelligence. *International Journal of Professional Business Review*, 8(4), e0873-e0873