

How Risk Tolerance Moderates the Mediating Effect of Investor Risk Perception between Perceived Asset Value and Real Estate Investment Decision in Iraq

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Corresponding Author Hind Dheyaa Abdulrasool	Abstract: This study examined how risk tolerance moderates the mediating effect of investor risk perception on the relationship between perceived asset value and real estate investment
College of Administration and Economics University of AL Qadisiyah, Al Diwaniyah, Iraq Article History Received: 06 /02/ 2025 Accepted: 20/02 / 2025 Published: 24 / 02 / 2025	decisions in Iraq. Survey data were collected from 205 investors across seven priority governorates. Results indicated that perceived asset value positively influences real estate investment decisions, both directly ($\beta = 0.250$, $t = 3.410$, $p = 0.001$) and indirectly through risk perception ($\beta = 0.126$, $t = 3.171$, $p = 0.002$). However, risk tolerance did not moderate the direct relationship between perceived asset value and investment decisions ($\beta = 0.149$, $t =$ 1.449, $p = 0.148$). Interestingly, risk tolerance negatively moderated the relationship between risk perception and investment decisions ($\beta = -0.356$, $t = 3.264$, $p = 0.001$), suggesting that the negative effect of risk perception diminishes as risk tolerance increases. These findings suggest that while risk tolerance does not directly influence the effect of perceived asset value on investment decisions, it plays a crucial role in how investors' risk perception stranslate into
	actual investment choices, even when asset values are favourable. Policymakers and practitioners should consider these behavioural factors when promoting real estate investment in Iraq. Keywords: Risk Tolerance; Investor Risk Perception; Perceived Asset Value; Real Estate Investment; Iraq; Moderating Effect.

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1. Introduction

There is an ongoing boom in Iraq's real estate sector, fuelled by population growth, rising disposable income, and limited housing availability (Bruneau and Rabah, 2022). According to Statista (2024), the Iraqi real estate sector is forecasted to reach US\$1.11 trillion in 2024, with residential properties leading the charge at US\$0.84 trillion. This growth is expected to continue at a steady 4.43% annually until 2028, reaching US\$1.32 trillion (Statista, 2024). While this growth presents a promising opportunity for real estate investors, it also underscores the need to thoroughly understand the factors shaping real estate investment decisions in the country (International Monetary Fund, 2020). This is because the Iraqi real estate market is still grappling with challenges arising from a combination of political instability (Shakor, 2020), economic challenges (Hassan, 2020), and ongoing reconstruction efforts following decades of conflict (Altaie and Dishar, 2024). Despite these challenges, the market nevertheless shows signs of resilience and potential for growth, driven by increasing urbanisation (Jarah et al., 2019), government initiatives to rebuild infrastructure (Altaie and Dishar, 2024), and a growing population seeking housing and commercial properties (Hamdan and Hussein, 2024). Thus, there is a need to thoroughly understand © Copyright IRASS Publisher. All Rights Reserved

the factors driving real estate investors' decision-making processes. Understanding how they perceive asset values and assess risks may help in formulating strategies that mitigate potential downsides and enhance investment returns (Ali *et al.*, 2023).

Real estate assets (Clayton et al., 2009a; Ling et al., 2020) and their pricing have profound implications on investment behaviours (Mattarocci and Scimone, 2022). In the past, researchers have studied several factors shaping real estate investment behaviours (e.g., Abdallah et al., 2021; Almansour et al., 2023; Bhat et al., 2018). For example, studies have shown that perceived asset value, which reflects an investor's subjective assessment of a property's potential for appreciation, can significantly influence investment decisions (Brzezicka, 2021; Sa-Aadu et al., 2010), even in volatile conditions (Ali et al., 2023; Raza and Guesmi, 2024). Also, investor risk perception, especially regarding legal risks (Tamilmathi and Priya, 2024), and flood risk (Bhattacharya-Mis and Lamond, 2016), and budget and occupancy risks (Bartelink et al., 2015), plays a crucial role in their decisionmaking process. Furthermore, real estate investors may differ on risk tolerance, some having low and others high tolerance levels, thereby necessitating the need for evidence supporting or rejecting its moderating influence in the real estate investment decision processes (Cervellati *et al.*, 2024). However, with the exception of a few emergent studies (e.g., Luan *et al.*, 2024; Singh *et al.*, 2023b; Yuvaraj and Venugopal, 2024), significant research gaps remain in understanding how risk tolerance moderates the relationship between perceived asset value and investor risk perception and investment decision, particularly in volatile environments like Iraq's real estate market (Yaseen *et al.*, 2023). Also, research on the interplay between risk tolerance and these factors in the highrisk Iraqi real estate market is just emerging (Morshed, 2022). Addressing these gaps can improve our understanding of real investment behaviour in Iraq.

Despite political instability, economic uncertainty, and financing constraints, Iraq's real estate market shows resilience due to urbanisation, government infrastructure initiatives, and a growing population (Alkhalefy, 2020; Wind and Ibrahim, 2020). Thus, knowing the behavioural dynamics of the Iraqi real estate market can contribute towards strengthening the confidence of investors, as insights into perceived asset values, risk assessments, and risk tolerance can inform investment strategies and policy development. Specifically, real estate markets are known to be highly diverse and complex (Sharmiladevi and Perumandla, 2024), and the decisions of its key actors driven by both rational and irrational factors (Sharmiladevi et al., 2024). While reasonable priced, high-quality real estate are generally seen as less risky (Abdallah et al., 2021), externalities like proximity to undesirable locations (McCluskey and Rausser, 2001) or economic downturns (Clayton et al., 2009b), and even investor's personal preferences (Cvijanović et al., 2022; Zulhajmi and Rafik, 2022), can influence risk perception and make high-quality, well-priced assets seem riskier than they objectively are (Bhattacharya-Mis and Lamond, 2016).

In view of the foregoing discourse, the current study aims to evaluate the pattern of relationships between perceived asset value, investor risk perception, and risk tolerance, examining how these factors interact to influence real estate investment decisions. The study's findings will provide valuable insights for investors, policymakers, and developers to navigate Iraq's volatile real estate market, contributing to the broader literature on investment behaviour in high-risk environments.

2. Literature Review

2.1 Variables in the Study

Real Estate Investment Decisions:

This involve choosing whether or not to acquire a property based on a combination of psychological and financial drives (Kahn, 2024; Majeed *et al.*, 2023). Thus, real estate investment decisions are not solely driven by rational economic calculations but are also influenced by psychological and emotional factors (Luan *et al.*, 2024; Xing, 2024; Yuvaraj and Venugopal, 2024). Investors' perceptions of risk, their attitudes towards uncertainty, and cognitive biases like overconfidence or anchoring can significantly affect their choices (Ali *et al.*, 2023). These decisions may also be influenced by social factors, such as herding behaviour (Singh *et al.*, 2023a) or the opinions of peers and experts (Talpsepp and Tänav, 2021). Thus, a behavioural finance approach to real estate investment decision-making recognizes that investors are not always perfectly rational actors and that their choices are shaped by a complex interplay of cognitive, emotional, and social factors (Elliott *et al.*, 2022).

Investor Risk Perception

This is defined as the subjective assessment of potential risks associated with an investment, influenced by an investor's personal experiences, knowledge, and emotional biases (Wang & Chen, 2017). This multidimensional concept encompasses both the cognitive understanding of risk and the emotional responses to uncertainty (Wieczorek-Kosmala and Gorzeń-Mitka, 2013). It is shaped by various factors, including the investor's knowledge, experience, and attitudes towards risk, as well as external factors such as market volatility, economic conditions, and political instability (Baker and Ricciardi, 2014). In the context of Iraqi real estate, investor risk perception is particularly influenced by factors such as security situations, corruption, and infrastructure challenges (EIU, 2010).

Perceived Asset Value

The perceived value of a product, including real estate, is highly contingent on the individual's preferences and personality (Rehman et al., 2023) and how these interact with the product's feature the individual deemed critical (Sánchez-Fernández and Iniesta-Bonillo, 2016). Thus, perceived asset value refers to an investor's subjective assessment of a property's worth in terms of its perceived quality and perceived price (Ali et al., 2023), reflecting expectations of future performance, potential appreciation, and returns. It includes evaluations of property characteristics like location, size, and condition, alongside market conditions and economic factors (Annin et al., 2024). This perceived value influences real estate investment decisions, as investors are more likely to invest in properties with high perceived value and growth potential (Baker and Ricciardi, 2014). Factors such as the security situation, corruption, and infrastructure challenges in Iraq further shape this perception (Diab, 2024; EIU, 2010).

Risk Tolerance

This refers to the degree of risk an investor is willing and able to endure, influenced by factors such as financial goals, investment horizon, personality traits, past experiences, age, income, and financial standing (Aeknarajindawat, 2020; Annin *et al.*, 2024; Cervellati *et al.*, 2024; Geetha and Selvakumar, 2016; Karki *et al.*, 2020; Ludwig, 2023; Zulhajmi and Rafik, 2022). It reflects an investor's comfort with variability in returns and potential financial losses in pursuit of higher gains (Annin *et al.*, 2024; Baker and Ricciardi, 2014). Risk tolerance plays a significant role in investment decision, with risk-seeking individuals more likely to invest in potentially high-reward, highrisk properties.

2.2 Theoretical Lenses

To underpin the study, two theoretical frameworks were integrated: namely, the behavioural finance theory and prospect theory. Behavioural finance theory, attributed by Velupillai (2019) to Thaler (1980) as the originator, explores the psychological influences and cognitive biases that impact investors' decisions, explaining that investors do not always act rationally but are influenced by various biases and emotions (Duxbury, 2015a, 2015b; Kawadkar, 2024). The theory serves as a valuable tool for guiding real estate investors in their property investment decisions and can also explain the non-financial reasons behind their preferences for certain properties over others (Agwu, 2023). Some of the theory's key concepts highlighted in Olsen (2010), such as risk perception and risk tolerance, are essential for understanding how perceived asset value influences real estate investment decisions.

Complementing this, Kahneman and Tversky's (1979) prospect theory provides insights into decision-making under risk, focusing on loss aversion and the value function. The theory provides a framework for understanding how people make decisions involving risk, emphasising loss aversion and the value function. Investors' fear of losing is stronger than their desire for gains, leading to risk-averse behaviour for potential profits and potentially irrational valuation of assets (Tversky and Fox, 1995). Thus, the prospect theory suggests investors value property relative to a reference point (Kahneman and Tversky, 1979), are risk-averse due to loss aversion (Tversky and Kahneman, 1992), and weight gains/losses differently based on risk tolerance (Barberis, 2013), ultimately influencing their investment decisions (Kahneman, 2024).

Rationally, perceived asset price and perceived asset quality significantly influence real estate investment decisions as investors evaluate properties based on their potential returns and inherent attributes. However, behavioural finance theory posits that psychological factors, including biases and emotions, also critically shape these decisions (Ogunlusi and Obademi, 2021; Utari et al., 2024). For instance, investors may overestimate a property's future value due to optimism bias or avoid investing due to fear, regardless of rational assessments of price and quality (Awais et al., 2021; Dervishaj, 2021). Investor risk perception, which is how investors view the risks associated with a property, mediates the impact of these psychological influences. This means that even if a property is objectively valuable, an investor's subjective risk perception-shaped by behavioural biases like overconfidence or loss aversion-can sway their decision to invest or not (Saivasan and Lokhande, 2022; Zhang et al., 2022). Thus, understanding both the rational and psychological dimensions is crucial for comprehending real estate investment behaviour.

Prospect theory further explains that risk tolerance influences how investors respond to their risk perceptions; those with higher risk tolerance are less affected by loss aversion and more willing to invest in high-value assets despite higher risks, while those with lower risk tolerance are more cautious and likely to avoid such investments (Harini and Subramanian, 2024). In real estate, this means investors might choose properties with guaranteed modest returns over high but uncertain returns due to risk aversion (Fabozzi et al., 2020; Ilmanen, 2022). Conversely, they might hold onto declining properties, hoping for market recovery to avoid certain losses, displaying risk-seeking behaviour (Khezr, 2023). Risk tolerance moderates these behaviours; highrisk-tolerant investors are more likely to pursue high-risk, highreward opportunities, perceiving high-value properties as worth the risk despite potential losses (Sivarajan, 2018). This moderating effect influences how perceived asset value and investor risk perception shape real estate investment decisions.

Considering the foregoing theoretical position, this study's framework suggests that perceived asset value influences investment decisions through the mediating effect of investor risk perception, which is moderated by the investor's risk tolerance. © Copyright IRASS Publisher. All Rights Reserved

Higher risk-tolerant investors perceive high-value assets more favourably and are more willing to invest despite perceived risks, whereas lower risk-tolerant investors are more cautious and less likely to invest, even if the perceived asset value is high. This integrated approach provides a robust theoretical framework for understanding the psychological and perceptual dimensions of investment decision-making, offering a nuanced explanation of investor behaviour in the real estate market.

2.3 Research Hypotheses and Framework

This section focuses on the relationships defining the research model and informing the study hypotheses as illustrated in Figure 1 and detailed in subsequent subsections.



Figure 1. Research Model

2.3.1 Perceived Asset Value and Real Estate Investment Decision

Distinct from actual market value, perceived asset value is a psychological construct driven by investor expectations and beliefs about growth, stability, and returns (Parveen et al., 2023). Real estate valuation, especially where informed by the investor's perception-driven cognitive biases (Zhang et al., 2022), exerts a determining influence on their investment decisions (Ali et al., 2023; Brzezicka, 2021; Sa-Aadu et al., 2010). Higher perceived asset value increases investors' willingness to invest due to optimistic expectations about the property's future (Parveen et al., 2023). Thus, perceived asset value plays a significant role in real estate investment decisions in Iraq (Annin et al., 2024; EIU, 2010; Parveen et al., 2023). Understanding how investors perceive the value of assets can greatly influence their investment choices in the real estate sector. This is because investors' perception of a property's key sustainability features as a basis for real estate investment decisions (Meins and Sager, 2015). This is evident in volatile environment such as during Covid-19 (Ali et al., 2023) or inflationary time (Gumasing and Niro, 2023). However, according the findings of Sun et al. (2019), such effects still holds true irrespective and time and locational differences. Nevertheless, based on prospect theory's position that people prioritise potential gains over losses (Kahneman and Tversky, 1979), investors in real estate might be more drawn to potential appreciation than depreciation (Poderytė and Šešplaukis, 2024). Accordingly, we hypothesise as follows:

 H_1 : Perceived asset value positively influences real estate investment decisions.

2.3.2 Perceived Asset Value and Investor Risk Perception

Investors are more likely to perceive real estate as less risky where the asset's quality (e.g., location, amenities) and price (fair or undervalued) are deemed favourable (Anzinger *et al.*, 2017; Bhattacharya-Mis and Lamond, 2016; Geltner and Minne, 2017; Wu et al., 2023). This positive perception of asset value translates to increased investment confidence due to low risk brought about by good maintenance (West et al., 2024). However, the relationship between perceived value and risk perception is complex. First, some research indicates a positive relationship, where higher perceived risk leads to lower asset prices, as investors demand a risk premium for riskier assets (Gupta, 2020; Huber et al., 2019), or higher asset values lead to increased risk perception due to fear of potential losses (De Bondt and Thaler, 2012). Conversely, other studies suggest a negative relationship (Yang, 2022), demonstrating that higher perceived risk correlates with lower trading prices due to investor risk aversion (Alhakami and Slovic, 1994), or higher asset values are deemed safer due to market validation and perceived stability (Baker and Wurgler, 2006; Jo et al., 2024). However, some research reveals a more complex inconclusive relationship (Amah, 2024), dependent on market conditions, investor sentiment, and behavioural biases, making it inconsistent across different contexts (Shefrin & Statman, 2000). Accordingly, the following non-directional hypothesis was formulated:

 H_2 : Perceived asset value correlates with investor risk perception.

2.3.3 Investor Risk Perception and Real Estate Investment Decision

Investor risk perception, heavily influenced by irrational emotions like loss aversion (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992), plays a critical role in real estate decisions (Sharmiladevi et al., 2024). Understanding investor risk perception is essential for navigating the complexities of the Iraqi real estate market and for developing strategies that align with investors' risk profile and financial goals (Alexandru, 2019; Baker and Ricciardi, 2014). Sentiments are known to shape an investor's risk perception in investment decisions (Baker and Wurgler, 2006; Das et al., 2015), and these sentiments include regret aversion, loss aversion, and overconfidence (Bihari et al., 2023). This perception is critical in predicting trading and risk-taking behaviour, as it influences investors' willingness to take on risk and their subsequent investment choices (Agava et al., 2021; Hoffmann et al., 2015). However, the literature seems to suggest a complex and context-dependent link between investor risk perception and real estate investment decisions. For instance, some studies provided evidence that high levels of risk perception or investor sentiment can lead investors to be more cautious (Clayton et al., 2009b), as risk-averse investors prefer safer, more liquid assets (Huber et al., 2019); whereas higher risk perception potentially drives riskseeking behaviour and pursuit of higher returns, thus leading to increased investments despite the challenges (Gbohoui et al., 2023; Tamilmathi and Priya, 2024). Also, Risqina et al. (2023) reported a positive but insignificant link between risk perception and investment decision. Nevertheless, some studies reported inconclusive outcomes. For instance, Dhar and Goetzmann (2006) suggest that the risk perception-investment decisions relationships could be non-linear, context-dependent, the direction and magnitude of which depend on factors beyond these two. Accordingly, the following non-directional hypothesis is assumed:

 H_3 : Investor risk perception correlates with real estate investment decisions.

2.3.4 Investor Risk Perception as Mediator Between Perceived Asset Value and Real Estate Investment Decision

It has been argued earlier in this paper that perceived asset value significantly influences real estate investment decisions, especially in volatile markets (Ali et al., 2023; Parveen et al., 2023). This perception is intertwined with investor risk perception, although the relationship is complex and context-dependent (Anzinger et al., 2017; Geltner and Minne, 2017; Wu et al., 2023). Investor risk perception itself plays a crucial role in real estate decisions (Sharmiladevi et al., 2024), with its impact varying based on individual and market factors (Clayton et al., 2009b; Gbohoui et al., 2023; Huber et al., 2019; Tamilmathi and Priya, 2024). These arguments suggest that perceived risk could plays a mediating role in the asset value-investment decision relationships (Zhang et al., 2022). As the prospect theory suggests, investors evaluate potential real estate investments not solely based on their perceived value but also through the lens of potential gains and losses (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). Thus, even a high perceived asset value might not lead to an investment if the perceived risk is too high. This dynamic is supported by numerous studies across various financial contexts (Abbas et al., 2022; Ahmed et al., 2022; Almansour et al., 2023; Khan, 2022; Mishra, 2019; Riaz and Hunjra, 2015; Wangzhou et al., 2021; Yadav and Chaudhary, 2022; Zhang et al., 2022), demonstrating the critical role of risk perception in shaping investment behaviour. we therefore hypothesise as follows:

 H_4 : Investor risk perception mediates the relationship between perceived asset value and real estate investment decisions.

2.3.5 Risk Tolerance as Moderator Between Perceived Asset Value and Real Estate Investment Decision

This study assumes that risk tolerance moderates the relationship between perceived asset value and real estate investment decisions is strongly supported by theoretical frameworks and empirical evidence. Investors with higher risk tolerance are more likely to be attracted to assets with high perceived value, even if associated with greater risk, prioritising potential returns over risk mitigation (Sudirman et al., 2023; Xing, 2024). Conversely, those with lower risk tolerance may avoid such investments, prioritizing capital preservation and seeking lowerrisk options with predictable returns (Khan, 2022; Kumar and Kumar, 2020). Thus, high risk tolerance leads to pursuing highvalue investments despite risks, while low risk tolerance favours conservative choices to minimise losses (Koch and Menkhoff, 2024; Mukhdoomi and Shah, 2023; Nguyen et al., 2019; Xing, 2024). This moderation effect is consistent with prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992) and the risk-return trade-off principle, where investors evaluate potential gains and losses based on their risk appetite (GCG Real Estate, 2024). Empirical evidence further substantiates this assumption. For example, Yuvaraj and Venugopal (2024) found that risk tolerance positively moderates the relationship between investment intention and actual investment behaviour. Similarly, Ali et al. (2023) found that during crises times, investors with higher risk tolerance were more likely to invest despite uncertainties, emphasising the pivotal role of risk tolerance in translating perceived asset value into investment decisions. However, Luan et al. (2024) and Singh et al. (2023b) demonstrated that risk tolerance significantly but negatively moderates the impact of influencer attractiveness and conscientiousness on investment willingness and investment riskiness, respectively. Furthermore, Tom and Rakesh (2021) little interaction effect of financial literacy and financial risk tolerance on willingness to pay. In the context of Iraqi real estate, risk tolerance is crucial in moderating the relationship between perceived asset value and investment decisions, influencing how investors respond to market volatility and uncertainties (Rehman *et al.*, 2023; Singh *et al.*, 2023b). In view of this preceding discourse, we formally hypothesise as follows:

 H_5 : Risk tolerance moderates the relationship between perceived asset value and real estate investment decisions.

2.3.6 Risk Tolerance as Moderator Between Investor Risk Perception and Real Estate Investment Decision

Research has shown that the psychological variant of perceived risk is the most influential on behaviours related to investment decision-making (Nur Aini and Lutfi, 2019; Wang et al., 2024). Further evidence by Jiang et al. (2024), Vuković (2023) and Zulhajmi and Rafik (2022) underscore the importance of individual differences in shaping investment behaviour, including the influence of personality traits. However, this effect varies based on individual risk tolerance profiles. For instance, investors with higher risk tolerance are more likely to make real estate investment decisions despite perceiving higher risks, while those with lower risk tolerance are less likely to invest in real estate when they perceive higher risks (Aeknarajindawat, 2020; Nur Aini and Lutfi, 2019). While studies show a clear correlation between risk perception and investment (Almansour et al., 2023; Wang et al., 2024), factors like the investor's risk appetite/tolerance strengthen (Singh et al., 2023b; Yuvaraj and Venugopal, 2024) or weaken (Khan, 2022; Roszkowski et al., 2009) this link. Empirical evidence exist suggesting that risk tolerance acts as a buffer against heightened risk perception, influencing individuals' willingness to embrace risk and seek higher returns (Nguyen et al., 2019). Theoretically, the preference for risk-return trade-offs among risktolerant investors, as outlined in prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992), can override the negative impact of perceived risk. Understanding the interaction of risk perception with risk tolerance on investment behaviours can help refine investment strategies and risk management approaches. Accordingly, we formally put forward the following hypothesis.

 H_6 : Risk tolerance moderates the relationship between investor risk perception and real estate investment decisions.

3. Methodology

The quantitative survey design (Tsolacos and Andrew, 2021) was employed to collect perceptual data from a sample of 205 real estate investors in Iraq. Respondents were asked to rate their responses to various questions related to the four study constructs using a Likert agreement scale. The data thus collected were analysed using JASP and SmartPLS to identify relationships between the variables (JASP Team, 2023) and to test the hypotheses proposed in the study (Ringle *et al.*, 2015), respectively.

3.1 Study Context and Population

The study was carried in Iraq. With a population of about 40 million and landmass of 435,052 km² (Al-Ghazi, 2024), Iraq an estimated 2.5 million housing units and a growing demand for @ Copyright IRASS Publisher. All Rights Reserved

commercial spaces, particularly in cities like Baghdad and Erbil (Diab, 2024). The majority of the population is urban, with 71.6% living in cities (Mhana et al., 2024). With rate of urbanisation at 2.91% and growing demand for housing (CIA, 2024), Iraq suffers "housing deficit" (NIC, 2024, p. 173), and needs an additional 250,000 residential units annually (Ozheb, 2023). Consequently, the Iraqi real estate market is experiencing a rapid boom (Morshed, 2022; Statista, 2024), particularly in Irbil (Baban, 2024), with rising property values and rents driven by high demand for both commercial and residential properties. However, this growth comes alongside a housing crisis impacting the working and middle class due to limited affordable housing options and high land costs (Hassan, 2020; Morshed, 2022). While the market is expected to keep growing (Statista, 2024), challenges related to affordability and access to financing remain (Bruneau and Rabah, 2022). Nevertheless, as an upper-middle-income country with a GNI per capita of \$5,270 in 2022 (World Bank, 2023), a large portion of Iraqis might have the financial capacity to invest in real estate.

The target population of the study consists of individual real estate investors in Iraq who actively participate in the Iraqi real estate market, either for residential or commercial purposes. Only investors who have made at least one real estate investment decision in Iraq within the past 5 years were included. Additionally, high school qualification was used as the threshold in ensuring that the investors had the capacity to understand and respond to survey questions. Individuals who are not directly involved in real estate investment decisions (e.g., real estate agents, property managers), or who have not participated in the Iraqi real estate market in the past 5 years, or who lack the capacity to understand the survey questions (having less than high school formal education) were excluded. Several reasons inform the use of these inclusion and exclusion criteria. First, focusing on individual investors directly captures their decision-making processes and perceptions. Second, the 5-year investment timeframe ensures respondents have recent experiences to draw on when responding to questions. Third, excluding real estate professionals keeps the focus on investor psychology rather than market-specific knowledge.

3.2 Sampling, Sample and Data Collection

A multi-method and multi-level sampling approach was employed to select a sample of 205 Iraqi real estate investors, combining the strengths of stratified and purposive sampling techniques (Leech and Donovan, 2023; Teddlie and Yu, 2007). At the city level, stratified sampling (Triveni et al., 2024) was used to divide Iraq into seven strata, corresponding to the seven priority governorates for the construction of new real estate investment opportunities (Table 1): Al Dewaniya, Al Muthana, Al Nasriya, Basrah, Maysan, Najaf, and Wasit (NIC, 2024), ensuring representation of diverse market environments (Ali et al., 2021). The sample of 205 real estate investors was proportionately allocated to these seven priority governorates, as shown in Table 1. Within each stratum (governorate), purposive sampling was employed to select individual investors, targeting experienced and knowledgeable participants who could provide rich insights into real estate investment decisions (Friday and Leah, 2024). This multi-level approach allowed for the capture of both city-level market characteristics and individual-level investor perspectives, providing a comprehensive understanding of the Iraqi real estate investment landscape (Tsolacos and Andrew, 2021).

Governorate	Housing Units	Sample
Al Dewaniya	59,643	29
Al Muthana	1,500	2
Al Nasriya	8,335	4
Basrah	117,000	58
Maysan	8,335	4
Najaf	144,409	71
Wasit	75,603	37
Total	414,825	205

Table 1. Study Sample by Investment Opportunities

Source: National Investment Commission, Iraq (NIC, 2024, p. 175)

It is noteworthy that an item seeking for the consent of the participant was included at the head of the questionnaire. The item required prospective respondents to tick a [Yes] or [No] option to this statement: By completing and submitting this questionnaire, I gave my consent to participate in the study and for my data to be used for research purposes.

3.3 Measures and Pilot Tests

A 5-point Likert agreement scale rated from 1 = Stronglydisagree to 5 = Strongly agree (Likert, 1932) was used in assessing the four study constructs. The adapted scales were pilot-tested using data collected from a pilot sample of 59 respondents. The data thus collected were analysed in JASP for internal consistency reliability using three indices: Cronbach's alpha (Nunnally and Bernstein, 1994), greatest lower bound (GLB) (Bendermacher, 2010), and average interitem correlation (AIC) (Tang et al., 2014). The reliability analysis showed satisfactory internal consistency across all constructs. For perceived asset value, the results indicate good reliability ($\alpha = 0.768$, GLB = 0.805) and moderate item consistency (AIC = 0.399). Real estate investment decisions had acceptable reliability ($\alpha = 0.707$, GLB = 0.761) and moderate item correlation (AIC = 0.378). Investor risk perception yielded high reliability ($\alpha = 0.791$, GLB = 0.861) and strong item consistency (AIC = 0.432). Finally, risk tolerance had good reliability (α = 0.769, GLB = 0.801) and moderate item consistency (AIC = 0.400). The GLB values were consistently higher than Cronbach's alpha, providing more accurate reliability estimates. Overall, the GLB values were consistently higher than Cronbach's alpha, providing more accurate estimates of reliability, while the AIC values suggested moderate to strong relationships among the items within each construct.

3.3.1 Investor Status

Investor status was ascertained using a single item measure adapted from Jin (2024). The scale assessed respondents' experience in real estate investment, distinguishing between experienced investors and newcomers. The scale consists of one question: "I have invested at least once in real estate before in the last five years," with a binary response option (1 = Yes, 2 = No).

3.3.2 Perceived Asset Value

Perceived asset value was evaluated using an adapted 5item scale. The scale draws on established research to capture an investor's perception of potential value in a real estate investment. Thus, it incorporates items on future appreciation potential (Sun *et al.*, 2019), rental income generation (Feng *et al.*, 2023), development possibilities and current market demand (Ali *et al.*, 2023). Additionally, it includes a holistic assessment of overall value perception (Puustinen *et al.*, 2013).

3.3.3 Real Estate Investment Decision

Scott and Bruce's (1995) decision-making style scale, widely used by researchers in real estate studies (e.g., D'Lima and Schultz, 2021; Wangzhou *et al.*, 2021), was adapted in measuring real estate investment decision as a 4-item measure. This is consistent with researchers' practices (Sharmila and Perumandla, 2023; Sun *et al.*, 2019). The scale captures key aspects of investor decision-making in the field of real estate studies, incorporating decision-making indicators such as confidence in financial analysis, risk propensity, and decisiveness. Also, the scale considers the importance of long-term vision in investment decisions.

3.3.4 Investor Risk Perception

Investor risk perception was assessed using a Likert scale adapted by drawing upon established research in risk perception and its application to real estate investment decisions. The scale incorporates concepts from existing studies on risk tolerance (Dohmen *et al.*, 2011), market uncertainty (Huber *et al.*, 2019), and potential negative outcomes like financial loss (Tamilmathi and Priya, 2024) and unexpected expenses (Weber *et al.*, 2002). The 5item scale consists of statements reflecting the potential for financial loss, market volatility, unforeseen costs, selling difficulties, and overall perceived risk associated with the real estate investment opportunity.

3.3.5 Risk Tolerance (5 items)

The risk tolerance scale was constructed to assess investor willingness to accept risk in real estate investment decisions. It incorporates established concepts from risk tolerance research, including comfort with uncertainty (Shou *et al.*, 2024) and tolerance for potential losses (Shou and Olney, 2022). The scale also considers the real estate investment context by including items on openness to high-risk opportunities (Abdul Hadi *et al.*, 2023) and preference for calculated risks (Gilliam *et al.*, 2010). The 5-item Likert scale captures investor perspectives on uncertainty, high-risk/high-reward opportunities, calculated risk preferences, risk management importance, and tolerance for potential losses in the context of real estate investment decisions (Ruiz-Menjivar *et al.*, 2014).

3.4 Data Analysis

In this study, we employed a multi-software approach for data analysis. Initially, we used JASP (Version 0.18.3) for descriptive analysis, calculating means, standard deviations, and frequencies, and conducting exploratory data analysis and statistical tests (JASP Team, 2023). Subsequently, SmartPLS was employed to perform path modelling (Ringle *et al.*, 2015), testing the hypotheses that perceived asset value directly affects real estate investment decisions, investor risk perception mediates this relationship, and risk tolerance moderates the mediation effect. This multi-software approach ensured robust data analysis, enhancing the reliability and validity of the research findings.

4. Results

4.1 Descriptives and Correlations

The sample of Iraqi real estate investors (n = 205, Table 2) was predominantly male 40.59, SD = 7.25), middle-income ($\overline{x} = 2.478$, SD = 1.182) on a 1-5 scale, mostly married ($\overline{x} = 1.156$, SD = 0.364), and relatively well-educated ($\overline{x} = 2.102$, SD = 0.689) on a

1–3 scale, with a diverse age range ($\overline{x} = 40.59$, SD = 7.25, range: 25–62) and geographic distribution ($\overline{x} = 4.790$, SD = 1.938) on a 1–7 scale. They demonstrated a positive perception of real estate asset value ($\overline{x} = 3.278$, SD = 0.570) and a strong inclination towards investment ($\overline{x} = 3.859$, SD = 0.733). Notably, while exhibiting high-risk perception ($\overline{x} = 3.921$, SD = 0.749), investors also reported a high degree of risk tolerance ($\overline{x} = 4.065$, SD = 0.671), suggesting willingness to take greater risks with the right investment.

Table 2. Descriptive Statistics									
Variable	Mean	SD	Min.	Max.					
Age	40.585	7.252	25.000	62.000					
Gender	1.176	0.381	1.000	2.000					
Income	2.478	1.182	1.000	5.000					
Education	2.102	0.689	1.000	3.000					
Marital	1.156	0.364	1.000	2.000					
Location	4.790	1.938	1.000	7.000					
Perceived Asset Value	3.278	0.570	0.800	4.000					
Real Estate Investment Decisions	3.859	0.733	1.250	5.000					
Investor Risk Perception	3.921	0.749	1.600	5.000					
Risk Tolerance	4.065	0.671	1.000	5.000					

For correlation analysis, Kendall's (1938) tau-b (τ b) in JASP was utilised due to its suitability for analysing mixed data types (ordinal, nominal, and continuous), and its robustness to non-normality of demographic and behavioural data (Croux and Dehon, 2010). The results in Table 3 revealed significant associations between several variables. Notably, a strong positive correlation was found between age and income (τ b = 0.893, *p* < .001), while weaker positive correlations were observed between gender and income (τ b = 0.121, *p* < .05), and marital status and real estate investment decisions (τ b = 0.128, *p* < .05). Also, moderate positive

correlations were identified between perceived asset value and risk tolerance ($\tau b = 0.273$, p < .001), and between investor risk perception and real estate investment decisions ($\tau b = 0.306$, p < .001). Interestingly, a weak positive correlation was found between investor risk perception and risk tolerance ($\tau b = 0.077$, p < .05), suggesting a complex interplay between these factors in the context of investment behaviour; ; however, it does not significantly correlate with real estate investment decisions or investor risk perception.

Table 3. Kendall's Tau-b Correlations											
Variable	Age	Gender	Income	Education	Marital	Location	PAVL	REID	IRIP	RIST	
1. Age	—										
2. Gender	0.120^{*}	—									
3. Income	0.893***	0.121	—								
4. Education	0.091	0.020	0.085	—							
5. Marital	0.067	0.119	0.069	-0.023	—						
6. Location	0.057	0.028	0.061	-0.027	0.017	—					
7. PAVL	-0.081	-0.035	-0.081	-0.022	0.045	0.012	—				
8. REID	-0.031	-0.091	-0.049	0.038	0.128^{*}	0.067	0.154**	_			
9. IRIP	-0.014	-0.040	-0.005	-0.055	0.040	-0.011	0.137**	0.306***			
10. RIST	-0.016	0.024	-0.027	-0.008	0.066	0.038	0.273***	0.072	0.077	_	

Note: * *p* < .05, ** p < .01, *** p < .001

4.2 Model Analysis

We used PLS-SEM to examine how perceived asset value influences investment decisions, whether investor risk perception mediates this relationship, and if risk tolerance moderates this mediation effect. Following Hair *et al.* (2019), we first assessed the measurement model to ensure that the construct indicators © Copyright IRASS Publisher. All Rights Reserved

adequately represent the underlying latent constructs. Subsequently, we analysed the structural model to test the direct and indirect effects (mediation and moderation) proposed in the study model.

4.3 Measurement Model Analysis

The measurement model analysis entails evaluating the reliability and validity of the study constructs. The former was achieved by computing factor loadings, being measures of indicator validity, and Cronbach's (1951) Alpha (CA), Dijkstra-Henseler's (2015) rho_A, and Jöreskog's (1971) Composite Reliability (CR) as the internal consistency indices of construct reliability.

Reliabilities

For reliability, the factor loadings shown in Table 4 for all constructs range from 0.675 to 0.796, MacCallum and Austin's (2000) minimum acceptable loading threshold of > 0.50.

Specifically, the loadings for investor risk perception (0.698-0.770), perceived asset value (0.706-0.745), real estate investment decisions (0.675-0.772), and risk tolerance (0.671-0.796) demonstrate strong associations between the indicators and their respective latent variables, thus providing robust support for the measurement model. Additionally, the internal consistency reliability indices indicate good to excellent reliability for all constructs, with most exceeding Nunnally and Bernstein's (1994) acceptable threshold of 0.70. Specifically, CA, rho_A, and CR values ranging from 0.708 to 0.857, indicating the reliability and consistency of the constructs' measures.

Table 4. Indicator and Construct Reliabilities									
Constructs	Items	Loadings	CA	rho_A	CR				
	IRIP1	0.698							
	IRIP2	0.751							
Investor Risk Perception	IRIP3	0.728	0.792	0.795	0.857				
reception	IRIP4	0.770							
	IRIP5	0.742							
	PAVL1	0.718							
	PAVL2	0.719							
Perceived Asset Value	PAVL3	0.706	0.769	0.771	0.843				
	PAVL4	0.708							
	PAVL5	0.745							
	REID1	0.772							
Real Estate Investment	REID2	0.727	0.709	0.719	0.010				
Decisions	REID3	0.733	0.708	0.718	0.818				
	REID4	0.675							
	RIST1	0.796							
	RIST2	0.709							
Risk Tolerance	RIST3	0.671	0.769	0.784	0.843				
	RIST4	0.737							
	RIST5	0.684							

Validities

Convergent and discriminant validities of the study constructs were also established using average variance extracted (AVE), the Fornell-Larcker criterion, and the homotrait-monotrait (HTMT) ratio of correlations, displayed in Table 5. The AVE results (i.e., IRIP = 0.545, PAVL = 0.517, REID = 0.529, and RIST = 0.520) indicate that the constructs have acceptable levels of convergent validity, as all AVE values exceed the recommended threshold of 0.50 (dos Santos and Cirillo, 2021). These values suggest that more than 50% of the variance in the indicators is accounted for by the underlying constructs, confirming the constructs' convergent validity. Furthermore, the Fornell-Larcker discriminant validity results show that the square root of the AVE for each construct (i.e., IRIP = 0.738, PAVL = 0.719, REID = 0.728, and RIST = 0.721) is greater than the correlations between that construct and all other constructs, meeting Fornell and Larcker's (1981) criterion and indicating that the constructs demonstrate adequate distinctiveness. However, due to the concerns identified with the Fornell-Larcker criterion (Cheung *et al.*, 2024), and in response to Cheung *et al.*'s (2024) recommendation for multiple criteria for assessment, the HTMT results were also reported which show that all the correlation ratios are below the recommended threshold of 0.85 (Hair *et al.*, 2022; Henseler *et al.*, 2015), with the highest ratio being 0.771 for the relationship between perceived asset value and risk tolerance. This indicates that the constructs demonstrate adequate discriminant validity.

Table 5. Convergent and Discriminant Validities

	Tuble 5. Convergent una Discriminant Valuaties											
		For	rnell-Larc	ker Criter	rion	Hor	notrait-M	onotrait F	Ratio			
Constructs	AVE	IRIP	PAVL	REID	RIST	IRIP	PAVL	REID	RIST			
IRIP	0.545	0.738				—						

IRASS Journal of Economics and Business Management. Vol-2, Iss-2(February-2025), 61-81.

PAVL	0.517	0.366	0.719			0.464	—		
REID	0.529	0.476	0.459	0.728		0.607	0.596	—	
RIST	0.520	0.264	0.587	0.299	0.721	0.344	0.771	0.377	

Note: IRIP = Investor Risk Perception, PAVL = Perceived Asset Value, REID = Real Estate Investment Decisions, RIST = Risk Tolerance

Lastly, cross-loadings, though its discriminant efficacy has been questioned (Henseler *et al.*, 2015), provides that indicator loadings should be higher on their intended constructs than any other construct (Cao and Liang, 2023). Thus, according to the data in Table 6, most indicators load strongly (> 0.50) on their primary construct, while loading weakly (< 0.50) on other constructs, indicating good discriminant validity. However, some items (i.e., perceived asset value, real estate investment decisions, and risk tolerance) exhibit moderate cross-loadings (between 0.30 and 0.50), as supported by Cao and Liang (2023). Investor risk perception items show the clearest distinction, while risk tolerance items show some overlap with perceived asset value and real estate investment decisions, supporting overall indicator/construct validity. The indicator loadings and the convergent validity scores are illustrated in Figure 2.

Table 6. Indicator Cross-Loadings									
Constructs	Indicators	IRIP	PAVL	REID	RIST				
	IRIP1	0.698	0.310	0.314	0.224				
	IRIP2	0.751	0.252	0.295	0.225				
Investor Risk	IRIP3	0.728	0.278	0.314	0.248				
reiception	IRIP4	0.770	0.244	0.341	0.120				
	IRIP5	0.742	0.265	0.460	0.164				
	PAVL1	0.302	0.718	0.386	0.403				
	PAVL2	0.253	0.719	0.322	0.344				
Perceived	PAVL3	0.243	0.706	0.227	0.477				
Asset value	PAVL4	0.245	0.708	0.373	0.333				
	PAVL5	0.264	0.745	0.308	0.577				
	REID1	0.400	0.356	0.772	0.300				
Real Estate	REID2	0.354	0.301	0.727	0.188				
Investment Decisions	REID3	0.359	0.390	0.733	0.227				
	REID4	0.242	0.267	0.675	0.115				
	RIST1	0.190	0.448	0.273	0.796				
	RIST2	0.199	0.379	0.185	0.709				
Risk Tolerance	RIST3	0.169	0.391	0.216	0.671				
	RIST4	0.185	0.430	0.194	0.737				
	RIST5	0.217	0.471	0.190	0.684				



Figure 2. Measurement Model

Structural Model Analysis

The bootstrapping method in SmartPLS was applied in testing the study's hypotheses: three direct, one mediated, and three moderated (Bittmann, 2021). The outcomes were interpreted based on the β values being estimates of predictor variable effects on non-residual variances of real estate investment decisions (Spencer, 2001). These tests were preceded by multicollinearity checks to ascertain the suitability of the dataset for regression analysis (Sarstedt *et al.*, 2019).

Multicollinearity Diagnostics

Variance inflation factor (VIF) was used in testing for multicollinearity. VIF indicates how much the variance of a

regression coefficient is inflated due to multicollinearity among independent variables (Thompson *et al.*, 2017). The VIF results displayed in Table 7, assessed using Hair *et al.*'s (2022) threshold value of VIF ≤ 3 , indicate that the outer VIF values for all construct indicators are below the threshold of 3, ranging from 1.292 to 1.811, and the inner VIF values for the latent constructs are also below 3, ranging from 1.160 to 1.645. This suggests that there is no significant multicollinearity among the indicators within each construct and among the latent constructs in the structural model. The study variables are thus sufficiently independent, and the path model analysis can be conducted without concerns about multicollinearity bias.

Table 7. Multicollinearity Statistics							
Constructs	Items	Outer VIF	Inner VIF				
Investor Risk Perception	IRIP1	1.606					
	IRIP2	1.796					
	IRIP3	1.614	1.160				
	IRIP4	1.811					
	IRIP5	1.508					
	PAVL1	1.329					
	PAVL2	1.436					
Perceived Asset	PAVL3	1.614	1.645				
Value	PAVL4	1.340					
	PAVL5	1.617					
	REID1	1.345					
Real Estate	REID2	1.391					
Decisions	REID3	1.292	—				
	REID4	1.371					
	RIST1	1.627					
	RIST2	1.447					
Risk Tolerance	RIST3	1.306	1.531				
	RIST4 1.547						
	RIST5	1.359					

Tests of Hypotheses

Results of all three direct hypotheses tests shown in Table 8 were found to be positive and statistically significant. Specifically, the study found positive and statistically significant relationships between perceived asset value and real estate investment decisions (H₁: $\beta = 0.250$, t = 3.410, p = 0.001), perceived asset value and investor risk perception (H₂: $\beta = 0.366$, t = 4.450, p < 0.001), and

investor risk perception and real estate investment decisions (H₃: β = 0.344, *t* = 4.833, *p* < 0.001). These results indicate that Iraqi investors who perceive higher value in real estate are more likely to invest in it; that higher perceived asset value leads to higher perceived risk; and that investors who perceive higher risk are, counterintuitively, more likely to make real estate investment decisions. All three relationships were found to be statistically significant, suggesting that the effects are unlikely due to chance.

Table 8. Path (Coefficients
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					CIBC			
Paths	β	SD	t-Stat	Bias	2.50%	97.50%	<i>p</i> -Value	Decision
$PAVL \rightarrow REID$	0.250	0.073	3.410	-0.007	0.103	0.392	0.001	Supported
$PAVL \rightarrow IRIP$	0.366	0.082	4.450	0.001	0.186	0.516	0.000	Supported
$IRIP \rightarrow REID$	0.344	0.071	4.833	0.001	0.203	0.493	0.000	Supported
$PAVL \rightarrow IRIP \rightarrow REID$	0.126	0.040	3.171	0.001	0.059	0.217	0.002	Supported
$PAVL \times RIST \rightarrow REID$	0.149	0.103	1.449	0.008	-0.068	0.324	0.148	Not Supported

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IRASS Journal of Economics and Business Management. Vol-2, Iss-2(February-2025), 61-81.

$IRIP \times RIST \rightarrow REID$	-0.356	0.109	3.264	-0.003	-0.563	-0.157	0.001	Supported
<i>Note: IRIP = Investor</i>	Risk Perception,	PAVL =	Perceived	Asset Value	, REID	= Real Estate	Investment	Decisions, RIST =
Risk Tolerance								

In addition to these direct relationships, we also analysed the mediating role of investor risk perception in the relationship between perceived asset value and real estate investment decisions in Iraq. The results, in Table 8, show a statistically significant indirect effect (H₄: $\beta = 0.126$, t = 3.171, p = 0.002). While the effect of perceived asset value on real estate investment decisions seems to be partially explained by investor risk perception, other factors might also play a role. Specifically, we evaluated how risk tolerance might moderate this relationship. The outcome indicates that risk tolerance does not significantly moderate the relationship between perceived asset value and real estate investment decisions in Iraq (H₅: $\beta = 0.149$, t = 1.449, p = 0.148). this suggests that regardless of their risk tolerance level, Iraqi investors who perceive real estate as more valuable are still generally more likely to invest in it. However, this finding does not rule out a potential role for risk tolerance in the model. Thus, we evaluated how risk tolerance might moderate the investor risk perception-real estate investment decisions relationship. The results establish that risk tolerance moderates the link between investor risk perception and real estate investment decisions (H₆: β = -0.356, t = 3.264, p = 0.001). The coefficient (β = -0.356) represents the change in real estate investment decisions resulting from the interaction between investor risk perception and risk tolerance, with a negative sign indicating that as risk tolerance increases, the negative impact of investor risk perception on real estate investment decisions decreases. This observed interaction effect is unlikely due to chance (t = 3.264, p = 0.001).

One of the two interaction terms (i.e., IRIP×RIST) suggests a moderation effect, but it does not show the exact nature of the slope for each level of risk tolerance. Thus, further slope analysis was performed to fully understand the specific interaction pattern, as shown in Figure 3. The plot examines the interaction term investor risk perception \times risk tolerance and its effect on real estate investment decisions. The three lines representing real estate investment decisions (y-axis) at different risk tolerance levels: +1 SD (high), mean, and -1 SD (low). The x-axis represents investor risk perception (low to high). Thus, investors with high risk tolerance (+1 SD) show minimal change in investment decisions

regardless of perceived risk ($y \approx 0.00$). For average risk tolerance (at mean), a negative relationship exists (y = -0.30, +0.30) such that as perceived risk increases, the likelihood of making an investment decrease. This negative effect is strongest for low risk tolerance investors (-1 SD) with a steeper negative slope (y = -0.75, +0.75), such that a slight rise in perceived risk significantly deters investment decisions.



Figure 3. Simple Slope Analysis of the IRIP×RIST Interaction Effects

Model Quality Assessment

The model selection criteria results in Table 9 revealed a good fit for both the investor risk perception and real estate investment decisions models, with the latter model demonstrating a superior fit compared to the former model. This is evidenced by consistently lower values across multiple criteria (Sharma et al., 2019), for real estate investment decision vs. investor risk perception models: Akaike's Information Criterion [AIC] (-72.104 vs. -26.559), Unbiased Akaike's Information Criterion [AICu] (-68.065 vs. -24.549), Bayesian Information Criteria [BIC] (-58.812 vs. -19.913), Hannan-Quinn Criterion [HQ] (-66.728 vs. -23.871), and Corrected Hannan-Quinn Criterion [HQc] (-66.325 vs. -23.738). This suggests that the real estate investment decisions model is a better predictor of the data, providing a more accurate representation of the relationships between the variables in the study. Therefore, the real estate investment decisions model is preferred over the investor risk perception model, supporting the significance of this model in explaining real estate investment decisions in Iraq.

Table 9. Model Selection Criteria							
	Model Selection Criteria						
Models	AIC	AICu	AICc	BIC	HQ	HQc	
Investor Risk Perception	-26.559	-24.549	180.56	-19.913	-23.871	-23.738	

-68.065

135.197

-72.104

Having considered various model selection criteria, we now evaluate the model's explanatory power using the R^2 statistic, which indicates how well the model fits the data (Piepho, 2023). Thus, R^2 value of 0.320 (in Table 10) indicates that approximately 32% of the variability in real estate investment decisions can be explained collectively by the predictors. The R^2 Adjusted (0.310) is slightly lower, accounting for model complexity. Overall, these coefficients of determination indicate that the moderate explanation of the variance in real estate investment choices are due to perceived asset value, investor risk perception, risk tolerance, and their interactions. However, model explains a relatively low portion ($R^2 = 0.134$; R^2 Adjusted = 0.130) of the variation (about 13%) in investor risk perception in the Iraq real estate market.

Real Estate Investment Decision

Table 10. Model Evaluation Metrics: R^2 and Q^2							
Endogenous Constructs	R^2	R ² Adjusted	Q^2				
Investor Risk Perception	0.134	0.130	0.066				
Real Estate Investment Decision	0.320	0.310	0.187				

-66.728

-66.325

-58.812

Regarding predictive relevance, the Q^2 values of 0.187 and 0.066 reported in Table 10 demonstrated some potential for the model to predict real estate investment decisions and investor risk perception, respectively. However, the Q^2 metric is susceptible to overestimation in PLS-SEM (Chin et al., 2020; Hair et al., 2019). Therefore, we utilised Shmueli et al.'s Shmueli et al. (2019) PLS_{predict} and associated guidelines to determine if the study model

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can predict out-of-sample populations (thereby improving generalisability). Firstly, each of the indicator Q^2_{predict} values shown in Table 11 are non-negative, suggesting that the model has predictive power. Secondly, we proceed and checked the prediction errors and found that they are non-symmetric (Figure 4). For this reason, we employed the mean absolute error (MAE) values rather than the root mean squared error (RMSE) statistics in comparing the PLS MAE with those of the linear model (LM) based on the "PLS-SEM < LM" yardstick. We found that, for all indicators, the PLS MAE values are lower than the LM MAE figures. Thus, we conclude that the model has high predictive power.

 Table 11. PLS_{predict} Evaluations Using Mean Absolute Error

 (MAE)

	PLS		L	\mathbf{M}
Indicators	MAE	$Q^2_{ m predict}$	MAE	$Q^2_{ m predict}$
IRIP3	0.769	0.065	0.800	0.010
IRIP4	0.826	0.048	0.845	0.010
IRIP1	0.723	0.086	0.756	0.024
IRIP5	0.752	0.061	0.780	0.028
IRIP2	0.722	0.055	0.746	0.022
REID3	0.747	0.135	0.762	0.099
REID1	0.713	0.112	0.720	0.108
REID4	0.841	0.059	0.868	0.005
REID2	0.727	0.078	0.745	0.039



Figure 4. Prediction Errors of Real Estate Investment Decisions

Constructs' Relative Importance and Performance

Using Martilla and James' (1977) importance-performance map analysis (IPMA) shown in Figure 5, we reveal key insights into factors influencing real estate investment decisions, highlighting areas requiring strategic attention and potential avenues for enhancing investment outcomes. Perceived asset value (total effect = 0.41, performance = 76.83) and investor risk perception (total effect = 0.34, performance = 72.99) emerge as critical drivers of real estate investment decisions. This underscores the importance Iraqi real estate investors place on the estimated worth (and associated perceived risks) of real estate assets. However, these two factors locate in the concentrate here quadrant of the IPMA, indicating a need for strategic intervention to address their suboptimal performance. Surprisingly, risk tolerance (total effect = -0.03, performance = 76.71) exhibits a negative relationship with investment decisions, indicating that higher risk tolerance does not automatically lead to increased investments in real estate. Nevertheless, the high LV performance score of risk tolerance indicates a general understanding and acceptance of risk levels in the Iraqi real estate market. This indicates a need for strategies to better align risk tolerance with successful investment outcomes. Overall, the IPMA highlight the

need for stakeholders in the Iraqi real estate market to prioritise enhancing perceived asset value and investor risk perception in their strategic initiatives to drive more informed investment decisions, while carefully managing risk tolerance to align it more positively with investment outcomes.



Figure 5. Importance–Performance

5. Discussions

In this discussion section, we explore the implications of the study findings. They provide significant insights into the complex interplay of perceived asset value, investor risk perception, and risk tolerance on real estate investment decisions in Iraq. The results offer support for all three hypothesised direct relationships between the variables. Additionally, the mediating role of investor risk perception in the relationship between perceived asset value and real estate investment decisions was confirmed. Importantly, the study also identified a moderating effect of risk tolerance on the relationship between investor risk perception and real estate investment decisions. These findings contribute to a deeper understanding of the factors influencing real estate investment behaviour in the context of the Iraqi real estate market.

Specifically, results of the first hypothesis test (H₁: β = 0.250, t = 3.410, p = 0.001) indicating a significant positive effect of perceived asset value on real estate investment decisions in Iraq aligns with various studies that explored the relationship between investor perception and investment behaviour. This finding means that Iraqi investors are more likely to invest in real estate when they perceive the asset value to be high, suggesting that perceived value is a critical determinant of investment decisions. This positive relationship lends further support to the proposition of the prospect theory that perceived value impacts risk-taking behaviour (Kahneman and Tversky, 1979), underlining the propensity of investors to be more drawn to potential asset appreciation than its depreciation (Poderytė and Šešplaukis, 2024). Empirically, the finding aligns with the reports of Ali et al. (2023), Brzezicka (2021), and Sa-Aadu et al. (2010) that perception and behavioural biases influence real estate investment decisions during crises like COVID-19. This finding seems to be fairly generalisable across various contexts as such relationships may be independent of time and locational differences (Sun et al., 2019). Relatedly, Parveen et al. (2023) and Zhang et al. (2022) discuss how investor sentiments and cognitive biases, including perceived value, significantly impact investment decisions, reinforcing the relevance of these findings in the Iraqi context. These results also align with the broader economic perspectives on investment in emerging markets, as outlined by the Economist Intelligence Unit (EIU, 2010), which emphasise the importance of perceived economic stability and asset valuation in shaping investor behaviour. Finally, the

importance of perception in shaping investment behaviour was also demonstrated in a study on real estate investment intentions among Filipino millennials and Gen Z (Gumasing and Niro, 2023). Overall, the significant impact of perceived asset value on investment decisions highlights the crucial role of investor sentiment and perception in real estate markets, particularly in volatile environments like Iraq.

Also, the finding of a positive and statistically significant relationship between perceived asset value and investor risk perception (H₂: $\beta = 0.366$, t = 4.450, p < 0.001) aligns with established theories and research in behavioural finance (Thaler, 1980; Velupillai, 2019) and risk assessment (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). For instance, the behavioural finance theory posits that investors' judgments and decisions are shaped by psychological biases and heuristics, including the tendency to associate higher asset values with increased risk (Almansour et al., 2023). Alhakami and Slovic (1994) had earlier discussed the psychological dynamics between perceived risk and perceived benefit, suggesting that as investors perceive higher asset value, their risk perception may also increase, influencing their investment decisions positively. This is further supported by Bhattacharya-Mis and Lamond (2016), who emphasise that risk perception significantly affects property value assessments, indicating that investors who recognise higher asset value may also perceive associated risks differently, potentially leading to more favourable investment decisions. Also, Huber et al. (2019) provide experimental evidence that investor risk perception drives asset prices, reinforcing the notion that perceived asset value and risk perception are closely intertwined in shaping investment behaviour. However, the relationship can also be negative (Yang, 2022), especially where the investor places a premium on the safety of invested funds (Baker and Wurgler, 2006; Jo et al., 2024). Nevertheless, research has shown that the relationship between perceived asset value and investor risk perception can vary depending on the specific market and asset class (Anzinger et al., 2017; Geltner and Minne, 2017). Indeed, Amah (2024) and Bhattacharya-Mis and Lamond (2016) have reported negative or inconclusive relationships between perceived asset value and risk perception. These contrasting results emphasise the complexity and context-dependent nature of this relationship, highlighting the need for further research to understand the nuances of investor behaviour and risk perception in different market conditions and asset classes.

The positive and statistically significant relationship between investor risk perception and real estate investment decisions (H₃: $\beta = 0.344$, t = 4.833, p < 0.001) underlines the crucial influence of risk perception on investor behaviour in the Iraqi real estate market. This finding aligns with both existing theoretical frameworks and empirical research in behavioural finance and real estate economics. From a theoretical perspective, this result resonates with prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992), which emphasises the role of loss aversion in decision-making. The heightened sensitivity to potential losses, as predicted by prospect theory, may lead investors to exercise caution or even withdraw from real estate investments when risk perception is high (Alexandru, 2019; Baker and Ricciardi, 2014). This finding is further supported by research on investor sentiment (Baker and Wurgler, 2006; Clayton et al., 2009b; Das et al., 2015), which demonstrates the influence of risk perception as sentiment on market dynamics and investment © Copyright IRASS Publisher. All Rights Reserved

behaviour. Moreover, experimental evidence from Huber et al. (2019) strengthens the notion that subjective risk assessment significantly drives asset prices in markets, including real estate. However, the relationship between risk perception and real estate investment decisions is not always linear and can be moderated by various factors (Dhar and Goetzmann, 2006). Indeed, studies have highlighted the heterogeneous nature of real estate investment performance, suggesting that risk perception may vary depending on specific market conditions and property characteristics (Agava et al., 2021; Hoffmann et al., 2015). For instance, Risqina et al. (2023) reported a positive but insignificant link between risk perception and investment decision. Also, Alexandru (2019) emphasises the complex and multidimensional nature of risk perception, influenced by both rational and irrational factors, including cognitive biases (Bihari et al., 2023). Gbohoui et al. (2023) and Tamilmathi and Priya (2024), who explore the multifaceted nature of risk perception premiums in different regional contexts, further underscored this complexity. Thus, while the positive relationship between investor risk perception and real estate investment decisions is evident in this study, it is crucial to consider the nuances and complexities surrounding this relationship.

The fourth hypothesis test finding shows that investor risk perception significantly mediates the relationship between perceived asset value and real estate investment decisions (H₄: β = 0.126, t = 3.171, p = 0.002). In other words, investor risk perception partially mediates the perceived asset value-real estate investment decision relationship, such that the positive relationship between the antecedent and outcome variables is significant, but reduced in strength, when controlling for investor risk perception. The positive beta coefficient suggests that higher perceived asset value leads to increased investor risk perception, subsequently affecting investment decisions. This aligns with prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992), which posits that individuals' perceptions of risk significantly influence their choices, particularly in uncertain situations like real estate investments. Furthermore, the finding aligns with various studies in behavioural finance emphasising the role of risk perception in investment decision-making. For instance, it was demonstrated that investors' risk assessments alter their decisionmaking processes (Ahmed et al., 2022), that psychological factors such as overconfidence and fear significantly influence investment choices through risk perception (Riaz and Hunjra, 2015), that investors' perceptions of risk are pivotal in translating perceived asset value into investment action (Almansour et al., 2023), that subjective risk assessments can significantly influence market behaviour (Huber et al., 2019), that that investors' fear of making poor choices or missing out significantly influences their decisionmaking (Wangzhou et al., 2021), and that investors' risk perceptions mediate how asset value impact investment decisions. These findings underscore the need for real estate investors to consider risk perception in their decision-making processes (Anzinger et al., 2017; Zhang et al., 2022). This help them develop strategies that account for both the value of assets and risk in making informed investment choices.

The fifth hypothesis, however, was not supported. The nonsignificant moderating effect of risk tolerance on the relationship between perceived asset value and real estate investment decision (H₅: $\beta = 0.149$, t = 1.449, p = 0.148) suggests that, in this particular context, an individual's willingness to accept risk does not significantly alter the influence of perceived asset value on their investment choices. This finding is in consonance with the findings of Handijaya and Wiryakusuma (2023) and Tom and Rakesh (2021) that the interaction terms financial attitude \times risk tolerance and financial literacy × risk tolerance have no effect on financial behaviour and willingness to invest in financial advisory, respectively. However, the finding of the current study diverges from some previous research, which has identified risk tolerance as a crucial moderator in investment decision-making (e.g., (Khan, 2022; Nguyen et al., 2019; Sudirman et al., 2023). Several factors could explain this non-significant effect. The specific context, such as the political-economic following the US invasion of Iraq (Alyabis, 2020), might have amplified the influence of perception and behavioural biases over risk tolerance (Ali et al., 2023). Also, the masking effect of sample homogeneity (Locke et al., 1978) could have obscured the moderating effect of risk tolerance in the model. The measurement method, as Hair et al. (2022) indicate, for risk tolerance could also be a contributing factor. Moreover, the unique characteristics of real estate as an asset class, as outlined by Clayton et al. (2009a), might have collectively overshadowed the individual's risk tolerance. However, this non-significant result does not diminish the importance of risk tolerance, as evidenced by other studies (Singh et al., 2023b; Wati et al., 2022; Yuvaraj and Venugopal, 2024), highlighting the need for further research to unravel the complex interplay of factors influencing real estate investment decisions.

Finally, the finding that risk tolerance negatively moderates the relationship between investor risk perception and real estate investment decisions (H₆: β = -0.356, t = 3.264, p = 0.001) is consistent with established behavioural finance theories and empirical research. According to the prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992), investors' perceptions of risk significantly influence their investment choices, often leading to risk-averse behaviour when risks are perceived as high, a position corroborated by empirical studies (Singh et al., 2023b; Yuvaraj and Venugopal, 2024). However, as risk tolerance increases, this negative impact of risk perception on investment decisions weakens, allowing investors to make more confident and proactive real estate investments despite the perceived risks (Khan, 2022). This moderation effect underscores the critical role of risk tolerance in investment decision-making (Aeknarajindawat, 2020; Nguven et al., 2019; Nur Aini and Lutfi, 2019). Higher risk tolerance enables investors to manage perceived risks more effectively, leading to rational and less emotionally driven investment choices (Almansour et al., 2023; Wang et al., 2024). This understanding aligns with several extant studies, such as Roszkowski et al. (2009) findings on the stability of risk tolerance and its influence on financial decisions, highlighting the importance of tailoring investment strategies to individual risk profiles. Also, some researchers have established relevance of the psychological variant of perceived risk is the most influential on behaviours related to investment decision-making (Nur Aini and Lutfi, 2019; Wang et al., 2024). Similarly, Zulhajmi and Rafik (2022) found risk tolerance moderating the neuroticism/openness to experience-students' investing behaviours relationships. Thus, the finding that risk tolerance negatively moderates the relationship between investor risk perception and real estate investment decisions reinforces the complexity of investment behaviour as posited by behavioural finance theories and supported by empirical research. As risk tolerance increases, the negative impact of risk

perception on investment decisions weakens, allowing for more confident and proactive investment strategies.

6. Conclusions

Theoretically, the findings of the current study offer significant theoretical implications for understanding investor behaviour in the real estate market, particularly in emerging markets like Iraq. The results confirm that perceived asset value plays a crucial role in shaping both risk perception and investment decisions, aligning with behavioural finance theories that emphasize the importance of cognitive biases and subjective evaluations in financial decision-making (Badola et al., 2023; Choudhary et al., 2024; Noch and Rumasukun, 2024). However, the research challenges traditional assumptions about the role of risk tolerance (Fox and Tannenbaum, 2011; Marinelli and Mazzoli, 2011). While it does not directly moderate the relationship between perceived value and investment decisions, it significantly influences how risk perception translates into investment actions. This suggests that risk tolerance acts as a filter, shaping how investors interpret and respond to perceived risks, ultimately influencing their final investment decisions. This complex interplay between perceived asset value, risk perception, and risk tolerance enriches our understanding of behavioural finance theories and underscores the importance of considering both cognitive biases and individual differences in investment decisionmaking processes.

There are also significant practical insights from the study's findings for various stakeholders in the Iraqi real estate market. For real estate developers and marketers, it is crucial to focus on enhancing the perceived asset value of properties through strategic marketing and development efforts, as this directly influences investment decisions (Autio et al., 2023). Additionally, providing transparent information about potential risks and offering tailored investment options to cater to varying risk tolerance levels can help mitigate investor risk perception and attract a wider range of investors. Policymakers can also utilise these findings to create a more conducive investment environment by promoting transparency, developing investor education programs, and implementing risk management frameworks (NIC, 2024). These strategies can collectively contribute to the growth and stability of the Iraqi real estate market by fostering informed decision-making and increasing investor confidence.

However, despite the foregoing theoretical and practical insights, this study has several methodological limitations that should be considered. The sample size of 205 respondents, while adequate, may not fully capture the diverse investor profiles across all of Iraq. Also, the self-reported nature of the survey data might introduce biases related to social desirability and inaccurate risk perception assessment (Holden and Marjanovic, 2021). The crosssectional design precludes the analysis of temporal dynamics in risk perception and investment decisions. Moreover, the focus on seven priority provinces might limit the generalisability of the findings to other regions of Iraq. Furthermore, the study did not account for other potential moderators or mediators that could influence the relationship between perceived asset value, risk perception, risk tolerance, and investment decisions, such as financial literacy, investment experience, or macroeconomic factors. Finally, the unique socio-political and economic context of Iraq, characterized by instability and uncertainty, might limit the applicability of these findings to more stable real estate markets.

To address the above limitations, it is suggested that a larger and more diverse sample, incorporating investors from various regions and socioeconomic backgrounds across Iraq, would enhance the generalisability of the findings. Employing mixedmethods approaches, including qualitative interviews or focus groups, could provide deeper insights into investors' risk perceptions and decision-making processes. Longitudinal studies could examine the temporal dynamics of risk perception, risk tolerance, and investment choices, particularly in response to market fluctuations or policy changes. Additionally, incorporating a wider range of variables, such as financial literacy, investment experience, and macroeconomic indicators, could help unveil the complex interplay of factors influencing real estate investment decisions in Iraq. Furthermore, comparative studies with other emerging markets could offer valuable insights into the unique characteristics of the Iraqi real estate market and investor behaviour.

Declarations

- Ethics Approval: This research has been reviewed and approved by the College Ethics Committee, College of Administration and Economics, University of Al-Qadisiyah, Iraq.
- Informed Consent: All respondents have read the information about this research and understand what it involves. Thus, they have provided informed consent prior to participation, and their confidentiality and privacy were safeguarded throughout the research process.
- Competing Interests: The authors declare no conflict of interest.
- Funding: This research did not receive any external funding.
- Data Availability: The data for the study are available from the corresponding author on request.

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