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Article

The Role of Fear of Missing out (FOMO), Loss Aversion, and Herd Behavior in Gold Investment Decisions: A Study in the Vietnamese Market

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Abstract

This study investigates the influence of FOMO, loss aversion, and herd behavior on gold investment decisions in the Vietnamese market. Employing data collected from 727 investors and the Partial Least Squares Structural Equation Modeling (PLS-SEM) method, the analysis results confirm the pivotal role of FOMO, with both direct and indirect impacts on gold investment decisions. Notably, both loss aversion and herd behavior positively influence FOMO, thereby indirectly encouraging relatively hasty and inadequately considered investment decisions. The study also finds that FOMO has a negative relationship with anticipated regret but is positively correlated with subjective expected pleasure. Furthermore, as determined through Multi-Group Analysis (MGA), psychological messages featuring "self-decision" or "risk warning" demonstrate a significant moderating role, potentially reducing or enhancing the influence of FOMO on investment decisions. These findings contribute to enriching behavioral finance theory and provide an empirical basis for developing effective risk management policies and gold market regulation aimed at mitigating the negative impacts of FOMO.

Keywords: FOMO; investment decision; gold; psychological factors; Vietnam

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1. Introduction

The contemporary global economic landscape continues to be shaped by prolonged uncertainties, ranging from US–China trade tensions to escalating geopolitical conflicts in key regions such as Ukraine, the Middle East, and the Korean Peninsula (Van Dong & Truong, 2022; Singh & Roca, 2022; Kim & Quốc, 2023). These complex developments not only weaken international trade flows but also significantly increase risks in global financial markets (M. Chin et al., 2023). In this uncertain environment, gold has emerged as an important safe-haven asset, reflected in its continuously rising price trend and the setting of new record highs. Particularly in Vietnam, the domestic gold market exhibits distinct characteristics with a significant price differential compared to the global market, at times exceeding 500 USD per tael. This phenomenon reflects a severe supply–demand imbalance and indicates clear speculative sentiment within the investor community (Tri & Nga, 2019). Gold products, from bullion bars and rings to jewelry, have become the

preferred choice for preserving asset value amidst the unpredictable volatility of the stock market, real estate, and other investment channels.

To stabilize the market, the Vietnamese government has issued management regulations, notably Decree No. 24/2012/ND-CP, granting the exclusive right to produce SJC gold bullion to the State Bank of Vietnam and aiming to limit the "goldization" of the economy. However, despite regulatory efforts, the appeal of gold to the Vietnamese people remains substantial. This stems not only from its role in asset preservation but is also linked to deep cultural and spiritual values, as gold is often considered a symbol of luck and prosperity during holidays, weddings, and major life events.

The strong and unpredictable volatility of gold prices, when combined with psychological factors such as FOMO, loss aversion, and herding behavior, risks leading to investment decisions lacking a rational basis. FOMO can drive investors to enter the market hastily when gold prices surge, due to fear of missing out on profit opportunities (Friederich et al., 2024). Loss aversion, the psychological tendency to prioritize avoiding losses over achieving equivalent gains, leads investors to prefer gold as a safe asset protection tool (Dar & Hakeem, 2015). Simultaneously, herd behavior, characterized by investors relying on crowd decisions instead of independent analysis, also contributes to amplifying market trends and increases the risk of emotionally driven investing.

These psychologically driven investment behaviors not only pose risks to individuals but also create negative consequences on a broader scale. At the macro level, excessive speculative sentiment can inflate gold prices, creating asset bubble risks, increasing inflationary pressure, and affecting macroeconomic stability (Pichet, 2017). At the industry level, capital flow concentrated in gold can reduce investment resources for essential production and business sectors (C. Xu & Zhang, 2018). At the micro level, individual investors face the risk of losses when buying gold at high prices, negatively impacting personal finances and other long-term decisions (Entrop et al., 2015). Therefore, in-depth research into the impact of psychological factors on gold investment decisions in Vietnam is highly necessary to identify behavioral risks and propose appropriate intervention strategies.

While previous studies have often focused on the impact of FOMO in the context of developed economies with different socio-economic and cultural conditions, the research gap concerning the simultaneous roles of FOMO, loss aversion, herd behavior, and related factors within the specific context of Vietnam remains significant. This study not only evaluates the direct and indirect impacts of these psychological factors on gold investment decisions but also delves into analyzing the moderating role of psychological messages (e.g., emphasizing self-decision or risk warning). Clarifying how these messages can amplify or mitigate the influence of FOMO on investment decisions will provide a crucial scientific basis for designing effective behavioral intervention strategies. Through this, the study aims to contribute to elucidating the complex psychological mechanisms governing gold investment behavior, expanding behavioral finance theory in the context of an emerging market, while also providing valuable practical implications for investors, policymakers, and stakeholders in Vietnam.

We adopt variance-based PLS-SEM because the research objective is to explain and predict gold investment decisions through multiple mediated paths and to compare structural relations across message groups. PLS-SEM is robust to non-normal data, handles complex models with many indicators, and emphasizes predictive relevance. With 727 observations and non-probability sampling, PLS-SEM provides stable estimates and out-of-sample oriented diagnostics suitable for our context.

2. Literature Review, Theoretical Framework

2.1. Literature Review

2.1.1. Research on FOMO (Fear of Missing out)

Initial research on FOMO indicated that the psychological origins of this phenomenon stem from anxiety disorders and the fear of being detached from communal experiences. FOMO is most commonly found in adolescents and is closely linked to social media abuse, the need for connection, psychological distress, and low satisfaction levels regarding psychological needs such as autonomy and social connectedness. The non-fulfillment of these psychological needs can lead to feelings of isolation, anxiety, and reduced social orientation, especially when individuals feel ignored or excluded from community interactions (Przybylski et al., 2013; Hodkinson, 2016; Lai et al., 2016; Abel et al., 2016).

In the field of consumer behavior, FOMO is a powerful driver promoting impulsive behaviors. Young consumers with high levels of FOMO often tend to engage in excessive alcohol consumption or participate in high-risk behaviors to avoid missing out on social experiences (Riordan et al., 2015). The fear of exclusion can override concerns about consequences, making them more likely to place themselves in situations seeking acceptance or attention from others (Riordan et al., 2015; Abel et al., 2016; Lai et al., 2016).

In the financial context, the impact of FOMO can lead to cognitive biases, causing investors to ignore factual elements and act primarily based on emotions rather than rational analysis. This contributes to the creation of speculative bubbles and herd behavior in markets such as stocks, real estate, cryptocurrencies, and other investment instruments (Pichet, 2017). Even institutional investors can be affected, especially through mutual funds, where behavioral biases and the fear of regret lead to inefficient investment strategies (Dennison, 2018; Kang et al., 2020; Chen et al., 2007; Banerji et al., 2020; Shukla et al., 2020).

2.1.2. Research on Loss Aversion

Loss aversion is the psychological tendency that causes people to perceive the pain of loss more strongly than the pleasure of achieving an equivalent gain (Kahneman & Tversky, 1979). In relation to financial behavior, loss aversion causes investors to become defensive, leaning towards risk avoidance rather than seeking profit, and often hold onto losing assets for too long (Shefrin & Statman, 1985; Odean, 1998).

Loss aversion has been analyzed more broadly in various investment contexts, showing it can lead to inefficient decision-making, especially when combined with emotional biases (Paudel & Yedgarian, 2024; Bonardi et al., 2024). Individuals overly focused on gains/losses often misjudge their ability to adapt to financial fluctuations, leading to emotionally driven trading behavior (Koszegi & Rabin, 2006; Massa & Simonov, 2005). Additionally, loss aversion tends to increase when investment decisions are linked to household financial responsibilities, increasing sensitivity to risk and emotional biases (Barberis & Thaler, 2003; Dar & Hakeem, 2015), demonstrating the profound role of loss aversion in distorting investment behavior and market efficiency.

2.1.3. Research on Herd Behavior

Herd behavior—investors acting according to the crowd instead of relying on individual analysis (Caparrelli et al., 2004)—is a complex phenomenon with multiple underlying causes. Banerjee (1992) argues that herd behavior occurs when individuals ignore their private information to act like the majority. Christie and Huang (1995) further clarified the paradoxical aspect of this phenomenon by pointing out that, even when doubtful, investors still tend to follow the market to avoid deviating from the crowd.

Studies indicate that this phenomenon stems not only from individual psychological factors but is also governed by social, economic, and political factors. Many theories have

been proposed by researchers to link herd behavior with geopolitical risk (Medhioub, 2025), stock market volatility (Chiang & Zheng, 2010), or the impact of the COVID-19 pandemic (Bouri et al., 2021).

Empirical studies also show that herd behavior often increases in crisis contexts and in emerging markets, where culture emphasizes community and performance pressure increase the tendency to imitate (Dar & Hakeem, 2015; Chauhan et al., 2020). Recently, systemic factors such as speculative limits in finance or the development of algorithmic trading also contribute to promoting individual herd behavior (Shukla et al., 2020; Tarjanne, 2020).

2.1.4. Research on Gold Investment Decision

Gold is a popular store-of-value asset and particularly important in investment portfolios during periods of market volatility. In relation to US, UK, and German stocks, gold exhibits a "safe haven" role due to its low correlation with risky assets (Baur & Lucey, 2010; Hood & Malik, 2013). However, upon deeper analysis under different market conditions, gold shows that its ability to preserve value is not fixed but depends on the level of stress-strong during crises, weak during stability (Beckmann et al., 2015). In developing economies, gold carries the significance of informal accumulation, differing from traditional theories, and is considered a potential resource for economic development (Chandavarkar, 1961; Patrick, 1963).

Gold prices also react markedly to macroeconomic factors such as real interest rates and the USD exchange rate-rising interest rates make gold less attractive, while gold prices often move inversely to the US dollar (Sjaastad, 2008). However, gold's role as an inflation hedge is debated, as some data suggest that high inflation might decrease gold prices (Levin et al., 2006). Additionally, psychological factors also significantly influence decisions to invest in gold. When fear levels increase, gold demand tends to rise, although gold does not always maintain its asset protection role (Baker & Wurgler, 2007). In some countries like China, gold also carries cultural significance, with demand surging before holidays like Lunar New Year, serving the purpose of lucky gifts (Qi & Wang, 2013).

2.2. Some Related Background Theories

2.2.1. Prospect Theory

Prospect Theory, developed by Kahneman and Tversky (1979), aims to explain how people make decisions under conditions of risk. This theory shows that people are often influenced by how information is presented (framing effect), cognitive biases, and emotions. Prospect Theory is the foundation for many behavioral finance studies, such as Barberis and Thaler (2003) or Rabin and Thaler (2001), which emphasize that investors do not always behave rationally and often avoid risk in ways unpredictable by traditional theory. In this study, Prospect Theory helps explain the psychology of FOMO in gold investment. According to Kahneman and Tversky (1979), investors fear losses more than they desire gains (loss aversion effect), making them prone to acting with the crowd when gold prices rise, even without fully assessing the risks.

2.2.2. Social Comparison Theory

Social Comparison Theory, proposed by psychologist Festinger (1954), aims to explain how people evaluate themselves through comparison with others. Festinger (1954) individuals are often unable to assess themselves solely through objective standards due to the lack of complete information. Festinger (1954) also emphasized that people tend to compare themselves with those who have similar characteristics rather than with those who are very different. In the context of gold investment, this drives FOMO, when investors observe that people in their community, friends, or on social media are profiting from gold and feel pressured to enter the market so as not to miss out on the opportunity.

2.2.3. Heuristics

The classic research by Kahneman et al. (1982) showed that under conditions of uncertainty, people often rely on mental shortcuts (heuristics) to make quick decisions without needing to analyze all information. The three most common heuristics include: availability, representativeness, and anchoring. When these heuristics are used en masse in a volatile investment environment, they not only lead to irrational decisions but also trigger the herd effect, where many investors act similarly despite no clear coordination. This helps explain why markets sometimes operate inefficiently but are dominated by emotions and common psychological reactions of the crowd.

2.3. Hypothesis Development

2.3.1. The Effect of Loss Aversion and Herd Behavior on FOMO

According to Kahneman and Tversky (1979), people perceive the pain from loss twice as strongly as the pleasure from profit. Dar and Hakeem (2015) explain that loss aversion is when investors worry about potential losses more than being satisfied with profitable investments. Bailey et al. (2011) affirm that investor behavior and decisions are strongly influenced by loss aversion, leading to a tendency to sell stocks that have achieved higher value and hold onto stocks with lower value. Consequently, loss aversion can have a positive impact on FOMO, as investors, in an effort to avoid losses, are driven to participate in new investment opportunities without careful calculation (Gupta & Shrivastava, 2022).

Herd behavior is when investors base their buying and selling decisions on the majority, instead of relying on their own risk tolerance (Waweru et al., 2008). Kang et al. (2020) and Tarjanne (2020) imply that FOMO leads consumers to collective product consumption to create internal psychological comfort. The spread of FOMO leads to herd behavior, and this continuously drives prices up (Hershfield, 2020). Therefore, the hypotheses proposed are:

H1. *Loss aversion has a positive impact on FOMO.*

H2. *Herd behavior has a positive impact on FOMO.*

2.3.2. The Effect of FOMO on Gold Investment Decision: The Mediating Role of Anticipated Regret

Regret is a negative emotion when we realize or imagine that the current situation would be better if a different decision had been made (Zeelenberg, 1999). When shopping, consumers often have thoughts like "If I buy it today and the price drops later, I will regret it" (McConnell et al., 2000). The effects of FOMO can reduce anticipated regret by providing a plausible reason to purchase the asset (Good & Hyman, 2020). Therefore, the authors assume that individuals experiencing FOMO tend to anticipate less regret about having invested. Anticipated regret occurs before the decision is made, when individuals imagine the potential feeling of regret (Wong & Kwong, 2007). Before making a decision, consumers may anticipate that if the outcome is not as expected, they will feel regret, which can influence their decision. Accordingly, the proposed research hypotheses are:

H3. *FOMO has a negative impact on anticipated regret.*

H6. *Anticipated regret has a negative impact on gold investment decision.*

2.3.3. The Effect of FOMO on Gold Investment Decision: The Mediating Role of Subjective Expected Pleasure

Subjective expected pleasure describes the state when individuals are certain about the positive emotions they will experience in a future consumption event (Moore, 2014). If consumers feel strong excitement about an opportunity, they anticipate experiencing greater pleasure when shopping (Alba & Williams, 2013). FOMO can increase expectations of positive experiences, as consumers imagine themselves not missing out on opportunities that others have seized. Investing individuals may feel positive when earning profits and negative when incurring losses; therefore, the expected pleasure arising from the investment can influence investment decisions (Cheng et al., 2015). Previous studies show that the effects of FOMO can drive consumer behavior by anticipating the pleasure derived from a consumption experience (Good & Hyman, 2021). Therefore, the effects of FOMO increase subjective expected pleasure, which leads to an increase in investment intention (Moore, 2014). Accordingly, the authors propose:

H4. *FOMO has a positive impact on the subjective expected pleasure.*

H7. *Subjective expected pleasure has a positive impact on gold investment decisions.*

2.3.4. The Effect of FOMO, Subjective Expected Pleasure and Loss Aversion on Gold Investment Decision

FOMO is an important factor influencing investment decisions, motivating investors to act quickly to avoid missing opportunities (Kang et al., 2020; Dennison, 2018). Specifically, when consumers are exposed to the effects of FOMO, they tend to have a higher propensity to reinvest, even after experiencing previous losses (Friederich et al., 2024). Shiva et al. (2020) surveyed the relationship between investor FOMO and the investment decisions of retail investors and found a strong relationship between these two factors.

Loss aversion is a concept in Prospect Theory stating that the pain or discomfort experienced from a loss is greater than the pleasure or satisfaction from achieving an equivalent gain (Barberis & Huang, 2001). This means that people feel more negative about losing money than they feel positive about gaining the same amount. Loss aversion significantly influences investment decisions (Dar & Hakeem, 2015). One of the clearest manifestations of this phenomenon is the tendency to sell profitable investments early and hold onto losing ones for too long (Shefrin & Statman, 1985; Odean, 1998). According to research by Bailey et al. (2011), biased behavior can lead to inefficient investment decisions, especially for high-income investors. Investors tend to avoid realizing losses due to the pain of loss, while quickly taking profits to secure gains, even if holding on could yield higher future returns (Dar & Hakeem, 2015).

Investors often tend to follow the decisions of other investors, regardless of their own risk tolerance or risk appetite level (Waweru et al., 2008). This phenomenon is called herd behavior, also known as the crowd effect in investing. Less informed investors feel safer when imitating the investment patterns of others or the crowd (Dar & Hakeem, 2015). Previous research literature indicates that investors behave this way to create a feeling of belonging to a surrounding group (Banerji et al., 2020). Accordingly, the proposed research hypotheses are:

H5. *FOMO has a positive impact on gold investment decisions.*

H8. *Loss aversion has a positive impact on gold investment decision.*

H9. *Herd behavior has a negative impact on gold investment decision.*

2.3.5. The Moderating Effect of Psychological Messages on Relationship Between FOMO and Gold Investment Decision

Recent research by Wen and Chang (2022) shows that the feeling of winning promotes more risk-taking behavior, while the feeling of losing reduces risk behavior. However, because FOMO strongly influences investment behavior and reduces risk mechanisms such as anticipated regret, the effects of FOMO can alter the natural impacts of winning or losing (Duman & Ozkara, 2021; Dutot, 2020). In that context, psychological messages are considered a potential moderating tool, as they have the ability to impact both the emotions and cognition of investors. Specifically, psychological messages can influence investment behavior by stimulating investor emotions and cognition. Warning messages often emphasize potential negative consequences of not following advice, thereby stimulating the fear of loss and promoting caution in investment decisions (X. Xu et al., 2015). Conversely, self-decision encouragement messages focus on enhancing individual awareness of the ability to make independent decisions, encouraging investors to clearly understand information about investment products, thereby minimizing feelings of insecurity and fear of missing out. Therefore, the authors propose:

H10. *Psychological messages moderate the relationship between FOMO and gold investment decision.*

The complete set of hypothesized relationships is visually summarized in the proposed research model presented in Figure 1.

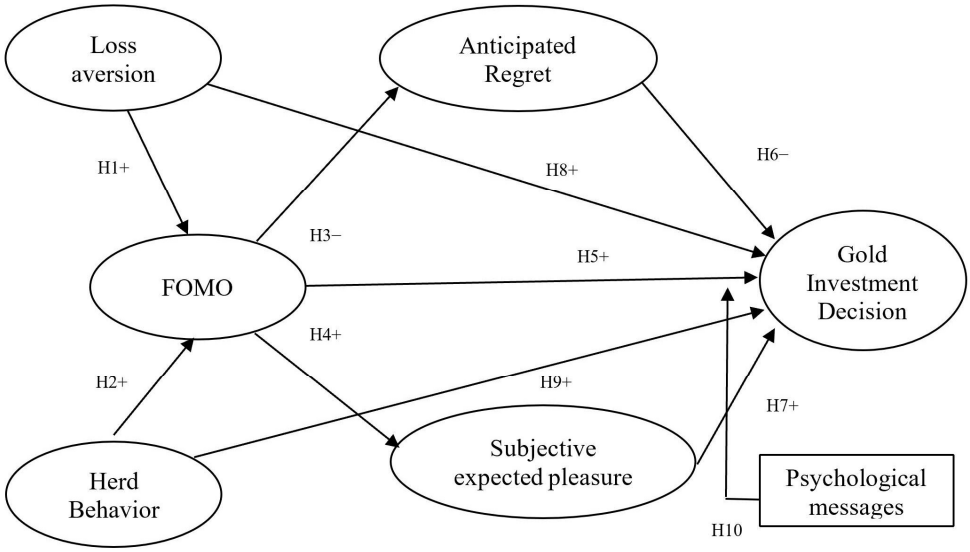

Figure 1. Research model.

3. Methodology

This study employs a combination of qualitative and quantitative methods to assess the impact of psychological factors on individual investors' decisions to invest in gold in Vietnam.

3.1. Data Collection

We used direct and online survey methods to collect data from 786 individual gold investors nationwide, with 727 valid responses, representing a rate of 92.49%. The study used a non-probability convenience sampling method, surveying all gold investors across Vietnam who have participated, are participating, or intend to participate in the gold market, and are influenced by certain psychological factors, such as loss aversion, herd behavior, FOMO, etc. The survey period took place from June 2024 to December 2024.

Occupation, age, income, gender, and investing experience were collected and summarized in Table 1. The sample was obtained via non-probability convenience sampling, which may induce selection bias and limit external validity; we therefore interpret results as associative rather than strictly causal. For the message experiment, random assignment produced balanced groups (Table 2), minimizing confounding across message types:

- Group 1: Risk Warning—"Many investors face major losses with gold. Are you ready to risk it?"—designed to spark fear of loss and encourage caution.
- Group 2: Self-Decision Encouragement—"Smart investing starts with you. Learn, think, and decide for yourself."—promotes independent, thoughtful decision-making.
- Group 3: Neutral Message—"Gold prices go up and down. Take time to consider before you invest."—serves as a neutral baseline with no emotional push.

Table 1. Measurement scales.

Item	Construct	References
	LOSS AVERSION	
LA1	Your prior loss experience highly affects your risk-taking ability.	Chen et al. (2007), Dar and Hakeem (2015), Banerji et al. (2020), Tarjanne (2020)
LA2	You usually have the tendency to avoid selling gold when the gold price decreases.	
LA3	You usually sell gold when the gold price increases.	
	HERD BEHAVIOR	
HB1	You prefer to invest in gold in which your peers and relatives have invested.	Dar and Hakeem (2015), Chauhan et al. (2020), Banerji et al. (2020), Shukla et al. (2020), Tarjanne (2020)
HB2	You analyze the customers/investors' preference before you invest in gold.	
HB3	You follow the market movements while buying or selling gold.	
HB4	Other investors' recommendation of investment affects your gold purchases.	
	FOMO	
FM1	It bothers you when you do not hear news about gold.	Dennison (2018), Kang et al. (2020), Shiva et al. (2020), Tarjanne (2020), Good and Hyman (2020)
FM2	You get anxious when you do not know about factors affecting gold price in the future.	
FM3	You would like to be immediately updated about the trends in the gold market.	
FM4	You get worried when you are not able to check in on your portfolio.	
FM5	It bothers you if you miss out on investment opportunities.	
FM6	You fear being the last to know about news that is relevant to your portfolio.	
	GOLD INVESTMENT DECISION	
ID1	You feel satisfied with your investment decisions in gold.	Dar and Hakeem (2015), Banerji et al. (2020), Shiva et al. (2020), Shukla et al. (2020)
ID2	Your recent gold investment has met your rate of return expectation.	
ID3	Your investment has lower risk compared to the market in general.	
ID4	Your normal rate of return is higher than the average rate of return of the gold market.	

Table 1. *Cont.*

Item	Construct	References
	SUBJECTIVE EXPECTED PLEASURE	
SE1	I feel excited when thinking about investing in gold.	Mellers et al. (1999), Van Boven and Ashworth (2007)
SE2	I feel elated when thinking about investing in gold.	
SE3	I feel satisfied when thinking about investing in gold.	
SE4	I feel happy when thinking about investing in gold.	
	ANTICIPATED REGRET	
AE1	I would be sorry I spent the money.	Tsiros and Mittal (2000)
AE2	I would be sorry because I should have saved the money.	
AE3	I would be sorry I did not spend the money on necessities.	

Table 2. Assessment of reliability and convergent validity.

Variable		Factor Loading	Cronbach's Alpha	AVE	Composite Reliability	VIF
ANTICIPATED REGRET	AE1	0.787	0.707	0.629	0.836	1.454
	AE2	0.796				
	AE3	0.796				
FOMO	FM1	0.819	0.893	0.652	0.918	1.846
	FM2	0.829				
	FM3	0.793				
	FM4	0.781				
	FM5	0.825				
	FM6	0.795				
HERD BEHAVIOR	HB1	0.828	0.900	0.770	0.930	1.051
	HB2	0.924				
	HB3	0.840				
	HB4	0.914				
GOLD INVESTOR DECISION	ID1	0.779	0.796	0.619	0.867	1.445
	ID2	0.805				
	ID3	0.799				
	ID4	0.765				
LOSS AVERSION	LA1	0.790	0.773	0.689	0.869	1.051
	LA2	0.862				
	LA3	0.836				
SUBJECTIVE EXPECTED PLEASURE	SE1	0.737	0.797	0.620	0.867	1.261
	SE2	0.852				
	SE3	0.793				
	SE4	0.764				

Source: Result from the SmartPLS 4.1 software.

Random assignment ensured homogeneity among the groups, allowing for accurate analysis of how different psychological messages affect the gold investment decisions of investors in Vietnam.

3.2. Variables Measurement

We conducted the following to build the research scale:

The 5-point Likert scale, from level 1 (completely disagree) to level 5 (completely agree), is used to measure: loss aversion (LA), herd behavior (HB), FOMO (FM), anticipated regret (AE), Subjective expected pleasure (SE), and gold investment decision (ID).

The detailed research scale is fully expressed in Table 1.

3.3. Analytical Techniques

Primary data obtained from the survey process will be synthesized, classified, and arranged by the research team to suit the research objectives and requirements. Specific implementation steps:

(1) Cronbach's Alpha reliability test:

Cronbach's Alpha coefficient ≥ 0.6 is acceptable, optimally from 0.8 to nearly 1. Measurement items with Corrected Item–Total Correlation ≥ 0.3 are retained; items below this level will be excluded (Hair, 1998; Nunnally & Bernstein, 1994).

(2) Exploratory Factor Analysis (EFA):

The EFA method is used to assess convergence and reduce observed variables into principal factors. EFA evaluation criteria (Hair et al., 2006) include: KMO ≥ 0.5; Bartlett's test with Sig. < 0.05; Factor loading > 0.5; Total Variance Explained (TVE) $> 50\%$; Eigenvalue ≥ 1.

(3) Assessment of the PLS-SEM measurement model:

Using SmartPLS 4.1 software to test the following criteria:

- Observed variable quality: Outer loading ≥ 0.708 (Hair et al., 2016).
- Reliability: Cronbach's Alpha and Composite Reliability ≥ 0.7 (Hair et al., 2010).
- Convergent validity: AVE ≥ 0.5 (Hair et al., 2021).
- Discriminant validity: Square root of AVE greater than correlations between latent variables; HTMT ≤ 0.85 (Fornell & Larcker, 1981; Henseler et al., 2014).

(4) Analysis of the PLS-SEM structural model:

Using SmartPLS 4.1 with the following tests:

- Multicollinearity: Based on VIF (Hair et al., 2019). VIF < 3 is ideal, 3–5 indicates potential risk, ≥ 5 is severe.
- Testing relationship significance and impact: Using Bootstrapping (5000 samples), t-value > 1.96 or p-value < 0.05 indicates statistical significance; the path coefficient (Original Sample) shows the direction and strength of the influence.
- Coefficient of determination R^2: Represents the model's explanatory power. $R^2 = 0.25$ (weak), 0.5 (moderate), 0.75 (strong) (Hair et al., 2016).
- Effect size f^2: Assesses the contribution level of exogenous variables; $f^2 = 0.02$ (small), 0.15 (medium), 0.35 (large).

(5) Multi-Group Analysis (MGA):

The MGA technique helps compare parameters between groups to test model stability and handle data heterogeneity (W. W. Chin & Dibbern, 2010; Sarstedt et al., 2014). MGA is suitable for multi-national studies or when needing to assess variations in the model structure between different segments, helping enhance the reliability of research results (Henseler et al., 2009; Picón-Berjoyo et al., 2016).

4. Results

4.1. Testing the Reliability of the Scale

Table 2 shows that all observed variables have Cronbach's Alpha coefficients > 0.7, proving that the scale meets requirements and can continue to be used in Exploratory Factor Analysis (EFA). This confirms that the factor groups all ensure reliability and are suitable for the research. Simultaneously, all calculated VIF values are <2, meaning there is no multicollinearity issue in this study.

Discriminant validity shows the degree of difference between constructs in the model when compared to each other. Table 3 shows the number at the top of each column is the square root of AVE (0.793; 0.807; 0.877; 0.797; 0.830; 0.788), and the numbers below are the correlations between latent variables. We see that the square root of AVE > Correlation

between latent variables (Fornell & Larcker, 1981), ensuring discriminant validity. Meanwhile, Clark and Watson (1995) and Kline (2015) use a stricter standard threshold of 0.85. The authors prefer to choose the 0.85 threshold in the assessment.

Table 3. Discriminant validity of factors (Fornell & Larcker, 1981).

	AE	FM	HB	ID	LA	SE
AE	0.793					
FM	−0.534	0.807				
HB	−0.268	0.370	0.877			
ID	−0.400	0.481	0.358	0.797		
LA	−0.251	0.401	0.226	0.346	0.830	
SE	−0.287	0.438	0.193	0.437	0.268	0.788

Source: Result from the SmartPLS 4.1 software.

Table 4 shows the adjusted R^2 values of the two mediating variables "anticipated regret" (AE) and "subjective expected pleasure" (SE) are 0.285 and 0.192, respectively, indicating that the independent variables explain 28.5% and 19.2% of the variance in the mediating variables "anticipated regret" (AE) and "subjective expected pleasure" (SE). Simultaneously, the adjusted R^2 value for the mediating variable "FOMO" (FM) is 0.241, meaning the independent variables (LA & HB) explain 24.1% of the variance in FOMO.

Table 4. R-square Test Results.

	R-Square	R-Square Adjusted
AE	0.285	0.284
FM	0.243	0.241
ID	0.362	0.357
SE	0.192	0.191

Source: Result from the SmartPLS 4.1 software.

Additionally, the adjusted R^2 value for the dependent variable "Gold investment decision" (ID) is 0.357. Thus, the independent variables explain 35.7% of the dependent variable "Gold investment decision" (ID). These values are considered moderate and acceptable (Hair et al., 2016).

4.2. Exploratory Factor Analysis (EFA)

We intentionally ran EFA on an independent pilot subsample (n = 112) to purify indicators before estimating the structural model on the full sample (n = 727). This split-sample approach avoids capitalizing on chance in factor extraction and improves the generalizability of the final measurement model.

After processing the preliminary dataset with 112 respondents, the results showed that seven factors were extracted. The total variance explained is 68.614% > 50% at an Eigenvalue = 1.330 > 1. Thus, the research team will proceed with the official quantitative survey with the set of 28 observation variables that meet the standards and have good statistical significance, which will continue to be included in the formal analysis.

Table 5 shows the Kaiser–Meyer–Olkin Measure of Sampling Adequacy (KMO) value = 0.841, exceeding the 0.5 threshold, demonstrating that the data used for factor analysis is entirely appropriate. Simultaneously, Bartlett's test result with Sig = 0.000 ($p < 0.05$) shows that the variables are correlated with each other and meet the necessary conditions for the factor analysis process.

Table 5. KMO test results.

Index to Evaluate	Comparison Criteria	Result	Conclusion
KMO Coefficient	$0.5 \leq KMO \leq 1$	0.841	Factor analysis is suitable for the dataset
Sig.	Sig. < 0.05	0.000	Observed variables are correlated in the population, showing high statistical significance and allowing the application of exploratory factor analysis
Total % Variance Explained	>50%	68.614	Factors extracted from EFA explain 68.614% of the data variance
Eigenvalue	>1	1.330	Represents a portion of variance explained by each factor; extracted factors have good information summarization significance

Source: Result from the SmartPLS 4.1 software.

4.3. Assessing the Structural Equation Model (SEM)

The research team proceeds to assess the level of influence of independent variables on mediating and dependent variables through the structural equation model (SEM), aiming to explore the relationship between the dependent variable "investment decision" (ID) and the remaining variables in the research model, including AE, FM, HB, LA, and SE. In this, the team uses a statistical significance level of 5%; the results are presented as follows (Figure 2):

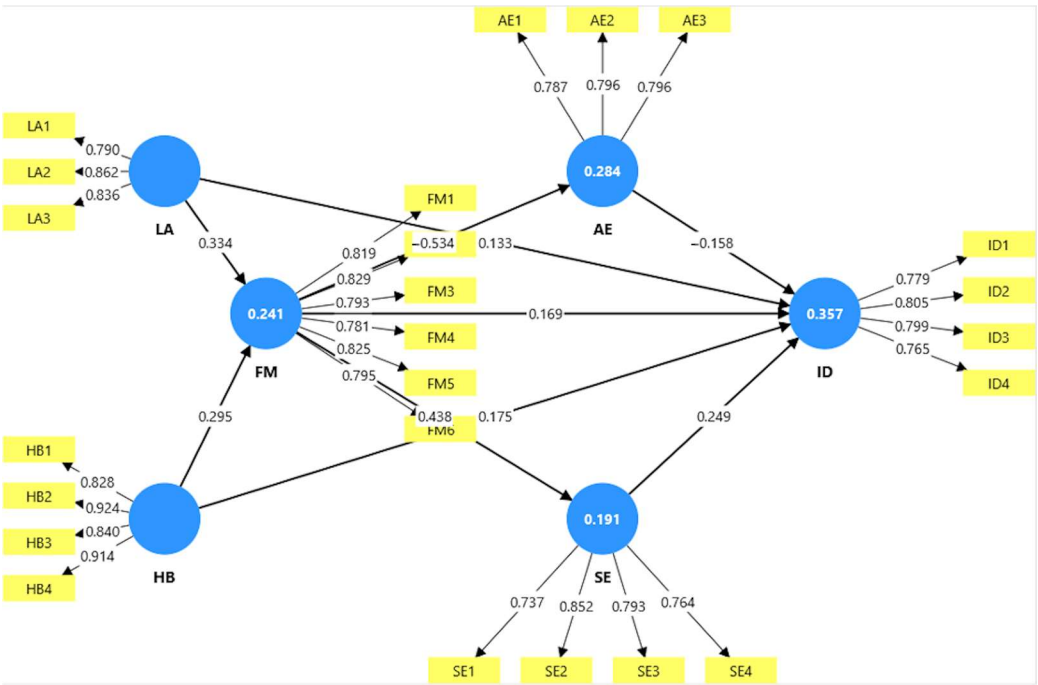

Figure 2. SEM structural model results. Source: Result from the SmartPLS 4.1 software.

The analysis results of the Partial Least Squares Structural Equation Model (PLS-SEM), performed using SmartPLS 4.1 software, have clearly identified significant causal relationships between psychological factors such as FOMO, loss aversion (LA), herd behavior (HB), anticipated regret (AE), subjective expected pleasure (SE), and gold investment decision (ID) in the Vietnamese market. The analysis, based on standardized path coefficients (β), f^2 coefficient, and *p*-value, aims to assess the level of influence, statistical significance, and magnitude of each relationship.

The analysis shows that the relationship where loss aversion (LA) positively impacts FOMO (FM) is statistically significant (β = 0.334, *p*-value < 0.05). Specifically, investors who tend to fear asset loss often have significantly higher levels of FOMO. Specifically, the risk aversion mentality makes them easily feel threatened by the possibility of "missing out" on profit opportunities in the market, especially in the context of rapidly fluctuating gold prices and investment sentiment spreading strongly through social media. This result aligns with the prospect theory of Kahneman and Tversky (1979), as well as empirical studies by Bailey et al. (2011) and Dar and Hakeem (2015), which indicate that high sensitivity to losses is a foundational factor making investors easily triggered by FOMO emotions, thus making quick investment decisions and relying less on rational analysis.

Similarly, herd behavior (HB) also shows a positive relationship with FOMO (β = 0.295; *p*-value < 0.05). This result reflects the reality that in environments with high uncertainty or lack of transparent information, investors often rely on the actions of the majority as a basis for personal decisions. When the general market trend is to buy gold, investors easily fall into a state of FOMO to keep up with the "investment crowd". This result is consistent with studies by Waweru et al. (2008) and Dar and Hakeem (2015), suggesting that investment behavior in emerging markets is strongly influenced by social dynamics rather than solely relying on quantitative financial data.

The results in Table 6 show that FOMO has a positive and statistically significant impact on the gold investment decision (β = 0.169; *p*-value < 0.05). This confirms the central role of FOMO as one of the factors driving biased investment decisions. When investors feel they might miss a profit opportunity, especially amidst volatile gold prices and news spreading rapidly via social media, they tend to act quickly, sometimes without careful consideration. This finding aligns with the research by Kaur et al. (2023), suggesting that FOMO is a key factor explaining emotionally driven investment decisions in volatile markets like cryptocurrencies or gold, where the information diffusion effect plays a strong role in triggering emotions.

Table 6. PLS-SEM testing results.

Hypothesis	Relationship	f Square	t-Value	Path Coefficient (β)	*p* Value	Result
H6	AE -> ID	0.027	3.966	−0.158	0.000	Accepted
H3	FM -> AE	0.398	17.692	−0.534	0.000	Accepted
H5	FM -> ID	0.025	3.255	0.169	0.001	Accepted
H4	FM -> SE	0.237	12.487	0.438	0.000	Accepted
H2	HB -> FM	0.109	9.164	0.295	0.000	Accepted
H9	HB -> ID	0.042	5.546	0.175	0.000	Accepted
H1	LA -> FM	0.140	10.675	0.334	0.000	Accepted
H8	LA -> ID	0.023	4.057	0.133	0.003	Accepted
H7	SE -> ID	0.077	6.514	0.249	0.000	Accepted

Note: Hypothesis testing results via Bootstrapping technique, performed using SmartPLS software. Source: Result from the SmartPLS 4.1 software.

Simultaneously, the analysis also shows that FOMO plays an important mediating role between fundamental psychological factors and the investment decision. Specifically, loss

aversion (LA) has a significant positive influence on FOMO (β = 0.334; *p*-value < 0.05). This confirms that when investors have a high level of sensitivity to potential financial losses, they are easily dominated by FOMO, leading to quick and ill-considered decision-making. This finding is fully consistent with the prospect theory of Kahneman and Tversky (1979) and is reinforced by studies such as Bailey et al. (2011) and Dar and Hakeem (2015), which assert that loss avoidance plays a strong dominant role in financial investment behavior.

In addition to the mediating relationships, FOMO also clearly impacts secondary emotional factors, contributing to shaping the investment decision. Specifically, FOMO has a significant negative influence on anticipated regret (AE) (β = −0.534; *p*-value < 0.05). This inverse relationship reflects that when dominated by FOMO, investors tend to minimize reflective capacity and pay less attention to potential consequences if the investment fails. The state of "acting not to be left behind" overrides long-term thinking ability. This assertion aligns with Friederich et al. (2024), who pointed out that FOMO reduces psychological self-regulation mechanisms, making investors hasty and prone to overlooking long-term risks.

Conversely, FOMO has a positive impact on subjective expected pleasure (SE) (β = 0.438; *p*-value < 0.05). This implies that investors believe that investing in gold will bring satisfaction, a sense of security, and strengthen self-esteem. When this expectation of positive emotions is accompanied by the fear of missing out, it further promotes quick investment decisions. This result is compatible with Good and Hyman (2021) in the context of Vietnam's gold culture, and also aligns with the behavioral expectation theory of Barberis and Huang (2001), according to which investors are concerned not only with profits but also with the emotions achieved after investing.

Regarding direct influence, herd behavior (HB) also has a positive and significant impact on the gold investment decision (β = 0.175; *p*-value < 0.05). This reflects that, even without FOMO as a mediator, the tendency to follow the crowd still has an independent influence on investment behavior. This finding reinforces previous conclusions by Shefrin and Statman (1985) and aligns with investment practices in Vietnam, where herd mentality is often clearly observed in gold buying waves at the beginning of the year, before political fluctuations or economic crises.

Anticipated regret (AE) has a significant negative influence on the investment decision (β = −0.158; *p*-value < 0.05), indicating that investors tend to become more cautious when anticipating potential future regret if the decision is wrong. This is a strong emotional control mechanism, consistent with the results of Hasler and Lusardi (2019), emphasizing the role of financial education in regulating emotional responses in complex investment decisions.

Conversely, subjective expected pleasure (SE) significantly positively impacts the gold investment decision (β = 0.249; *p*-value < 0.05), confirming that investors are driven not only by financial expectations but also by anticipated positive emotions. This finding is supported by the behavioral model of Barberis and Huang (2001), in which expected pleasure acts as a factor guiding financial behavior in an emotion-rich environment like gold investing.

Finally, loss aversion (LA) also shows a direct positive influence on the investment decision (β = 0.133; *p*-value < 0.05). Investors, when faced with the fear of losing asset value in risky investment channels like stocks or real estate, tend to shift towards gold as a safe haven option. This finding is consistent with studies by Bailey et al. (2011) and Dar and Hakeem (2015), showing that the need for asset preservation can directly trigger behavior shifting towards gold, especially during unstable economic periods.

4.4. Multi-Group Analysis (MGA) Results

Multi-Group Analysis (MGA) is a technique applied in structural equation modeling, helping to assess and compare differences in parameters between subject groups, thereby effectively addressing data heterogeneity (W. W. Chin & Dibbern, 2010; Sarstedt et al., 2014). According to Henseler et al. (2009), MGA is particularly suitable for multi-national studies, where cultural differences and contextual specifics can greatly influence research outcomes. Additionally, Picón-Berjoyo et al. (2016) also point out that this method is highly valuable when needing to test the stability or variation in structural relationships in the model between different segments, thereby ensuring the representativeness and accuracy of the research results, facilitating the drawing of more reliable scientific conclusions.

Multi-Group Analysis (MGA) results were performed on a total of 727 observations, divided into three groups corresponding to three different types of psychological messages: "self-decision" message (n = 239), "risk warning" message (n = 241), and "neutral" message (n = 247). The specific results presented in Table 7 show clear and notable differences regarding the moderating role of these messages on the relationship between FOMO and gold investment decisions.

Table 7. Multi-Group Analysis (MGA) Results.

	Difference	Observations (n = 727)		FM -> ID	2-Tailed *p* Value
		Frequency (1)	Frequency (2)		
Psychological Message	(Self-decision—Risk warning)	239	241	0.487	0.000
	(Self-decision—Neutral)	239	247	−0.793	0.000
	(Risk warning—Neutral)	241	247	−1.280	0.000

Source: Result from the SmartPLS 4.1 software.

Specifically, when comparing the investor group receiving the "self-decision" message with the group receiving the "risk warning" message, the difference coefficient for the impact of FOMO on investment decision reached +0.487 with high statistical significance (p-value < 0.05). This means that, under the influence of the "self-decision" message, FOMO effect significantly more strongly promotes gold investment decisions, reflected in investors being more confident and trusting in their decisions, thus more readily participating in the gold market amidst the psychological fear of missing out on opportunities.

However, when directly comparing the group receiving the "self-decision" message with the group receiving the "neutral" message, a contrasting result was recorded with a negative difference coefficient of −0.793 (p-value < 0.05). This indicates that the "self-decision" message, despite encouraging investor confidence and proactivity, actually significantly reduces the FOMO effect compared to the "neutral" condition. In other words, investors receiving the "self-decision" message experience less pressure from FOMO, possibly because the proactive and confident mindset helped them better control financial decisions rather than merely following market trends.

Particularly noteworthy is the comparison result between the group receiving the "risk warning" message and the "neutral" group. Here, the impact of FOMO on investment decisions weakened very significantly, with a difference reaching −1.280 (p-value < 0.05). This clearly demonstrates that "risk warning" messages had a very significant influence in weakening the effect of FOMO, clearly shown by investors becoming more cautious and reserved when making decisions under unstable market conditions. Risk warnings can activate psychological defense mechanisms, minimize hastiness and impulsivity, and prevent the spread of FOMO within the investor community.

These results are also similar to the findings of Friederich et al. (2024), that messages emphasizing risk significantly reduce FOMO-driven investment decisions. This phenomenon is further explained by social comparison theory (Festinger, 1954), which emphasizes that messages reinforcing belief in personal competence ("self-decision") can stimulate investors to act more decisively based on positive expectations. Conversely, providing clear warnings about potential risks ("risk warning") makes investors feel uncertain, thereby increasing defensive behaviors aimed at minimizing financial risk.

Furthermore, this result is also fully consistent with Prospect Theory by Kahneman and Tversky (1979), affirming that investors are often more sensitive to messages focusing on potential losses than on equivalent potential gains. Accordingly, risk warning messages can highlight loss possibilities, helping investors make decisions more cautiously; conversely, the "self-decision" encouragement message drives investors towards potential profit opportunities, making them more proactive in their investment decisions.

5. Conclusions

From the research results above, the authors find that FOMO, loss aversion, and herd behavior all play key roles in influencing gold investment decisions in the Vietnamese market. FOMO stands out with its important mediating role, strongly promoting quick and sometimes ill-considered investment decisions. This is even more pronounced when the gold market experiences large fluctuations, accompanied by the strong spread of information through social media channels.

Additionally, loss aversion is also identified as a factor with a clear positive impact on both FOMO and gold investment decisions. The psychology of fearing asset loss leads investors to shift towards gold as a value preservation solution, especially during unstable economic periods. Parallel to loss aversion, herd behavior also has a significant impact, as investors are easily swept up by general investment trends, regardless of factual information or individual assessment capabilities.

Another notable finding is that affective psychological factors such as subjective expected pleasure and anticipated regret play an important role in controlling investment behavior. Among these, anticipated regret helps limit hasty decisions, while the emotion of expected pleasure strongly promotes positive investment decisions. Particularly, psychological messages have shown effective moderating capabilities between FOMO and gold investment decisions. Messages encouraging self-decision increase confidence, while also minimizing the negative impact of FOMO. Meanwhile, risk warning messages have demonstrated the ability to significantly reduce the FOMO effect, encouraging investors to be more cautious.

Relative to developed markets, Vietnam exhibits stronger upstream loss-aversion and herding pressures that channel into FOMO, magnifying emotionally driven purchases of physical gold. In markets with deeper financial product menus and narrower price dislocations, FOMO often funnels into diversified risk assets; in Vietnam it concentrates on gold due to cultural preference, informational cascades, and market frictions. This explains why HB maintains a significant direct path to decisions here, over and above FM's mediating role.

These results provide important suggestions not only for investors in becoming more aware of their own psychological biases, but also for policymakers and financial institutions in developing effective psychological management messages and strategies, aimed at minimizing speculative bubble risks, while also stabilizing the gold and financial markets in the long term. For investors, we propose a three-step anti-FOMO protocol (rule-based entries, 24 h cooling-off, pre-mortem regret notes). For regulators, risk-warning campaigns timed to seasonal gold spikes and a public data dashboard can reduce rumor-driven

herding. Financial institutions can embed default delays and personalized risk notices in apps. Understanding and leveraging these psychological factors is the key to enhancing financial management efficiency and strengthening the competitive capacity of individual investors in Vietnam's volatile gold market.

This study relies on non-probability convenience sampling, which may induce selection bias and limit the generalizability of the estimates. The cross-sectional, self-reported design may also be subject to common-method variance and recall biases; we applied procedural remedies and statistical checks, yet residual bias cannot be ruled out. Finally, the evidence is restricted to Vietnam's gold market and does not incorporate verified transaction data; future work should employ probability samples, link survey responses to account-level trading records, and run field experiments with randomized message treatments to validate external validity.

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