

Exploring the Factors Shaping Green Stock Investment Decisions among Novice Investors in Indonesia: An Exploratory Factor Analysis

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Abstract. The rapid growth of young invest

ors in Indonesia has increased interest in sustainable investment and the behavioral factors underlying green stock investment decisions. This study aims to identify the underlying behavioral dimensions associated with green stock investment among young Indonesian investors. A quantitative survey was conducted involving 110 investors aged 18–36 years in Surabaya and Denpasar. Data were analyzed using Exploratory Factor Analysis (EFA). The Kaiser-Meyer-Olkin (KMO) value of 0.684 and significant Bartlett's Test indicated that the data were suitable for factor analysis. The analysis identified four latent dimensions, namely Rational Investment Analysis, Overconfidence Bias, Emotional Decision Making, and Investment Priority Orientation, which jointly explained 61.39% of the total variance. The findings indicate that green stock investment behavior is multidimensional, involving rational evaluation, psychological confidence, emotional responses, and investment prioritization. This study contributes to behavioral finance and sustainable finance literature by providing an exploratory perspective on young investors in an emerging market.

Keywords: Green Investment, Young Investors, Behavioral Finance, Exploratory Factor Analysis, Sustainable Finance.

1 Introduction

Stock Investment relate to how investors evaluate investment opportunities worldwide. Most of them focusing solely on financial returns, price, and performance of the firm as their considerations into their investment decisions. Investment in Indonesia has risen significantly and dominated by Young Investor (millennial and Gen Z) approximately almost 80% [1]. Indonesia reflects this global trend through the rapid expansion of retail investors, particularly among Generation Z and Millennials. Nevertheless, the remarkable increase in investor participation has not necessarily been accompanied by improvements in investment quality. Previous studies suggest that young investors frequently rely on intuitive judgment and behavioral biases such as overconfidence, herding, and illusion of control that distort investors' decision-making processes, particularly in retail capital markets rather than objective financial analysis when making investment decisions [2] [3] [4].

Despite the growing literature on behavioral finance and sustainable investment, an important research gap remains. Previous studies have frequently examined behavioral characteristics such as overconfidence, herding, risk perception, emotional responses, and sustainability perceptions as separate predictors of investment decisions. Although this approach provides valuable evidence regarding individual behavioral factors, it provides limited understanding of whether these indicators represent broader underlying behavioral dimensions. In particular, limited empirical evidence is available regarding the underlying factor structure of behavioral characteristics associated with green stock investment among young investors in emerging markets.

This issue is particularly relevant in Indonesia, where young investors increasingly participate in the capital market through digital investment platforms while simultaneously being exposed to extensive financial, social, and sustainability-related information. Their investment decisions may therefore reflect a combination of rational evaluation, psychological confidence, emotional responses, and sustainability considerations. However, the extent to which these different behavioral indicators converge into broader latent dimensions remains insufficiently understood.

Accordingly, this study adopts an Exploratory Factor Analysis (EFA) approach to investigate the underlying behavioral structure associated with green stock investment decisions among young Indonesian investors. Rather than imposing a predetermined factor structure, EFA allows the observed indicators to be empirically grouped according to their underlying correlation patterns. This approach is particularly appropriate because the behavioral structure of green stock investment among young investors in Indonesia has not yet been sufficiently established.

The objective of this study is therefore to identify the underlying latent behavioral dimensions associated with green stock investment decisions among young investors in Indonesia. Specifically, the study explores how indicators reflecting rational investment analysis, psychological characteristics, emotional responses, and sustainability-related considerations are empirically organized into broader latent dimensions.

The study contributes to the literature in three ways. First, it extends Behavioral Finance Theory by identifying broader latent dimensions rather than examining behavioral biases solely as independent variables. Second, it integrates behavioral finance with sustainable investment by examining financial, psychological, emotional, and sustainability-related considerations within a single exploratory framework. Third, it provides empirical evidence from young investors in Indonesia, an emerging market in which sustainable investment is developing rapidly.

2 Literature Review

2.1 Behavioral Finance Theory

Behavioral Finance Theory provides the primary theoretical foundation for understanding investment decisions that cannot be fully explained by conventional assumptions of investor rationality. Traditional financial theory assumes that investors process available information rationally and make decisions to maximize expected utility. Behavioral finance, however, recognizes that investment decisions may also be influenced by psychological characteristics [5], cognitive limitations, emotions, and behavioral biases.

Behavioral finance gained recognition in academic research following the work of [6], who introduced psychological aspects into the study of investment and stockbroker decision-making [6]. This theory demonstrates how psychological factors can influence investors' rational behavior when making investment decisions and explains why investors choose to buy, sell, or refrain from purchasing stocks. The influence of psychological factors may result in behavioral biases or deviations from investors' expected assessments of risk and returns. According to [8], several investor attitudes and behaviors may influence investment decisions, including overconfidence, risk perception, loss aversion, and herding.

Investors may therefore deviate from fully rational decision-making because they are affected by biases such as overconfidence, illusion of control, herding, loss aversion, and emotional responses. These behavioral characteristics influence how investors perceive information, evaluate risk, and respond to market uncertainty. The literature on sustainable investment similarly indicates that investors' choices are shaped not only by financial motives but also by psychological and value-based considerations.

Behavioral Finance Theory is particularly relevant to the present study because green stock investment requires investors to process both financial and non-financial information. Investors may consider expected returns and risk while simultaneously evaluating environmental responsibility and sustainability-related information. Thus, behavioral finance provides the theoretical basis for examining whether different behavioral indicators form broader underlying dimensions in green stock investment.

2.2 Prospect Theory

Prospect Theory complements Behavioral Finance Theory by explaining how individuals evaluate alternatives involving uncertain gains and losses. According to [9], they argue that individuals evaluate outcomes relative to a reference point and that losses generally have a greater psychological impact than equivalent gains. This phenomenon, known as loss aversion, may influence how investors respond to investment risk and uncertain outcomes.

In stock investment, investors may therefore react differently to potential gains and losses even when the expected financial value is comparable. Psychological responses to losses, uncertainty, and perceived investment outcomes can affect investment evaluation and subsequent decisions. These mechanisms are particularly relevant to young investors who may have relatively limited investment experience and may rely on subjective perceptions when evaluating uncertain investment alternatives.

In the context of green stock investment, Prospect Theory provides an additional perspective because investors simultaneously evaluate potential financial outcomes and sustainability-related benefits. Recent literature suggests that investors' preferences for ESG

assets may reflect both financial motives and non-pecuniary benefits associated with sustainability. Therefore, Prospect Theory provides a theoretical basis for including indicators related to risk perception, gains and losses, and emotional responses in the exploratory analysis.

2.3 Green Stock Investment and Sustainability Considerations

Green stock investment represents an investment approach in which investors consider the environmental and broader sustainability characteristics of companies alongside conventional financial considerations. ESG-related information has increasingly become relevant to investment decisions as investors consider not only financial performance but also environmental and social consequences. Recent reviews indicate that investors have developed preferences for ESG and sustainable assets, although the motivations underlying these preferences are heterogeneous. Investors may pursue financial returns, manage sustainability-related risks, express ethical or social values, or obtain non-financial benefits from holding sustainable assets.

This multidimensional nature of sustainable investment suggests that green stock investment decisions cannot necessarily be reduced to a conventional risk-return assessment. A recent systematic review of sustainable investing literature also shows that research has examined diverse determinants, including financial returns, financial literacy, risk, attitudes toward sustainable investment, and environmental concerns. Consequently, sustainability considerations are included in the present study as part of the broader set of indicators used to explore the underlying structure of green stock investment behavior.

2.4 Young Investor Behavior

Young investors represent an increasingly important group in contemporary capital markets because digital investment platforms have reduced barriers to market participation. At the same time, young investors may encounter a complex information environment involving financial news, social media, online investment communities, and sustainability-related information. The behavioral characteristics of young investors are therefore not necessarily homogeneous. Investment decisions may involve analytical evaluation, confidence in personal investment ability, emotional reactions to market outcomes, and prioritization among alternative investments.

The relevance of this issue is particularly strong in sustainable investment. A recent study focusing on Generation Z's green investment intentions emphasizes the interaction of psychological mechanisms, digital stimuli, value-based reasoning, and investment decision-making in explaining sustainable investment behavior. Within the Indonesian context, previous research has also examined financial literacy and green perceived risk in relation to investment decisions among millennials, indicating the relevance of both financial and sustainability-related considerations among younger investors.

However, these dimensions have generally been examined as separate variables. The present study instead explores whether multiple behavioral indicators can be empirically organized into a smaller number of underlying dimensions.

2.5 Behavioral Dimensions in Green Stock Investment: An Exploratory Perspective

The preceding literature indicates that green stock investment involves multiple forms of consideration. Numerous studies have demonstrated that firms with superior ESG performance tend to exhibit stronger long-term resilience, lower investment risk, and enhanced firm value, making sustainable investment an attractive option for both institutional and retail investors ([5], [6]; [7]). Investors may evaluate financial information rationally, develop confidence in their investment judgments, respond emotionally to gains and losses, and consider sustainability-related characteristics when selecting investment alternatives. However, the literature does not necessarily establish a single, universally accepted factor structure that represents these behavioral characteristics in the context of young investors in emerging markets. Recent literature on sustainable investing demonstrates considerable theoretical and methodological diversity, with studies drawing on behavioral finance, planned behavior, psychological theories, and economic theories to explain sustainable investment decisions.

Investment decisions are generally expected to be based on rational considerations supported by thorough fundamental and technical analysis. However, in practice, investors frequently exhibit behavioral tendencies that may deviate from fully rational decision-making, including overconfidence ([8], [9], [10]); herding effects ([10], [11], [4]), disposition effects [12] and the influence of investment communities on stock selection [13]. Risk perception may further affect how investors evaluate investment alternatives and respond to uncertainty [10]. At the same time, the growing importance of green investment has introduced additional considerations into investment decision-making, as investors increasingly evaluate sustainability-related aspects alongside conventional financial information [14]. These considerations may arise from both internal and external factors, including firm characteristics, regulatory and policy influences, economic conditions, and environmental, social, and governance (ESG) considerations [15]. The coexistence of these diverse factors suggests that investment decision-making, particularly in the context of green stocks, is a multidimensional phenomenon that may not be adequately explained by individual behavioral factors considered in isolation.

This condition provides a rationale for adopting an Exploratory Factor Analysis (EFA) approach. Rather than assuming in advance that particular indicators must belong to predetermined constructs, EFA allows the underlying structure to emerge from the observed correlations among indicators. Accordingly, this study does not propose that rational behavior, psychological characteristics, emotional responses, and sustainability considerations necessarily constitute four confirmed constructs. Instead, these theoretical perspectives provide the conceptual basis for selecting and developing the observed indicators, while the empirical factor structure is determined through EFA.

The resulting factors are subsequently interpreted by considering three criteria: (1) the pattern and magnitude of factor loadings, (2) the conceptual similarity of indicators within each factor, and (3) their consistency with relevant behavioral finance and sustainable investment theories. This approach enables the study to develop an exploratory understanding of the behavioral dimensions underlying green stock investment among young Indonesian investors.

3 Methodology

3.1 Research Design

This study employed a quantitative research design using an exploratory approach to identify the underlying behavioral dimensions associated with green stock investment decisions among young investors in Indonesia. The exploratory approach was selected because the study seeks to examine the underlying structure of several behavioral indicators rather than test predetermined causal relationships. Accordingly, Exploratory Factor Analysis (EFA) was employed to identify groups of observed indicators that share common underlying characteristics.

The EFA approach enables the study to explore whether indicators related to rational investment considerations, psychological biases, emotional responses, risk perception, and sustainability considerations can be empirically grouped into a smaller number of latent dimensions. The resulting factor structure was subsequently interpreted based on the factor loadings, conceptual similarity of the indicators, and their relevance to behavioral finance and sustainable investment.

3.2 Population and Sample

The population of this study consisted of young retail investors participating in the Indonesian capital market. Young investors were defined as individuals aged 18–36 years. This group was selected because young investors constitute an important segment of retail market participants and are increasingly exposed to digital investment platforms and sustainability-related investment information.

A purposive sampling technique was employed. Respondents were required to meet four criteria: (1) aged 18–36 years; (2) actively investing in the Indonesian stock market; (3) having conducted stock transactions within the previous twelve months; and (4) having knowledge of green stock investment. A total of 110 valid responses were obtained from investors in Surabaya and Denpasar.

3.3 Data Collection

Primary data were collected using a structured questionnaire. The questionnaire employed a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed to respondents who met the predetermined sampling criteria. Before the analysis, all responses were screened for completeness and consistency. Only questionnaires that were fully completed and met the specified respondent criteria were included in the final analysis.

3.4 Measurement Instrument

The measurement instrument was developed based on the behavioral finance literature and adapted to the context of green stock investment. The indicators were designed to capture

several aspects of investors' decision-making, including rational investment considerations, psychological characteristics, emotional responses, and sustainability-related considerations. Rather than assuming that these indicators represented predetermined latent constructs, the study used EFA to examine their underlying structure empirically. The observed indicators were therefore subjected to factor analysis to determine how they naturally clustered into latent dimensions based on their correlations.

3.5 Data Analysis

Data were analyzed using IBM SPSS Statistics. The analysis was conducted through several stages. First, the suitability of the data for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO statistic was used to assess the adequacy of the correlation pattern for factor analysis, while Bartlett's Test was used to determine whether the correlation matrix was significantly different from an identity matrix. A KMO value above 0.50 and a statistically significant Bartlett's Test were considered evidence that the data were suitable for factor analysis. Second, Principal Axis Factoring (PAF) was employed as the factor extraction method. PAF was selected because the objective of the analysis was to identify the underlying latent dimensions represented by the observed indicators.

Third, the number of factors to be retained was determined by considering eigenvalues greater than one and the scree plot, together with the conceptual interpretability of the resulting factor structure.

Fourth, Varimax rotation with Kaiser normalization was applied to obtain a clearer and more interpretable factor structure. Indicators were evaluated based on their factor loadings and conceptual relevance. Factor loadings of approximately 0.50 or higher were considered adequate for interpretation.

Finally, the internal consistency of the resulting factors was assessed using Cronbach's Alpha. The extracted factors were then interpreted based on the pattern of factor loadings, the conceptual similarity among indicators within each factor, and their theoretical relevance to behavioral finance and green stock investment.

3.6 EFA Analytical Procedure

The analytical procedure can be summarized as follows:

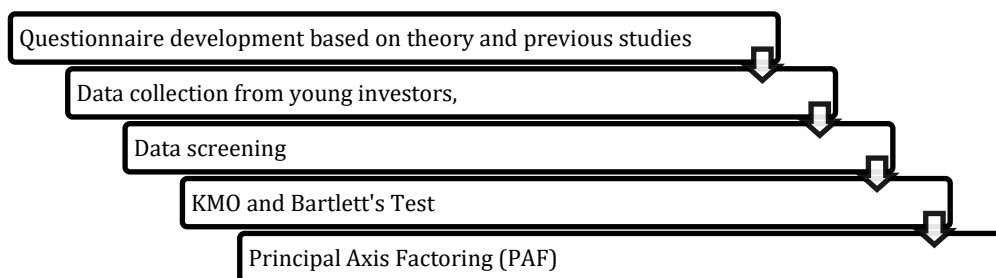


Figure 1. EFA analytical procedures

3.6 Conceptual Framework

Based on Behavioral Finance Theory, Prospect Theory, and sustainable investment literature, this study considers green stock investment behavior as a multidimensional phenomenon involving financial, psychological, emotional, and sustainability-related considerations. These theoretical perspectives provide the basis for identifying observed indicators that may reflect different aspects of young investors' investment decision-making.

Rational considerations may be reflected in investors' evaluation of financial performance, investment alternatives, and risk. Psychological considerations may involve confidence in personal investment knowledge and judgment. Emotional considerations may emerge from investors' responses to uncertainty, gains, and losses. Meanwhile, sustainability-related considerations may reflect the importance attached to environmental responsibility and ESG characteristics when selecting stocks. However, because the underlying factor structure of these indicators has not been sufficiently established in the context of young Indonesian investors, the present study does not impose a predetermined factor structure. Instead, Exploratory Factor Analysis is used to examine how the observed indicators are empirically grouped into latent dimensions.

4 Result

4.1 Respondent Profile

A total of 110 valid responses were included in the analysis. The respondents consisted of young investors aged between 18 and 36 years who actively participated in the Indonesian stock market. As presented in Table 1, 61 respondents (55%) were male and 49 (45%) were female. The largest age group was 18–21 years, accounting for 48 respondents (44%). In terms of education, 84 respondents (76%) held a diploma qualification, while 26 respondents (24%) held a bachelor's degree. Regarding investment experience, most respondents had 1–2 years of investment experience.

4.2 Descriptive Statistics

Descriptive statistics were examined to assess the distribution and variation of the observed indicators before conducting factor analysis. The results indicate that the observed variables demonstrated sufficient variation in respondents' responses. The standard deviations indicate differences in respondents' perceptions regarding rational investment behavior, psychological characteristics, emotional responses, and other investment considerations. These variations provided an adequate basis for examining the underlying relationships among the observed indicators.

4.3 Assessment of Data Suitability for Factor Analysis

Table 1. KMO and Bartlett's Test

Measure	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.684
Bartlett's Test of Sphericity – Approx. Chi-Square	431.185
df	78

Measure	Value
Sig.	< .001

The KMO value of 0.684 indicates adequate sampling adequacy for factor analysis. Furthermore, Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 431.185$, $df = 78$, $p < .001$), indicating that the correlation matrix was not an identity matrix. Therefore, the observed indicators demonstrated sufficient intercorrelations to proceed with Exploratory Factor Analysis.

4.4 Communalities

The communalities were examined to determine the proportion of variance in each observed indicator that could be explained by the extracted factors. The results indicate that the retained indicators generally demonstrated adequate communalities, suggesting that the extracted factor structure was able to explain a meaningful proportion of the variance in the observed variables. Indicators with insufficient communalities or weak factor loadings should be considered for exclusion based on both statistical and conceptual considerations.

4.5 Factor Extraction and Total Variance Explained

Exploratory Factor Analysis was conducted using Principal Axis Factoring (PAF) as the extraction method. The number of factors was determined based on eigenvalues greater than one, supported by examination of the scree plot and conceptual interpretability. The analysis resulted in four factors with eigenvalues greater than one. Together, the four factors explained 61.39% of the total variance, indicating that the extracted factor structure captured a substantial proportion of the variance contained in the observed indicators.

The four-factor solution provides an exploratory representation of the underlying behavioral structure associated with green stock investment. However, the factors should be interpreted as empirically emerging dimensions rather than theoretically confirmed construct.

4.6 Rotated Factor Matrix

Following factor extraction, Varimax rotation with Kaiser normalization was applied to facilitate interpretation of the factor structure. The rotated solution produced a clearer pattern of factor loadings, allowing the observed indicators to be grouped according to their strongest associations with the extracted factors.

Indicators with factor loadings of approximately 0.50 or higher were considered practically meaningful for interpretation. The factor structure was subsequently examined based on the magnitude of the loadings and the conceptual similarity among indicators loading on the same factor.

4.7 Factor Formation and Interpretation

According to Factor loading pattern, it revealed four underlying dimensions associated with young investors' green stock investment behavior. The factors were interpreted by considering the grouping of indicators, factor-loading magnitude, and conceptual similarity among the indicators.

Factor 1: Psychological/Confidence Dimension

The first factor is characterized by indicators reflecting investors' psychological characteristics and confidence in their investment judgments. The relatively strong factor loadings indicate that these indicators share a common underlying dimension related to investors' perceptions of their own investment knowledge, ability, and judgment. Accordingly, the factor is interpreted as a **Psychological/Confidence Dimension**, particularly reflecting the role of investor confidence in green stock investment decisions.

Factor 2: Rational Investment Analysis

The second factor represents indicators associated with investors' rational evaluation of investment alternatives. These indicators reflect the use of financial information, evaluation of investment opportunities, and systematic consideration of investment-related information.

Accordingly, this factor is interpreted as **Rational Investment Analysis**, representing the analytical dimension of young investors' green stock investment decisions.

Factor 3: Emotional and Sustainability Considerations

The third factor reflects indicators associated with investors' responses to investment outcomes, uncertainty, and sustainability-related considerations. The grouping of these indicators suggests that investment decisions may involve both affective responses and perceptions regarding the broader implications of green investment. Accordingly, this factor is interpreted as an **Emotional and Sustainability Considerations** dimension. This interpretation should be based on the exact wording of the indicators and not solely on the statistical loading pattern.

Factor 4: Additional Investment Considerations

The fourth factor consists of indicators that demonstrate meaningful loadings but show a relatively more heterogeneous conceptual composition than the other factors. The factor therefore represents an **Additional Investment Considerations** dimension. Because of its heterogeneous composition, this factor should be interpreted cautiously. Its final conceptual meaning should be determined by examining the substantive meaning of each retained indicator and its theoretical relevance to green stock investment.

3.8 Reliability Analysis

The internal consistency of the extracted factors was assessed using **Cronbach's Alpha**. The results indicate that the extracted factors demonstrated acceptable internal consistency, with the reported Cronbach's Alpha coefficients meeting the minimum criterion used in this study. These findings suggest that the indicators retained within each factor demonstrate sufficient consistency in representing their respective emerging dimensions. The reliability results therefore provide additional support for interpreting the four-factor structure

Factor	Indicators
Factor 1	H1–H4
Factor 2	RP1–RP6
Factor 3	C2–C5
Factor 4	T2, C6, K1, K4

4 Conclusion

This study aimed to explore the underlying behavioral dimensions associated with green stock investment decisions among young investors in Indonesia using Exploratory Factor Analysis (EFA). Based on the analysis of 110 young investors in Surabaya and Denpasar, the results indicate that green stock investment behavior is multidimensional. The factor analysis identified four underlying dimensions, which collectively explained 61.39% of the total variance. These dimensions reflect different aspects of investors' decision-making, including rational evaluation, psychological characteristics, emotional responses, and investment-related considerations.

The findings indicate that young investors do not consider green stocks solely from a conventional financial perspective. Their investment decisions involve a combination of analytical evaluation, psychological confidence, emotional responses to uncertainty and potential outcomes, and the prioritization of investment alternatives. The emergence of these dimensions provides exploratory evidence that behavioral finance can be applied to understand the complexity of green stock investment decisions in an emerging-market context.

The study contributes to the behavioral finance and sustainable finance literature by providing an exploratory framework of the behavioral dimensions underlying green stock investment among young Indonesian investors. However, because the study employs EFA, the identified factor structure should be considered exploratory rather than a confirmed measurement model. Future research should replicate the findings using larger and more geographically diverse samples and employ Confirmatory Factor Analysis (CFA) to test the stability and validity of the factor structure identified in this study.

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