Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

Sri Utami Ady[1], Nur Sayidah[2], Alvy Mulyaning Tyas[3], Mar'atus Sholikhah[4], Fauziyah Kusniati[5], Chindy Ayu Nurkholifa[6]

[1,2,3,4,5,6]Economic and Business Faculty, Dr. Soetomo University, Surabaya 60118, Indonesia

ABSTRACT: This study aimed to measure the effectiveness of training and the introduction of mutual funds in a limited environment, namely for students, novice investors, and the community. The novelty of this study was the first quantitative research that combines the phenomenon of psychological aspects of investors and mutual fund training to produce a training model that effective in increasing mutual fund purchasing decisions. The first stage was to observe participants without attending training to see their interest in mutual funds. Stage 2 examines observing participants with training to determine their decisions. With the addition of qualitative methods, the third step was to develop the model produced in stages 1 and 2 as an effective model of mutual fund training and introduction, as well as the integration between technology advancement and psychology management for investors. The method used was quantitative with Chi-Square analysis by combining psychological aspects of investor behavior. The implication of this study for Partners are policy references for more attractive mutual fund introduction training models to increase investor decisions to buy mutual funds, and for investors are getting the proper education about mutual fund financial products and comparing them with stocks.

KEYWORDS: effectiveness model; mutual fund; introduction and training; technology advancement; psychological mangement

I. INTRODUCTION

The behavior of market participants creates stock prices. If their behavior is optimistic, the share price will rise, and vice versa; if their behavior is pessimistic, it will create a general market price decline. It can be concluded that stock prices occur more due to psychological factors of market participants rather than rational as they should be. (Ady et al., 2013); (Ady, 2014); (Ady, 2015); (Ady, 2018a); (Jannah & Ady, 2017); (Ady & Hidayat, 2019); (Ady, Mulyaningtyas, et al., 2020).

The COVID-19 pandemic, from 2020 to 2022, severely hit the global economy, including Indonesia. High layoffs have caused people to experience a decrease in income. To overcome this, many people are looking for online jobs, including online trading. At the same time, daily online trading causes a lot of biased behavior because quick decisions become irrational and cause losses.

Among the biased behavior of investors are representativeness, loss aversion, and self-attribution bias (Ady et al., 2013); (Ady, 2015); (Shefrin, 2007) states that representativeness bias is decision-making based on stereotypical thinking or analogies, and will causes investors to make financial decisions that do not increase returns. Loss aversion is an incredible urge to avoid losses rather than gain profits (Pompian, 2006). Loss aversion makes investors risk-averse when evaluating possible profits, causing them to hold losing stocks and sell profitable stocks. This makes the portfolio return not optimal because they sell stocks too quickly (Ady, 2015); (Ady et al., 2013). Self-attribution bias is the tendency to attribute success to internal factors, while failure is attributed to external factors. This bias will cause (1) Overconfidence (Ady, 2015); (Ady, Borovitskaya, et al., 2020); (Ady, Tyas, et al., 2020), (2) investors trading too often (overtrading) (Jannah & Ady, 2017); (Ady & Hidayat, 2019); (3) investors only hear what they want to hear, (Ady, 2018a), (4) holding an underdiversified portfolio (Ady, Borovitskaya, et al., 2020); (Ady, Mulyaningtyas, et al., 2020).

Previous research shows that trading automation is carried out through several steps, using trading robots (Ady et al., 2022) or the menu available on the application system in each securities company (Ady et al., 2023). On the other hand, many

investors turn to mutual funds for those who need more time to analyze stocks. However, psychological aspects also occur in institutional investors, such as pension and mutual funds (Ady et al., 2021). The training is hoped to help investors/students better understand mutual funds when making investment decisions. The objectives of this research are: 1) To analyze the significant difference between mutual fund decision-making before and after mutual fund introduction and training, and 2) To analyze the psychological factors experienced by investors in mutual fund decision-making.

The approach used is a positivist paradigm with quantitative methods. The purpose of the research is to analyze the differences in mutual fund purchase decision-making before and after training, and what psychological factors are experienced by investors in mutual fund decision-making making, and produce **an effectiveness model of mutual fund introduction and training, integration of technology advancement and psychology management for investors**. The novelty of this research is that until now, no quantitative research has analyzed the effectiveness of mutual fund introduction training by including psychological aspects in investment

II. THEORETICAL FRAMEWORK

2.1. Development of Behavioural Finance (BF) Theory

Behavioral finance, the application of psychology to finance, has been a scorching topic since the tech stock bubble in March 2000 (Pompian, 2006). BF is an investigative study that seeks to explain market inefficiencies using psychological theory (Ady, 2015). The emergence of BF began when Shiller warned investors that stock prices, based on various historical measures, would be over-inflated, and the public would be severely disappointed with future stock performance. It was evidenced by the emergence of stock price bubbles shortly after Shiller's warning.

Behavioral finance was published in 2000 and contained a debate on market efficiency, which then formulated the prospect theory (Pompian, 2006). BF is a new paradigm in finance that supplements standard financial theory by introducing behavioral aspects to decision-making. Behavioral finance focuses on the application and principles of economics to develop financial decision-making (Olsen, 1998), 1998).

There are two topics in BF, namely: (1) behavioral finance micro (BFMI), which examines the behavior or biases of individual investors that distinguish them from rational individuals as in classical economic theory (Ady et al., 2013); (Ady, 2015); (Jannah & Ady, 2017); (Ady, 2018a); (Ady & Hidayat, 2019); (Ady, Mulyaningtyas, et al., 2020). (2) behavioral finance macro (BFMA), which detects and describes anomalies in the efficient market hypothesis described in behavioral models (Nuroniyah et al., 2018). This study focuses on BFMI. The behavioral biases that will be studied in this study are.

2.2. Representativeness Bias (RB)

Representativeness bias (RB) is decision-making based on stereotypical or analogous thinking and will cause investors to make erroneous financial decisions (Shefrin, 2007). investors who experience (RB) tend to overreact when processing information to make transaction decisions (Kahneman & Ripe, 1998). There are two interpretations of (RB) in individual investors: base-rate neglect and sample-size neglect. In base-rate neglect, investors tend to determine the success of investing in a familiar company that is easy to classify. They tend to believe in stereotypes in making investment decisions (Ady, 2015). Sample size neglect is investor behavior, where a small sample size is representative of the population, which is called the "law of small numbers." Evidence of empirical findings, including (Bílek et al., 2018), found that the way of thinking (RB) causes investors to mistake good companies for suitable investments. In addition, it can also cause extrapolation of past returns to future returns (Alkhars et al., 2019).

2.3. Loss Aversion

Loss Aversion (LA) is an excellent drive to avoid losses rather than gains, where the probability of a loss is twice the motivational power of a gain of the same amount (Pompian, 2006). LA causes investors to hold losing and sell profitable stocks (Ady, 2015). LA may also lead investors to experience the ignorance that they face higher risk by holding loss-making stocks. LA also results in portfolio imbalance.

2.4. Self-Attribution Bias (SAB)

Self-attribution bias (SAB) is the tendency of individuals to attribute success experienced to internal factors, while failure experienced is due to external factors. This bias will cause (Pompian, 2006): 1) (SAB) after a long success will cause excessive self-confidence, thus taking more significant risks, namely overconfidence (Ady, 2018b); (Ady, Tyas, et al., 2020), 2) Causing investors to trade too often (overtrading) (Ady et al., 2013), 3) Causing investors only to hear what they want to hear, 4) Holding portfolios that are underdiversified (Ady, Tyas, et al., 2020).

2.5. Mutual Funds

Panin Asset Management, a company that collects public funds for investment purposes, is already highly professional. Each type of mutual fund product has its own investment manager, so each MI is more focused on developing the investment value of each product. PAM has a high level of discipline, not quickly wavering in making decisions about the type of product that is by the theme even though economic conditions change not in line with the product, but provides a way out by launching new products that adjust to current conditions. This principle makes PAM a superior asset management institution, receiving awards almost every year and having mutual fund products superior to similar products from competing companies (Ady, Mulyaningtyas, et al., 2020).

Overconfidence behavior in the Panin Investment company occurred by launching a mutual fund investment product based on infrastructure stocks about four years ago with the hope that this product would become a flagship during the then government. However, currently, it does not bring returns as expected. Meanwhile, cognitive dissonance behavior occurs in mutual funds when they maintain risky but still maintained products such as infrastructure growth mutual funds (Ady, Mulyaningtyas, et al., 2020a). Panin Asset Management's mutual fund products vary; there are stock-based mutual funds, bond-based mutual funds, and liquid mutual funds based on deposits and savings, so it depends on investors to choose the type of mutual fund (Ady, Mulyaningtyas, et al., 2020).

III. RESEARCH METHOD

The method used in this research in the 1st stage is a quantitative research design to Analyse the performance and decision-making of investors/students before training. In the 2nd stage, Provide training and literacy about mutual funds. Then, a different test of performance and decision-making before and after training is conducted, and the 3rd stage adds a phenomenological qualitative method by conducting interviews to support the results of stages 1 and 2 and constructing a model based on the results of stages 1 and 2. The qualitative paradigm is designed with phenomenological methods to explore and gain an understanding of individual investor behavior through an inductive thinking process in the actual context, where the main characteristics of the qualitative approach in this research are more concerned with meaning, context, and emic perspectives (Kuswarno, 2009). The research location was at the Indonesia Stock Exchange, Panin Asset Management in Surabaya, Pintraco Securities and Panin Securities Bali.

Data collection will be done by distributing questionnaires via Google Forms to the selected sample. Sample selection based on Cluster sampling: Cluster 1 is students and people who have yet to receive mutual fund training. Cluster 2 is students and people who have been given training, with each cluster totaling 100 people.

For the 3rd stage, the addition of the interview method to complement the quantitative test results. The technique of determining critical informants in this study uses the condition sine qua nontechnique (Fatchan, 2011), namely the technique of determining informants based on specific criteria. The snowball technique is used to get the next informant, which is obtained based on information from key informants. This research will be completed if the researcher considers the information obtained from the informants sufficient (data saturation) depending on the subjectivity of the researcher and the research problem to be answered (Guba & Lincoln, 2004).

In Phases 1 and 2, Chi-Square analysis was used to test the differences in performance and decision-making before and after the training. There is more than one formula for the Chi-square test. If the contingency table is 2 X 2, then the formula used is Continuity Correction. If the contingency table is 2 X 2 but does not meet the requirements of the Chi-square test, the formula used is the Fisher Exact Test. Meanwhile, if the contingency table is more than 2 X 2, for example, 2 X 3, the formula used is Pearson Chi-square (Supranto, 2016).

The Chi-square test can be formulated as follows:

$$X2 = \sum_{i=1}^{n} \frac{O_i \, E_i}{E_i}$$

where:

X^2 = Chi-square Distribution

Oi = Observation value (observation) i^{th}

Ei = Expected Value i^{th}

Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

The steps in Chi-square testing are:

1. Formulate hypothesis H_0 and H_1

H_0 : There is no significant influence between two variables

H_1 : There is a significant influence between two variables

2. Find the expected frequency value (E_i)

$$E_i \text{ for each cell} = \frac{(\text{Total Row})(\text{Total Column})}{\text{Grand Total}}$$

3. Calculating the Chi-square distribution

4. Determining the significance level α

5. Determining the value χ^2 table:

    a. The significance level (α) = 0,05

    b. d.f = (Number of rows – 1) (Number of columns – 1)

6. Determine the test criteria

    If χ^2 Count < χ^2 table, then H0   Accepted

    If χ^2 Count > χ^2 table, then H0   Rejected

    If *Sig.* ≥ 0,05 then H0   Accepted

    If *Sig.* < 0,05 then H0   Rejected

7. Comparing χ^2 count with χ^2 table or *Sig.* with α Decision H_0 Rejected or Accepted

8. Making conclusions whether there is an influence between variables or not

IV. DATA ANALYSIS AND DISCUSSION

4.1. QUANTITATIVE ANALYSIS

Data on respondents who participated in the training are as follows:

1. By Gender

Table 1. Gender of Respondents who Participated in the Training

Gender			
No	Gender	Frequency	Percentage
1	Male	32	32%
2	Female	68	68%
Total		100	100%

Source: Respondents' data processed (2024)

In table 1. Respondents who participated in the training consisted of 32 (32%) males and 68 (68%) females, while respondents who did not participate in the training were as follows:

Table 2. Gender of Respondents Not in Training

Gender			
No	Gender	Frequency	Percentage
1	Male	42	42%
2	Female	58	58%
Total		100	100%

Source: Respondents' data processed (2024)

Respondents who did not attend the training in Table 2 consisted of 42 (42%) males and 58 (58%) females.

Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

2. Based on age, the respondents who participated in the training are as follows:

Table 3. Respondents in Training by Age

Usia			
No	Usia	Frekuensi	Persentase
1	Less than 20 years	7	7%
2	20 years to less than 30 years	89	89%
3	30 years to less than 40 years	1	1%
4	40 years to less than 50 years	1	1%
5	50 years or more	2	2%
Total		100	100%

Source: Respondents' data processed (2024)

Based on Table 3, respondents aged less than 20 years were 7 people (7%), aged 20 to less than 30 years were 89 people (89), the most significant respondents were aged 30 to less than 40 years, as many as 1 person (1%), aged 40 to less than 50 years were 1 person (1%), and aged 50 years or more were 2 people (2%).

Table 4. Non-training respondents by age

Usia			
No	Usia	Frekuensi	Persentase
1	Less than 20 years	8	8%
2	20 years to less than 30 years	76	76%
3	30 years to less than 40 years	10	10%
4	40 years to less than 50 years	3	3%
5	50 years or more	3	3%
Total		100	100%

Source: Respondents' data processed (2024)

Based on Table 4, respondents aged less than 20 years were 8 people (8%), aged 20 to less than 30 years were 76 people (76), the most significant respondents were aged 30 to less than 40 years, as many as 10 people (10%), aged 40 to less than 50 years were 3 people (3%), and aged 50 years or more were 3 people (3%).

Panin Asset Management conducted mutual fund introduction training performed 2 times on 19 July and 1 August 2024. Students and lecturers of the Faculty of Economics and Business, Dr Soetomo University Surabaya, attended this training. The respondents who did not attend the training were students and lecturers from the Faculty of Economics and Business and other faculties (Law and administration Science Faculty) of Dr Soetomo University and the general public. This training aims to introduce Panin Assets Management's products and mutual funds. Table 5. shows the variables and indicators of each variable submitted in the form of questions/questionnaires distributed to respondents who attended the training and respondents who did not participate in the training. Based on questionnaires collected from respondents, both those who attended the training and those who did not were tabulated and analyzed using SPSS version 27.

4.1.1. Comparison Test

A. Respondents who Participated in Mutual Fund Introduction Training

1. Validity Test for Respondents Who Participated in the Training

The validity test refers to evaluating the suitability of the research tools' content to assess the accuracy of the tools used in the study (Sugiyono, 2019).

The basis for decision-making in the validity test is as follows:

  a. If the r count value> r table, then the item or variable is considered valid.

  b. If the rhasil value < rtable then the item or variable is considered invalid.

A questionnaire is valid if the calculated correlation coefficient (rxy) exceeds the critical value at the 5% significance level (rtable). The validity test uses the principle of correlating or connecting each item or question score with the total score obtained from the respondent's answer to the questionnaire. The rule of thumb of the validity test is seen through the value of r count> r

table and the significance is <0.05, so it can be said to be valid. The following are the validity results of respondents who took part in the mutual fund introduction training:

Table 5. Validity Results of Participating in Training

Indikator	Nilai r hitung	Nilai r tabel	Signifikansi	Validitas
PP1	0,777	0,195	0,000	Valid
PP2	0,886	0,195	0,000	Valid
PP3	0,879	0,195	0,000	Valid
PP4	0,825	0,195	0,000	Valid
PP5	0,810	0,195	0,000	Valid
DP1	0,922	0,195	0,000	Valid
DP2	0,926	0,195	0,000	Valid
DP3	0,942	0,195	0,000	Valid
DP4	0,835	0,195	0,000	Valid
PPr1	0,894	0,195	0,000	Valid
PPr2	0,895	0,195	0,000	Valid
PPr3	0,913	0,195	0,000	Valid
PPr4	0,681	0,195	0,000	Valid
PK1	0,897	0,195	0,000	Valid
PK2	0,841	0,195	0,000	Valid
PK3	0,882	0,195	0,000	Valid
PK4	0,861	0,195	0,000	Valid

Source: SPSS version 27, (2024)

Table 5 shows that all the calculated r values in each indicator are more significant than the r table value, and each indicator has a significance value of less than 0.05. Therefore, the indicators are declared valid.

2.   Reliability Test for Respondents who Participated in Training

The reliability test is used to test whether the instrument used is reliable. It is reliable if there is similar data at different times. This reliability testing technique uses an analysis technique that Alpha Cronbach has developed. In this reliability test, α is considered reliable if greater than 0.6 (Ghozali, 2020). The reliability test can be carried out simultaneously on all or question items in the research questionnaire. The rule of thumb for the reliability test is if the value of Cronbach's alpha> 0.6, the reliability level of each indicator is met, and the variable is declared reliable. The results of the calculation of the reliability test of respondents who attended the mutual fund introduction training are shown in Table 6 below:

Table 6. Reliability Results of Participating in Training

Indikator	Nilai Cronbach's Alpha	Reliabilitas
PP1	0,852	Reliabel
PP2	0,846	Reliabel
PP3	0,844	Reliabel
PP4	0,844	Reliabel
PP5	0,842	Reliabel
DP1	0,846	Reliabel
DP2	0,844	Reliabel
DP3	0,847	Reliabel
DP4	0,851	Reliabel
PPr1	0,841	Reliabel
PPr2	0,840	Reliabel
PPr3	0,841	Reliabel
PPr4	0,851	Reliabel

PK1	0,869	Reliabel
PK2	0,867	Reliabel
PK3	0,862	Reliabel
PK4	0,862	Reliabel
Overall	0,858	Reliabel

Source: SPSS version 27, (2024)

Based on Table 6, it is known that all variables met the reliability requirements. It is indicated by Cronbach alpha on each variable having a value greater than 0.6. So, all variables are declared reliable.

B. Respondents who did not attend the Mutual Fund Introduction Training

1. Validity Test for Respondents Who Did Not Participate in the Training

    The following are the results of the validity test of respondents who did not attend the mutual fund introduction training:

Table 7. Validity Results of No Training

Indikator	Nilai r hitung	Nilai r tabel	Signifikansi	Validitas
PP1	0,918	0,195	0,000	Valid
PP2	0,934	0,195	0,000	Valid
PP3	0,935	0,195	0,000	Valid
PP4	0,859	0,195	0,000	Valid
PP5	0,881	0,195	0,000	Valid
DP1	0,969	0,195	0,000	Valid
DP2	0,968	0,195	0,000	Valid
DP3	0,981	0,195	0,000	Valid
DP4	0,939	0,195	0,000	Valid
PPr1	0,910	0,195	0,000	Valid
PPr2	0,927	0,195	0,000	Valid
PPr3	0,865	0,195	0,000	Valid
PPr4	0,626	0,195	0,000	Valid
PK1	0,905	0,195	0,000	Valid
PK2	0,841	0,195	0,000	Valid
PK3	0,833	0,195	0,000	Valid
PK4	0,890	0,195	0,000	Valid

Source: SPSS version 27, (2024)

Table 7 shows that all calculated r values in each indicator are more significant than the r table value, and each indicator has a significance value of less than 0.05. Therefore, the indicators are declared valid.

2. Reliability Test for Respondents who did not Participate in Training

The following are the results of the respondent's reliability test who did not take part in the mutual fund introduction training:

Table 8. Reliability Results for No Training Respondent

Indikator	Nilai Cronbach's Alpha	Reliabilitas
PP1	0,920	Reliabel
PP2	0,919	Reliabel
PP3	0,919	Reliabel
PP4	0,919	Reliabel
PP5	0,918	Reliabel
DP1	0,918	Reliabel

DP2	0,918	Reliabel
DP3	0,918	Reliabel
DP4	0,920	Reliabel
PPr1	0,920	Reliabel
PPr2	0,919	Reliabel
PPr3	0,918	Reliabel
PPr4	0,924	Reliabel
PK1	0,929	Reliabel
PK2	0,929	Reliabel
PK3	0,928	Reliabel
PK4	0,926	Reliabel
Overall	0,926	Reliabel

Sumber: SPSS versi 27, (2024)

Based on Table 8, it is known that all variables have met the reliability requirements. It is indicated by Cronbach alpha on each variable having a value greater than 0.6. So, all variables are declared reliable.

C. Chi Square Test

The chi-square test determines the relationship between variables contained in rows and columns. The chi-square test is part of non-parametric statistical analysis. The rule of thumb for the chi-square test is if the value of the Pearson chi-square significance <0.05, then there is a relationship between one category and another. The Chi-Square test crosstabulation results are shown in Table 9:

Table 9. Crosstabulation Chi Square Result

Mutual Fund Training * Mutual Fund Investment Decision Crosstabulation				
Count				
		Mutual Fund Investment Decision		
		No Investment	Investment	Total
Mutual Fund Training	Not Attending	78	22	100
	Attending	44	56	100
Total		122	78	200

Source: SPSS version 27, (2024)

It can be seen that 78 respondents did not attend the training and did not invest in mutual funds; there are also 22 respondents who did not but invested in mutual funds. 44 respondents participated in the training but did not invest in mutual funds, and 56 respondents attended the training and invested in mutual funds. The Chi-Square test results are shown in Table 10:

Table 10. Chi Square Test Results

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	24,296[a]	1	,000		
Continuity Correction[b]	22,888	1	,000		
Likelihood Ratio	24,932	1	,000		
Fisher's Exact Test				,000	,000
Linear-by-Linear Association	24,174	1	,000		
N of Valid Cases	200				
a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 39,00.					
b. Computed only for a 2x2 table					

Sumber: SPSS versi 27, (2024)

Based on Table 10, it can be seen that for all variables, the significance value of Pearson chi-square is less than 0.05. So, a relationship exists between attending mutual fund training and mutual fund decision-making. It can also be interpreted that by attending mutual fund training, mutual fund decision-making increases. In other words, the training and introduction of mutual funds conducted by Panin Asset Management has effectively attracted public interest, in this case, student respondents to decide to invest in mutual funds. The results of this study are (3), which shows that training increases Generation Z's understanding of financial management and investment, also in line with (4), which shows that training can increase knowledge and confidence in making investment decisions, and (5) which shows Capital market training and education can increase Generation Z's interest in investing.

D. Mann Whitney Test

The Mann Whitney test is used to determine whether there is a difference in the means of two unpaired samples. The mann whitney test is part of non-parametric statistics. The rule of thumb for the mann whitney test is if the value of significance <0.05 then there is a difference in results between one group and another. The Mann Whitney test in this research was conducted to see if there were differences in each dimension or variable. The results of the Mann Whitney test calculation are shown in table 11 below:

Table 11. Mann Whitney Test Results

Test Statistics[a]				
	Perception of Understanding	Dimensions of Training	Product Knowledge	Decision Making
Mann-Whitney U	3147,000	2474,000	3780,500	3139,500
Wilcoxon W	8197,000	7524,000	8830,500	8189,500
Z	-4,534	-6,184	-2,987	-5,171
Asymp. Sig. (2-tailed)	,000	,000	,003	,000
a. Grouping Variable: Mutual Fund Training				

Sumber: SPSS versi 27, (2024)

Based on Table 11, it can be seen that all variables have a significance value of less than 0.05. So, there is a significant difference between the group that did not attend the training and the group that participated in the training in all dimensions. The existence of this difference shows that the difference in perceived understanding, training dimensions, product knowledge, and decision-making for respondents who take part in the training is significantly different from respondents who do not take part in the training, so it can be further concluded that the mutual fund introduction training conducted by Panin Asset Management is effective in increasing perceived understanding, training dimensions, product knowledge, and decision making in respondents. The results of this study are (3), which shows that training increases Generation Z's understanding of financial management and investment, also in line with (4), which shows that training can increase knowledge and confidence in making investment decisions, and (5) which shows capital market training and education can increase Generation Z's interest in investing.

4.1.1. *Causality Test*

The causality test is used to analyze further the relationship and influence of each independent variable on the dependent variable using multiple linear regression analysis. Before multiple linear regression analysis is carried out, classical assumption tests will first be carried out, including the normality test, linearity test, multicollinearity test, heteroscedasticity test, and autocorrelation test, both on respondents who attended the training and those who did not participate in the training.

A. Respondents who Participated in Mutual Fund Introduction Training

1. Normality Test

   The normality test in this study uses the one-sample Kolmogorov-Smirnov test on the residual equation. The rule of thumb for the normality test is that if the value of Significance> 0.05, then it is normally distributed. The results of the calculation of the normality test for respondents who attended the mutual fund introduction training are shown in Table 12 :

Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

Table 12. Normality Results Test of Participating in Training

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			100
Normal Parameters[a,b]	Mean		,0000000
	Std. Deviation		8,17390331
Most Extreme Differences	Absolute		,138
	Positive		,138
	Negative		-,083
Test Statistic			,138
Asymp. Sig. (2-tailed)[c]			,000
Monte Carlo Sig. (2-tailed)[d]	Sig.		,080
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 743671174.			

Sumber: SPSS versi 27, (2024*)*

Based on table 12, it can be seen that the significance value of 0.000 is bigger than 0.05, which means that the residual data is normally distributed.

2. Linearity Test

The linearity test determines whether two variables have a significant linear relationship. A good correlation should have a linear relationship between the predictor and criterion variables. The rule of thumb for the linearity test is that if the value of Deviation from Linearity Sig> 0.05, there is a significant linear relationship between the independent and dependent variables. The results of the calculation of the linearity test for respondents who attended the mutual fund introduction training are shown in Table 13 below:

Table 13. Linearity Results of Participating in Training

Variable	Significant	Linierity
Perception of Understanding	0,507	There is a Linear relationship
Dimensions of Training	0,080	There is a Linear relationship
Product Knowledge	0,543	There is a Linear relationship

Source: SPSS version 27, (2024)

Based on Table 13, it can be seen that all of these variables have a significance value of more than 0.05, so it can be concluded that there is a significant linear relationship between the variables of perceived understanding, training dimensions, and product knowledge with the decision-making variable.

3. Multicollinearity Test

The multicollinearity test determines whether there is a correlation between independent variables. A good regression model should not correlate with the independent variables, or there are no symptoms of multicollinearity. This study calculates multicollinearity by looking at the tolerance and VIF values. The rule of thumb for the multicollinearity test is if the value of tolerance> 0.10 and VIF < 10, then there is no multicollinearity in the regression model. The results of the multicollinearity test calculation for respondents who attended the mutual fund introduction training are shown in Table 14 below:

Table 15. Multicollinearity Results Participate in Training

Coefficients^a								
Model		Unstandardized Coefficients		Standardized Coefficients				Collinearity Statistics
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	16,343	3,704		4,412	,000		
	Perception of Understanding	-,042	,181	-,032	-,230	,818	,498	2,008
	Dimensions of Training	-,575	,222	-,364	-2,595	,011	,492	2,031
	Product Knowledge	,499	,249	,313	2,008	,047	,397	2,521
a. Dependent Variable: Decision Making								

Sumber: SPSS versi 27, (2024)

Based on Table 15, it can be concluded that all Tolerance values are more significant than 0.10, and each of these variables has a VIF value of less than 10. Therefore, there is no multicollinearity in the regression model.

4. Heteroscedasticyty Test

The heteroscedasticity test is used to test the variance in the data group to determine whether there are differences in observations. If the variation of the residual value is fixed, it is called homoscedasticity, but if the variation of the residual value is different, it is called heteroscedasticity. A good regression model should have something other than heteroscedasticity symptoms. This study tested heteroscedasticity using Glejser with a rule of thumb. If the significance value is> 0.05, there are no heteroscedasticity symptoms in the regression model. The results of the calculation of the heteroscedasticity test for respondents who attended the mutual fund introduction training are shown in Table 16 below:

Table 16. Heteroscedasticity Results of Attending Training

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	8,818	1,696		5,198	,000
	Perception of Understanding	,103	,083	,176	1,242	,217
	Dimensions of Training	-,041	,101	-,058	-,405	,686
	Product Knowledge	-,173	,114	-,241	-1,520	,132
a. Dependent Variable: ABS_RES						

Sumber: SPSS versi 27, (2024)

Based on Table 16 above, it can be concluded that all significance values are more significant than 0.05. Therefore, it can be concluded that there are no symptoms of heteroscedasticity in the regression model.

5. Autokorelation Test

The autocorrelation test aims to test whether there is a correlation between confounding errors in period t and in period t-1 (previous) in a linear regression model. If there is a correlation, it is called an autocorrelation problem. A good regression model is free from autocorrelation symptoms. This study will test autocorrelation with Durbin Watson (DW test) with a rule of thumb. If d (Durbin Watson) lies between dU and 4-dU, then there is no autocorrelation, but if d is more minor than dL or more significant than 4-dL, then there is autocorrelation. A definite conclusion is not produced if d lies between dL and dU or between 4-dU and 4-dL. The results of the calculation of the autocorrelation test for respondents who attended the mutual fund introduction training are shown in Table 5.19 below:

Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

Table 17. Autocorrelation Results of Attending Training

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,270[a]	,073	,044	8,301	1,774
a. Predictors: (Constant), Perception of Understanding, Dimensions of Training Product Knowledge,					
b. Dependent Variable: Decision Making					

Sumber: SPSS versi 27, (2024)

This study shows that the d value is 1.774, the dL value is 1.613, and the dU value is 1.736. So, based on the table above, it can be concluded that there is no autocorrelation in the regression model because d (1,774) lies between dU (1,736) and 4-dU (2,264).

6. Analisis Regresi Linier Berganda

Multiple linear regression analysis analyzes the effect between two or more independent variables and the dependent variable. This study examined the influence between the independent variables (perceived understanding, training dimensions, product understanding) and the dependent variable (decision-making). The following formula is used, namely:

$$Y = a + \beta 1.X1 + \beta 2.X2 + \beta 3.X3 + e$$

Table 18. Multiple Linear Regression Participate in Training

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	16,343	3,704		4,412	,000
	Perception of Understanding	-,042	,181	-,032	-,230	,818
	Dimensions of Training	-,575	,222	-,364	-2,595	,011
	Product Knowledge	,499	,249	,313	2,008	,047
a. Dependent Variable: Decision Making						

Sumber: SPSS versi 27, (2024)

Based on Table 18 above, it can be seen that the constant value (α value) is 16.343, the perceived understanding (β value) is -0.042, the training dimension (β value) is -0.575, and the product knowledge (β value) is 0.499. So that the multiple linear regression equation is obtained as follows

$$Y = 16.343 - 0,042 X1 - 0,575 X2 + 0.499 X3$$

Which means:

1) The constant (α) shows 16.343, which means that if the variable Perception of understanding (X1), Training dimensions (X2), and Product knowledge (X3) is 0, then Decision making has a value of 16.343, assuming other variables that can affect decision making are considered fixed.

2) The regression coefficient value of the perceived understanding variable: if the perception of understanding increases by 1 unit, then investment decision-making will decrease by 0.042 or vice versa. If there is a decrease in perceived understanding by 1 unit, decision-making will increase by 0.042.

3) The regression coefficient value of the training dimension variable: if the training dimension increases by 1 unit, the decision-making will decrease by 0.575 or vice versa; if there is a decrease in the training dimension variable by 1 unit, the decision-making will increase by 0.575.

4) The regression coefficient value of the product knowledge variable: if product knowledge increases by 1 unit, then decision-making will increase by 0.499 or vice versa. If there is a decrease in the product knowledge variable by 1 unit, decision-making will decrease by 0.499.

7. Partial t Test

Hypothesis testing can be done using the t-test. The t-test aims to determine whether the independent variables partially (individually) affect the dependent variable. This study's confidence level is 95%, so the alpha value is 5% or 0.05. The rule of thumb for the partial t-test is if the value of significance <0.05, then the independent variable influences the dependent variable, or the variable is accepted. The results of the partial t-test calculation of respondents who attended the mutual fund introduction training are shown in Table 19 below:

Table 19. Results of the t-test for Participation in Training

Coefficientsᵃ						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16,343	3,704		4,412	,000
	Perception of Understanding	-,042	,181	-,032	-,230	,818
	Dimensions of Training	-,575	,222	-,364	-2,595	,011
	Product Knowledge	,499	,249	,313	2,008	,047
a. Dependent Variable: Decision Making						

Sumber: SPSS versi 27, (2024)

Based on Table 19 above, it can be seen that the perceived understanding variable has a significance value of 0.818, more than 0.05, so the perception of understanding variable has no effect on investment decision-making. Meanwhile, the training dimension variable has a significance value of 0.011, less than 0.05, which means that the training dimension significantly negatively affects investment decision-making. The product knowledge variable has a significance value of 0.047, less than 0.05, indicating that product knowledge significantly affects investment decision-making.

The insignificant effect of perceived understanding on investment decision-making indicates the existence of cognitive and psychological biases. The existence of a negative relationship between perceived knowledge and investment decision-making shows that even though respondents consider their understanding to be good in terms of various products in mutual funds, understand the risks in investing in Panin Assets Management mutual funds, know the returns from investing in Panin assets Management, and are interested in investing in Panin Assets Management, it does not necessarily make them decide to invest in Panin Asset Management. There is a hesitation to start investing. They still need to have a fixed income because they have not worked, and a firm intention to invest is defeated by the intention to fulfill other needs, so the investment is still not a priority for them.

The significant influence of the training dimension on decision-making shows that the training provided by Panin Assets Management is practical. The t-test shows significantly different results between those who take part in the training and those who do not take part in the training, meaning that the training provided has been effective in increasing investment decisions. Still, the negative direction of influence shows that even if training increases, it will reduce investment decisions. Panin Assets Management needs to review the technical training provided, primarily if it is intended for students, who certainly have different characteristics from those provided to workers with a fixed income. It is necessary to design a sound system to bring Panin Assets Management closer to prospective customers so that they understand more, are more familiar with them, and maintain a sustainable relationship with customers and prospective customers..

Mutual Fund Introduction and Training on Investment Decision, Integration between Technology Advancement and Psychological Management for Investors

The significant positive effect between product knowledge and investment decision-making indicates that the respondents' understanding of investment products is good enough, and the higher the respondents' knowledge of investment products and risks, the more their investment decisions will increase. This is in line with the findings of (Andriani et al., 2022), which show that prospective investors' knowledge of investment increases interest and investment decisions. Capital market training will improve the understanding of prospective investors to increase interest and decisions to invest smartly (Akbar et al., 2023).

8. Simultaneous F Test

Hypothesis testing can be done using the F test. The F test aims to determine whether the independent variables simultaneously (together) affect the dependent variable. This study's confidence level is 95%, so the alpha value is 5% or 0.05. The rule of thumb for the simultaneous F test is if the value of significance <0.05, then the independent variable simultaneously affects the dependent variable, or the variable is accepted. The results of the simultaneous F test calculation of respondents who took part in the mutual fund introduction training are shown in Table 20 below:

Table 20. F-test for Participating in Training

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.[b]
1	Regression	520,053	3	173,351	2,516	,063[b]
	Residual	6614,457	96	68,901		
	Total	7134,510	99			

a. Dependent Variable: Decision Making

b. Predictors: (Constant), Perception of Understanding, Dimensions of Training Product Knowledge

Sumber: SPSS versi 27, (2024)

Table 20 shows that the significance value is more than 0.05 (0.063), which means that perceived understanding, training dimensions, and product knowledge simultaneously have no effect on decision-making.

9. Determination Coefficient Test

The coefficient of determination test is carried out to predict and see how much influence the independent variables contribute simultaneously to the dependent variable. The R Square value determines the coefficient of determination. The rule of thumb for the coefficient of determination test is that if the R Square value is small, then the ability of the independent variables to explain the variation in the dependent variable is minimal. The results of the calculation of the coefficient of determination test for respondents who attended the mutual fund introduction training are shown in Table 21 below:

Table 21. Results of the Coefficient of Determination of Participating in Training

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	,270[a]	,073	,044	8,301

a. Predictors: (Constant), Perception of Understanding, Dimensions of Training Product Knowledge

b. Dependent Variable: Decision Making

Sumber: SPSS versi 27, (2024)

Based on Table 21, it can be concluded that the Adjusted R Square value is 0.044 or equal to 4.4%, which means that the variation of the independent variables simultaneously contributes to changes in the variation of the dependent variable by 4.4%. At the same time, the rest (100% - 4.4% = 95.6%) is influenced by other variables outside of this regression equation or variables not examined.

4.2. Analisa Kualitatif

4.2.1. Teknologi Advancement pada Panin Asset Management

Panin Asset Management (PAM) is a company that collects public funds for investment purposes and already has a high level of professionalism. Each type of mutual fund product has its investment manager (MI), so each MI is more focused on

developing the investment value of each product. PAM has a high level of discipline and is not easily shaken in making decisions about the type of product that is by the theme even though economic conditions change not in line with the product, but provides a way out by launching the latest product that adapts to current conditions. This principle makes PAM a superior asset management institution, and it gets awards almost every year. It has superior mutual fund products compared to similar products from its competitors (Ady, Mulyaningtyas, et al., 2020).

In the subsequent development, PAM further spoils its customers by bringing up applications that can be downloaded on smartphones; this application allows customers to make investment purchases via smartphones to make transactions at any time, wherever they are.

The training that PAM has carried out on students who are respondents to this study, several obstacles prevent potential investors from experiencing difficulties in registering or re-registering when opening an account in mutual funds. It is because there are several reasons, based on interviews with prospective mutual fund customers who cannot verify their data, including:

1. Ease of use of the application

   Many students need help registering an account due to their lack of understanding of the application and a more detailed explanation from PAM about the flow to register.

2. Difficulty uploading data because there are data that most students do not have at that time, such as parents' ID cards for students who are not working, causing them difficulties and ultimately delaying registration; it is better for PAM before providing training, especially for students, to announce in advance about the need for data including parents' ID cards that may be needed for data verification, to facilitate and expedite the registration process of prospective customers. There are times when prospective customers interested in registering for an account become delayed or even discouraged from opening a mutual fund account, which is less profitable for PAM.

3. There is no guide or video tutorial for new customers to make transactions, so students find it difficult to make initial purchases or transfer funds to their mutual fund accounts. Eventually, even though they open an account, there is no further progress, and they leave the account abandoned. PAM must provide guidance or video tutorials for prospective customers who make purchases or investments online to make their first investment smoothly.

4. In the iProsper application (PAM application), when customers want to log in, they have to enter their ID and password, which are not automatically saved in the application, making it very difficult for customers always to remember the ID and password, unlike the application on the web, where the user ID and Password can be saved, mainly because it is connected to the user's email, making it easier for customers not always to need to remember the PAM ID and password. The suggestion for PAM is to store the customer's user ID and password on each customer's smartphone as found in banking applications or use fingerprint or Face ID to facilitate customers.

5. There is a need for training on the menu in the application and how to execute buying or selling mutual funds for potential investors and novice investors. Some respondents have not mastered technology, so it becomes an obstacle for them, especially for investors / prospective investors who are elderly, so they tend to stick to conventional investments and retention of technology. It will result in slow development of the capital market or mutual funds in technology advancement (Ady et al., 2022).

4.2.2. Psychological Management of Investors

Psychological stability in investors is essential for making investment decisions because investment decisions are uncertain and contain risks that require in-depth consideration and analysis for investors so as not to lose their assets. Behavioral finance or behavioral finance is the application of psychology to financial science, which has become a scorching topic since the tech stock bubble in March 2000 (Pompian, 2006). Behavioral Finance is an investigative study that seeks to explain market inefficiency using psychological theory (Ady, 2015). Behavioral finance is a new paradigm in finance that supplements standard financial theory by introducing behavioral aspects to decision-making. Behavioral finance focuses on the application and principles of economics to the development of economic decision making (Olsen, 1998). There are two topics in behavioral finance, namely:

1. Behavioral finance micro (BMFI) yang menguji perilaku atau bias dari individu yang membedakan mereka dari individu yang rasional seperti dalam teori ekonomi klasik (Ady et al., 2013); (Ady & Hidayat, 2019); (Ady, 2018b)

2. Behavioral finance macro (BMFA) yang mendeteksi dan mendeskripsikan anomali dalam hipotesis pasar efisien yang dijelaskan dalam model perilaku (Nuroniyah et al., 2018).

This study focuses on BMFI as the known bias behaviors in this study are:

1. Loss aversion: most of the respondents in this research are afraid to invest because of the fear of loss. They are 4-8 semester students who have never known stock investment or mutual funds, so their understanding is still very minimal when introduced to investments, including mutual funds; with the limited funds they have, there is a fear of losing money, but there is also a lack of courage to ask further questions about risk.

2. Representativeness bias: some of the respondents assume that mutual funds are as risky as stocks, although, on the other hand, they also know that there are less risky mutual fund products, such as liquid mutual funds and sharia liquid mutual funds, but in general respondents assume that having an account in mutual funds has almost the same risk as stocks.

3. Representativeness bias, by assuming that because students are not working, they do not need to save. They represent that people who do not work do not need to have savings. Almost 36.4% think there is no need for savings because they are not working. The awareness to save and invest still needs to be improved in students in semesters 4 to 8 due to their limited funds, so they have yet to awaken the awareness to consider saving.

4. Cognitive dissonance is a mental/psychological discomfort experienced by a person when there is a mismatch of new information with what has been believed, or it can be referred to as an imbalance that occurs when cognitive contradictions arise (Pompian, 2006). Several respondents experience cognitive dissonance. This mental imbalance occurs due to an inner conflict between the desire to do and learn to invest in mutual funds and spend their excess money. Most students surveyed do not work, so they only receive an allowance from their parents. So when they feel they have excess cash, they spend it on fashion products rather than investing. On the other hand, they need to have the habit of saving money rather than the desire to spend it. The ease of access to the latest fashion in online marketplaces such as Shopee, Tokopedia, Zalora, and so on makes today's students more likely to follow fashion developments than people in the 90s. Currently, various marketplaces that can be accessed online make people, including students, easily see fashion development trends and tend to imitate them, so the temptation to save money is certainly more difficult. Many students are entangled in pinjol because they cannot resist being fashionable according to fashion developments.

5. Confirmation Bias: The tendency to seek information that supports existing beliefs and ignore conflicting information. If there is information that contradicts what is already believed, let alone the decisions of groups, friends, communities, and so on, then the respondents tend to follow their beliefs without examining the new information they get.

6. Overconfidence Bias: Overconfidence in one's ability to predict market movements can lead to taking undue risks. It occurs mainly in novice investors who have experienced/earned returns that match their predictions, so their confidence increases. They need to be more confident in predicting the market and more vigilant and cautious in investing.

7. Herding Behavior: The tendency to follow other people's investment decisions without conducting in-depth analysis. In general, investors/respondents make decisions because they follow friends or communities; if their community considers mutual funds unattractive as a place to invest, then they tend to all follow the joint decision without feeling the need to analyze more deeply because they feel hesitant about making mistakes in decision making if they are not with friends or communities.

5. CONCLUSIONS

Based on the results and discussion in the previous chapter, it can be concluded that The Chi-square difference test results show that the two groups of respondents tested have significant differences. So, a relationship exists between attending mutual fund training and mutual fund decision-making. By attending mutual fund training, mutual fund decision-making increases. In other words, the training and introduction of mutual funds conducted by Panin Asset Management has effectively attracted public interest, in this case, student respondents who decided to invest in Panin Assets Management.

The Mann Whitney Test Results show a significant difference between the group that did not attend the training and those that participated in all dimensions. The existence of this difference indicates that the difference in perception of understanding, training dimensions, product knowledge, and decision-making for respondents who take part in the training is significantly different from respondents who do not take part in the training so that it can be further concluded that the mutual fund introduction training conducted by Panin Asset Management is effective in increasing the perception of understanding, training dimensions, product knowledge, and decision making of respondents.

Based on the results of the causality test through multiple linear regression analysis, the t-test results show that the training and knowledge dimensions significantly influence decision-making, although the effect is low and even harmful for the perceived

understanding variable and the training dimension, this shows that respondents still have a cognitive bias towards what is conveyed in training, thus causing them to feel hesitant to decide to invest in Panin Assets Management mutual funds

ACKNOWLEDGMENT

REFERENCES

1) Ady, S. U. (2015). Manajemen Psikologi dalam Investasi Saham (Kajian Fenomenologi dalam Sentuhan Behavioral Finance). *Penerbit ANDI*, *1*(1), 1–200.

2) Ady, S. U. (2018a). The Cognitive and Psychological Bias in Investment Decision-Making Behavior: (Evidence From Indonesian Investor's Behavior). *Journal of Economics and Behavioral Studies*, *10*(1), 86–100. https://doi.org/10.22610/jebs.v10i1.2092

3) Ady, S. U. (2018b). The Moral Values of Psychological Stability, Successful Key of Investment (Study of the Indonesian Stock Exchange Investor Behaviors). *ASSEHR*, *125*, 33–37. https://doi.org/10.2991/icigr-17.2018.8

4) Ady, S. U. (2014). Nilai-nilai dibalik Kestabilan Psikologis, Kunci Sukses Berinvestasi (Studi pada Perilaku Investor di Bursa Efek Indonesia. *Simposium Riset Ekonomi VI-2014*, 323–334.

5) Ady, S. U., Borovitskaya, M. V, Nguen, H. F., & Artha, R. (2020). *Peran Pinjaman Jangka Pendek untuk Pertumbuhan Bisnis Mengenai Kegiatan Lingkungan*. *8*(2), 621–624.

6) Ady, S. U., Farida, I., Winedar, M., MUlyaningtyas, A., Susena, D. O. S., & Pratama, A. H. (2022). The Role of Investors' Behavior and Psychological Unbiasedness on The Digitization of The Capital Market in Indonesia: Mediating Role of Technology Advancement. *International Journal of e Business and EGoverment Studies*, *14*(2), 350–368. https://doi.org/10.34109/ijebeg.

7) Ady, S. U., & Hidayat, A. (2019). Do Young Surabaya's Investors Make Rational Investment Decisions ? *International Journal of Scientific & Technology Research*, *8*(07), 319–322. https://doi.org/https://www.ijstr.org/research-paper-publishing.php?month=july2019

8) Ady, S. U., Mulyaningtyas, A., & Farida, I. (2020). *Meneropong Perilaku Investor Lembaga Di Bursa Efek Indonesia* (1st ed.). Zifatama Jawara. https://books.google.co.id/books?id=7LUKEAAAQBAJ

9) Ady, S. U., Sudarma, M., Salim, U., & Aisyah, S. (2013). Psychology's Factors of Stock Buying and Selling Behavior in Indonesia Stock Exchange (Phenomenology Study of Investor Behavior in Surabaya). *IOSR Journal of Business and Management*, *7*(3), 11–22. https://doi.org/10.9790/487X-0731122

10) Ady, S. U., Tyas, A. M., Farida, I., & Gunawan, A. W. (2020). Immediate and Expected Emotions toward Stock Returns through Overconfidence and Cognitive Dissonance: The Study of Indonesian Investor Behavior. *PalArch's Journal of Archaelogy of Egypt/Egyptology*, *17*(3), 1140–1165.
https://doi.org/https://archives.palarch.nl/index.php/jae/article/view/238/241

11) Ady, S. U., Tyas, A. M., Farida, I., & Gunawan, A. W. (2021). Overconfidence and Cognitive Dissonance Behavior in the Pension Fund Investment Manager in the New Normal Era. *Proceedings of the 2nd International Conference on Business and Management of Technology (ICONBMT 2020)*, *175*, 219–226. https://doi.org/10.2991/aebmr.k.210510.036

12) Ady, S. U., Winedar, M., Farida, I., Susena, D. O. S., & Putri, F. M. (2023). Trading Robots: Effective but Limited in Replacing Human Traders for Short-Term Investors. *Troceding of The International Conference on Advance Research in Social and Economic Science (ICARSE 2022)*, *1*, 248–254. https://doi.org/10.2991/978-2-38476-048-0_28

13) Akbar, M., Bachtiar, Y., Nastiti, R., Munawaroh, R. . S., Norbaiti, Dwitia, S. J. L., Fitriany, N., Setiawan, K., & Sumerta, I. K. (2023). Smart Investment Strategis To Promote Investment Awareness of Generation Z. *BAKTI BANUA : Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 39–43.

14) Alkhars, M., Evangelopoulos, N., Pavur, R., & Kulkarni, S. (2019). Cognitive biases resulting from the representativeness heuristic in operations management: An experimental investigation. *Psychology Research and Behavior Management*, *12*, 263–276. https://doi.org/10.2147/PRBM.S193092

15) Andriani, S., Fietroh, M. N., Oktapiani, S., & Hartini, H. (2022). Edukasi Capital Market Pada Gen Z. *SELAPARANG: Jurnal Pengabdian Masyarakat Berkemajuan*, *6*(4), 2178–2182. https://doi.org/10.31764/jpmb.v6i4.11647

16) Bílek, J., Nedoma, J., & Jirásek, M. (2018). Representativeness heuristics: A literature review of its impacts on the quality

of decision-making. *Scientific Papers of the University of Pardubice, Series D: Faculty of Economics and Administration*, *26*(43), 29–38.

17) Fatchan, H. A. (2011). *Metode Penelitian Kualitatif, beserta contoh proposal skripsi, tesis, dan disertasi*. Jenggala Pustaka Utama.

18) Ghozali, I. (2020). *Aplikasi Analisis Multivariete Dengan Program IBM SPSS 23 (Edisi 8). Cetakan ke VIII*. Badan Penerbit Universitas Diponegoro.

19) Guba, E. G., & Lincoln, Y. S. (2004). Competing paradigms in qualitative research. In *Approaches to qualitative research: A reader on theory and practice* (pp. 17–38). https://doi.org/http://www.uncg.edu/hdf/facultystaff/Tudge/Guba%20&%20Lincoln%201994.pdf

20) Jannah, W., & Ady, S. U. (2017). Analisis Fundamental, Suku Bunga, Dan Overconfidence Terhadap Pengambilan Keputusan Investasi Pada Investor Di Surabaya. *Ekspektra: Jurnal Bisnis Dan Manajemen*, *1*(2), 138–155. https://doi.org/10.1007/BF00139728.5

21) Kahneman, D., & Ripe, M. W. (1998). Aspects of Investor Psychology. *The Journal of Portfolio Management*, *24*(4), 52–65. https://doi.org/DOI: https://doi.org/10.3905/jpm.1998.409643

22) Kuswarno, E. (2009). *Metode Penelitian Komunikasi, Fenomenologi, Konsepsi, Pedoman, dan contoh penelitian, Fenomena Pengemis Kota Bandung,*. Widya Padjadjaran.

23) Nuroniyah, R., Ady, S. U., & Sugiyanto. (2018). Market Anomalies of LQ 45 Companies Stock Return Listed On the Indonesia Stock Exchange. *Ekspektra: Jurnal Bisnis Dan Manajemen*, *2*(2), 103–120. http://ejournal.unitomo.ac.id/index.php/manajemen/article/view/414/556

24) Olsen, R. A. (1998). Behavioral finance and implications volatility for stock-price volatility. *Financial Analysts Journal*, *54*(2), 10–18.

25) Pompian, M. M. (2006). Behavioral Finance and Wealth Management: How to Build Investment Strategies That Account for Investor Biases. In *John Wiley & Sons, Inc.* https://doi.org/10.1002/9781119202400

26) Shefrin, H. (2007). *Behavioral Corporate Finance: Decision That Create Value* (McGraw-Hil).

27) Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (Edisi ke-2). Bandung: Alfabeta.

28) Supranto, J. (2016). *Statistik Teori dan Aplikasi* (8th ed.). Erlangga.