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Investors psychology on the biased investment decision: The mediating effect of extra-motivation to invest

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Abstract

This study aims to prove that individual investors' psychology consisting of positive attitude, affective-self affinity, familiarity, trust, and nationalism affects investment decisions mediated by the extra motivation to invest. The data collected through questionnaires were processed and tested for the validity and reliability of the construct. Respondents in this study are individual investors who use psychological considerations as more motivation to make decisions and 404 questionnaires distributed to individual investors. This study uses Partial Least Square (PLS). It passes the fit and quality indices model criteria to determine the strength of this study's structural model before the hypothesis testing is carried out. We found four psychological variables of individual investors (positive attitude, familiarity, trust, and nationalism) that directly affect investment decisions and indirectly with the mediator of extra motivation to invest. Extra incentive to invest is not influenced by affective-self affinity and does not mediate its relationship with investment decisions. We also found that investors with psychological considerations tend to make biased decisions. Investors show behaviour that is overreaction, overconfidence, and risk tolerance (low risk with high return).

Abstrak

Tujuan penelitian ini untuk membuktikan bahwa psikologi investor individu yang terdiri dari positive attitude, affective-self affinity, familiarity, trust, dan nasionalisme berpengaruh terhadap keputusan investasi yang dimediasi oleh extra motivation to invest. Data yang terkumpul melalui kuesioner diolah dan diuji validitas dan reliabilitas konstruksinya. Penelitian ini menggunakan Partial Least Square (PLS) serta lolos dari kriteria model fit and quality indices untuk menentukan kekuatan model struktural penelitian ini sebelum uji hipotesis dilakukan. Penelitian ini menemukan bahwa, ada 4 variabel psikologi investor individu (positive attitude, familiarity, trust, dan nasionalisme) berpengaruh langsung terhadap keputusan investasi dan juga tidak langsung dengan mediator extra motivation to invest. Extra motivation to invest tidak dipengaruhi oleh affective-self affinity dan tidak memediasi hubungannya dengan keputusan investasi. Penelitian ini juga menemukan investor dengan pertimbangan psikologi cenderung membuat keputusan yang bias. Investor memperlihatkan perilaku yang overreaction, overconfidence, dan risk tolerance (risiko rendah dengan return yang tinggi).

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1. Introduction

The basis for making decisions is not rational humans but normal humans, Shefrin & Statman (1985). This is the difference or gap between standard finance and behaviour finance. All standard finance theories (modern finance) assume that all market participants have the same horizon of knowledge as rational humans when making decisions. Humans will always maximize profits and minimize risk by forming an efficient portfolio. Each Investor's portfolio investment decision reflects the comprehensive market information and decisions made on the optimal portfolio efficiency frontier - Mean and Variance Optimization, Markowitz (1952).

Behavioral finance offers an alternative theoretical perspective on the functioning of financial markets (i.e. investors, asset prices, and market behavior) based on a positive philosophical view, which does not assume the full rationality of market participants. The current theoretical foundations for investor behavior in the behavioral finance paradigm are Simon (1955) theory of limited rationality and Kahneman & Tversky (1979) prospect theory drawn from the fields of psychology and Loewenstein (2000) theory of emotions in economics and behavior (risks as feeling). In a psychological perspective, irrationality on the part of human decisions is a basic human trait (Shefrin & Statman, 1985). This is evidenced by extensive experimental evidence from cognitive and affective psychology on systematic heuristics and biases arising from people's beliefs and preferences (Shefrin, 2002 and Baker & Ricciardi, 2014).

Psychological factors are decision-making bias that is generated internally by individuals through two systems of human thought, namely the cognitive-affective dual process. It is claimed that this thinking system causes errors in individual decision making. Cognitive systems will produce errors which are collectively known as cognitive heuristics or the tendency to use rules of thumb in the decision-making process as a form of simplification

of very complex situations, De Bondt (1998). Furthermore, the bias in decision making produced by the affective system is sentiment or feelings, emotions, and moods (Finucane et al., 2000; Loewenstein, 2000; MacGregor et al., 2000; Lucey & Dowling, 2005; Aspara et al., 2008) Investment decisions with psychological factors lead to biased decisions. Wärneryd (2001), decision bias is an implication of the psychological factors that underlie investors in making investment decisions. Biased investment decisions can be seen from the presence of overreaction-underreaction and overconfidence-underconfidence. Investors will transact larger or very small amounts (maybe not even) on the shares of the company that is their target. Trade with more frequency or vice versa. Next is risk tolerant, based on MacGregor et al. (2000) and Lucey & Dowling (2005) including Baker & Ricciardi (2014) state that investors with psychological motivation assess the risk of target stocks as more acceptable (considered low) even though they are actually high and receive adequate or high expected returns even though they are actually low.

Recent event in 2019 that severely hit investor confidence related to ethics, behaviour and code of ethics (moral hazard) against the company's management for the financial statements of two large companies in Indonesia, namely PT. Tiga Pilar Sejahtera Food Tbk (AISA), Taro snack food producer, and state-owned airline company PT. Garuda Indonesia Tbk (GIAA). These two cases have undoubtedly triggered a decline in market players' confidence (especially investors) to the management, auditors of public accountants, boards of directors, and commissioners of companies regarding their behaviour, ethics, and ethical actions, including the accuracy of published reports. Maybe many investors do not own these two shares of this company, but there will be questions in the hearts and minds of market participants, can the claims of the company that I own now also be trusted?

This human being's uniqueness makes the psychological aspect of the central of study in invest-

ment decision making. Slovic and others show this (Finucane et al., 2000; MacGregor et al., 2000; Statman et al., 2008; Slovic et al., 2007; Rubaltelli et al., 2015). Behavioural researchers in finance are interested in the role psychology plays in investment decisions. This area still has much to be developed and there are still many gaps for debate, including differences in research results and opinions.

Research by Shefrin & Statman, (1985); Seasholes & Zhu (2010); Barber & Odean (2013), that companies originating from within the country benefit from domestic investors, among others, nationalism and patriotism as well as familiarity from investors (psychological factors), so that both of them influence investment decision making. In contrast to the research results of Christanti & Linda, 2011, it shows that indications of familiarity and nationalism are not important considerations in making investment decisions. Stocks with domestic (domestic) operating locations are few or not many of the number of research objects that consider them for investment decisions.

Researchers such as Rubaltelli et al. (2010); Rubaltelli et al. (2015); Statman (2004); Statman et al. (2008); Loewenstein (2000) states that the psychology of an investor's affection affects decision making in conditions that are highly uncertain and risky. Unlike the four researchers stated earlier, Mehra & Prescott (1985) states that the best investment decision making is by using information and data (accounting, macro and microeconomic conditions), affections or psychology from an investor should not be the basis for consideration of investment decision making. Feeling reactions are used to assess and identify and explain the puzzle of risk and return after investors have experienced gains and losses.

The importance of psychological factors (affective, feeling and emotional) in financial behaviour in influencing financial practitioners' decision-making cannot be ignored. Behavioural finance is a growing field, and academic research demonstrates

the critical role investor psychology plays in investment decisions.

2. Hypotheses Development

Attitude is one of the factors that influence behaviour, such as Statman et al. (2008) reported that their research subjects considered that stocks associated with a powerful positive influence had a paradox, high expected returns, and low risk. Aspara et al. (2008) and Aspara & Tikkanen (2011) even state that a person's positive attitude or impact on a company can lead to such motivation to invest in company shares beyond the incentive to maximize financial returns. Frieder & Subrahmanyam (2005); Barber & Odean (2008); Aspara & Tikkanen (2011) said that the brand is always associated with awareness and knowledge of the brand when deciding to invest. When an investor chooses to choose stocks for their investment, the first thing that comes to mind for them is the brand of the company's next product, and so on. In addition, Aspara & Tikkanen (2011) states that brand awareness is the buyer/investor's ability to identify both the company's introduction and recall and the brand name to decide on purchases based on the details of good categories.

Every individual has "a sense of self," which becomes a conscious reflection and can understand, assess, and define themselves or their identity about or contrast to the objects around them. Besides, such as Aspara et al. (2008), assessment suitability is not limited to tangible things but also applies to actual items such as services, images of a person, abstract ideas, and organizations. Thus, our concept is that an individual may have ASA for anything, including companies. Aspara et al. (2008) explain that the conceptualization of "affinity" as "identification and attachment" is embodied in the research tradition. It contains related terms and theories applied, especially to certain types of objects (other people, organizations, material objects) and formed through mental processes that are not necessarily supported in a theoretical manner.

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Affective-self affinity identification is seen, especially when identifying people, groups, communities, and organizations. They suppose that the things that underlie the formation of *ASA* are the process of self-affective categorization. Aspara & Tikkanen (2011) and Aspara et al. (2008) reveal several things that can form an individual *ASA* so that they make their choice on the company and not on other companies to invest, namely: 1) everything related to the company's business; 2) Communicating by involving individuals and groups; 3) Behaviour of employees and top managers.

Finally, given that *ASA* raises options for similar alternative behaviour, individual *ASA* for a company will also lead to its choice to invest in its stock over alternative investment opportunities with similar estimates of return and risk. A consistent suggestion relates to the use of individual mental shortcuts called "heuristics" (Finucane et al., 2000; Slovic et al., 2007; Aspara & Tikkanen, 2011), investors often use affective impressions of overall intimacy and this provides a mental shortcut in making investment decisions rather than having to carefully calculate the estimated return and risk. A person's *ASA* for a company will lead to an increased tendency to invest in its stock, even beyond the expected financial returns and risks - considering and selecting stock investing as a supportive and resourceful behaviour towards the company.

Aspara et al. (2008) states that *ASA* as self-attraction is also for investing from individual investors, the affective-self-affinity of an individual for a company can act as something that affects the extra motivational basis and is also the basis for making decisions to invest in shares of companies outside financial returns.

A guide that is considered very easy when making decisions is to consider familiar feelings towards target stocks, Aspara & Tikkanen (2011). Financial literature often describes individual investors as "noise" and unsophisticated traders subject to psychological bias Kaniel et al. (2012). It is this

familiar consideration when making investment decisions is discriminatory behavior. Such behavior indicates that investors have little or little knowledge about investing so that in the end, the decisions made with the familiarity result in biased decisions. The psychological bias of familiarity has received widespread attention from researchers in the past two decades, providing ample evidence of the impact of familiarity on individuals' investment decisions.

The investors who are under the pressure of conditions that are very uncertain and risky, so the preferences used by investors are feelings of trust and self-familiarity with their investment choices. Investors are willing to take high risks from these conditions based on familiarity preferences. The competence of investors' familiarity with domestic stocks is an option based on familiarity preferences for decisions to buy. Reports from Strong & Xu (2003) show that familiarity, or perceived competence, tends to increase the value of the distribution of expected returns and decrease their variance.

Some researchers, such as Seasholes & Zhu (2010), argue that individual investors with better information than other investors on the company's prospects, and ultimately the benefits of this information lead to superior investment performance. Barber & Odean (2013) and Zhu (2017) state that familiarity is another factor of motivation that influences investors to make decisions. They investigated and saw that investors tend only to buy shares in companies that investors or potential investors know well. In our hometown, we interact with friends, read local newspapers, and enjoy local companies' services. Such familiarity not only increases investors' awareness of local companies but often encourages them to invest in them.

Research on trust issues is mostly conducted in marketing research, such as Olsen (2012), including experts in marketing, stated that trust is the willingness to rely on other parties as a partner of the exchange who has confidence. In particular, he

continued, we think that if the trustor has complete knowledge of the partner's actions on the deal, can control the exchange partner, or has not transferred essential resources to the exchange partner. Trust is not required in this relationship. Van Esterik-Plasmeijer & van Raaij (2017), emphasized that the concept of trust is essential in relationships with customers. Trust facilitates transactions and does not need to worry about their interests.

Investment decisions require a strong feeling of trust in what they have chosen because relying solely on the decision maker's cognition is shackled at the level of concepts and rules. Before reaching the point of making choices, decision making usually weighs partiality feelings based on the attributes of trust. More recent psychological research shows that humans experience positive mental states to follow trustworthy behavior and punish irresponsible behavior. Humans view justice as an attribute of trustworthy behavior and behave cooperatively in most decision situations, Olsen (2012).

Affective-based trust is characterized by a feeling of security and the strength of a perceived relationship. Affective trust is the trust placed in a partner based on feelings generated by the level of care and attention the partner shows. So it is evident that the concept of affective-based trust is part of investors' psychology, which forms the basis of their motivation to decide on their investment target choices, Houjeir (2009). Affective trust is closely related to the perception that a partner's actions are intrinsically motivated. Trust can be captured as investor optimism that optimistic investors can be stimulated to participate in the stock market by increasing their expected return.

The mirror of nationalism can be seen in the compilation of Hendrastomo (2007) and Guibernau (2004) provide several characteristics of nationalism, namely: (1) There is a feeling of love for their homeland,; (2) There is a feeling of love for their nation; (3) Willing to sacrifice for the sake of the state and nation; (4) There is a feeling of pride in owning a

homeland and part of a nation; (5) The interests of the country are always placed in the highest position; (6) Always want the nation's integrity and the country's safety and state; and (7) Having a soul capable of providing renewal and never giving up.

When making investment decisions, the feeling of investor nationalism tends to take sides with what investors feel. This tendency to take sides based on a sense of nationalism is part of psychology, especially affection. Emotional feelings are to keep selecting target stocks in local stocks and portfolios, maintaining them, and feeling good about expressing feelings of nationalism by participating in and following programs and recommendations of the competent government authorities. Furthermore, investors are unwilling to feel the domination of the domestic capital market by foreign investors and control of companies by foreign corporations through share ownership. The feelings and emotions shown are the psychological studies of investor nationalism, which can motivate investment decision-making and as one of the sources or causes of bias in investment decision making.

Furthermore, Aspara & Tikkanen (2011), Rubaltelli et al. (2010) and Rubaltelli et al. (2015) state that other non-financial factors are considered or that encourage investors to decide on investment other than financial motivation, which is psychological motivation, especially when faced with a situation full of risks. Statman et al., 2008, even on investment is not solely a consideration of risk and return on investment portfolios (mean-variance-optimization), but there is an intuitive preference or psychological consideration in investment decisions.

The motivation for this individual's desire in this study is to make investment decisions. The five predictor variables influence the variable extra motivation to invest (*EMI*), then the *EMI* variable is expected to influence the decision of individual investors to invest as seen from the value of their investment. Psychological factors, not financial mo-

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tivation influence the extra motivation to invest in this study. Thus, it will mediate the influence of investor psychology on investment decisions.

The following hypotheses will be answered in this study:

$H_{1a, 2a, 3a, 4a, 5a}$: the psychology of individual investors (positive attitude, affective-self affinity, familiarity, trust, nationalism) has a positive effect on extra motivation to invest

$H_{1b, 2b, 3b, 4b, 5b}$: the psychology of individual investors (positive attitude, affective-self affinity, familiarity, trust, nationalism) has a positive effect on investment decisions

$H_{1c, 2c, 3c, 4c, 5c}$: the psychology of individual investors (positive attitude, affective-self affinity, familiarity, trust, nationalism) has a positive effect on investment decisions mediated by extra motivation to invest

H_6 : extra motivation to invest affects investment decisions

3. Method, Data, and Analysis

This study aims to examine investors' psychological influence on investment decisions (*INV*) mediated by the extra motivation to invest (*EMI*). Investment decisions use bias decision guidelines, according to Wärneryd (2001), decision bias is an implication of the psychological factors that underlie investors making investment decisions. Biased investment decisions can be seen from the presence of overreaction-underreaction and overconfidence-underconfidence. Investors will transact larger or very small amounts (maybe not even) on the shares of the company that is their target. Trade with more frequency or vice versa. Next is risk tolerant, based on MacGregor et al. (2000) and Lucey & Dowling (2005) including Baker & Ricciardi (2014) state that investors with psychological motivation assess the risk of target stocks as more acceptable (considered low) even though they are actually high and receive adequate or high expectations of return even (even though they are actually low).

We used a variance-based SEM structural model (SEM PLS) with path analysis. Structural model with PLS is a powerful analytical model because it is not based on many assumptions and is based on variance. Besides using PLS can avoid indeterminacy problem.

Measurement of the variables that have been defined above, such as positive attitudes, Affective-Self Affinity (*ASA*), Familiarity, Trust and Nationalism, and extra motivation to invest in this researcher uses interval scale. Number 1 of the respondent's answer shows the level of the respondent is very low, namely "not in accordance or not agreeing", while 7 shows the highest response or "very suitable or strongly agree". The investment decision variable is in the form of investment value consisting of investment value, perceived risk and return. Here the interval scale is designed to get the strength of the subject agreeing or disagreeing with the statement on a 7-point scale. Psychology of positive attitude investors uses 12 indicators or manifest, affective-self affinity uses 12 indicators, familiarity uses 10 indicators, trust uses 17 indicators and nationalism uses 10 indicators) and extra motivation to invest uses 8 indicators while investment decisions use 12 indicators. The general equation for the outer model and inner model can be written as Table 1.

Respondents in this study are individual investors who use psychological considerations as more motivation to make decisions. This study uses sampling with non random sampling. We use a quota sampling technique, the subject is selected and determined from the securities company where the subject invests. To obtain data on the psychological motivations of investors that underlie their influence on their real stock investment decisions, we made contact with individuals who had recently invested through an investment firm. To ensure that subjects will remember and be able to reflect on their psychological motivations for investing in stocks. We also consider the timing of investment decisions that occurred at most half a year ago.

Table 1. The outer model as the inner for confirmatory factor analysis (CFA), the inner model (model structure) and path analysis

Outer Model				
General equation for latent exogenous can be written as follows: $x = \Lambda x \xi + \epsilon x$				
PA	ASA	FAM	TRS	NAS
$PA_1 = \lambda_1 \xi_1 + \epsilon_1$	$ASA_1 = \lambda_1 \xi_2 + \epsilon_{13}$	$FAM_1 = \lambda_1 \xi_3 + \epsilon_{25}$	$TRS_1 = \lambda_1 \xi_4 + \epsilon_{35}$	$NAS_1 = \lambda_1 \xi_5 + \epsilon_{52}$
$PA_2 = \lambda_2 \xi_1 + \epsilon_2$	$ASA_2 = \lambda_2 \xi_2 + \epsilon_{24}$	$FAM_2 = \lambda_2 \xi_3 + \epsilon_{26}$	$TRS_2 = \lambda_2 \xi_4 + \epsilon_{36}$	$NAS_2 = \lambda_2 \xi_5 + \epsilon_{53}$
.....
$PA_{12} = \lambda_{12} \xi_1 + \epsilon_{12}$	$ASA_{12} = \lambda_{12} \xi_2 + \epsilon_{24}$	$FAM_{10} = \lambda_{10} \xi_3 + \epsilon_{34}$	$TRS_{17} = \lambda_{17} \xi_4 + \epsilon_{51}$	$NAS_{10} = \lambda_{17} \xi_5 + \epsilon_{61}$
$\Lambda x = \lambda_{ij}$ = Loading factor indicator latent exogenous $i = 1, 2, \dots, m$ and indicators $j = 1, 2, \dots, n$ ξ_i = Latent exogenous $i = 1, 2, \dots, m$ ϵ_{ij} = Residual indicator latent exogenous $i = 1, 2, \dots, m$ and indicators $j = 1, 2, \dots, n$				
General equation for Laten exogenous can be written as follows: $y = \Lambda y \eta + \epsilon y$				
Extra Motivation to Invest (EMI)		Investment Dicionsions (INV)		
$EMI_1 = \lambda_1 \eta_1 + \epsilon_{62}$		$INV_1 = \lambda_1 \eta_2 + \epsilon_{70}$		
$EMI_2 = \lambda_2 \eta_1 + \epsilon_{63}$		$INV_2 = \lambda_2 \eta_2 + \epsilon_{71}$		
.....			
$EMI_8 = \lambda_8 \eta_1 + \epsilon_{69}$		$INV_{12} = \lambda_8 \eta_2 + \epsilon_{81}$		
<p>PA = Positive for each respondent i ($i = 1, 2, \dots, n$), where the j indicator of the positive attitude variable ($j = 1, 2, \dots, m$) has a value of "1" means the respondent i have a very low positive attitude towards investment choices, and the indicator j is worth "7" which means that the respondent i has a very high positive attitude towards his investment choice.</p> <p>ASA = Affective-Self Affinity ASA = Affective-Self Affinity for each respondent i, if the indicator $j = 1$ then the ASA of respondent i is not appropriate, and the indicator $j = 7$ then the ASA of respondent i is very high on his investment choice.</p> <p>FAM = Familiarity Familiarity of each respondent i, if indicator $j = 1$ then respondent i does not feel familiar, and if indicator $j = 7$ then respondent i is very familiar with investment choices.</p> <p>TRS = Trust Trust for each respondent i, if indicator $j = 1$ then respondent i trust is very low, and indicator $j = 7$ then respondent i trust is very high on his investment choice</p> <p>NAS = Nationalism of respondent i, if indicator $j = 1$ then the nationalism of respondent i is very low, and indicator $j = 7$ then trust respondent i is very high on his investment choice</p> <p>EMI = Extra motivation to invest in each respondent i, if indicator $j = 1$ then EMI respondent i is very low motivation t, and if the indicator $j = 7$ then respondent i has extra motivation very high to decide to invest</p> <p>INV = Stock investment decision, consisting of legal investment value in both the monetary value and the number of shares and the frequency of transactions. Investment decisions are also associated with risk and return.</p>				
Inner Model (Model Structure)				
General equation for the Inner Model can be written as follows: $\eta = \beta \eta + \Gamma \xi + \zeta$				
$\eta_1 = \gamma_{11} \xi_1 + \gamma_{21} \xi_2 + \gamma_{31} \xi_3 + \gamma_{41} \xi_4 + \gamma_{51} \xi_5 + \zeta_1 \dots\dots\dots$	Hypotheses: 1a, 2a, 3a, 4a, and 5a			
$\eta_2 = \gamma_{12} \xi_1 + \gamma_{22} \xi_2 + \gamma_{32} \xi_3 + \gamma_{42} \xi_4 + \gamma_{52} \xi_5 + \zeta_2 \dots\dots\dots$	Hypotheses: 1b, 2b, 3b, 4b, and 5b			
$\eta_2 = \beta_{13} \eta_1 + \gamma_{13} \xi_1 + \gamma_{23} \xi_2 + \gamma_{33} \xi_3 + \gamma_{43} \xi_4 + \gamma_{53} \xi_5 \dots\dots\dots$	Hypotheses: 1c, 2c, 3c, 4c, 5c and 6			
η = (<i>eta</i>), endogenous latent variable ξ = (<i>ksi</i>), exogenous latent variable ζ = (<i>zeta</i>), residual (error) on the structural equation γ = (<i>gamma</i>), path coefficient matrix for the relationship of endogenous and exogenous variables β = (<i>beta</i>), path coefficient matrix for the relationship between endogenous latent variables				

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Our initial sampling target was 400, considering that not all investors use psychological motivation in making decisions investment, so we anticipate adding 50 percent of the sampling target. The response rate is quite good, namely 75.5 percent, which is 600 questionnaires distributed to individual investors and 453 questionnaires returned. Of these that cannot be used (due to financial motivation) and incomplete answers to the questionnaire are 49 questionnaires, so that 404 questionnaires can be used in this study.

1. Results

Model fit and quality indices

Following the PLS results with WardPLS 6.0, we started to use full indicators (81 indicators) that have met the fit and quality indices model, but the results of the loading factor of the indicators are still low. The results of checking the loading factor of each latent variable indicator, there are 11 indicators that have a loading factor below 0.50. The acceptable loading factor is at least 0.50 ($LF > 0.50$). Indicators with a loading factor less than 0.50 are eliminated from the model. After eliminating the indicators, the process is repeated with WarpPLS until there are no more loading factor values below 0.50 and finally up to 70 indicators that have a

loading factor above 0.50, and after that we run again to make sure there are no more loading factor indicators below 0.50. After the loading factor meets the requirements, then assess the fit of this research model. The next results of the model fit and quality indices with 70 latent indicators are as in Table 2.

From Table 2, the PLS results have shown that the research model has a good fit, indicated by the p-value for the average path coefficient (APC), average R-square (ARS) and average adjusted R-square (AARS) less than 0.05. With an $APC = 1.78$, $ARS = 0.650$ and $AARS = 0.645$. Likewise, the value for the average full collinearity VIF (AFVIF) = 2.550 is smaller than 3.3, this means that there is no multicollinearity problem in the model. Tenenhaus (GoF) which produced an index of 0.594, this index is to ensure the inner strength of the model, this study also evaluates the Goodness of Fit (GoF) index. PLS is variant based SEM, so PLS does not have a formal GoF. The GoF calculation results in a score of 0.594, because the GoF index of the model tested in this study exceeds 0.36, the model proposed in this study is a robust model. Nonlinear bivariate causality direction ratio (NLBCDR) produce the same value of 1, this means that there is no causality problem in the model.

Table 2. Model structure: PLS model fit and quality indices

Model Fit and Quality Indices	Criterion of Fit	Results	
Average path coefficient (APC)	$p < 0,05$	0.178; $p < 0.001$	good
Average R-square (ARS) (Fit $< 0,05$)	$p < 0,05$	0.650; $p < 0.001$	good
Average adjusted R-square (AARS)	$p < 0,05$	0.645; $p < 0.001$	good
Average block VIF (AVIF)	Ideally $< 3,3$	1.864	good
Average full collinearity VIF (AFVIF)	Ideally $< 3,3$	2.550	good
Tanenhaus (GoF)	$S \geq 0,1$; $M \geq 0,25$; $L \geq 0,36$	0.594	large
Sympson's paradox ratio (SPR)	acceptable $> 0,7$	1.000	Ideal
R-square contribution ratio (RSCR)	acceptable $> 0,9$	1.000	Ideal
Statistical suppression ratio (SSR)	acceptable $> 0,7$	1.000	Ideal
Nonlinear bevariate causality direction ratio (NBCDR)	acceptable $> 0,7$	1.000	Ideal

Validity and reliability

The outer model or what is called the measurement model is related to testing the validity and relevance of the research instrument. There are 2 validity to test the questionnaire, namely; first, the convergent validity for each indicator is seen from the correlation between the indicator score and the latent variable score, which is called the loading factor. Loading factor is considered valid if the indicator has a value greater than 0.50. The results of the convergent validity of this study were considered valid against 70 of the 81 indicators. Second, discriminant validity the results of discriminant validity in this study can be seen in Table 3 on row Avg. var.extrac. From Table 4 all AVE values are greater than 0.50 so that it can be said that all latent variables of the study have good discriminant validity.

Furthermore, for the reliability of the questionnaire using 2 sizes as well, namely; first, composite reliability, based on the results in Table 3, all latent variables have a composite reliability value > 0.70, so it can be said that all the questionnaires from the latent variables of this study are good. Second, internal consistency, the results in Table 3 show that the cronbach's alpha values are all greater than 0.60, so that all latent variables, both endogenous and exogenous, have good internal consistency reliability.

Table 3 of the results of the latent output variable shows the R-square of the endogenous *EMI*

0.495, which means that the exogenous variable of investor psychology affects 49.5 percent of extra motivation to invest, the remaining 50.1 percent is influenced by other factors. Whereas for endogenous investment decisions after *EMI* entered as control variables, the magnitude of the influence of exogenous variables of investor psychology on investment decisions was 80.2 percent and the remaining 19.1 percent was influenced by other factors outside of the variables studied. Finally, the Q-square value is greater than 0, meaning that the prediction validity of the latent variables from the structural model of this study is very good.

Hypotheses testing

The first objective of this study is to prove the psychological influence of individual investors on extra motivation to invest. This is reflected in hypotheses *1a, 2a, 3a, 4a* and *5a*. From Table 5, the results of the confirmation factor analysis, hypothesis *1a, 3a, 4a* and *5a* are supported, while hypothesis *2a* is not supported. So, the motivation of investors to make investment decisions is based on these 4 psychological factors. The better and more positive the psychological condition of the investors, the higher the motivation of investors to use psychological considerations to make investment decisions.

The second research objective is to evaluate the influence of investor psychology on investment

Table 3. Output latent variable coefficients

	<i>PA</i>	<i>ASA</i>	<i>FAM</i>	<i>TRS</i>	<i>NAS</i>	<i>EMI</i>	<i>INV</i>
R-square						0.495	0.806
Adjust R-square						0.488	0.802
Composite reliab.	0.947	0.912	0.923	0.948	0.930	0.864	0.870
Cronbach's alpha	0.939	0.892	0.906	0.940	0.808	0.808	0.834
Avg. var.extrac	0.624	0.539	0.575	0.560	0.519	0.519	0.505
Full collin. VIF	2.093	1.582	1.724	2.384	3.773	3.773	4.554
Q-square						0.502	0.790

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decisions. Based on the results of hypothesis testing 1a, 3a, 4a and 5a are supported, and rejected hypothesis 2b. Furthermore, the third research objective is related to the mediating variable, namely testing the extra motivation to invest from investors which can be a mediator of the influence of their psychology on investment decisions. In order to find out whether extra motivation to invest mediates between exogenous investor psychology and investment decisions, a single mediation test is first performed.

Sobel's test Table 4 shows that only affective-self affinity has no effect on investment decisions mediated by extra motivation to invest, which is indicated by a p-value > 0.05 or not significant. Thus, hypothesis 1c, 3c, 4c and 5c is accepted, while hy-

pothesis 2c is rejected. The higher the positive attitude, familiarity, trust and nationalism of individual investors towards a company's stock, the stronger or greater the tendency of investors to choose these stocks as investment decisions mediated by extra motivation to invest.

The following shows the recapitulation of the results of the path coefficients with PLS and the acceptance and rejection of the hypothesis.

From the results of this hypothesis, it is found that investors who involve psychology when making decisions can support financial, psychological motivation. Other than financial motivation has also been shown to mediate the influence of psychological factors on investment decisions. The results of

Table 4. Test the effect of mediation with the Sobel test

Variable	a	b	sa	sb	Sab	a.b	Z	p-value
PA	0.197	0.637	0.052	0.049	0.0345	0.1255	3.63716	<0.001
ASA	0.009	0.637	0.053	0.049	0.0338	0.0057	0.16980	0.433
FAM	0.108	0.637	0.053	0.049	0.0342	0.0688	2.01315	0.044
TRS	0.247	0.637	0.052	0.049	0.0353	0.1573	4.46151	<0.001
NAS	0.315	0.637	0.051	0.049	0.0360	0.2007	5.57882	<0.001

Table 5. Hypotheses testing

Hypotheses	Path	Coefficients Path	p-value	Information
H _{1a}	PA -> EMI	0.197	<0.001	accepted
H _{2a}	ASA -> EMI	0.009	0.430	rejected
H _{3a}	FAM -> EMI	0.108	0.021	accepted
H _{4a}	TRS -> EMI	0.247	<0.001	accepted
H _{5a}	NAS -> EMI	0.315	<0.001	accepted
H _{1b}	PA -> INV	0.219	<0.001	accepted
H _{2b}	ASA -> INV	-0.019	0.360	rejected
H _{3b}	FAM -> INV	0.166	<0.001	accepted
H _{4b}	TRS -> INV	0.224	<0.001	accepted
H _{5b}	NAS -> INV	0.363	<0.001	accepted
H _{1c}	PA -> EMI -> INV		<0.001	accepted
H _{2c}	ASA -> EMI -> INV		0.433	rejected
H _{3c}	FAM -> EMI -> INV		0.044	accepted
H _{4c}	TRS -> EMI -> INV		<0.001	accepted
H _{5c}	NAS -> EMI -> INV		<0.001	accepted
H ₆	EMI -> INV		<0.001	accepted

this study are following the predictions of the hypothesis that was built. The psychology variable turned out to be investors with investment decisions and significant. Investment decisions show the same pattern as their psychology. It is shown in the decision pattern. Investors tend to use more considerable funds to develop a higher transaction frequency by selecting more familiar target stocks. These psychological factors also assess the risk borne low and the level of high expectations (bias).

2. Discussion

As a model development from Aspara & Tikkanen (2011), the novelty of this research on the mediation model with extra-motivated investors can be proven, as well as the addition of psychological factors, the effect of trust and nationalism, which is proven to strengthen the investment decision making model.

The individual psychology towards something inevitably has an impact on the consistency of their behavior, Aspara & Tikkanen (2011), so that investor's psychology are closely related to their behavior. The results of this study support this opinion, when researchers examine the effect of investors psychology on investment decisions mediated by extra motivation to invest, investors psychology tend to result in investors to be aggressive in transactions or to increase the number of shares they own, that investor's psychology reflects the individual as stated in the decision to buy shares. The psychology of investors makes them to invest their funds in large enough amounts, transact more aggressively, take greater risk but with more tolerance. The average score of the positive attitude indicators of investors has a high enough score, this will ensure they make decisions in the same direction. Such characteristics indicate they are optimistic investors.

The results of this study are same from those of MacGregor et al. (2000), about understanding the application of investor heuristic effects for invest-

ment decision making. The results of their research show that investors make consistent decisions using heuristic affect -emotion or feeling predictions, the evaluation of company equity is influenced by the congruence assessment of the company's image by investors whether it is appropriate or not, like it or not, trusted or not, familiar or not.

Optimism is a characteristic of investors who have positive behaviour and always have a strong belief in what they have decided. Optimistic investors always think that in the future they will have higher yields than the market average, Aspara & Tikkanen (2011). This study shows that a more positive belief affects the decision-making process of investors. Investors tend to act aggressively based on the expected financial return on the target company's shares and minimize regrets. This is in line with Baker & Ricciardi (2014), optimism is an expression of feelings or emotions, this is the same as a reflection of motivation so that it tends to influence biased investment decisions, namely overreaction, overconfidence and risk tolerance.

Investors with confidence in the company's products are better than competitors, trust in the communication built by the company and its openness, are confident in the company's social concern, are able to motivate investors to tend to decide to buy company shares in greater numbers and more often choose the company's shares for each transaction with a tendency to return obtained as expected. These results are consistent with and support the research of Aspara & Tikkanen (2011), that the investment decision model with an investor psychology approach can affect the motivation of investors to set stock investment targets by not only using risk and return considerations. Investment decisions that use investor psychology using the theory of planned behavior approach also prove that investor behavior is influenced by bias behavior (overconfidence, excessive optimism, psychology of risk and herd behavior) mediated by intention to

investment as their motivation to make investment decisions, Cuong & Jian, (2014).

Finucane et al. (2000) stated, if something includes people's motivation towards something, and people tend to dislike it, then they will judge it in the opposite way - high risk with low profit, and vice versa if they really like it, then assess low risk with high profit. This is the same as from the results of this study which lead to a negative relationship between risk and return. Many people or investors make the mistake of believing that a company with a good corporate image in the past is representative of a company with a high performance in the future. This finding is the same as the results of this study which support the influence of investor psychology, but contradicts from the point of view of the efficient market (standard finance), because it will occur that stocks with low risk (due to a good image) are expected to have future returns high, on the other hand, companies with high risks are estimated to have low future returns, which is the opposite of the positive relationship between expected risk and return.

Finally proved that the tendency of investors who use their psychology to be optimistic or pessimistic (a reflection of feelings and emotions) as their motivation or motivation has implications for the decisions made, namely bias. The investment decisions they make tend to give the impression of overreaction or underreaction, overconfidence or low confidence and risk tolerance. In stark contrast to the results of this study, investors show biased behaviour towards overreaction and overconfidence by using more of the funds they have to buy target stocks, transact more frequently and are willing to allocate more of their funds to familiar and domestic stocks even though in fact this does not guarantee efficiency. They also seem to have more risk tolerance and overconfidence by perceiving the stocks they buy are always low and believing that the expected return to be obtained is high.

3. Conclusion

Behavioral finance postulates that as humans, retail investors do some irrational element in their decision making. This human irrationality is psychologically inherent in normal human nature. This study finds and proves that psychological factors (positive attitude, affective-self affinity, familiarity, trust and nationalism) provide extra encouragement to investors to make investment decisions on their target stocks. This study also proves that investors' decision making shows biased behavior, excessive action, and risk tolerance. These results also prove that in every capital market, including Indonesia, conditions will always occur, investors tend to make biased decisions. That is the decision of investors, it is impossible to force them to want to eliminate psychological aspects of consideration when and to make investment decisions in accordance with ideal and rational assumptions. The implication of this research leads to capital market authorities and capital market practitioners, it turns out that market players (individual investors) are proven to be irrational, including institutional investors, which in turn will make the market inefficient (over or under value). Capital market authorities and securities companies should continue to improve financial literacy for individual investors, so that investment decisions are made better and more rational, which reduces the tendency of bias. Biased tendency can make investors deterred, afraid and can even stop investing.

Human behaviour is as complex as many claims, to understand investor behaviour, the best approach is to focus on individual decision making through detailed interviews, observations, and controlled experiments. We observe that research in this perspective is lacking in finance. We also observe that in future research there is a need to take into account and consider individual differences from the point of view of demographic, cultural and institutional backgrounds in order to recognize the

heterogeneity of human behaviour. One more piece of advice we especially to individual investors to learn from the experiences of successful investment managers. In essence, to become a successful investor, at least use eight general rules, namely patience

and discipline, do it yourself, develop your own way of investing, the ability to access information and data, invest or speculate, buy non-stock companies, diversify based on portfolios, and hone analytical skills.

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