Understanding herding behavior among Indonesian stock market investors

Brian Trisno¹, Vidayana¹;

¹Bina Nusantara University, Binus Business School, Jakarta, Indonesia

Abstract: This paper examined the factors that affect investor herd behavior. Herd behavior bias is a well-known phenomenon in financial markets in which individuals blindly follow the investing decisions of others without understanding the fundamental principles of investment. While extensive research has explored herd behavior in financial markets, there remains a significant research gap in understanding herding behavior at the level of individual investors. Previous studies have primarily focused on herding behavior within market contexts, neglecting the examination of specific factors that influence herding behavior among individual investors. Using a sample of 217 Indonesian investors this study investigates the factors that influence herding behavior. The findings showed that stock influencer credibility had a significant positive impact on herd behavior bias, suggesting that investors with high trust in stock influencers were likely to follow the herd. Financial literacy also had a significant negative impact on herd behavior bias, indicating that investors with higher financial knowledge are less likely to herd. However, financial literacy was found to have a significance towards herding behavior when mediated through risk perception. Lastly, risk perception had a significant positive impact on herd behavior bias, indicating that investors with higher risk perception are more likely to follow the herd. This study contributes to the existing literature by enhancing our understanding of herd behavior dynamics among investors, specifically at the individual level. By exploring the factors that influence herding behavior, it provides valuable insights into the mechanisms that drive this bias. The findings highlight the importance of targeted financial education programs and regulatory measures to address herding behavior bias among Indonesian investors, focusing on enhancing financial literacy and reducing risk perception.

1 Introduction

Rather than relying solely on newspapers and traditional forms of analysis, people now have access to a variety of social media platforms that can help them make more informed investment decisions. Social media has altered the way people interact, receive information, as well as making investment decisions. It has also been used to encourage one another to trade and exchange information about trading decisions [1]. The current group of investors is immersed in the social realm throughout all aspects of their existence.

A study [2] showed that 40% of professional financial advisors have personal social media profiles. They build social media platforms as thought leaders and influencers. This remains to be the case as individuals are exposed to the likes of financial “influencers” who at most times “disseminate” a large amount of financial market information and thus become important sources of information for the individual investor. Thus, the possibility of individual investors engaging in online trading rises as a result of the increased reliance on social network connections as a result of social media usage.

On the other hand, the constant information provided by social media users exacerbates fear of missing out and motivates people to make an investment decision to “lessen the worry and apprehension that comes from the possibility of missing out on the benefits social contacts are enjoying”. Investors start to imitate others' activities without fully comprehending the underlying principles of the investment [2]. According to [2], social media may have a big impact on people's investment behavior since they are influenced by what they read and see on these platforms. Other social media users may also copy one another's trading choices, which will spread swiftly in social networks and aggravate herding habits [4]. The phrase "herding" has become a pejorative term in the financial dictionary as a result of the recent financial crisis.

The information disseminated by "social (trading) influencers" is likely to be prominent due to sensationalism and strong viewpoints that can swiftly amplify favorable or unfavorable views. The dissemination of purposeful false information, or fake news, that draws attention due to its allure as sensationalism was sparked by social trading platforms. As it is so easy to comprehend, faulty technical analysis that favors irrational judgments and swarming tendencies is frequently used in the information published by online trading publications. Meanwhile, rather than relying on their research, traders follow the

* Corresponding author: vidayana.vidayana@binus.ac.id
herd and make judgments based on what others are doing. This might result in the bandwagon effect, when traders follow a trend without fully comprehending what is behind it, ultimately exacerbating herding behaviors.

While the influence of social media on consumer behavior is widely understood, its impact on online trading behavior is less well-known. There is still a shortage of literature analysis and research that defines the characteristics of individual investors leading to exacerbate herding behaviors, specifically influenced by social media platforms [5]. Accordingly, the research question that needs to be answered is what factors influence individual investors' behavioral bias in herding toward the Indonesian financial market?

This paper aims to identify the relationship between stock influencers' credibility and individual investors' financial literacy on herding behavior mediated by risk perception. As a result, the main purpose or objective of this research is to investigate factors that affect the "herd behavior bias" of Indonesian individual investors in the financial market. This study also has the desire to provide relevant and essential information that allows existing and new entrants of individual investors, in comprehending what factors influence the existence of behavioral bias by Indonesian individual investors in the financial market. The research results are intended to assist future researchers to conduct additional studies on herd behavior more comprehensively. This study gives researchers an in-depth significant investigation and a forward-looking perspective on the factors influencing herd behavior bias individual investors exhibit during their decisions in the Indonesian financial market.

2 Literature review

2.1 Herding behavior in financial markets

The application of behavioral science in financial terms is a fairly recent phenomenon in the study of financial markets. Unlike normal economic discussions and theories, this instance demonstrates how conduct and knowledge may impact economic attributes. Such financial and investment decisions are preceded by perceptions and projections, and they illustrate the role of psychological considerations in financial markets. [6] proposes the investigation of the economic decision-making process to be the focus of behavioral finance, whereas advocates of behavioral economics point to the frequent disruptions of the principles of rational economic decision-making. Aside from the disruption of this concept, another fundamental issue arises the problem of systematically recurrent irrationality, and thus behavioral biases occur.

In terms of obtaining substantial influence in the financial markets, herding behavior is also the most prominent, influential, and biased viewpoint. In financial markets, herd behavior occurs when investors are swayed by other investors when their knowledge is ambiguous, and as a result, they do not mimic or examine the judgments of other investors and defined as “a phenomenon in which a market participant follows a collective action or action from the market, regardless of the research that he or she has done, even if the investor considers the market's collective action to be incorrect or disagrees with it. Herd behavior is a phenomenon that occurs in which investors disregard individual convictions in favor of group action while making investment decisions [7]. [8] mentioned that this is the case where investors participate in regulated activity even though the group's choice may be incorrect but carries on taking a herding resolve due to a majority session.

2.2 Factors affecting herding behavior

2.2.1 The Effect of Stock Influencer Credibility on Herding

Influencers are individuals who regularly utilize their social media accounts, frequently participate in a certain topic, and constantly provide fresh information, consumers "seeking information about products or services frequently see influencers as credible information sources". The role of an influencer in this regard is its credibility which ascertic impact studies reveal that customers can favorably perceive brands and products they believe to be credible [9]. “Trustworthiness and expertise are two components of a person's credibility” [10]. The term of being trustworthy refers to the recipient's perception of authenticity, integrity, and trust, whereas the term expertise refers to the speaker's knowledge, competence, or experience [11]. In terms of influencers, research in the broader field of “electronic word of mouth” ("eWOM") demonstrates that the success of "eWOM" in connection to consumer items and purchases is dependent on the trustworthiness of the "influencer" [12; 13].

According to the evidence from past research, there is an indication of the relationship between the credibility of stock influencers and the tendency of investors to engage in herding behavior [14; 15]. The previous studies also indicate that in Indonesia's capital market, there is a phenomenon where popular influencers can lead to behavioral bias in the stock market. The stock price can experience significant changes after these stock influencers share information or recommend specific stocks [15]. Additionally, [15] concludes that the status of the influencer would determine the magnitude of the herding. An influencer with a higher level of credibility would create a significant herding behavior among stock investors.

Meanwhile, [14] discovered that investors in developed capital markets are more likely to exhibit herding behavior. While the investor in developing countries makes transaction decisions based on historical price. However, during a downturn economic situation, emerging stock market investors tend to become irrational and most of them make the decision by mimicking other investors. [14] claim that prominent investors become a reference for many retail investors during that situation. This irrational transaction happens because the investors are worried and have lost hope. [16] study has also successfully found factors that affect herd behavior in the stock market. According to [16]
monetary policies such as interest rate, foreign investment, and exchange rate, have a significant contribution toward herding in the stock market. [16] argued that information or opinion spread out from an acknowledged leader in the field of monetary policy would trigger a speculative transaction in the stock market. This phenomenon can be seen more clearly in developing countries rather than in developed countries. However, [16] study is only focused on the effect of monetary policies on herding behavior not the effect of information coming from persons with a good reputation.

Another indication that the influencers may affect investor herd behavior is shown by the study conducted by [17] and [18]. They suggest that influencer credibility is crucial in influencing purchase behavior as they are renowned to publish user-oriented product evaluations, suggestions, and personal experiences on their social media platforms. Thus, so far, studies from the past still provide unclear and mixed information, therefore, we propose a hypothesis:

H1. Stock influencer credibility has a positive relationship toward investor herding behavior.

2.2.2 The Effect of Risk Perception on Herding Behavior

[19] stated that risk perception is a subjective assessment of a specified type of accident and the type of consequences individuals experience, based on its characteristics and intensity. Perception of the risks includes the assessment of the consequences as well as the probability.

Perception is a psychological process in which the senses, such as seeing, hearing, and feeling, are impacted by information and subsequently influence judgment. This enables a person who receives information to construct an image of the information's outcomes [20]. [21] mention that "risk perception is a method of evaluating risks that deviate from estimations, thoughts, or realities. Cognitive bias encompasses risk perception". The greater the bias in human behavior, the lower the sense of risk. As they lack specific knowledge, people frequently mistake the risks associated with a certain activity. People can make incorrect judgments or conclusions if they lack appropriate knowledge or are misinformed.

According to [22], herding behavior is one of the psychological aspects that can influence the decision-making process. Specifically, [23] argued that investor risk tolerance which is also one of the investor behavior component, positively affect investor intention to invest in the stock market. It is known that risk-taker people typically have a higher intention to invest in the stock market than risk-averse people. This is because risk-taker persons generally have more confidence than risk resistance persons. Thus, investor risk perception could become the early indicator of whether an investor would like to invest in a particular market or not [14]. Additionally, according to [14], investor ‘risk perception determines their sentiment toward the market. For investors with negative market sentiment, their trading strategy would rely on other investors' opinions because their trading decisions are driven by emotion.

[24] believed that several attitude elements, such as choice conformity, quick decision, mood, decision accuracy, and overconfidence, have a significant contribution to herding behavior. [14] point out that there is an association between investor risk perception and herding behavior since herding behavior can be seen as an investor's effort to deal with the risk. Moreover, according to [14], herding behavior can be triggered by pessimistic investors with negative sentiments toward the market who tried to prevent financial losses. This investor usually will make investment decisions without thinking rationally. This idea is also supported by [25] who found that risk may have a positive direct effect on herding behavior. This phenomenon could be observed during the COVID-19 pandemic when consumer risk perception toward public health conditions affects herding behavior on medical equipment. Therefore, based on the shreds of evidence, we propose:

H2. Investor risk perception is positively related to investor herding behavior.

2.2.3 The Effect of Financial Literacy on Investor Herding Behavior

[26] defines the basic theory of Financial Literacy as the ability to be competent as well as the possession of a set of skills and information that enables an individual to make informed and effective financial decisions. This is due to the fact that financial literacy cannot be tested directly, a trustee must be used. Literacy is achieved via the active integration of knowledge and is a hands-on experience. As individuals get more literate, they become more economically sophisticated, and it is hypothesized that this may also imply that a person is more competent. [27] made a similar remark on Financial Literacy as "the capability to assess new and sophisticated financial instruments and make informed decisions about which instruments to employ and how much to use that would be in their best long-run interests."

In addition to literature, financial literacy is defined by [28] as the capability to read, solve, manage, and communicate about personal financial circumstances that influence material well-being. “This includes the ability to distinguish between economic choices, finances, and economic situations, as well as the ability to plan for the future and respond appropriately to life events that affect daily economic decisions as well as events in terms of financial inclusion [29]. [30] noticed a similar issue when they defined financial literacy as an individual’s capacity to make accurate assessments and effective decisions concerning the usage and management of money, specifically those in vulnerable populations.

The result from previous studies shows that there is an agreement among scholars regarding the effect of financial literacy on herding behavior. [31] found that investors’ level of financial literacy has an adverse effect on herding behavior. They argued that investors...
with high financial literacy or having more experience tend to be more confident than the investor with low financial literacy. Similarly, according to [32], there is evidence that financial literacy has a direct impact on consumer confidence. Investors with high financial literacy tend to be more confident to make investment decisions. Moreover, [32], also found that high financial literate investors can perform much better than low financial literate investors because they can make a good financial analysis. They also point out that the degree of investor herding behavior might be influenced by the level of investor financial literacy.

A study conducted by [15] revealed an interesting finding. 132 individual investors took part in the study, and the outcome demonstrated that investors' herding tendency was significantly influenced by an influencer's credibility. However, there was little solid proof that this relationship is moderated by financial literacy. Furthermore, they claimed that there was no discernible difference between millennial and non-millennial investors in herding behavior. A similar result has been found by [33]. The findings for the direct influence of financial literacy on herding behavior were insignificant. [33] argue that Shariah literacy may encourage logical thinking and independent decision-making behavior among investors as opposed to encouraging them to follow the crowd.

Additionally, [34] study found that financial literacy significantly moderated the relationship between herding bias and investment decisions among female investors, however, the study failed to prove that the same thing happened among male investors. [34] concluded that female investors with a high level of financial ability tend to use brokers' and friends' advice as the main consideration to make an investment decision.

According to [34], there is a negative relationship between financial literacy and investor behavior bias. Investors with a higher level of financial literacy have a lower tendency to have behavioral bias and are very less likely to engage in impulsive transactions. This finding is supported by [31] who found that financial literacy has a negative effect on investor herding behavior, but it has a positive contribution to mentality bias.

It is clear that some previous studies have shown evidence that investor financial literacy influences investment behavior, however, there is no evidence that financial literacy has a direct impact on herding behavior. Therefore, in this study, we proposed a hypothesis:

**H3. Financial literacy negatively affects investor herding behavior.**

### 2.2.4 The Effect of Stock Influencer Credibility on Investor Risk Perception

A study conducted by [35] found that information screening and information asymmetry have an important contribution to risk perception. The investor's perceived risk will determine the type of information sources that the investors will use in the investment decision-making process. Information from trustworthy resources can reduce investor risk perception [35].

Meanwhile, from consumer behavior research, there are a lot of pieces of evidence that show social media influencers have a strong impact on consumer behavior [37; 38; 15]. According to those studies, a social media influencer's attractiveness, reliability, and knowledge have a beneficial impact on the intention to make purchases. Perhaps because, during the decision-making process, customers build an overall appraisal of an influencer's trustworthiness to assess the value of the product recommendation. Thus, we also proposed a hypothesis:

**H4. Stock influencer credibility has a positive relationship with investor risk perception.**

#### 2.2.5 The Effect of Financial Literacy on Investor Risk Perception

According to [38] investor knowledge of investment instruments and market reduces people's reliance on information while at the same time increasing their belief in their capacity to make acceptable judgments. [39] discovered that financial literacy is related to better financial planning. The persons who are risk-takers are more likely to have a variety of investments. [39] also discovered that financial literacy which is known as the fundamental knowledge of financial investments, has a strong positive link with investment performance, with risk tolerance playing a role in mediating that relationship.

Understanding the significance of market uncertainty and being financially literate enables investors to substantiate their portfolio decisions. [39] believed that improving investor financial literacy in turn makes them more risk tolerant. So that the investor would be willing to invest in high-risk instruments. By the same token [40] found that the investor's capability in reading and understanding a company’s transaction data can encourage them to hold high-risk investments. Another past study that found a similar result is carried out by [41]. The objective of their study was to investigate the impact of investor financial literacy on risk tolerance. [41] also investigate investor demographic conditions such as age, gender, and education level. This study revealed that both financial literacy and investor demographic factors were affecting investor risk attitudes. According to [41], investors with high levels of financial literacy, education, and income, in general, do not hesitate to put their money in a medium to high level of risk instrument with the objective to get a higher return. Nevertheless, investor age and the child count have a negative impact on investors' risk tolerance. As a result, financial literacy level is theoretically expected to alter individuals' risk tolerance since increases in financial literacy level allow individuals to make more mindful judgments regarding financial investments [41].

The study, which used data from 538 investors, discovered evidence of the effect of financial literacy on individual investors' risk tolerance [42]. It was found that financial literacy positively affects risk tolerance. Therefore [42] suggested that investment firms and the
wealth management industry need to educate their clients to improve client’s knowledge of financial literacy. All things considered; we proposed a hypothesis:

**H5. Financial literacy has a positive relationship with investors’ risk perception.**

Based on the objective of the present study, Figure 1 signifies the theoretical framework of the study. The extended theoretical framework is based on the reviewed literature. In the present study, herding behavior in Financial Markets is used as the dependent variable. External and internal factors of an individual investor; notably Influencer Credibility and Financial Literacy act as the independent variables along with risk perception which is recognized as both an independent and mediating variable in the framework.

Fig. 1. Theoretical Framework

### 3 Research Methodology

The research approach incorporated a quantitative research method. The numerical data was obtained quantitatively and analyzed statistically. An online questionnaire was used to gather data for this study, which will then be distributed to the respondents. The information gathered from this online questionnaire was then examined quantitatively.

The design is consistent with the research's objective, which is to investigate the role of financial literacy, influencer credibility, and risk perception on the herding behavior bias, particularly those in the financial market sector. Additionally, this research was directed at individuals in the country of Indonesia who have an experience as individual investors in the financial market.

The primary data in this study was collected using online surveys generated with Google Forms. This online questionnaire was delivered to a minimum of 175 Indonesian residents who have experience as an individual investor in the financial market and are at least 18 years old. The author employed numerous social media and messaging sites, including WhatsApp, Instagram, Line, and LinkedIn to reach out to the intended responders. Invitation of participation distributed among the author's connections as well as utilizing the author’s social media presence. The questionnaire was further distributed with the aid of his colleagues in sharing the questionnaire on their respective social media platforms.

The questionnaire was broken into several sections. The first section is a cover letter in which the author describes the research's background and purpose. The background section gave a summary of the research subject so that respondents can better comprehend the context of this study. The cover letter assists respondents in ensuring that the information they contribute is only utilized for this survey. The first component also included question filtering, and the objective of this section is to eliminate respondents who do not qualify for this survey. Respondents' investment experience in the Indonesian financial market is influenced by factors such as "age, past investment, etc.”.

The second section of the questionnaire focused on gathering information about the respondents’ profiles and included basic demographic statistics such as gender, occupation, average monthly income, and financial market participation. Subsequently, the questionnaire proceeded to the following sections where respondents were asked to provide ratings on a Likert scale ranging from 1 to 5. The scale was designed to capture the level of agreement or disagreement with the statements presented. Specifically, respondents were asked to indicate their level of agreement ranging from "Strongly Disagree" (1) to "Strongly Agree" (5) in relation to the provided statements. The research measurement used, “Likert Scale” was adapted from [43], which investigated “Herding Behavior in Malaysia’s Stock Market”. The measurement method used in the study was also adopted/adapted from the validated scale used by [44] to ensure the consistency and comparability of results. The resulting measurement instrument has demonstrated its ability in [43;44] to capture the nuances of herding behavior accurately and reliably, making it a suitable choice for replication. Additionally, this segment will assist in revealing respondents' behavior before, during, and after their activities in the financial market. The investment activity of respondents in the financial market, as well as their behavioral habits throughout their time in investment decisions, are apparent in strategic data. This section ultimately went through all of the variables utilized in this study, including stock influencer credibility, financial literacy, and risk perception.

This study carried out four variables with five hypotheses, the variables are Influencer Credibility, Financial Literacy, risk perception, and herding Behavior. The hypotheses were developed to highlight the relationship between the antecedents of herding Bias (Influencer Credibility, Financial Literacy, risk perception) towards individual “investors' herding behavior bias” in the financial market.

Several methods were utilized in this study to assess whether the collection of observed values matches the anticipated relevant model, including; VIF (Variance Inflation Factor; “to measure the strength of the correlation between the independent variables in regression analysis”), Model-fit Testing (“to assess if a collection of observed values matches those anticipated by the relevant model”), R-Squared test (“to investigate
the correlation which describes the strength of the link between independent and dependent variables in the study), and F-Squared test ("to measure the effect size of the independent variables towards the dependent variable when exogenous constructs were removed"). Primarily, the author utilized hypothesis testing through the use of PLS-SEM, as remains to be the best option to estimate complex models containing many constructs/variables, indicators, and structural paths without imposing distributional assumptions on the data [45].

Table 1. Variable Measurement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Number of Indicators</th>
<th>Measurement</th>
</tr>
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<tbody>
<tr>
<td>Stock Influencer Credibility</td>
<td>&quot;The extent of the believability of the provided information and in their providers&quot;</td>
<td>8</td>
<td>Bakker (2007)</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>&quot;The ability to evaluate the new and complex financial instruments and make informed judgments in both choices of investments and extent of use that would be in their own best long-run interests&quot;</td>
<td>9</td>
<td>Likert Scale of 1-5</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>&quot;Subjective assessment of the probability of a specified type of accident happening and how convinced we are with the consequences&quot;</td>
<td>10</td>
<td>Mens et al. (2001)</td>
</tr>
<tr>
<td>Herding Behavior</td>
<td>&quot;The behavior of investors who tend to follow other investors in investing without conducting a fundamental analysis first so that the formed market becomes inefficient&quot;</td>
<td>8</td>
<td>Fishein &amp; Auffer (2015)</td>
</tr>
</tbody>
</table>

Table 2. Validity and Reliability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
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<tbody>
<tr>
<td>FL</td>
<td>0.861</td>
<td>0.608</td>
</tr>
<tr>
<td>SIC</td>
<td>0.833</td>
<td>0.556</td>
</tr>
<tr>
<td>RP</td>
<td>0.864</td>
<td>0.614</td>
</tr>
<tr>
<td>HB</td>
<td>0.869</td>
<td>0.623</td>
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4 Results and Discussion

The research concluded 217 respondents submitted the Google Forms online questionnaire that the researcher distributed. Out of 217 gathered respondents’ information, the gender proportion of the Indonesian population that answered the questionnaire, with 112 respondents (51%) being male and 105 respondents (48.4%) being female. Additionally, 119 of the respondents were between the ages of 18 and 22, with the remaining 98 being the age of 22 years old and above. Out of 217 gathered respondent’s information the survey source proportion of the respondent population that answered the questionnaire, with 101 respondents (46.5%) having received the survey from WhatsApp, 69 respondents (31.8%) from Instagram, 43 respondents (19.8%) from LinkedIn and lastly 4 respondents (1.8%) from Line. To ensure that respondents were eligible to participate in this study, the researcher conducted a filter question regarding whether or not the respondents have ever participated in investing in the Indonesian financial market before. Out of the 217 respondents, twenty-one (21) answered no in response to the filter question, leaving the author with 196 respondents for this research. The researcher then discarded four invalid respondents due mainly to random inputs and biased responses to preserve data accuracy. As a result, the 192 respondents were initially qualified and are thus studied thoroughly below.

The questionnaire also investigated the respondent profiles, which mainly focus on their monthly personal income, experience in investing, the proportion of income towards investment, and how frequently they invest. The majority of responses comprise respondents who generate less than 10 million IDR per month, have 3 to 6 months of investment experience, invested 10% of their income, and invest monthly.

The survey responses collected were then evaluated towards a reliability test, where the research variables had a composite reliability above 0.708. [46] recommends removing from the construct any indicators with outside loadings between the range of 0.40 to 0.70, a total of 16 indicators were discarded. Subsequently, after removing 16 indicators from the model, the PLS Algorithm is executed once again with the remaining indicators. "However, the AVE values for the components risk perception (RP), stock influencer credibility (SIC), and herding behavior (HB) are some left insufficient or not at a satisfactory value.

All three independent variables (Financial Literacy, stock influencer credibility, and risk perception) as well as the dependent variable in this study (Herding Behavior) scored above the 0.5 minimum value in regard to AVE during the validity pre-testing phase, this means that all the question items in these variables are valid for this study and can then proceed to large-scale survey distribution.

As a result, 3 indicators must be deleted to increase the AVE values as the indicated threshold value, yielding a total of 19 indicators removed from the study. In addition, a validity test was conducted as every indicator is considered as a distinct approach to examine the same construct in the reflective measurement model. According to [47], “0.4 or less can be acceptable if the AVE is less than 0.50 but the composite reliability is greater than 0.60, and therefore the construct’s convergent validity is still considered adequate”.

As a result, the AVE value of risk perception (RP), stock influencer credibility (SIC), and herding behavior (HB) are more than the 0.50 threshold which is sufficient while also having a composite reliability that is greater than the 0.60 threshold is deemed satisfactory.

Collinearity statistics via VIF were also computed in the study as it is used to determine whether there is any problematic high-multi collinearity [48]. The inner VIF values for Financial Literacy (FL), stock influencer credibility (SIC), and risk perception (RP) with herding behavior (HB) are 1.635, 1.229, and 1.370 respectively, indicating that there are no collinearity issues between the constructs (not greater than 4).

Model-fit testing via NFI was conducted in the study to compute the suggested model’s Chi-Square value and compare it to a suitable benchmark. “As a result, the NFI produces values ranging from 0 to 1”. The greater the
NFI, the better the fit. NFI values greater than 0.9 generally indicate a good match. The model-fit analysis score is below the 0.9 thresholds, being at only 0.852. However, [49] mentions in their “Model-fit Criteria and Acceptable Fit Interpretation” that values close to 0.90 are interpreted as a “good model fit”. Moreover, Model-fit testing via SRMR was computed to capture whether the study model succeeded in capturing important associations among the variables. “A good fit is defined as a value less than 0.10 or 0.08” (in a more conservative variant; [50]). The Model Fit Analysis score is below the 0.08 threshold, being at 0.075, and therefore proves to be a good fit in correlation to the study.

Coefficient of Determination ($R^2$ Value) was conducted in the study to represent a “structural model's prediction accuracy and is calculated as the squared correlation between the actual and estimated values of a certain endogenous component” (Hair et al., 2014). $R^2$ values close to one (1) indicate great prediction accuracy. The $R^2$ value of 0.313 in the study suggested that the combined influence of all independent variables (Financial Literacy (FL), stock influencer credibility (SIC), risk perception (RP)) might lead to a 31.3 percent variance in herding behavior (HB).

$F$-square was tested in the study as well to measure the change in $R^2$ value in order to assess the substantive effects of the exogenous construct's removal on the endogenous construct [51], “comparing impacts of varying sizes, where 0.02, 0.15, and 0.35 represent the tiny, medium, and big effects of the exogenous latent variable, respectively”. The $f^2$ value obtained in the study ranged from 0.005 to 0.122 “show small (<0.15) effects on herding behavior (HB)”.

4.1. Hypotheses Testing

4.1.1. Hypothesis 1

To investigate the relationship between the independent variables (Financial Literacy, stock influencer credibility, and risk perception) and the dependent variable (herding Behavior), five hypotheses have been proposed. “The path analysis result confirms hypothesis 1, (the stock influencer credibility has a positive relationship toward investor herding bias) is valid with $p = 0.025$. The study revealed that there is a positive relationship between stock influencer credibility and herding behavior bias among Indonesian investors “.

Influencers with a track record of providing credible recommendations and utilizing the recommended product may be trusted; in this instance, influencers who buy the stock he or she advised. As a result, the likelihood of Indonesian investors engaging in herding behavior increased in the context of this study, as did the credibility of influencers who suggested the stocks [15]. The study results showed that a substantial number of investors appear to be following the stock influencer who recently aggressively provoke the investors using social media such as Instagram and TikTok. As pointed out by [17] and [18] that those influencers contributed to investors' herding behavior in the market.

4.1.2. Hypothesis 2

The statistical evidence shows that hypothesis 2 of this study stated that there is a positive relationship between risk perception and herding behavior bias among Indonesian investors can be considered valid ($p = 0.017$). This result confirmed [14] study which discovered that investors with negative sentiment toward the market would follow other investor advice. When investors believe that the risk of investing in the market is high, they have a less favorable attitude toward the market, or they have a negative sentiment toward the market. This is because they feel that the possible losses outweigh the potential return on investment. So they may not be ready to take chances in their financial selections. As a result, the investors tend to follow other investors. Their decision-making process is based on impulsive or irrational thinking. This study approved [25] study which found out that during the COVID-19 pandemic, consumer risk perception has a positive direct effect on herding behavior on medical equipment.

4.1.3. Hypothesis 3

On the other hand, the path analysis result shows that hypothesis 3 (Financial literacy is negatively related to investor herding behavior) is considered as not valid (p-values of 0.417). This research discovered that there is no significant relationship between financial literacy and herding behavior among Indonesian stock market participants. The statistical analysis result cannot confirm the existing literature [15; 33; 31; 34] which discovered that investors' herding tendency was significantly influenced by an influencer's credibility. According to [33], Shariah literacy could improve investor knowledge and reduce investors' irrational behavior. This study result also fails to approve [34], who found that high financial literate male investors are very less likely to engage in impulsive transactions.

The literature and results recognize that individuals may have varying levels of financial literacy. While some possess high levels of financial knowledge, others may have limited understanding. When studying the relationship between financial literacy and herd behavior, the heterogeneity of participants' financial literacy levels may lead to varied results, making it challenging to establish a significant association.

4.1.4. Hypothesis 4

Hypothesis 4 in this study states that there is a negative relationship between stock influencer credibility and risk perception among investors in the Indonesian financial market. The result shows that this hypothesis is not valid ($p = 0.186$), therefore it fails to validate [35] which discovered that type of information becomes the determinant of investor risk perception.

Even if stock influencers are perceived as credible, individuals may still question their motives. Skepticism about the underlying intentions of influencers, such as potential conflicts of interest or hidden agendas, can impact the degree to which individuals rely on
influencer credibility when evaluating investment risks. As a result, the direct influence of stock influencer credibility on risk perception may be weakened. [41] described risk perception to be a complex cognitive process influenced by various individual factors, such as personal experiences, cognitive biases, and heuristics. Individuals may have their own unique evaluation and decision-making processes that are not solely dependent on stock influencer credibility. These individual differences and idiosyncrasies can result in the insignificance of stock influencer credibility in shaping risk perception across a sample population.

4.1.5. Hypothesis 5

Another hypothesis testing result has shown that the relationship between financial literacy and investor risk perception is valid with \( p = 0.000 \). According to the findings of this study, there is a positive relationship between financial literacy and risk perception among Indonesian stock market participants. This result validates [41] study which found that highly financially literate investors are more likely to invest their money in a high level of risk instrument to get a higher return. While [42] that discovered investor risk tolerance is affected by their level of financial literacy can also be validated as well.

Even in the context of this study, financial literacy and information may influence risk perception among Indonesian investors. Such a factor might have a “significant impact on the majority demographics of this study”, being low-income investors or those who are new to the industry. As investors with modest incomes are afraid of losing their money, and investors without sufficient information are unsure of how, where, and in which product to invest. This ideology aligns in regard to [42] research on financial literacy and risk perception which revealed that “individuals with a greater degree of financial literacy assumes a disproportionately higher level of risk” and vice-versa.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path Coefficient</th>
<th>P-Value</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>0.199</td>
<td>0.025</td>
<td>YES</td>
</tr>
<tr>
<td>H2</td>
<td>0.477</td>
<td>0.000</td>
<td>YES</td>
</tr>
<tr>
<td>H3</td>
<td>0.082</td>
<td>0.417</td>
<td>NO</td>
</tr>
</tbody>
</table>

4.2. Path coefficient

In terms of the path coefficients, the findings reveal that risk perception (\( \beta = 0.210 \)) exhibits the strongest direct effect on herding behavior, highlighting its prominent influence. Conversely, stock influencer credibility (\( \beta = 0.199 \)) demonstrates a comparatively weaker direct effect on herding behavior when compared to risk perception. Moreover, the analysis demonstrates that stock influencer credibility (\( \beta = 0.199 \)) exerts a significant and positive impact on herding behavior, with a p-value of 0.025 (\( \alpha < 0.05 \)), indicating a statistically significant relationship between the two variables.

Financial literacy (\( \beta = 0.082 \)) exhibits the “weakest direct path effects on herding behavior”. Furthermore, there is a relationship between financial literacy (\( \beta = 0.082 \)) and herding behavior, but it is insignificant to influence herding behavior with p-values of 0.417 (\( \alpha > 0.05 \)). As seen from Table 3, the independent variable financial literacy is seen to have a higher coefficient towards herd behavior when it is undergoing an indirect SDWK value of 0.031 PDN. Financial literacy significant towards herding behavior, but only if mediated through risk perception. In this case, the “hypothesis testing” of financial literacy that suggested a “positive relationship with herding behavior” is found to have significance when mediated. The findings are consistent with [52]’s study mentioning that “an investor with excessive self-confidence may disregard knowledge regarding other people’s assets and feel that everything he or she has chosen or done must be genuinely based on his or her ability in financial literacy”, meaning that overconfident investors have a positive risk perception and a “risky” mentality, which leads them to pursue investments on their own accord, and therefore optimistic in their investments.

<table>
<thead>
<tr>
<th>SIC -&gt; HB</th>
<th>Direct Path</th>
<th>Indirect Path</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.199</td>
<td>-</td>
<td>0.025</td>
<td></td>
</tr>
</tbody>
</table>
In contrast, the independent variable stock influencer credibility demonstrates a weaker indirect path towards herding behavior, which is found to be statistically insignificant (p-values = 0.240, α > 0.05). This implies that the hypothesis testing of stock influencer credibility does not support the finding that stock influencer credibility significantly influences herding behavior in the Indonesian financial market when mediated through risk perception.

5 Conclusion

This research provided findings that may be used to give insights and suggestions to individual investors of the Indonesian financial market. Several implications should be considered for both old and new individual investors for them to comprehend the existence of herding behavior bias that is present in the Indonesian financial market. Given the primary goal of this study is to “determine the relationship between the dependent variable, herding behavior of investors, and the independent factors, which include financial literacy, stock influencers credibility, and risk perception” in Indonesia’s financial market, respondents in Indonesia were given questionnaires as part of this study’s primary data collection through the utilization of the author’s social media platforms.

The findings of this paper indicated that stock influencer credibility is negatively associated towards risk perception among Indonesian investors, whereas financial literacy is positively associated towards Indonesian investors’ risk perceptions. The findings additionally corroborate the positive and substantial association between investor herding behavior and all independent factors (stock influencers’ credibility and risk perception), with the exception of financial literacy, which turned out to be insignificant. However, the relationship between financial literacy and herding behavior became significant when the path was mediated by the presence of risk perception.

Additionally, it is important to acknowledge that the results obtained may be due to the study’s limitations in regard to the questionnaire and its distribution, the researcher had a limited amount of time to collect and analyze data, thus having a small sample size. Moreover, since the survey was mainly closed ended, respondents were not obligated to respond with their own personal responses, thus the author was unable to tell whether this stock recommendation craze will be long-lasting or merely impulsive. Not to mention several indicators were removed to improve reliability and validity, thus the author felt that the limited number of independent variables accounted signify that it is not a good fit with the data received and there is no method to make sure whether the respondents understood the questions or answered them properly.

Future researchers should stick to the questionnaire methodology for quantitative data collection, expand the sample size and number of questionnaires used, and perform research in all Indonesian states. The variable/construct of financial literacy has been studied in various existing literatures, but this paper was not able to find significance between the two variables. Further research should be done in regard to the usability of the variable financial literacy as an independent variable towards herding bias and revision of its indicators. Future studies should increase the time invested in researching towards the factors that influence investors’ herding behavior, particularly in the Indonesian stock market, by inputting other variables that may influence herding behavior bias. Additionally, a number of indicators were dropped, implying the possibility of employing alternative forms of indicators or measurements in future research endeavors. Researchers should consider exploring different indicators that may provide a more comprehensive and nuanced understanding of herding behavior among investors.

The study’s findings may serve as a suggestion or direction for existing and potential investors. Ultimately, the findings of the study on herding behavior among Indonesian individual investors have significant management ramifications. To combat herding behavior, managers and regulators should adopt targeted investor education programs to improve financial literacy, establish regulatory measures to encourage independent decision-making, and promote risk perception awareness. These measures can empower investors, enhance financial market stability, and mitigate the possible negative consequences of herding behavior in the near future.

References