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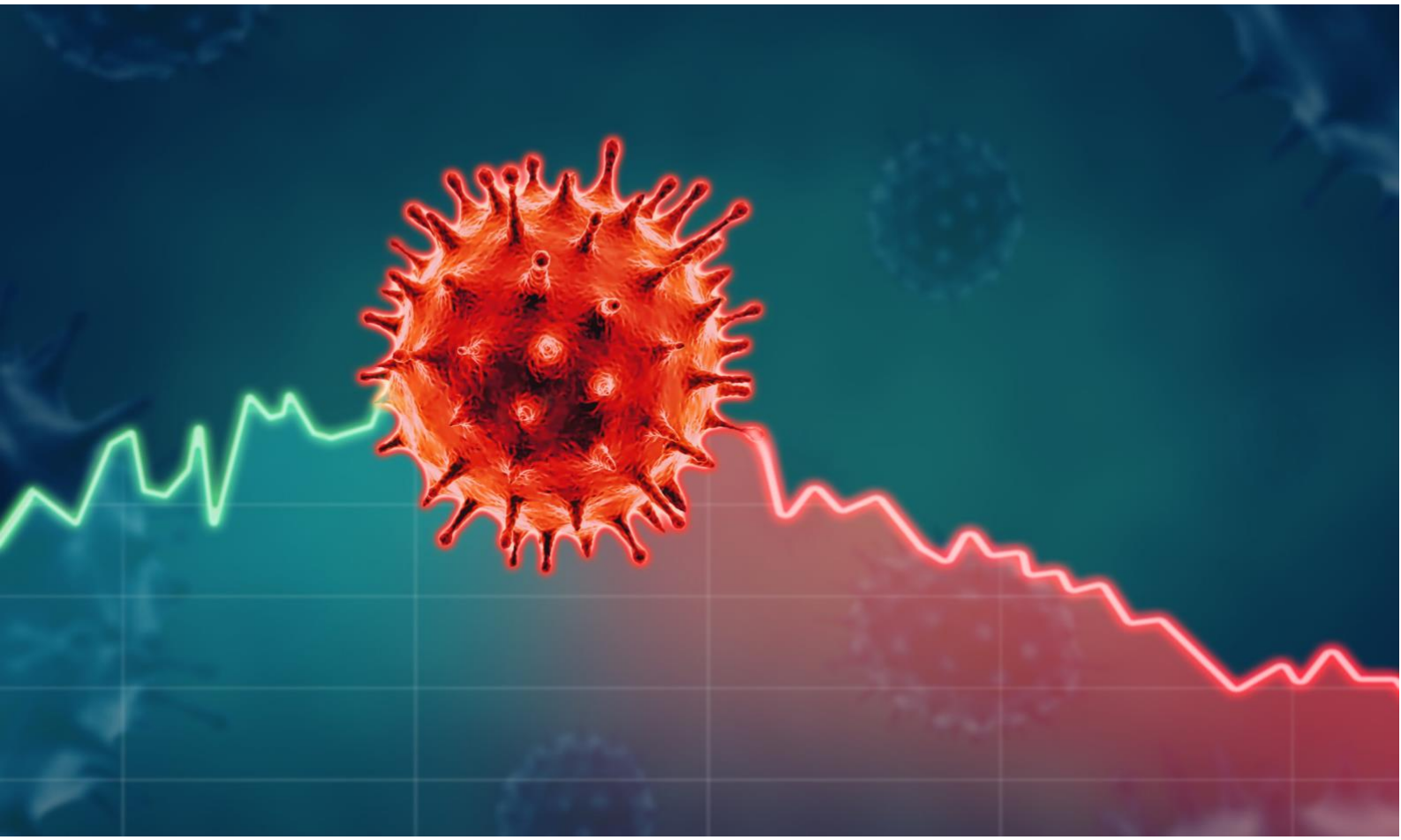

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The Herding and Overconfidence Effect on the Decision of Individuals to Invest Stocks

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Abstract
Investors should reasonably transact their stocks. Unfortunately, not all of them are cogent. They make decisions based on some people's suggestions, such as friends, colleagues, family members, and overconfidence. This study attempts to test and analyze the effect of overconfidence and herding on investors' decision to transact their stocks. This study's population is the investors in the investment gallery, becoming the partner of *PT Sinar Mas Sekuritas*, in Maranatha Christian University. The investors become the samples taken by a simple random sampling method, and their number is calculated by the Slovin formula with the 10% border of inaccuracy. Based on this formula, the total investors are 74. Unfortunately, only 50 investors participate in this online survey; therefore, the response rate is 67.57%. Consequently, the structural equation model (SEM) based on variance suits the method to test data. After examining two proposed hypotheses, overall, this study concludes that overconfidence is the only determinant having a positive effect on the decision to invest.

Keywords: individual investors, overconfidence, stocks, the decision to invest, variance-based SEM

I. Introduction

The capital market contributes to the economy of the nation. This contribution gets associated with two functions. Firstly, the capital market is the source of funds for companies (Husnan, 2015) to invest to gain profits and reduce joblessness (Darmadji & Fakhruddin, 2012). Secondly, the capital market is the connector facilitating people to invest their funds in its various instruments (Sunariyah, 2011). One of them is the shares, becoming the most favorite one for investors (Panji & Pakarti, 2006) because of dividends and the change in price as the attractiveness (Sunariyah, 2011).

The change in stock price occurs because of demand and supply power (Sunariyah, 2011). Before transacting the stock in the market, investors must collect and analyze information (Natapura, 2009). However, not all investors do so. Without adequate information, they select to follow others to invest; this is called herding. This fact is proven by Ghalandari & Ghahremanpour (2013), Khalid, Javed, & Shahzad (2018), Mahanthe & Sugathadasa (2018), and Qasim, Hussain, Mehboob, & Arshad (2019).

Also, overconfidence, as the other inclination in the capital market, influences the market participants' decision to invest. This situation gets affirmed by Wibisono (2013), Alquraan, Alqisie, & Al-Shorafadi (2016), Riaz & Iqbal (2015), Bakar & Yi (2016), Khan, Azeem, & Sarwar (2017), Jannah & Ady (2017), Khalid et al. (2018), Mahanthe & Sugathadasa (2018), Setiawan, Atahau & Robiyanto (2018), and Malik, Hanif, & Azhar (2019).

Unfortunately, these two behaviors still show the various effects on investing stocks by conferring those previous research results. Related to herding behavior, for example, the study of Ghalandari & Ghahremanpour (2013), Khalid et al. (2018), Qasim et al. (2019) affirms a positive effect. Conversely, the study of Mahanthe & Sugathadasa (2018) confirms a negative. Also, the study of Gozalie & Anastasia (2015), Alquraan et al. (2016), Bakar & Yi (2016), and Setiawan et al. (2016) cannot prove it.

Similarly, interconnected to the overconfidence, for instance, the study of Wibisono (2013), Alquraan et al. (2016), Riaz & Iqbal (2015), Bakar & Yi (2016), Khan et al. (2017), Jannah & Ady (2017), Khalid et al. (2018), Mahanthe & Sugathadasa (2018), Setiawan, et al. (2018), Malik et al. (2019) shows that self-confidence positively affects this decision to invest. On the other hand, the study of Zacharakis & Shepherd (2001) displays a negative effect exists. Additionally, the study of Wulandari & Iramani (2014) and Gozalie & Anastasia (2015) do not exhibit this effect.

The contradiction of this previous evidence stimulates this study by exhausting the investors in the investment gallery at Maranatha Christian University. Because of the highest transaction value, this gallery got the best award from Indonesia Stock Exchange in 2016 (Bursa Efek Indonesia, 2017) and 2017 (Pelaku_Bisnis, 2018). This award to this gallery directly shows that the investors inside actively make the decision-related to the stocks.

1.1. Some-related concepts

1.1.1. Decision to invest

Investment is capitalizing funds by postponing the current consumption to get wealth in the future (Hartono, 2017). According to Tandelilin (2010), the basis for investment decisions covers two aspects. Firstly, the expected return from the invested funds: the compensation for the opportunity cost of inflation, causing a decrease in society's purchasing power. Secondly, the risks that must be taken by investors. Investors preferring risk will place their money in risky investments, followed by its high expected return, and vice versa.

Besides, the increase in investors' wealth becomes another basis for an investment decision (Christanti & Mahastanti, 2011). Furthermore, this wealth gets reflected by the stock return components: capital gain and dividend (Hartono, 2017). The stock intended has to be easily traded by investors and is issued by a profitable firm (Arrozi & Septyanto, 2011).

1.1.2. Herding

Herding is the contemplate of Keynes (1936), who equalizes human beings to animals in their instinct: they always follow what their group does. Moreover, herding is broadly defined in the investor behavior context by Chang, Cheng, & Khorana (2000), and Qasim et al. (2019). According to them, herding is the imitation of one investor to follow the others without a reliable strategy (Qasim et al., 2019); hence, this becomes irrational behavior (Chang et al., 2000). Additionally, Kumar & Goyal (2015) explain that individual investors tend to execute this strategy, unlike institutional investors.

1.1.3. Overconfidence

Overconfidence is the prejudice associated with how investors assess their limited ability and knowledge. Investors with this perspective feel more well-informed than others (Shefrin, 2007). When individuals become overconfident, they will overemphasize and wrongly estimate their potential investment return. They excessively

trade their stocks because they believe their information differs from the others and keep holding risk tolerance despite the high risk of investment (Asri, 2013).

1.2. Hypothesis Development

1.2.1. The herding effect on the decision to invest

The herding is where one investor follows the other investors without steady strategy supports (Qasim et al., 2019) because they cannot find clear facts in the market (Fityani & Arfinto, 2015). Individuals with this behavior easily invest the money in the stocks, as the study of Ghalandari & Ghahremanpour (2013), Khalid et al. (2018), and Qasim *et al.* (2019) describe. By indicating this information, the second hypothesis is like this way:
H_1: Herding makes individuals decide to invest.

1.2.2. The overconfidence effect on the decision to invest

Self-confidence is the bias of the way of the investors to evaluate their ability and knowledge limitation. Investors with this bias admit to having better ability and knowledge (Shefrin, 2007). Consequently, they are likely to invest, as the study of Wibisono (2013), Alquraan et al. (2016), Riaz & Iqbal (2015), Bakar & Yi (2016), Khan et al. (2017), Jannah & Ady (2017), Khalid et al. (2018), Mahanthe & Sugathadasa (2018), Setiawan, et al. (2018), and Malik et al. (2019) display. By standing for this information, the second hypothesis is like this way:
H_2: Overconfidence makes individuals decide to invest.

II. Method

2.1. Research Variables

The variables utilized in this study, i.e., herding, overconfidence, and the decision to invest, are latent. Hence, they need deriving until the measurement process is over.

a. The first variable is herding. Mentioning Sarwar & Afaf (2016), it has three indicators: HERD1, HERD2, HERD3. Their content is in Table 1.
b. The second variable is overconfidence. According to Sarwar & Afaf (2016), it has seven indicators: OCD1, OCD2, OCD3, OCD4, OCD5, OCD6, and OCD7. Their content is in Table 1.

Table 1. The content of indicators for herding and overconfidence

Explanatory Variable	Indicator
Herding	HERD1: I confide in the information from my friends.
	HERD2: I confide in the information from my colleague.
	HERD3: I confide in the information from the members of my family.
Overconfidence	OCD1: I can create a favorable investment in the past.
	OCD2: I can predict the future of the stock price.
	OCD3: I entirely have the capital market knowledge.
	OCD4: I am determined to assess the stock price in the portfolio.
	OCD5: I am bold to invest when the stock market index is in the opposite direction.
	OCD6: I always invest the stocks by my best thinking based on the experience.
	OCD7: I am interested in investing stocks in the capital market.

c. The third variable is the decision to invest (DTI). Alluding to Sarwar & Afaf (2016), DTI consists of two dimensions, i.e., satisfaction (SAT) and efficiency of skill (ES). Both of them own four indicators, as displayed in Table 2.

Table 2. The content of indicators for each dimension of the decision to invest

Dimension	Indicator
Satisfaction	SAT1: I am satisfied with my investing way. SAT2: My decision helps me to achieve my investment goal SAT3: I have already made the right decision to invest. SAT4: I can catch a higher stock return more than a market return based on my investment decision.
Efficiency of skills	ES1: I make all my investment decisions by myself. ES2: I believe that my skills and knowledge about the market help me get more returns than the market return. ES3: I can anticipate the movement of the market return. ES4: I think through all the possible factors to make the investment decision.

2.2. Population and Samples

The 290 individual investors in the investment gallery of Sinar Mas Securities in Bandung located in Maranatha Christian University become the study population. Furthermore, the Slovin formula in the first equation with a 10% boundary of fault (e), by referring to Suliyanto (2009), acts to obtain the total samples (n) reflecting the total population (N).

$$n = \frac{n}{1+Ne^2} \quad \text{(Eq. 1)}$$

By indicating this formula, the total samples are: $\frac{290}{1+(290*0.10*0.10)} = \frac{290}{3.9} = 74.35 \approx 74$. Moreover, we use simple random sampling to take them.

2.3. The method to collect the data

This research uses a survey method to get the data. According to Hartono (2012), the data get collected by the questionnaire distribution in this method in this method. By considering the practical aspect, we distribute it online. Furthermore, the investors get asked for selecting one of 5 points of the Likert scale, starting from 1 (strongly disagree) until 5 (strongly agree).

As a result, 50 investors join the survey; the response rate is: $\frac{50}{74} x100\% = 67.57\%$. This rate is satisfactory because it is larger than 20% as the minimum rate required by Sugiyanto et al. (2018) for the online survey.

2.4. Method to analyze the data

In this study, the structural equation model (SEM) based on variance becomes the method to analyze the data. This model's utilization is due to the unobserved variables and the total samples between 30 and 100 (Ghozali, 2008). Additionally, this intended model is in equation two.

$$DTI = \gamma_0 + \gamma_1 HERD + \gamma_2 OCD + \zeta \quad \text{(Eq. 2)}$$

The validity and reliability test are essential because of employing dimensions and indicators. To perform the validity test, we use the confirmatory factor analysis in the variance-based SEM. To determine the valid answer of the respondent, we compare the loading factor (LF) of each indicator with 0.5 as the cut-off by following these rules explained by Sholihin & Ratmono (2013):

- If the LF is higher than 0.5, the answer of respondents to the indicator is valid.
- If the LF is the same as or lower than 0.5, the answer is invalid; therefore, eliminating this indicator is mandatory.

To perform the reliability test, we utilize the composite reliability coefficient (CRC) analysis. To determine the consistency of the valid answer to each indicator, we compare the CRC with 0.7 as the cut-off value by following these rules explained by Sholihin & Ratmono (2013):

- If CRC is higher than 0.7, the respondents' valid answers are consistent; hence, this study already accomplishes the reliability test.
- If CRC is similar to or lower than 0.7, respondents' valid answers are not consistent; hence, this study does not attain the reliability test.

III. Results dan discussion

This section informs two things. The first is the result covering the statistics describing demographic features (see Section 3.1), the validity and reliability test of each variable (see Section 3.2), the estimation of variance-based SEM (see section 3.3), the hypotheses test (See Section 3.4). The second is the discussion based on the hypotheses test result (See Section 3.5).

3.1. The result of the descriptive statistics

The statistic to describe the categorical data is frequency based on gender (see Table 4), occupation (see Table 5), age range (see Table 6), the last formal education (see Table 7), and monthly range of money earned (see Table 8).

- Table 4 presents the respondents based on gender participating in this survey. The total males are 35 (70%), and females are 15 (30%).

Table 4. The number of respondents based on gender

Gender	Total	Percentage
Male	35	70
Female	15	30
Total respondents	50	100

Source: Primary data processed

- Table 5 describes the number of respondents based on their occupation: college students (CS) and private company employees (PE) take the top two in domination; their totals are 26 (52%) and 16 (32%), respectively.

Table 5. The number of respondents based on their occupation

Occupation	Total	Percentage
Auditor	1	2
Banker	1	2
Lecturer	2	4
The employee of the private company	16	32
The employee of the government institution	1	2
Consultant	1	2
Entrepreneur	2	4
College student	26	52
Total respondents	50	100

Source: Primary data processed

- Table 6 depicts the number of respondents based on the age range. The distribution of respondents owning age is as follows.
  A. The total respondents between 20 and 29 are 42 (84%),
  B. The total respondents between 30 and 39 are 6 (12%);
  C. The total respondents below 20 and above 39 are 1 (2%), respectively.

Table 6. The number of respondents based on the age range

Age Range	Total	Percentage
Below 20	1	2
Between 20 and 29	42	84
Between 30 and 39	6	12
Above 39	1	2
Total respondents	50	100

Source: Primary data processed

- Table 7 displays the number of respondents based on the last formal education. The total respondents owning a bachelor's degree is 26 (84%), graduated from senior high school is 17 (34%); the rest have a master's degree with a total of 6 (12%) and a doctoral degree with a total of 1 (2%).

Table 7. The number of respondents based on the last formal education

Last formal education	Total	Percentage
The senior high school graduate	17	34
Bachelor	26	52
Master	6	12
Doctor	1	2
Total respondents	50	100

Source: Primary data processed

- Table 8 exhibits the number of respondents based on the monthly range of money earned. The total respondents possessing an income below 3 million rupiahs is 26 (40%), between 3 and 6 million rupiahs is 12 (24%), between 6 and 9 million rupiahs is 11 (22%); between 9 and 12 million rupiahs is 6 (12%), and above 12 million rupiahs is 1 (2%).

Table 8. The number of respondents based on income range

Income Range	Total	Percentage
Below 3 million rupiahs	20	40
Between 3 and 6 million rupiahs	12	24
Between 6 million and 9 million rupiahs	11	22
Between 9 and 12 million rupiahs	6	12
Above12 million rupiahs	1	2
Total respondents	50	100

Source: Primary data processed

3.2. The result of the validity and reliability of each variable

Table 9 shows the loading factors and composite reliability coefficient for the herding indicator. In this table, the loading factor of HERD1 is 0.908, HERD2 is 0.940, HERD 3 is 0.893, respectively. Because these values outdo 0.5, the answer of the respondents for this each indicator is valid. Likewise, the CRC of three accurate indicators is 0.938, higher than 0.7 as the required cut-off value so that the answer of respondents to three indicators is consistent.

Table 9. Loading Factor of Herding Indicator

Indicator	Loading factor	Description
HERD1	0.908	Valid

Table 9. Loading Factor of Herding Indicator

Indicator	Loading factor	Description
HERD2	0.940	Valid
HERD3	0.893	Valid
CRC	0.938	Consistent

Source: Warp PLS 3 modified Output

Table 10 illustrates the loading factors and composite reliability coefficient (CRC) for overconfidence indicators. In this table, the final loading factor of OCD2 is 0.759, OCD3 is 0.815, OCD4 is 0.839, OCD5 is 0.692, OCD6 is 0.678, and OCD7 is 0.552. Because these values outdo 0.5, the answer of the respondents for this each indicator is valid. Likewise, the CRC of three valid indicators is 0.870, higher than 0.7 as the required cut-off value; therefore, the respondents' answer to six indicators is consistent.

Table 10. Loading Factor of Overconfidence Indicators

Indicator	Initial Step		Final Step	
	Loading factor	Description	*Loading Factor*	Description
OCD1	0.202	Invalid	n.a.	OCD1 gets removed
OCD2	0.748	Valid	0.759	Valid
OCD3	0.825	Valid	0.815	Valid
OCD4	0.839	Valid	0.839	Valid
OCD5	0.693	Valid	0.692	Valid
OCD6	0.681	Valid	0.678	Valid
OCD7	0.537	Valid	0.552	Valid
CRC	-	-	0.870	Consistent

Source: Warp PLS 3 modified output

Table 11 contains two panels: A and B. Panel A reports the loading factor and composite reliability coefficient for indicators in the dimension of satisfaction and efficiency of skill. Meanwhile, Panel B informs the loading factors and composite reliability coefficient (CRC) for two dimensions.

Table 11. Loading Factor and Composite Reliability Coefficient Related to Satisfaction and Efficiency of Skill Dimensions

Panel A. Loading factor and CRC of Each Indicator of satisfaction and efficiency of skill

The dimension of satisfaction			*The dimension of efficiency of skills*		
Indicator	*Loading factor*	*Description*	Indicator	*Loading factor*	Description
SAT1	0.702	Valid	ES1	0.687	Valid
SAT2	0.865	Valid	ES2	0.816	Valid
SAT3	0.826	Valid	ES3	0.758	Valid
SAT4	0.843	Valid	ES4	0.659	Valid
CRC	0.884	Consistent	CRC	0.822	Consistent

Panel B. Loading factor of each dimension and CRC of the decision to invest

Dimension	Loading factor	Description	CRC	Description
Lv_SAT	0.890	Valid	0.885	Consistent
Lv_ES	0.890	Valid		

Source: Warp PLS 3 modified output

The explanation for Panel A can get seen as follows.

- For the satisfaction dimension, the loading factor of SAT1, SAT2, SAT3, and SAT4 is 0.702, 0.865, 0.826, and 0.843, respectively. These values are higher than 0.5; consequently, the answer of respondents for each indicator is valid. Also, the CRC of four accurate indicators is 0.884, higher than 0.7 as the required cut-off value; therefore, the respondents' answer to these indicators is consistent.

- For the skills dimension's efficiency, the loading factor of ES1, ES2, ES3, and ES4 is 0.687, 0.816, 0.758, and 0.659, respectively. These values are higher than 0.5; consequently, the answer of respondents for each indicator is valid. Also, the CRC of four accurate indicators is 0.822, higher than 0.7 as the required cut-off value; therefore, the respondents' answer to these indicators is consistent.

The explanation for Panel B can get seen as follows.

- The loading factor for the satisfaction dimension (Lv_SAT) and the efficiency of the skill dimension (Lv_ES), is 0.890 and 0.890. Because two values exceed 0.5, they can reflect the decision to invest.
- The CRC of two dimensions is 0.885, higher than 0.7 as the required cut-off value; hence, respondents' answer to these two dimensions is consistent.

3.3. The estimation result of the model

Table 12 presents the result of the variance-based SEM estimation with the probability value of t-statistic for the two path coefficients for HERD and OCD.

Table 12. Estimation result of the variance-based SEM: the effect of herding and overconfidence on the individual decision to invest

Latent variable	Path coefficient	Standard error	t-statistic	Probability value
HERD	0.029	0.142	0.204225	0.419
OCD	0.593	0.144	4.118056	<0.001

Source: Warp PLS 3 modified output

3.4. The hypothesis testing result

The first hypothesis, becoming the alternative one, declares that herding makes individuals decide to invest. This hypothesis gets rejected because the probability value of t-statistic for HERD is 0.419, higher than a 5% significance level. Instead, the null hypothesis stating that herding does make individuals decide to invest gets recognized.

The second hypothesis, becoming the alternative one, declares that overconfidence makes the individuals decide to invest. This hypothesis gets acknowledged because the probability value of t-statistic for OCD is <0.001, lower than a 5% significance level.

3.5. Discussion

Denoting the first statistical hypothesis testing, it infers that herding does not make individuals decide to invest. This evidence supports the result of the study of Gozalie & Anastasia (2015), Alquraan et al. (2016), Bakar & Yi (2016), as well as Setiawan et al. (2018). In this research context, additionally, this situation exists because the investors becoming our respondents do not count on the information from their friends, colleagues, family members. This unbelieving is reflected by the accumulated response of undecided, disagree, and strongly disagree on information from their friends of 66%, colleagues of 52%, and family members of 58% (see Table 13).

Table 13. Total Response of Undecided, Disagree and Strongly Disagree of Valid Herding Indicators

Valid indicator content	Response			Total Responses
	Undecided	Disagree	Strongly disagree	
HERD1: I confide in the information from my friends.	17	15	1	33
	34%	30%	2%	66%
HERD2: I confide in the information from my colleague.	15	10	1	26
	30%	20%	2%	52%
HERD3: I confide in the information from the members of my family.	17	11	1	29
	34%	22%	2%	58%

The number of participating respondents is 50.
Source: The primary data processed

By denoting the second statistical hypothesis testing, it infers that overconfidence makes the individuals decide to invest. Investors, who are frequent to transact their stocks, think they are already so smart that they are brave to take the stock transaction-associated risks. This situation is also fair because they are young and well-educated (Asri, 2013). This evidence is in line with Wibisono (2013), Alquraan et al. (2016), Riaz & Iqbal (2015), Bakar & Yi (2016), Khan et al. (2017), Jannah & Ady (2017), Khalid et al. (2018), Mahanthe & Sugathadasa (2018), Setiawan, et al. (2018), and Malik et al. (2019). In this research context, additionally, this condition happens because their accumulated response of strongly agree and agree on:

a. Their ability to predict the stock price is 52% (OCD2).
b. Their knowledge of the capital market is 42% (OCD3).
c. Their steadiness in evaluating the stock prices in the portfolio is 50% (OCD4).
d. Their boldness to keep transacting against the opposite movement of the market index is 70% (OCD5).
e. Their experience-based thought is 80% (OCD6).
f. Their belief in the attractiveness of the capital market is 92% (OCD7).

Table 14. Total Response to Strongly Agree and Agree on The Valid Overconfidence Indicators

Valid indicator content	Response		Total Response
	Strongly agree	Agree	
OCD2: I can predict the stock price.	3	23	26
	6%	46%	52%
OCD3: I entirely have the capital market knowledge.	4	17	21
	8%	34%	42%
OCD4: I am determined to assess the stock price in the portfolio.	4	21	25
	8%	42%	50%
OCD5: I am bold to invest when the stock market index is in the opposite direction.	7	28	35
	14%	56%	70%
OCD6: I always invest the stocks by my best thinking based on the experience.	7	33	40
	14%	66%	80%
OCD7: I am interested in investing stocks in the capital market.	14	32	46
	28%	64%	92%

The number of participating respondents is 50.
Source: The Primary data processed

IV. Conclusion

This study wants to examine the herding and overconfidence effect on the decision of individuals to invest. After testing and discussing two associated hypotheses; overall, this study deduces that herding does not affect the decision to invest; conversely, overconfidence does with a positive sign. These findings mean the individual investors do not depend on the information from others to decide to invest. Instead, they entrust themselves to do that. As long as it is risky, overconfidence should get reduced because of some reasons. Firstly, the future is

uncertain. Secondly, the access and ability of individuals to get information and assess their stock portfolio are more limited than those of the institution. Thirdly, the consequence of getting lost if individuals keep trading against the market movement. Finally, the experience is not repetitive yet in the future.

Academically, this research has some limitations. Firstly, it only utilizes a small number of samples, 50. To fix this limitation, the next scholars need to search for:

a. The individual investors in the investment galleries in Indonesia, becoming partners of securities companies, acting as the population.
b. The individual investors associated with one securities company, distributed in big cities in Indonesia, acting as the population.

Secondly, this research only utilizes two determinants of the decision of individuals to invest. This circumstance allows the next scholars to place the other affecting factors: heuristic, investor competency, experienced regret, risk avoidance, risk tolerance, self-control, market situation, optimistic bias, illusion control, loss aversion, risk perception, conservatism, and cognitive dissonance bias.

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