

## MENTAL ACCOUNTING AND LOSS AVERSION ON INDONESIA FIRM'S PERFORMANCE DURING COVID-19

Grace Turangan  
Sung Suk Kim  
*sungsuk.kim@uph.edu*  
Universitas Pelita Harapan

### ABSTRAK

*Dunia dikejutkan dengan ditemukannya virus baru COVID-19 yang berdampak pada kinerja perusahaan. Tujuan dari penelitian ini adalah untuk menguji pengaruh mental accounting behavior dan loss aversion terhadap kinerja perusahaan di Indonesia yang terdaftar di KOMPAS100 selama periode pandemi COVID-19. Model regresi Ordinary Least Square (OLS) pada data panel dibentuk dengan menggunakan dua variabel dependen ROA dan Tobin's Q. Hasil penelitian menunjukkan bahwa perilaku loss aversion berpengaruh negatif terhadap kinerja perusahaan, baik pada variabel ROA maupun variabel Tobin's Q dan perilaku tersebut umumnya memiliki dampak yang semakin meningkat ketika krisis akibat pandemi COVID-19 terjadi. Sementara perilaku mental accounting juga terbukti memberikan dampak negatif terhadap kinerja perusahaan dengan menggunakan variabel ROA selama masa pandemi COVID-19, namun perilaku ini meningkat signifikan sehingga berdampak negatif terhadap kinerja perusahaan. Namun hasil tersebut tidak sejalan dengan penelitian menggunakan Tobin's Q yang menunjukkan hasil yang signifikan bahwa perilaku mental accounting memberikan dampak positif terhadap kinerja perusahaan dan dampak tersebut meningkat saat masa krisis akibat pandemi COVID-19. Hasil penelitian menyimpulkan penelitian sebelumnya menunjukkan bahwa baik mental accounting maupun loss aversion berpengaruh terhadap kinerja perusahaan.*

*Key words: mental accounting, loss aversion, COVID-19.*

### ABSTRACT

The world shocked by the found of new virus COVID-19 which impact the firm's performance. The objective of this study is to examine the effect of mental accounting behavior and loss aversion on the performance of companies in Indonesia listed on KOMPAS100 during the period of pandemic COVID-19. The Ordinary Least Square (OLS) regression model on panel data was formed using the two dependent variables ROA and Tobin's Q. The results show that loss aversion behavior gives a negative impact on company performance, both on variable ROA and Tobin's Q variables and that behavior generally has an increasing impact when the crisis due to the COVID-19 pandemic occurs. While mental accounting behavior also influence on a negative impact on company performance by using the ROA variable along COVID-19 pandemic period, this behavior significantly increased giving a negative impact on company performance. However, these results are not in line with research using Tobin's Q which shows significant results that mental accounting behavior gives positive impact on company performance and the impact increases when crisis period due to COVID-19 pandemic. The research concluded previous research shows that both mental accounting and loss aversion gave impact to the company performance.

Kata kunci: mental accounting, loss aversion, COVID-19

### INTRODUCTION

Closing the year 2019, shocking news shocked the world with the found of new virus COVID-19, which was first detected in

Wuhan and had a worrying impact not only on human health but also on global economic sentiment (Fitzgerald et al., 2020). Bank Indonesia (2020) the first semester of 2020

economic report stated that the Covid-19 pandemic has caused limited movement or mobility as well as the movement of world economic activities globally, thereby increasing the uncertainty of world financial market conditions and also affecting the wave of contractionary economic growth in Indonesia. Since the announcement of the first case of COVID-19 by President Jokowi in early March 2020, it has taken the public by surprise and has also brought the sluggish movement of the economy in Indonesia which impacting few companies that being affected by terminating the employment of some of their employees, discontinuing work contracts or even cutting employee income (Cucinotta and Vanelli, 2020). This, of course, makes the public even more worried, apart from those related to their health and safety, but of course it also creates a sense of concern for investors. Meanwhile, on the one hand, since the announcement of the first case and with the increase in cases, many government decisions have been implemented to mitigate the increase of case and the spreading COVID-19 virus, which has almost paralyzed the economy in Indonesia.

The financial market's response to the spread of the COVID-19 virus can be seen from research conducted by Smales (2021), where in his research it was proven that the news of COVID-19 became the attention of investors in making investment decisions, where in this case it was seen that the condition of the spreading of COVID-19 virus has a negative impact on high stock volatility. By continuing to pay attention to news developments regarding COVID-19, investors are becoming more careful in making their investment decisions, because the information that investors continue to seek is not only to direct investors to which investment is good to buy, but tends to generate a feeling of uncertainty from investors, especially at the crisis period of COVID-19 pandemic. Ortmann et al. (2020) found that in supporting the increasing number of positive cases of COVID-19 led to an increase in the average weekly trading

intensity of investors by 13.9%. Normally investors add funds to their accounts and decide to have more new accounts and allocate positions to their investments. The behavioral financial theory is based on the assumptions where investors are in the position not entirely reasonable in the sense that emotions and beliefs influence the demand for the risky financial assets, so it can be said that financial behavior in this case affects investor behavior and therefore strategic investment choices. Financial psychological behavior in this case is loss avoidance behavior. Investors with a tendency to increase the return on their investment. We are currently faced with an uncertain situation due to the COVID-19 pandemic. What steps should be taken by investors in these conditions, of course, makes investors more careful in making investment decisions.

Kahneman and Tversky (1979) linking investor behavior and psychological factors of loss aversion have a significant relationship in investment decisions made by investors. In their research, they argue that everyone has a character to always try to avoid possible losses and tends to be more sensitive to the losses they may suffer. Riaz et al. (2020) and Rashata (2022) in his research on the stock market in Pakistan, they looked at the variables that influenced investors in making investments during the COVID-19 pandemic, where three financial behaviors from the prospect theory dimension that influenced investors' investment decisions in Pakistan were the tendency to seek quick profits, loss aversion behavior. and the fear of great loss. Shah et al. (2021) in his research using qualitative methods and by conducting interviews based in the United Arab Emirates, proved that loss aversion behavior during the crisis due to the uncertain COVID-19 pandemic gives negative impact on financial decision making that affects the company's economic performance.

Meanwhile, the investor's question on the profit or loss on the investment that has been made, refers to the mental accounting behavior of the investor. The term mental

accounting, where in a good situation, many investors act inconsistently to the theory. Under these conditions, economic behavior makes systematic mistakes in predicting behavior. Rooted in prospect theory Kahneman and Tversky (1979), mental accounting can explain why investors act that way. Few experimental studies (Banerjee et al., 2019; Kremer et al., 2019; Martina, 2020) shows that when people engage in mental accounting behavior, they engage in a narrow view, that is the area where they will focus on pay more alert to review deeply on defined advantages and disadvantages. In this case, investors will feel more regret for the losses incurred than the gains experienced. If one of the many investments underperforms, in this case the investor will feel sorry for the particular decision to buy that investment. Mascareñas and Yan (2017) in his journal, discusses how investors apply mental accounting behavior in risky investments and the results of their research conclude that investment portfolios must be determined by the risk appetite and profit preferences of investors. They argue that not all investors want to sacrifice their gain to take risks to lose the return of what they have been invested in and not all investors can easily give up their gain as they try to avoid the risks that must be faced. In the conditions of the COVID-19 pandemic, where it is known that the economic conditions are uncertain, it is possible that the mental accounting behavior of investors will become dominant in determining their decision to invest so that it can affect the performance of companies in Indonesia.

The next discussion in writing this journal is a discussion of the supporting theories used in this research, then it will be explained further the data in the research and the methods formed to answer research problems and continue with description of what shown from the research and then author tries to conclude the results of the study and provide suggestions for further research.

## **THEORETICAL REVIEW**

Loss aversions a view that tends to be carried out by investors who seek to avoid losses and prefer profits over their investments. Many studies have raised the behavior of these investors in relation to psychological factors that have a significant influence on an investment strategy decision. Prospect Theory by Kahneman and Tversky (1979) argues that humans have character to avoid losses and are more sensitive to losses. In the understanding of traditional financial theory, risk in investing presume as a manifested in the variance of the distribution of returns expected by each investor, while in some research journals (Li et al., 2018; Schleich et al., 2019) it has been widely discussed that a risk in investing is identical to a loss. The predictions arising from the assumption that individuals dislike variance systematically differ from the predictions discussed from the loss aversion assumption. Loss aversion is an important psychological concept that is getting more and more attention in economic analysis.

Furthermore, clear proofs of loss aversion i.e., change for the worse (loss) or greater than the equivalent change for the better. This is explained by Kahneman and Tversky (1979) in risky investment options to explain more about financial loss aversion. Previously loss aversion was at the beginning studied in relation to the choice between a financial bet over two expected outcomes, many studies have showed loss aversion in few examples of research including the prime area of finance, in relation to the economic development of a company or even in agency matters (Alessandri et al., 2018; Bouteska and Regaieg, 2020; Hoffmann and Thommes, 2020; Yang, 2019).

The form of loss aversion in general can be seen from how the rejection of losses is discussed, which is where humans have a tendency to feeling a greater pain or regret when committing a mistake, even for a mistake of small value and the human tendency to desire to avoid the pain of regret.

Mentally, the impact of a loss on the behavior of investors on their investment becomes more important than the effect of the profits they receive, this is what characterizes a form of loss aversion and clarifies the form of human pessimism that is subject to this bias. Thus, it can be concluded that when investors are very sensitive to the losses they suffer and they have a tendency to always try to avoid losses that may occur which will ultimately affect investors' decision making in investing.

While other investor behavior, namely mental accounting refers to the fact that investors create a mental budget allocation to manage their sources of funds which are then linked to certain consumption actions or certain payments (Hahnel et al., 2020). It can be said that mental accounting as a form of administration where human manage their money in several separate accounts, either consciously or unconsciously, where each mental accounting direct them to their own accounting method and has psychological value. Mental accounting is to see and review on consumer behavior, where people have a tendency to calculate the advantages and disadvantages of each of their mental accounting as an evaluation of the decisions and investment choices they make. Otuteye and Siddiquee (2020) argues that mental accounting with various other risk factor biases can lead investors to behave less optimally in allocating their investments, both at the retail and institutional levels. Not only that, mental accounting in the broader context of consumer behavior has been shown on influencing a slow decision making (Liu and Chou, 2019).

Barberis and Huang (2001) examines how mental accounting and loss aversion influence individual stock returns, where the results show that loss aversion makes investors have a direction to be more sensitive to losses than gains and in a narrower frame of mind they will tend to focus more on profits and losses that are defined in terms of profit and loss. narrow but plays an important role in evaluating

risky investments. Meanwhile, in the case of mental accounting research, research (Alessandri et al., 2018; Bikas and Saponaité, 2018; Das et al., 2018) shows that investors avoid losses on individual stock fluctuations and also avoid losses on portfolio fluctuations.

### **Loss Aversion**

As discussed earlier, the bias of loss aversion explains as a development from theory which developed by Kahneman and Tversky (1979) and known as Prospect Theory. In investing, those who invest are faced with a problem over how to calculate a profit that is not balanced with the loss suffered on the investment made. Investors in this case use the profits to make a decision in investing rather than the losses suffered because in this case the investor tries to avoid a risk that may occur on his investment, namely a loss. In investing, investors have a tendency to avoid losses when investors think that investors are not aware of losses on the assets they hold in the stock market, then investors realize profits. Investors generally want to get an immediate profit on their profits by selling the assets they hold due to very fast price developments; the investor sells an asset whose value is lower in the market at the price the investor bought it for. This kind of bias becomes very important in order to see its effect on decision making by an investor on the purchase and sale of its assets.

To understand the decision-making decisions made by investors, many researchers in their research or writing use prospect theory, such as research Wang et al. (2020), Sun et al. (2019), and Zhang et al. (2018), which relies on a normative model in which in this case investors based on certain criteria, have a tendency to maximize the utility function of their investment behavior. The extent of an investor's loss aversion depends on the past returns of their investment, i.e. when it comes to gains and losses, by mean when an investor is aware of past gains the investor will be very averse to

losses, but when the investment is losing money, the investor becomes very resistant to the possible losses. It can be said that this loss aversion attitude will continue to make investors experience more losses on their investments and tend not to sell their investments with the thought that they will once again experience losses on their investments.

The limitations of arbitration and psycho-logical elements are the two topics discussed by Cook et al. (2016), Barberis (2018) also presents a number of applications of financial behavior in the aggregate stock market, cross-sectional rates of return, on individual trading behavior and corporate finance. Khan et al. (2017) after conducting a thorough analysis in his research looking at the impact of bias from a high level of trust and loss avoidance in decision makers, he concluded that loss avoidance by investors has a negative and significant impact on individual investors' investment decisions. A recent study Shafqat and Malik (2021) also explores that loss aversion is detrimental to the trading frequency of individual investors listed on the stock market in Pakistan. Ghelichi et al., (2016) argue that loss aversion has a negative impact, where in this case investors become more careful in looking for risky investments, especially in increasing their transactions and with the hope of a high rate of return as well.

### **Mental Accounting**

Thaler (1999) pioneered the research on mental accounting behavior on individuals and households as a set of cognitive operations that were used to organize, evaluate, and manage their financial activities. Everyone in their mind makes different accounts of their expenses and income. They also relate certain categories of inflows and outflows. It can also be said, that people tend to spend more money won in the lottery but will pay more attention to their hard-earned savings, even though they are economically the same value. Some of them have already provided an account to save sudden expenses or used

as a place of savings for them just in case, then another account to buy a house and another savings account to allocate loans taken to buy a motor vehicle. Although, it can be said that this step is not economically rational, where deposits with low interest rates are simultaneously borrowers who usually have high interest rates. From a psychological perspective, however, the decision was deemed correct by the decision makers, as they argued that savings were allocated for a different purpose than loans. The importance of such an accounting separation of gains and losses is because normally those who make the decision have their own way of selection based on whether they relate to positive or negative benefit. Thus, it can be assumed here that investors or decision makers think differently and see review the profit and loss considered separately than they would at the aggregate level. To clarify that this is the root of the idea on what Kahneman and Tversky (1979) try to explained on prospect theory however, the decision was deemed correct by the decision makers, as they argued that savings were allocated for a different purpose than loans. Many private investors are involved in mental accounting, which means they make a distinction that is not financially in their minds, where the losses incurred are viewed separately from the losses recorded on the books. This means that investors release their stocks from their portfolios way too fast when they make profits and being too slow to sell when they lose their portfolios. Converting profit on the book becomes a real profit is what investors expecting, but in this case investors did not realize that they are even making the loss on the books into an actual loss.

Mental accounting in financial decision making is common in portfolio building. In common portfolio theory rationally, investors should not only focus specific component but they have to care and pay more attention on the expected utility of their portfolios (Aliaga-Diaz et al., 2020; Koumou, 2020). On the other hand, what is happening

is that investors intend on dividing their portfolio profile of investment into secured accounts, build their secure financial levels, and not so safe accounts for trialing is what mostly happen.

### **Hypothesis Formulation**

Huber et al. (2021) in his research, he looked at how the financial market shocks in America and professional investment behavior due to the COVID-19 pandemic, where investors in this case invested less during the COVID-19 pandemic which in this case was more because investors tried to avoid higher risks, not by change of belief. According to Ghelichi et al. (2016) loss aversion has a significant negative impact on decision making, where many investors seek riskier investments by increasing their transactions with the expectation of high returns. At the beginning of the discussion of the literature review based on this prospect theory, it was shown that the loss aversion bias giving a big impact investors' decision making in investing and determining their way on allocating their financial strategy. Two factors that may have a close relationship are investor sentiment and company performance so that the loss-aversion bias can giving impact to company performance, especially through the company's asset performance, the hypothesis formed in this study is

H<sub>1</sub>: that loss aversion has a negative impact on company performance in Indonesia, especially during the COVID-19 pandemic.

While how big is the gain and loss that people focus on is a question of what Thaler (1999) call it mental accounting, it is the situation that people use on reviewing and evaluate their investment allocation or their transactions. In the global crisis situation that occurred due to the COVID-19 pandemic, of course, it will also make directing investors to be more sensitive on their mental accounting attitude which can make a comparison of the profits that investors will automatically calculate carefully to the risks

they will accept in investing, given the uncertain economic conditions during this period. COVID-19 pandemic. Where it is known, when an investment provides a small profit for him, investors will tend to hesitate in making decisions, but this mental accounting situation can make investors to be more careful and take careful movement in making investment decisions. Then the second hypothesis in this study is.

H<sub>2</sub>: that mental accounting has a negative impact on company performance in Indonesia, especially during the COVID-19 pandemic.

## **RESEARCH METHODS**

### **Data and Measurement Variables**

On this research, the sample is 207 companies, namely non-financial companies in Indonesia that are still active in IDX trading and registered as KOMPAS100 for the period January 1, 2009 to December 31, 2021 with quarterly data taken from S&P Capital IQ. The research period related to the COVID-19 pandemic is from March 2, 2020 to December 31, 2021.

The analytical method used in this research is to use panel data, which is a combination of cross-sectional data and time-series data. In this study, unbalance panel data was used, because during the research period, there were several companies that had just made an initial public offering or IPO during the research period, so the amount of time for each company in this study was different. Meanwhile, balance panel data is where the cross section data has the same number of time series observations. As for the purpose of using this panel data analysis method, it is hoped that it will provide BLUE (Best Linear Unbiased Estimated) results, so that the research results are not biased, that is, where it is said to be biased if the results that should be rejected are not rejected but the results that should be accepted are instead rejected.

The first model is for control variables that can affect company performance, namely market capitalization, company book

value, leverage, share ownership and company asset return (ROA) as indicators of company economic performance. The second model uses the Tobin's Q ratio as an indicator of stock market performance with the control variables being market capitalization, asset growth, net income, leverage and share ownership. Hypothesis 1 is checked by entering the loss aversion variable into both models, where the data is by trading volume (Bouteska and Regaieg, 2020) in during the study period. The use of these variables is supported by many studies in several literatures (Zamzami Zamzamin et al., 2021; Zandi et al., 2020). Still using the same control variables as the first and second models, to test Hypothesis 2, it is tested by including mental accounting variables into both models to replace the loss aversion variable, which is showed by the price-dividend ratio (Cherono, 2020).

**Empirical Model**

The empirical model developed on this research in order to see the impact of loss aversion and mental accounting on financial market performance formulated as follows:

$$ROA_{i,t} = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 B/M_{i,t} + \beta_3 LEV_{i,t} + \beta_4 OWNL_{i,t} + \beta_5 OWNF_{i,t} + \beta_6 COVID_{i,t} + \beta_7 LA_{i,t} + \beta_8 MA_{i,t} + \beta_9 LA_{i,t} * COVID_{i,t} + \beta_{10} MA_{i,t} * COVID_{i,t} + \epsilon_{i,t} \dots\dots (1)$$

$$TOBIN'S Q_{i,t} = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 AG_{i,t} + \beta_3 NI_{i,t} + \beta_4 LEV_{i,t} + \beta_5 OWNL_{i,t} + \beta_6 OWNF_{i,t} + \beta_7 COVID_{i,t} + \beta_8 LA_{i,t} + \beta_9 MA_{i,t} + \beta_{10} LA_{i,t} * COVID_{i,t} + \beta_{11} MA_{i,t} * COVID_{i,t} + \epsilon_{i,t} \dots\dots\dots(2)$$

where  $SIZE_{i,t}, \frac{M}{B}_{i,t}, LEV_{i,t}, OWNL_{i,t}, OWNF_{i,t}, COVID_{i,t}, LA_{i,t}$  and  $MA_{i,t}$  sequentially are company size, market to book ratio, leverage, local ownership, foreign ownership, dummy variables for the crisis period due to the COVID-19 pandemic. Then LA and MA are loss-aversion variable coefficients and mental accounting coefficients at company i in time t. LA will be representing and indicating that investors' loss aversion giving

influence on the ROA of companies in Indonesia. The equation model controls a number of other variables which in previous studies  $SIZE_{i,t}, \frac{M}{B}_{i,t}, LEV_{i,t}, OWNL_{i,t}, OWNF_{i,t}, COVID_{i,t}, LA_{i,t}$  and  $MA_{i,t}$  (Bouteska and Regaieg, 2020) has explained the economic performance of the company. Regression is carried out with Tobin's Q ratio which is a generally accepted measure of market performance (Gregory, 2021; Almari et al., 2021; Yang and Gan, 2021) and replacing the market to book variable with a variable, namely asset growth and additional control, namely net income and re-entering the variables  $SIZE_{i,t}, LEV_{i,t}, OWNL_{i,t}, OWNF_{i,t}$ , and  $LA_{i,t}$  in order to see whether the interaction of the loss aversion variable appears more during the COVID-19 crisis, this study conducted an interaction between loss aversion and the dummy period which is denoted by  $LA_{i,t} * COVID_{i,t}$ . Likewise with the mental accounting variable, in order to see whether the interaction appears more during the COVID-19 crisis or not, the study conducted the interaction of the mental accounting variable with the dummy period, which is symbolized by  $MA_{i,t} * COVID_{i,t}$ .

**Variable Measurement**

The control variables for the first hypothesis is measured as follows; SIZE is the size of the company measured by standardized market capitalization, namely:  $SIZE = \text{number of shares in the market} \times \text{price shares}$

Then the book to market variable ratio (B/M) which is calculated by the formula:

$$B/M = \frac{\text{book price}}{\text{market share price}}$$

Then the leverage variable (LEV) is calculated by the formula:

$$LEV = \frac{\text{debt}}{\text{total asset}}$$

Meanwhile, the share ownership of both local and foreign investors is the number of shares owned by local (OWNL) and foreign (OWNF) investors, whose percentage value

is compared to the total share ownership. The COVID-19 variable is a dummy variable that distinguishes the period during the crisis period due to the COVID-19 pandemic, namely the research period January 2020–December 2021 which is symbolized by the number 1, while the period outside the COVID-19 period, namely January 2009–December 2019 is symbolized by the number 0.

Then for the independent variable to test Hypothesis 1, namely loss aversion (LA) is the percentage variation of the volume of transactions made by investors, where the formula used is as follows:

$$LA_{i,t} = \frac{\frac{VOL_{i,t}}{Size_{i,t}} - \frac{VOL_{i,t-1}}{Size_{i,t-1}}}{\frac{VOL_{i,t}}{Size_{i,t-1}}}$$

where  $LA_{i,t}$  is the percentage variation of the volume of transactions per quarter carried out by investors,  $VOL_{i,t}$  is the transaction volume of company  $i$  at time  $t$ ,  $SIZE_{i,j}$ , namely the market capitalization of company  $i$  at the end of quarter  $t$  in the study and  $Size_{i,t-1}$  is the market capitalization of company  $i$  at the end of quarter  $t-1$  in the study.

While in TOBIN's Q, the formula used is:

$$TOBIN'SQ = \frac{\text{Total Market Value of Firm book} + \text{Book Value of Debt}}{\text{Total Asset Value of Firm}}$$

Control variable in Tobin's Q empirical method, in addition to reusing the variables that have been used in model (1) but by replacing the book to market ratio (B/M) variable with asset growth (AG) variable which is obtained using the formula:

$$AG_{i,t} = \frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}}$$

where  $TA_{i,t}$  is the total assets of company  $i$ , at time  $t$  and  $TA_{i,t-1}$  is the total assets of company  $i$  at time  $t-1$ . Another independent variable is net income (NI) which is standardized by total assets

Meanwhile, to test Hypothesis 2, namely the mental accounting variable, it is measured by the price-dividend ratio, which is a financial ratio that indicates how much the company pays dividends each year relative to its share price, so the formula used is:

$$K_{i,t} = \frac{P_{i,t}}{D_{i,t}}$$

where  $K_{i,t}$ ,  $P_{i,t}$ ,  $D_{i,t}$  sequentially is the price-dividend ratio, the same price and dividends paid by company  $i$  in time period  $t$ .

While the interaction variable for the loss aversion variable for the dummy period and the mental accounting variable for the dummy period, is formed by the formula:

$$LA_{i,t} * \text{Dummy 1} \\ MA_{i,t} * \text{Dummy 1}$$

## ANALYSIS AND DISCUSSION

### Descriptive Statistical Analysis

Description of statistics in table 1, it can be seen that the number of observations for all variables is 9,356, except for the mental accounting variable, the observation data is reduced to 3,728, this is because there are still many companies in Indonesia that are not disciplined in paying dividends regularly so that companies that do not pay dividends are eliminated by system and were not included in the study. This causes, the entire regression process with the equation model involving the mental accounting behavior variable only uses the number of observations of 3,728. This also causes the number of companies in the study to decrease when the study includes mental accounting variables, from a total of 207 companies in the study it was reduced to 152 companies. If you look at the TobinsQ standard deviation value of 1.94, it can be said that the difference between companies looks very large, especially when viewed from the standard deviation value of 1.94 and the minimum value of 0.047 while the maximum value is 12.838, even though all companies in this study are in the same stock market. rate differently. The same information can also be seen from the value of the book to market ratio (BM) where the standard deviation value is 4,054 and the minimum value is quite far, namely 0.073, the difference is against the maximum value of 28,387, so the valuation on the stock exchange for the company is quite different.

**Table 1**  
**Statistics Description**

Variable	Obs	mean	Std. Dev.	Min	Max
ROA	9356	.05	.069	-.118	.327
TOBINs	9356	1,238	1.94	.047	12.838
SIZE	9356	28,898	1.839	24.76	33.313
BM	9356	2,672	4.054	.073	28,387
NI	9356	.011	.026	-.09	.103
LEV	9356	.572	.424	.000	2.119
LOWN	9356	.068	.079	.000068	.452
FOWN	9356	.261	.234	.000574	.943
AG	9356	.087	.308	.000	1.475
COVID	9356	.169	.375	0	1
LA	9355	.005	.27	-.741	1.119
MA	3782	71.236	91.513	3.273	614,589

*Source: Data are collected from S&P Capital IQ and are modified in 2022*

If it is seen that the value of local ownership (LOWN) or local ownership has a smaller maximum value when compared to foreign ownership (FOWN) or foreign ownership, because in this study, local companies in the form of individuals were excluded because in this study what was seen was institutional ownership considering the role of individual companies and institutional companies have different roles where usually individual companies generally sided with the owner and the manager team, while institutional ownership played a role as outsiders who wanted to monitor the company's activities. While foreign ownership, all ownership is calculated in value in this study, so that the value becomes greater than local ownership.

#### **Correlation coefficient**

To check the direction and magnitude of the linear relationship between the dependent, control and independent variables used in the research model, it can be seen from the correlation matrix. Table 2, namely the Pairwise correlation matrix, the dependent variable of ROA on the control variable and the independent variable on the model formed. It can be seen that the control variables SIZE, BM, and FOWN have a positive correlation to ROA while other control

variables such as LEV and LOWN have a negative correlation to ROA, as well as the COVID dummy variable, where company performance is negatively affected during the COVID-19 period. This supports research from Hu and Zhang (2021) and Shen et al. (2020), both of which argued that the COVID-19 pandemic contribute a negative impact on the company's performance. If you look at the independent variables, it can be seen that all variables have a negative correlation with ROA, namely both LA and MA. Likewise, the LA interaction variable for the crisis period due to the COVID-19 pandemic and the MA interaction variable during the crisis period due to the COVID-19 pandemic both showed significance at the 1% confidence level and negatively correlated with ROA, but both behaviors showed an increasing influence due to the COVID-19 crisis is 0.07, which is where the interaction with LA behavior increases from -0.098 to -0.028, while MA behavior increases by 0.1 due to the impact of the COVID-10 pandemic crisis from -0.168 to -0.068.

**Table 2**  
**Correlation Matrix Pairwise ROA**

Variables	ROA	SIZE	BM	LEV	LOWN	FOWN	COVID	LA	LACOVID	MA	MACOVID
ROA	1,000										
SIZE	0.416***	1,000									
BM	0.417***	0.406***	1,000								
LEV	-0.273***	-0.158***	-0.058***	1,000							
LOWN	-0.100***	0.074***	0.065***	-0.031***	1,000						
FOWN	0.079***	0.156***	0.056***	0.144***	-0.118***	1,000					
COVID	-0.124***	-0.005	-0.085***	0.008	0.045***	-0.093***	1,000				
LA	-0.098***	-0.053***	-0.084***	0.061***	0.024**	0.003	0.045***	1,000			
LACOVID	-0.028***	-0.025**	-0.034***	0.035***	0.027***	-0.010	0.089***	0.494***	1,000		
MA	-0.165***	0.057***	0.020	0.175***	0.095***	0.056***	-0.023	-0.023	-0.047***	1,000	
MACOVID	-0.068***	0.021	-0.037**	0.057***	-0.010	-0.085***	0.584***	-0.017	-0.071***	0.244***	1,000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Data are collected from S&P Capital IQ and are modified in 2022.

While the dummy variable for the COVID-19 pandemic crisis period can be seen to be not significantly correlated with the SIZE and leverage variables, it is positively correlated with the local ownership control variable (LOWN). Meanwhile, the independent variable LA does not appear to be significantly correlated with the foreign ownership variable (FOWN). And the MA variable separately does not appear to be correlated with the BM control variable and the COVID dummy variable.

### Empirical Results and Discussions

To test the hypothesis that has been formulated in the empirical model in this study, fixed-effect regression was carried out, which is more precisely by using the two-panel fixed-effect model to capture the effect of the loss-avoidance bias in the financial market in Indonesia. The selection of this fixed-effect model is justified by the results of the F-statistics test (homogeneity test, namely the Wald test:  $P(\text{F-statistics}) < 0.05$ ) and the Hausman test ( $\chi^2$  test), where from the test results, the fixed-effect model is proven to be the most appropriate model in this study than the pooled regression model (pooled OLS) or random effects model (with significant values  $\chi^2$  at the 1 percent, 5 percent, and 10 percent levels). In general, it

is known that pooled panel data analysis is more appropriate to use only if the data is a mixture of time-series and cross-section data, and with a small sample of observations, not as used in this study. In addition, to show that some correlations on the empirical model that are formed do not cause problems in the research model, the Wooldrige test is carried out. And, in order to avoid biased research results, in the data processing process, violations of the classical assumptions of heteroscedasticity, autocorrelation and checking of cross-sectional dependence/contemporaneous correlation on the regression model formed, have been overcome with the robust standard error method.

The regression process in the study was carried out in several steps, where the results of the entire data process can be view on table 4 and result preview that the first step is regression with the dependent variable ROA on all control variables and the COVID dummy variable to see how the impact of the crisis period due to the COVID-19 pandemic on company performance, and the numbers preview that COVID-19 giving a negative effect on company performance by -0.019 and is significant at the 1% confidence level. This is in line with previous research by Hu and Zhang (2021), who saw how the impact of the COVID-19 pandemic had a negative

impact on company performance. Likewise with research by Shen et al. (2020) which examines in more detail which industrial sectors are most affected by the COVID-19 pandemic and have a negative impact on company performance in the industrial sector studied. As well as research by Ren et al., (2021) which in his research examines how the movement of the stock market in China and how the impact of the government's policy on locking several regions to limit movement, has a negative impact on company performance. However, we can say also that the foreign ownership control variable has no effect on the company's performance during the crisis period. The second step in the regression process, the equation model adds the LA behavior variable and the results show that the LA behavior variable has a negative effect on the company by -0.01 and again the foreign ownership control variable does not affect the company's performance.

In the third step of the regression process, it can be seen how the LA variable is interacted with the COVID dummy variable in order to see how the variable affects LA's behavior during the crisis period due to COVID-19. And the regression results from the third step can be seen that the results of the interaction of LA's behavior in the COVID-19 period caused LA to have a positive influence on company performance, so that the influence of LA on the crisis period due to the COVID-19 pandemic became smaller, which was -0.02. Where the effect before the crisis period due to the COVID-19 pandemic was -0.013 then due to the COVID-19 pandemic crisis LA behavior had an effect of 0.011. This may happen, because in times of crisis many companies have to consider projects that have been planned. Market participants become more confident in companies that continue to run their projects until their increasing level of trust makes them increase their trade transactions which causes LA behavior to have a positive impact on company performance in addition to the desire of

market behavior to cover losses that may have been suffered by the market. at the beginning of the crisis due to the COVID-19 pandemic became a profit. The result referred to previous research by Roel and Chen (2021) who in his research proves that the crisis period is bad enough to ensure that the company continues to carry out the most profitable projects and has a special character during the crisis and brings about changes to the company. The results also prove that the crisis period will always encourage decision makers to make decisions and implement projects that are better than the status quo, although in practice various kinds of regulatory and policy reforms must be carried out. This is in line with research from Ouzan (2020) argue that generally in crisis condition increase of loss aversion of investors intensify the cautiousness of their trading. However, as investors' aggressiveness in their trading relies on their own private signal, loss aversion level of investors do not decrease of their trading intensity.

The next regression step is the existence of a model with a dependent variable ROA which is regressed with all control variables and MA independent variables. The regression results prove the research of Koohkan et al. (2021) where in this study the behavior of MA has a negative effect on the company's performance that is equal to -0.0007. Meanwhile, when the MA behavior variable is interacted with the crisis period due to COVID-19, the results show that the COVID-19 period significantly has a negative influence so that the MA influence on the crisis period due to the COVID-19 pandemic becomes larger, which is 0.00001, where the influence of behavior on the MA before the crisis due to the COVID-19 pandemic was -0.0009 then due to the COVID-19 pandemic crisis, MA's behavior had an effect of 0.0001. This might happen, considering that psychologically not all investors are willing to take risks to gain profits during a crisis and not all investors are willing to give up their profits because they are afraid of the losses they may suffer. In line with the opinion of Mascareñas

and Yan (2017) that mental accounting behavior will risk and return to meet their investment expectations, investors will engage in investing activities only if their psychological needs are met.

The sixth column in table 3, clearly shows the effect of loss aversion behavior and mental accounting, which has a significant negative effect on company performance. The results also show how the influence of the control variables BM, LEV, LOWN, FOWN and the COVID dummy period also significantly influences the

company's performance. Where apart from BM, all control variables show a negative effect on company performance. In this step, the result of the coefficient of determination  $R^2$  is 20.17 per-cent, which means that all control and independent variables are statistically significant ( $F = 45.33$ ,  $p\text{-value} = 0.0000$ ) giving an effect on the company's ROA performance of 20.17 percent.

**Table 3**  
**Regression Result - ROA**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SIZE	.007*** (.002)	.007*** (.002)	.007*** (.002)	.0003 (.003)	0 (.002)	.001 (.003)	.002 (.002)
BM	.003*** (0)	.003*** (0)	.003*** (0)	.009*** (.001)	.009*** (.001)	.009*** (.001)	.009*** (.001)
LEV	-.021*** (.003)	-.02*** (.003)	-.02*** (.003)	-.035*** (.007)	-.036*** (.006)	-.034*** (.007)	-.034*** (.008)
LOWN	-.032** (.014)	-.03** (.014)	-.031** (.014)	-.082** (.036)	-.08*** (.028)	-.079** (.036)	-.064 (.039)
FOWN	.006 (.005)	.006 (.005)	.006 (.005)	-.026*** (.01)	-.026** (.01)	-.025** (.01)	-.011 (.01)
COVID	-.019*** (.004)	-.019*** (.004)	-.019*** (.004)	-.016*** (.004)	-.024*** (.006)	-.015*** (.004)	-.023*** (.007)
LA		-.01*** (.003)	-.013*** (.003)			-.01** (.004)	-.011** (.005)
LACOVID			.011** (.005)				.006 (.008)
MA				-.00007*** (.001)	-.00009*** (.000)	-.00007*** (.000)	-.00009*** (.000)
MACOVID					.0001** (.035)		.0001 (.168)
_cons	-.139*** (.047)	-.133*** (.044)	-.139*** (.044)	.08 (.102)	.084 (.072)	.073 (.096)	.026 (.057)
Observations	9356	9355	9355	3782	3782	3782	3782
Pseudo R2	.1002	.1034	.1042	.1990	.2033	.2017	.205
F-Value / Wald	49.20	45.48	48.15	38.62	51.19	45.33	237.36
Prob	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Robust standard errors are in parentheses*

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Data are collected from S&P Capital IQ and are modified in 2022

Table 4  
Regression Results - ROA per Sector

	Communication Services Industry	Consumer Industry (Non-Essential)	Consumer Industry (Essential)	Energy	Health	Industry	Information Technology	Material	Housing area	Infrastructure, Utilities & Transportation
SIZE	.009*** (.003)	-.002 (.004)	-.005 (.005)	.005 (.008)	.005 (.004)	.003 (.005)	-.027*** (.002)	.006** (.003)	.001 (.004)	-.027 (.027)
BM	.009*** (.002)	.009*** (.001)	.009*** (.002)	.01*** (.003)	.004** (.002)	.011* (.006)	.028 (.026)	.008** (.003)	.019*** (.006)	.015*** (.003)
LEV	-.102*** (.009)	.005 (.012)	-.066*** (.017)	-.067** (.033)	-.043 (.047)	-.027** (.013)	.056*** (.019)	-.057*** (.02)	-.009 (.01)	-.013 (.089)
LOWN	-.308 (.237)	-.093** (.04)	-.115 (.145)	.261 (.181)	.312** (.132)	-.106*** (.04)	.067 (.063)	-.079 (.09)	.048 (.067)	-.404*** (.135)
FOWN	-.07 (.044)	-.025 (.018)	.012 (.022)	-.017 (.061)	-.001 (.042)	-.0004 (.025)	.2*** (.06)	-.051*** (.019)	-.012 (.011)	.331*** (.088)
COVID	.016 (.014)	-.028*** (.011)	-.013 (.013)	-.044** (.018)	-.017 (.013)	-.012 (.016)	-.019 (.027)	-.015*** (.005)	-.006 (.006)	.023*** (.003)
LA	-.008 (.021)	-.002 (.005)	-.029*** (.007)	-.019 (.015)	-.035** (.017)	.009 (.01)	-.036 (.032)	.012 (.01)	-.004 (.007)	-.025* (.015)
LACOVID	.013 (.022)	.004 (.014)	.004 (.014)	.03 (.031)	.05* (.028)	-.003 (.015)	-.006*** (.002)	-.019 (.013)	-.028 (.025)	.074*** (.007)
MA	-.00007* (.073)	-.00006*** (.009)	-.0001*** (.003)	-.00009 (.286)	-.00002** (.018)	-.0002** (.032)	.00004 (.759)	-.0001*** (.000)	-.00005*** (.000)	.00003 (.309)
MACOVID	.00008 (.245)	.00003 (.668)	.00002 (.775)	.0004*** (.000)	.00003 (.955)	-.0001 (.363)	.001* (.001)	.0000005 (.905)	.001* (.050)	-.001 (.001)
_cons	-.111 (.123)	.123 (.106)	.268* (.157)	-.072 (.237)	-.066 (.128)	-.01 (.139)	.731*** (.097)	-.069 (.079)	-.003 (.102)	.84 (.89)
Obs.,	287	524	908	383	188	474	49	617	286	66
R-squared	0.275	0.195	0.278	0.311	0.036	0.225	0.356	0.296	0.190	0.798

Standard errors are in parentheses

\*\*\* p<.01, \*\*p<.05, \*p<.1

Source: Data are collected from S&P Capital IQ and are modified in 2022.

The seventh step, namely the regression process in which all control variables together with the independent variables LA and MA as well as the interaction variables LA and MA on the crisis period due to the COVID-19 pandemic which are all interacted with the dependent variable ROA, it is seen that when the entire regression process is carried out for all these variables, it can be seen how the behavioral variables LA and MA still have a negative influence on the company's performance, namely where each is significant at the 5% confidence level for the LA variable with a coefficient of -0.011 and at the 1% level for the MA variable with a coefficient of coefficient -0.0009. However, at this step, all interaction variables, both LA and MA on the crisis period due to the COVID-19 pandemic, are insignificant. This might happen considering that the results in the third and fifth regression processes show conflicting results where during the crisis due to the COVID-19 pandemic, LA behavior becomes smaller by -0.02 while MA behavior becomes larger by 0.00001. However, the results show that the COVID variable still has a significant negative effect on the company's performance by -0.023.

Meanwhile, the results of the regression per industry sector can be seen in table 5 where the LA and MA behavioral factors that affect the company's performance are only the essential consumer goods industry sector and the health sector, both of which have a negative impact on company performance. However, the behavior affected by the COVID-19 pandemic crisis, namely LA's behavior in the health and utility sectors. Where in the health sector, LA's behavior during the crisis period had a positive influence and increased by 0.15 to be higher, this might have happened considering that during the crisis period due to COVID-19, investors were hesitant to invest because Indonesia was still dependent on imported medical equipment and the inability to produce medical equipment in the early days of the crisis due to the COVID-19 pandemic, this is as stated by the Coordinating Minister

for Maritime Affairs and Investment Luhut Binsar Pandjaitan (Junida, 2021). This is in line with the utility sector which shows LA behavior during the crisis period increased by 0.049, this could be due to many companies reviewing their projects so that investors are also more careful with the possibility of failure or cessation of projects. work planning projects during the crisis due to the COVID-19 pandemic, where during the crisis many companies were more careful in implementing their project plans.

Meanwhile, MA's behavior can be said to have a negative effect on company performance in almost all sectors except for the energy, information technology and utilities sector. And if it is interacted with the crisis period due to COVID-19, it can be seen that only the housing sector has shown its effect in increasing the MA behavior, which is 0.00095. Of course, the uncertain conditions due to the COVID-19 pandemic crisis have encouraged investors to be more careful in allocating their investment funds, especially in the housing sector which may be most affected by the COVID-19 pandemic crisis (Petriella, 2020; Susanto, 2021). Meanwhile, other sectors did not show the influence of MA behavior during the crisis period due to the COVID-19 pandemic.

From the results of this regression per sector, it can be seen that the highest coefficient of determination  $R^2$  is from the infrastructure, utilities and transportation sectors of 79.8 percent, which means that the biggest influence on the company's ROA performance is from the infrastructure, utilities and transportation sectors, although in this sector only loss behavior aversion which significantly shows a negative effect on the company, but the mental accounting variable does not significantly affect the company's performance.

**Table 5**  
**Regression Results – TOBIN's Q**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SIZE	.668*** (.043)	.661*** (.041)	.668*** (.039)	.901*** (.081)	.901*** (.081)	.903*** (.073)	.924*** (.068)
NI	7,735*** (1.077)	7,402*** (1,098)	7,378*** (1.101)	19,138*** (1,399)	19,203*** (1.374)	18,756*** (1,434)	18,607*** (1.376)
AG	-.231*** (.082)	-.229*** (.083)	-.235*** (.082)	-.087 (.087)	-.087 (.087)	-.08 (.087)	-1 (.086)
LEV	-.053 (.096)	-.048 (.095)	-.052 (.094)	-.242 (.29)	-.238 (.289)	-.237 (.29)	-.241 (.291)
LOWN	.01 (.35)	.044 (.337)	.022 (.336)	-.614 (.667)	-.621 (.672)	-.548 (.639)	-.665 (.639)
FOWN	-.125 (.149)	-.107 (.147)	-.106 (.148)	.84*** (.187)	.841*** (.186)	.855*** (.192)	.839*** (.194)
COVID	-.466*** (.081)	-.461*** (.086)	-.47*** (.077)	-.54*** (.134)	-.501*** (.131)	-.534*** (.142)	-.532*** (.116)
LA		-.244*** (.063)	-.338*** (.06)			-.218 (.131)	-.409*** (.095)
LACOVID			.388*** (.089)				.849*** (.183)
MA				.0002 (.0000)	.0003 (.0000)	.0002 (.0000)	.0002 (.0000)
MACOVID					-.001 (.001)		-.0003 (.001)
_cons	-17,996*** (1,285)	-17.8*** (1.203)	-17,987*** (1,169)	-25,551*** (2,397)	-25,561*** (2,411)	-25.62*** (2,154)	-26.233*** (2,031)
Observations	9356	9355	9355	3782	3782	3782	3782
Pseudo R2	.2505	.2541	.2558	.3741	.3742	.3762	.3817
F-Value	150.12	145.89	258.18	99.27	88.04	96.23	121.38
Prob	.0000	.0000	.0000	.0000	.0000	.0000	.0000

Standard errors are in parentheses

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Data are collected from S&P Capital IQ and are modified in 2022.

The results per industry sector also show that there is no single sector where the interaction of the crisis period due to the COVID-19 pandemic on loss aversion behavior and mental accounting during a crisis together has a significant effect on company performance in each sector.

### Robustness Tests

The results of the regression to the dependent variable TOBIN's Q in table 6 can be seen how the results show things that are in line with the results of the first step regression with the dependent variable ROA, where the COVID-19 pandemic crisis period has a negative effect on company

performance. However, the control variables LEV, LOWN and FOWN have no significant effect on company performance. While SIZE and NI have a significant positive effect on the company's performance and AG has a significant negative effect of -0.231 on the company's performance.

The second step, shows how LA's behavior has a significant negative effect on the company by -0.244. Meanwhile, in the third step, LA's behavior is interacted with the crisis period of the COVID-19 pandemic, so the variables formed indicate an increase in LA behavior from before the crisis due to COVID-19 compared to during the crisis due to the COVID-19 pandemic, which is 0.05.

different from the results of the regression on ROA where the previous results showed that the impact of the crisis due to COVID-19 brought a decrease in LA behavior.

Different results are also shown in the fourth and fifth steps, where MA behavior has no significant effect on company performance. The results of the MA behavior interaction after being interacted with the crisis period due to COVID-19 also showed that there was no effect on the company's performance. This different thing, can be influenced by several things, maybe for this study, due to the limited availability of MA data as a result in this study the MA calculation using dividend data which as previously informed that there are still many companies that distribute dividends regularly. In this study, the distribution of dividends varies widely, some are distributed quarterly, per semester, but some are distributed annually and more do not distribute dividends. Considering that the research uses quarterly data, the researchers do data equality in order to get quarterly data. This is a shortcoming in this study which may cause the results to show different results and their effect on company performance.

In the seventh regression processing step, where all control variables and independent variables are regressed against the dependent variable TOBIN's Q, the results again show that only LA behavior variables have an influence on company performance, both before the crisis period due to the COVID-19 pandemic and during the crisis period due to COVID-19, which is where LA's behavior shows a negative influence on company performance and during the crisis period due to COVID-19, this behavior increased by 0.44. This may be because investors are still very careful when making their investments, as revealed by Riaz et al. (2020) which examines market behavior in Pakistan, where they become more cautious in investing considering that Pakistani investors have a behavioral character to want to increase their wealth immediately, avoid risk, fear losses and

always expect income from companies and dividends.

This is in line with research in India by Surana (2021) which examines how investors behave in the retail sector before and after the crisis due to the COVID-19 pandemic, where the behavior of investors in India is more cautious by investing more in companies that have just IPOs and making their investment decisions based on speculative measures rather than fundamentals. actual problem under consideration.

Furthermore, in terms of per industrial sector in table 6, it can be seen that almost all industrial sectors except for the telecommunications services sector, essential consumer industries, information technology and housing indicate that LA behavior has an influence on company performance and its interaction with the crisis period due to COVID-19 has a significant effect. significant and all indicate that the crisis period due to COVID-19 has an effect on increasing LA behavior.

And only one sector, namely the essential consumer industry sector, showed results that MA's behavior had a positive influence on companies, as well as after interacting with the crisis period due to the COVID-19 pandemic where there was an increase in MA's behavior by 0.0067. This contradicts the theory Thaler (1999) where everyone thinks that they make different accounts for their expenses and income and investors do this because it is related to their behavior of aversion to losses that may be suffered from each investment they make. As is the case with research conducted by Baucells et al. (2023), where in their research they used mental accounting models as a result of loss aversion, reference point updating, and narrow framing and examined how they impact investment decisions. However, as previously explained, this theoretical conflict may occur because of the weakness of the MA variable research data in this study, due to the undisciplined company in Indonesia in distributing dividends.

Table 6  
Regression Results – TOBIN's Q per Sector

	Communication Services Industry	Consumer Industry (Non- Essential)	Consumer Industry (Essential)	Energy	Health	Industry	Information Technology	Material	Housing area	Infrastructure, Utilities & Transportation
SIZE	1.523*** (.217)	.842*** (.117)	.77117*** (.084)	2.1533*** (.330)	1.480*** (.138)	.51438*** (.041)	.21423 (.130)	.92405*** (.161)	.25270*** (.050)	1,219*** (.218)
NI	25,376*** (6,549)	15,812*** (3,820)	21,696*** (2,966)	13,0297** (5,145)	27,258 (5,898)***	.38746*** (2,338)	18,801* (9,394)	14,811*** (2,634)	3,1172*** (1,075)	23,528*** (4,428)
AG	-707** (.317)	-0269 (.193)	.2631 (.234)	-0421 (.230)	-5578 (.887)	-1977** (.089)	-12799 (.153)	-12827 (.217)	-03210 (.073)	-782*** (.291)
LEV	-843 (.621)	.7653 (.653)	-1.33*** (.289)	-0268 (.907)	-4223 (1,660)	-09260 (.192)	-82994 (.709)	-13446 (.313)	-4644* (.248)	.442 (.383)
LOWN	2,998 (6,464)	-1.321 (1,334)	-6142 (1,293)	2,9007 (3,255)	-1,6947 (3,622)	.37 (.472)	4,291 (2,583)	-5,4498*** (1,744)	-57162 (.380)	-7,137 (6,478)
FOWN	-1,296 (1,535)	.0544 (.510)	.7954 (.487)	2,7461** (1,340)	4,7507*** (.999)	-6805*** (.176)	2,5062 (3,003)	.66735** (.306)	.19496 (.184)	2,373 (4,579)
COVID	-1,312 (.256)	-1.33* (.677)	-7,530*** (.116)	-4095 (.315)	-5,9906** (.229)	-2,662*** (.082)	-8,9221* (.482)	-2,418* (.141)	-.05 (.127)	.686*** (.210)
LA	-2,547 (.422)	-5,43*** (.185)	-1,372 (.150)	-8,328** (.352)	-9,2721*** (.317)	-3,112*** (.054)	-1,6984 (.212)	-2,618** (.116)	-2,1706* (.119)	-.11 (.154)
LACOVID	.8878** (.440)	2,4679** (1,171)	.1982 (.279)	1,679*** (.378)	1,2878** (.496)	.4069*** (.090)	.45929 (.338)	.40558*** (.150)	.07082 (.117)	.871*** (.236)
MA	-0005 (.001)	-0009 (.001)	.0033*** (.001)	.00174 (.001)	-00060 (.001)	-00009 (.000)	.00167 (.002)	.00093 (.001)	-00009 (.000)	.001 (.001)
MACOVID	-0028* (.002)	.0079* (.005)	.0034*** (.001)	-00318** (.001)	-002586 (.002)	.00102 (.001)	.01821* (.010)	-00356 (.003)	-0018 (.002)	-012** (.005)
_cons	-44,847*** (6,595)	-23,659*** (3,495)	-21,2125*** (2,469)	-65,281*** (10,072)	42,777*** (4,091)	-13,857*** (1,159)	-6,3683* (3,740)	-25,8795*** (4,703)	-6,5085*** (1,437)	-37,982*** (6,602)
Observations	287	524	908	383	188	474	49	617	286	66
Pseudo R2	.6618	.3812	.4248	.5414	.6871	.5715	.6881	.3567	.4137	.9120
F-Value	52.33	16.19	27.09	85.86	63.19	51.76	5.69	10.20	88.60	47.36
Prob	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0000	.0000	.0000

Standard errors are in parentheses

\*\*\* p<.01, \*\*p<.05, \*p<.1

Source: Data are collected from S&P Capital IQ and are modified in 2022.

## CONCLUSION AND SUGGESTIONS

Previous research by Bouteska and Regaieg (2020) has proven that loss aversion behavior has a negative effect on the company. From the results of both research looking at the performance of companies with ROA and TOBIN's Q, it is proven that loss aversion behavior has a negative effect on the company. Likewise, if viewed from the results of research for each sector, both ROA and TOBIN's Q it is proven that loss aversion behavior with significant results with a confidence level of 1%, 5% or 10% shows a negative effect on the company. The study also proves that several control variables also influence the company's performance in line with loss aversion behavior. So from the results of the study it can be said that the hypothesis in this study is accepted,

While previously described, research Barberis and Huang (2001) form a portfolio to assess whether mental accounting is formed based on the price-dividend ratio to explain market reactions and to assess whether companies paying lower dividends are able to beat companies paying higher dividends. This study uses a price-dividend ratio to show that mental accounting behavior has a negative impact on company performance. And the results of research on the performance of ROA companies show that mental accounting behavior has a negative influence. Likewise, after the crisis period due to the COVID-19 pandemic, there was an increase in the influence of mental accounting. However, when viewed from each sector, only one sector shows the effect of changes in the crisis period due to the COVID-19 pandemic,

Looking at the operating results of company performance on TOBIN's Q, mental accounting behavior does not appear to have an effect. This is in line with the results of research by sector, where only one sector does show an effect, but the results show the opposite of theory Thaler (1999) which shows a positive influence on company performance. However, as discussed earlier, this may be due to the data in this

study which eliminated companies that did not pay dividends, which is almost more than 33% of the data in the study were eliminated.

In this study, companies are limited to companies that have been members of KOMPAS100. The purpose of this limitation is so that research is more focused on companies that are liquid and still actively trading in the market during the research period. The research also does not focus on one industrial sector because researcher main focus is to see the effect of loss aversion behavior and mental accounting as a whole on companies in Indonesia without limiting certain sectors. However, researchers in conducting comparative analysis still display the results of the analysis per sector as a whole.

To see mental accounting behavior, researchers only use the price-dividend ratio variable, as a benchmark for measuring mental accounting behavior, while there are many companies in Indonesia that are not disciplined in making dividend payments and if payments are made, they are not made regularly, either three-quarters, six-sixths, month or per year. So that this study has limitations in providing mental accounting data from all companies in the study. And the limitations of this data, which is suspected to be the cause of the research results that contradict the theory that has been discussed previously.

The implications of the results of this research theoretically are as proof of existing theories as well as to prove previous studies, but not limited to checking whether theories and research that have existed before still apply the same during the crisis period due to the COVID-19 pandemic. considering that this event had recently occurred and could be said to have shaken the world economy.

## REFERENCES

- Fitzgerald, A., K. Kwiatkowski, V. Singer, and S. Smit. 2020. *The Coronavirus Effect on Global Economic Sentiment*. McKinsey & Co. New York.

- Alessandri, T. M., J. Mammen, and K. Eddleston. 2018. Managerial Incentives, Myopic Loss Aversion, and Firm Risk: A Comparison of Family and Non-Family Firms. *Journal of Business Research* 91: 19–27. <https://doi.org/10.1016/j.jbusres.2018.05.030>.
- Aliaga-Diaz, R., G. Renzi-Ricci, A. Daga, and H. Ahluwalia. 2020. Portfolio Optimization with Active, Passive, and Factors: Removing the Ad Hoc Step. *The Journal of Portfolio Management* 46(4): 39–51. DOI: 10.3905/jpm.2020.1.127.
- Almari, M. O. S., S. R. S. Weshah, M. M. A. Saleh, H. H. H. Aldboush, and B. J. Ali. 2021. Earnings Management, Ownership Structure and the Firm Value: an Empirical. *Journal of Management Information and Decision Sciences* 24(7): 1–14. <https://www.proquest.com/docview/2565213061?pq-origsite=gscholar&fromopenview=true>.
- Banerjee, P., P. Chatterjee, S. Mishra, and A. A. Mishra. 2019. Loss is a Loss, Why Categorize It? Mental Accounting Across Cultures. *Journal of Consumer Behaviour* 18(2): 77–88. <https://doi.org/10.1002/cb.1748>.
- Bank Indonesia. 2020. Krisis Kemanusiaan COVID-19 dan Implikasinya pada Tatanan Perekonomian Global. [https://www.bi.go.id/id/publikasi/laporan/Documents/3\\_LPI2020\\_BAB1.pdf](https://www.bi.go.id/id/publikasi/laporan/Documents/3_LPI2020_BAB1.pdf).
- Barberis, N. and M. Huang. 2001. Mental Accounting, Loss Aversion, and Individual Stock Returns. *The Journal of Finance* 56(4): 1247–1292. <https://doi.org/10.1111/0022-1082.00367>.
- Barberis, N. 2018. Psychology-Based Models of Asset Prices and Trading Volume. *Handbook of Behavioral Economics* (1st ed., Vol. 1). <https://doi.org/10.1016/bs.hesbe.2018.07.001>.
- Baucells, M., Y. Grushka-Cockayne, and W. Hwang. 2023. Managerial Mental Accounting and Downstream Project Decisions. *Darden Business School Working Paper No. 3265724*. <https://dx.doi.org/10.2139/ssrn.3265724>.
- Bikas, E. and V. Saponaitė. 2018. Behavior of the Lithuanian Investors at the Period of Economic Growth. *Entrepreneurship and Sustainability Issues* 6(1): 44–59. [https://dx.doi.org/10.9770/jesi.2018.6.1\(4\)](https://dx.doi.org/10.9770/jesi.2018.6.1(4)).
- Bouteska, A. and B. Regaieg. 2020. Loss Aversion, Overconfidence of Investors and Their Impact on Market Performance Evidence from the US Stock Markets. *Journal of Economics, Finance and Administrative Science* 25(50): 451–478. <https://doi.org/10.1108/JEFAS-07-2017-0081>.
- Cherono, I. 2020. Investor Behaviour and Stock Market Reaction in Kenya. *European Journal of Economic and Financial Research* 4(2): 89–127. <http://dx.doi.org/10.46827/ejefr.v4i2.856>.
- Cook, D. O., X. Fu, and T. Tang. 2016. Are Target Leverage Ratios Stable? Investigating the Impact of Corporate Asset Restructuring. *Journal of Empirical Finance* 35: 150–168. <https://doi.org/10.1016/j.jempfin.2015.11.003>.
- Cucinotta, D. and M. Vanelli. 2020. WHO Declares COVID-19 a Pandemic. *Acta bio medica: Atenei Parmensis* 91(1): 157–160. <https://doi.org/10.23750%2Ffabm.v91i1.9397>.
- Das, S. R., D. N. Ostrov, A. Radhakrishnan, and D. Srivastav. 2018. A New Approach to Goals-Based Wealth Management. *SSRN Electronic Journal*: 1–34. <https://dx.doi.org/10.2139/ssrn.3117765>.
- Ghelichi, M. A., B. Nakhjavan, and M. Gharehdaghi. 2016. Impact of Psychological Factors on Investment Decision Making in Stock Exchange Market. *Asian Journal of Management Sciences & Education* 5(3): 36–44. [http://www.ajmse.leena-luna.co.jp/AJMSEPDFs/Vol.5\(3\)/AJMSE2016\(5.3-04\).pdf](http://www.ajmse.leena-luna.co.jp/AJMSEPDFs/Vol.5(3)/AJMSE2016(5.3-04).pdf).
- Gregory, R. P. 2021. Why ROE, ROA, and Tobin's Q in Regressions Aren't Good Measures of Corporate Financial Performance for ESG Criteria. *SSRN Electronic Journal*. <https://dx.doi.org/10.2139/ssrn.3775789>.

- Hahnel, U. J. J., G. Chatelain, B. Conte, V. Piana, and T. Brosch. 2020. Mental Accounting Mechanisms in Energy Decision-Making and Behaviour. *Nature Energy* 5(12): 952–958. <https://doi.org/10.1038/s41560-020-00704-6>.
- Hoffmann, C. and K. Thommes. 2020. Using Loss Aversion to Incentivize Energy Efficiency In a Principal-Agent Context-Evidence from a Field Experiment. *Economics Letters* 189, 108984. <https://doi.org/10.1016/j.econlet.2020.108984>.
- Hu, S. and Y. Zhang. 2021. COVID-19 Pandemic and Firm Performance: Cross-Country Evidence. *International Review of Economics and Finance* 74(2020): 365–372. <https://doi.org/10.1016/j.iref.2021.03.016>.
- Huber, C., J. Huber, and M. Kirchler. 2021. Market Shocks and Professionals' Investment Behavior-Evidence from the COVID-19 Crash. *Journal of Banking and Finance* 133, 106247. <https://doi.org/10.1016/j.jbankfin.2021.106247>.
- Junida, A. I. 2021. Luhut: Industri Kesehatan Prioritas Investasi Di Tengah Pandemi. <https://www.antaranews.com/berita/2564145/luhut-industri-kesehatan-prioritas-investasi-di-tengah-pandemi>.
- Kahneman, D. and A. Tversky. 1979. Prospect Theory: an Analysis of Decision under Risk. *Econometrica* 47(2): 263–292. <https://doi.org/10.2307/1914185>.
- Khan, A. R., M. Azeem, and S. Sarwar. 2017. Impact of Overconfidence and Loss Aversion Biases on Investment Decision: Moderating Role of Risk Perception. *International Journal of Transformation in Accounting, Auditing & Taxation* 1(1): 23–35.
- Koohkan, F., M. R. Shourvarzi, A. Masihabadi, and A. Mehrazin. 2021. Investigating the Effect of Investors' Mental Accounting on Investment and Financing Policies. *Journal of Accounting Knowledge* 12(4): 137–153. DOI: 10.22103/JAK.2021.17368.3453.
- Koumou, G. B. 2020. Diversification and Portfolio Theory: a Review. *Financial Markets and Portfolio Management* 34(3): 267–312. <https://doi.org/10.1007/s11408-020-00352-6>.
- Kremer, M., G. Rao, and F. Schilbach. 2019. Behavioral Development Economics. *Handbook of Behavioral Economics: Applications and Foundations* 1, 2: 345–458. <https://doi.org/10.1016/bs.hesbe.2018.12.002>.
- Li, D., Y. Zeng, and H. Yang. 2018. Robust Optimal Excess-of-Loss Reinsurance and Investment Strategy for an Insurer in a Model with Jumps. *Scandinavian Actuarial Journal* 2018(2): 145–171. <https://doi.org/10.1080/03461238.2017.1309679>.
- Liu, H. and H. Chou. 2019. The Effects of Promotional Package Frames and Price Strategies on Inaction Inertia. *Psychology & Marketing* 36(3): 214–228. <https://doi.org/10.1002/mar.21173>.
- Martina, R. A. 2020. Toward a Theory of Affordable Loss. *Small Business Economics* 54(3): 751–774. <https://doi.org/10.1007/s11187-019-00151-y>.
- Mascareñas, J. and F. Yan. 2017. How People Apply Mental Accounting Philosophy to Investment Risk? *International Journal of Economics and Financial Issues* 7(3): 145–151. <https://dergipark.org.tr/en/pub/ijefi/issue/32021/354213>.
- Ortmann, R., M. Pelster, and S. T. Wengerek. 2020. COVID-19 and Investor Behavior. *Finance Research Letters*, 37, 101717. <https://doi.org/10.1016/j.frl.2020.101717>.
- Ututeye, E. and M. Siddiquee. 2020. Underperformance of Actively Managed Portfolios: Some Behavioral Insights. *Journal of Behavioral Finance* 21(3): 284–300. <https://doi.org/10.1080/15427560.2019.1692210>.
- Ouzan, S. 2020. Loss Aversion and Market Crashes. *Economic Modelling* 92(July): 70–86. <https://doi.org/10.1016/j.econmod.2020.06.015>.

- Petriella, Y. 2020. Properti Terdampak Pandemi Covid-19, Ini Harapan DPD RI. <https://ekonomi.bisnis.com/read/20201228/47/1336144/properti-terdampak-pandemi-covid-19-ini-harapan-dpd-ri>.
- Rashata, H. 2022. Investors' Behavior in the Pakistan Financial Market during the COVID-19 Pandemic. *SSRN Electronic Journal*. <https://dx.doi.org/10.2139/ssrn.4013498>.
- Ren, Z., X. Zhang, and Z. Zhang. 2021. New Evidence on COVID-19 and Firm Performance. *Economic Analysis and Policy* 72: 213–225. <https://doi.org/10.1016/j.eap.2021.08.002>.
- Riaz, S., P. Riaz Ahmed, R. Parkash, and M. Javed Ahmad. 2020. Determinants of Stock Market Investors' Behavior in COVID-19: A Study on the Pakistan Stock Exchange. *International Journal of Disaster Recovery and Business Continuity* 11(3): 977–990. <https://philpapers.org/rec/RIADOS>.
- Roel, M. and Z. Chen. 2021. The Silver Lining of Crises – a Loss Aversion Based Model of Reform. *SSRN Electronic Journal*, 71903046. <https://dx.doi.org/10.2139/ssrn.3827274>.
- Schleich, J., X. Gassmann, T. Meissner, and C. Faure. 2019. A Large-Scale Test of the Effects of Time Discounting, Risk Aversion, Loss Aversion, and Present Bias on Household Adoption of Energy-Efficient Technologies. *Energy Economics* 80: 377–393. <https://doi.org/10.1016/j.eneco.2018.12.018>.
- Shafqat, S. I. and I. R. Malik. 2021. Role of Regret Aversion and Loss Aversion Emotional Biases in Determining Individual Investors' Trading Frequency: Moderating Effects of Risk Perception. *Humanities & Social Sciences Reviews* 9(3): 1373–1386. <https://doi.org/10.18510/hssr.2021.93137>.
- Shah, S. F., M. T. Alshurideh, A. Al-Dmour, and R. Al-Dmour. 2021. Understanding the Influences of Cognitive Biases on Financial Decision Making During Normal and COVID-19 Pandemic Situation in the United Arab Emirates. *Studies in Systems, Decision and Control*, 334: 257–274. Springer, Cham. [https://doi.org/10.1007/978-3-030-67151-8\\_15](https://doi.org/10.1007/978-3-030-67151-8_15).
- Shen, H., M. Fu, H. Pan, Z. Yu, and Y. Chen. 2020. The Impact of the COVID-19 Pandemic on Firm Performance. *Emerging Markets Finance and Trade* 56(10): 2213–2230. <https://doi.org/10.1080/1540496X.2020.1785863>.
- Smales, L. A. 2021. Investor Attention and Global Market Returns during the COVID-19 Crisis. *International Review of Financial Analysis* 73(June 2020), 101616. <https://doi.org/10.1016/j.irfa.2020.101616>.
- Sun, L., W. Zhan, Y. Hu, and M. Tomizuka. 2019. Interpretable Modelling of Driving Behaviors in Interactive Driving Scenarios based on Cumulative Prospect Theory. *2019 IEEE Intelligent Transportation Systems Conference (ITSC)*: 4329–4335. <https://doi.org/10.1109/ITSC.2019.8916944>.
- Surana, S. 2021. Indian Retail Investors and Initial Public Offers: Pre and Post Covid Analysis. *Information Technology in Industry* 9(2): 345–352. <https://doi.org/10.17762/itii.v9i2.353>.
- Susanto, V. Y. 2021. REI: Efek Pandemi Terhadap Penjualan Properti akan Terasa 2 Tahun Ke Depan. <https://newssetup.kontan.co.id/news/rei-efek-pandemi-terhadap-penjualan-properti-akan-terasa-2-tahun-ke-depan-1>.
- Thaler, R. 1999. Mental Accounting Matters. *Journal of Behavioral Decision Making* 12(3): 183–206. [https://doi.org/10.1002/\(SICI\)1099-0771\(199909\)12:3%3C183::AID-BDM318%3E3.0.CO;2-F](https://doi.org/10.1002/(SICI)1099-0771(199909)12:3%3C183::AID-BDM318%3E3.0.CO;2-F).
- Wang, T., H. Li, X. Zhou, B. Huang, and H. Zhu. 2020. A Prospect Theory-Based Three-Way Decision Model. *Knowledge-Based Systems*, 203, 106129. <https://doi.org/10.1016/j.knosys.2020.106129>.
- Yang, B. and L. Gan. 2021. Contingent Capital, Tobin's Q and Corporate Capital Structure. *The North American Journal of Economics and Finance*, 55,

101305. <https://doi.org/10.1016/j.najef.2020.101305>.
- Yang, L. 2019. Loss Aversion in Financial Markets. *Journal of Mechanism and Institution Design* 4(1): 119-137. <https://ssrn.com/abstract=3531959>.
- Zamzamin Zamzamin, Z., R. Haron, and A. H. A. Othman. 2021. Hedging, Managerial Ownership and Firm Value. *Journal of Asian Business and Economic Studies* 28(4): 263-280. <https://doi.org/10.1108/JABES-08-2020-0101>.
- Zandi, G., J. Singh, S. Mohamad, and S. Ehsanullah. 2020. Ownership Structure and Firm Performance. *International Journal of Financial Research* 11(2): 293-300. <https://doi.org/10.5430/ijfr.v11n2p293>.
- Zhang, L., H. Zhang, and S. Hao. 2018. An Equity Fund Recommendation System by Combing Transfer Learning and the Utility Function of the Prospect Theory. *The Journal of Finance and Data Science* 4(4): 223-233. <https://doi.org/10.1016/j.jfds.2018.02.003>.