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# Does Disposition Effect Appear on Investor Decision During the COVID-19 Pandemic Era: Empirical Evidence from Indonesia\*

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## Abstract

Disposition Effect (DE) is one of the many investment biases, wherein the investors sell the profitable stocks rather quickly and they tend to hold on the loss making stocks. Various factors related to the DE are the character of investors applying risk management which is also influenced by the social media, Salient Shock (COVID-19), and in the specific case of Indonesia, the phenomenon of rumor stocks wherein the price can rise as much as up to 8500%. The study aims to provide empirical evidence regarding the DE with specific explanatory factors, namely investor behavior and rumors. Data was obtained through a questionnaire sent to 248 Indonesian Stock Exchange Investors (IDX) during the period October-November 2021 by using Ordinary Least Square (OLS) method. The results show: Generation Z, women, and investors with a low education has a greater DE, risk-takers tend to have lower DE, and professionals have negative DE. Implementation of risk management will reduce DE. Social Media and the COVID-19 situation positively affect DE. Especially on stock rumors, there is evidence that investors who own rumor stocks will have a low DE. The results indicate the need for: (i) risk management, especially for Z Generation, women and low education Investors, (ii) to provide positive information so that information on social media can be responded to positively.

**Keywords:** Disposition Effect, Rumor, COVID-19, Risk Management, Social Media

**JEL Classification Code:** G14, G32, G41

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## 1. Introduction

Disposition effect (DE) is one of the many behaviors of investors in stock transactions. DE tends to sell potential gains stocks quickly and hold potential losses stocks. It causes investors to get real profits but still bear the potential for losses. The existence of the COVID-19 pandemic has shocked the world, and its effects can also be witnessed in the behavior of the stock investors. The pandemic has caused many to sit in their homes or work from their homes, leading to a surge in new stock investors and an increase in the time spent in online transactions. These new investors have minimal knowledge of stock investments. Currently, the influence of social media is very dominant, especially in Indonesia. There is a rumor stock phenomenon. The research provides evidence of the Disposition Effect. Our novelty research is about; (i) the relationship between risk management and DE, (ii) the impact of social media on DE, and (iii) the influence of rumors on DE. To our best knowledge, there is no research regarding rumors

and DE. This research can provide enrichment research on behavioral finance.

## 2. Literature Review

Breitmayer et al. (2019) found that age positively affects the disposition effect. Women had more frequent DE (Breitmayer et al., 2019), Cueva et al. (2019), Oreng (2021), but Talpsepp (2010) found no difference between women and men in DE. Da Silva et al. (2020) show the impact of literacy, where investors with high education and mathematical abilities will have lower DE. Aren (2019) shows men are more risk-takers than women, and financial literacy also causes them to prefer risky assets. Oreng (2021) shows a bearish situation will increase DE. Conservative investors tend to have higher DE. Frydman et al. (2015), Mutual Fund managers will tend to get a more significant DE if they cannot do a rolling mental account; selling and buying new assets; then a new situation, DE in the initial portfolio no longer occurs. Mokhtar et al. (2020), show that age positively affects money management, where the pension group has higher experience than other groups. Ke (2021) refers to the family (husband and wife) participating in shares. If the husband works in the financial sector, participation in the stock market will also increase. Ke, referring to various studies, confirms ‘gender differences’ where men: (i) tend to be less risk-averse; (ii) overconfident; (iii) more optimistic; (iv) participate in social bonding; and (v) have a better position.

Brettschneider et al. (2020) shows a wide framing concerning DE; the potential to realize losses will increase if the percentage of profits from the portfolio increases—the proportion of realized profits with the percentage of portfolio profits in the form of a U-shape. Chang et al. (2014) found that DE occurs in individual assets and vice versa in mutual fund assets. Thus, among professionals, there is an inverse of DE. An and Argyle (2020) find data on fund managers selling profitable and large losing portfolios. Chang et al. (2014) found that individual investors are more likely to do DE, while delegated assets (such as mutual fund managers) tend to do the opposite (reverse DE). Amman et al. (2011) show DE exist among professionals and mutual fund managers. Amman finds Low DE if the manager puts large amounts of funds in blue-chip stocks, high volume trading, good past performance, low idiosyncratic risk, and high ‘risk-adjusted-performance. Bernard et al. (2021) emphasize the situation where DE is not constant over time but will increase during the bearish time and decrease during booms (countercyclical). This change occurs due to investor risk aversion and belief in financial market cycles. Bernard et al. (2021) also found a negative correlation between the disposition effect and market return.

### 2.1. Risk Management, Salient Shock and Disposition Effect

Hermann et al. (2017) stated that many factors could affect DE, including a combination with dependency behavior, emotions, point formation, i.e., investors with ‘loss-averse’ characteristics will have difficulty realizing capital losses, and investors with loss aversion characteristics have a positive correlation with DE. Richard (2015) shows two investment strategies carried out by investors, namely using stop losses, through two automatic trading strategies, namely ordinary stop losses and tracking stop losses. Fischbacher et al. (2017) examine the risk management on DE. The use of ‘automatic selling’ tools causes a decrease in DE. Imas (2014) shows that after losing experience, investors become both more risk-takers and risk averters. If the investor realizes a loss, the investor has avoided the risk; On the other hand, investors can get an even higher risk if there is a paper loss. Thus, investors with risk-taker characteristics tend to have a higher DE. In our understanding, very few articles directly link risk characteristics with DE. Henriksson (2020) attributes major external events to investors’ strategies, including DE. In this case, the significant events are significant individual-specific events and random. This research is in line with Frydman and Wang (2020), which shows the impact of salience shock on investors in China. Frydman and Wang (2020) found salience shock increased DE by 17%. Herwany et al. (2021) showed that during the COVID-19 era, the market return decreased significantly on the Indonesian Stock Exchange (IDX). The COVID-19 pandemic can be called a significant event. The above description shows the role of risk management in the portfolio.

### 2.2. The Effect of Social Media and Rumor on DE

What Heimer stated can be referenced whether investors attend paid stock groups and training, thus influencing their investment decisions. Boumda et al. (2021) researched a professional fund (mutual fund) related to SRI (Social Responsible Investment). Boumda et al. (2021) tested whether this SRI affected DE. There is no different result between the manager (who managed based on SRI) and the conventional manager in terms of DE. Hermann et al. (2017) found that DE occurs in situations on behalf of others. Behalf of other is a transaction by an investor influenced by the profit of another party (which is equivalent). Referring to previous empirical research, this investment behavior is more common in non-professional investors. Breitmayer et al. (2019) showed that social networks provide additional valuable information to explain abnormal returns, around 3.3%.

The information shared through the social media becomes vital because (one of the reasons) can be a recommendation for investors to buy and sell. Chen et al. (2014) also show the role of social media, which replaces the role of ‘expert’. Hong (2016) shows that information blockages cause sharp price fluctuations in the Chinese Stock Market. De Souza et al. (2018) show that trading volume is affected by the only negative news. Heimer stated, supported by Glaser and Risius (2016), that social trading platforms, having a high degree of transparency, can cause other investors to follow their portfolio. This transparency mechanism causes DE to increase.

Contrary to Heimer, Lukas et al. (2017) say that DE tends to be lower in the transparent trading environment and it is likely to decrease by around 35%. Pelster (2017) shows that the impact of social interaction will be even more significant in the future, where investors can copy other investors’ transactions, and the barriers to market entry are minimal. Pelster and Hofmann (2018) show that DE will increase when investors completely copy other investors. There will be lead traders with followers, and traders with many followers will tend to have DE. DE is also more applicable if the followers are women; and if the follower is older than the average age of the follower. Social interactions positively impact DE, except for Lukas’s research, which finds a negative impact, and Boumda’s research finds no effect. In particular, we researched rumor stocks (continuously inform on various social media platforms) such as ARTO (JAGO BANK) and linked to DE.

### 2.3. Disposition Effect

The disposition effect tends to sell profitable stocks and hold losing stocks. Trejos et al. (2019) stated that overconfidence (OC) and DE could not be separated. Ho (2011) shows that DE will be more significant if investors do OC. Both DE and OC will cause a positive relationship between return and trading volume. Ben-David and Hirshleifer (2012), Waiyasara and Padungsaksawasdi (2020) show that DE is not monotonic based on ‘asset return’ but is more ‘v-shaped’ where there is a tendency to sell stocks with extreme situations (winner and loser), and it is in line with the rank effect of Hartzman.

### 2.4. Research Contribution

We propose research related to DE by proposing three critical factors: the character of the risk, the role of social media, and the impact of salience shock. The character of risk, which is essential in investment, refers to a readiness to face risks and policymakers. Social media has become very important both individually and due to the COVID-19 situation; COVID-19 is an important event,

so it needs to be immortalized in research. Along with the COVID-19 pandemic is the growth of Generation Z as young investors. Our contribution is: provide new evidence concerning DE.

## 3. Research Methods

This study related to DE uses a sample of Investor respondents at IDX, taken from a questionnaire during October-November 2021. We tested the risk character of the respondents by providing several questions adapted from Bodie et al. (2011). Ke (2021) refers to a hypothetical income gamble question for comparison. We make multiplicative factors Gene and social media; and Genes and Sex. The application of risk management can be identified through investment techniques, including stop loss and target gain, where risk management will reduce DE. Salience shock is measured by frequency and investment funds during the COVID-19 pandemic.

First, we examine the disposition effect as factors influenced by investors’ risk character and demographic profiles. Investors with a risk-averted character tend to sell their shares at a loss so that DE will go down. We tested whether the risk character was nonlinear for DE, which refers to the concept of risk character, and investment decisions are not linearly related. We propose this test as a finding in this study. The existence of Gen is a common concern, given the number of online transactions. An additional concern is whether there is an interaction between the sexes and this generation. Like previous research, women tend to do DE. Does the interaction apply to genes? The question is whether women and older people are more likely to have the DE. Thus it can be written as follows:

$$\begin{aligned}
 DE = & a_{10} + b_{11}Sex + b_{12}(Risk\_Character) \\
 & + b_{13}(Risk\_Character)^2 + b_{14}Portfolio \\
 & + b_{15}Generation + b_{16}Expertise \\
 & + b_{17}(Sex \times Generation) + b_{18}Education
 \end{aligned} \quad (1)$$

Second, we want to test whether there is an effect of risk management on DE. The imposition of stop loss and gain targets is recommended as a tool to deal with unexpected price fluctuations. If investors do risk management, the potential for DE will be reduced. Is there a multiplier effect of this risk management regarding genes and gender? The older generation tends to have a risk-averted risk character, and do they use risk management as a control? Also, for women, is there any interaction with risk management? Thus it can be written as follows:

$$\begin{aligned}
 DE = & a_{20} + b_{21}Risk\_Character + b_{22}Method \\
 & + b_{23}Generation + b_{24}(Method \times Generation) \\
 & + b_{25}Sex + b_{26}(Sex \times Method)
 \end{aligned} \quad (2)$$

Third, we examine the impact of social media (peer relations), salience shock and rumors, on the potential for DE. The impact of social media is joining groups (peers), participating in training, and investor responses to this. The salience shock that occurred was the COVID-19 pandemic starting in 2020. Thus, investors in the year before 2020 did not experience a salience shock. These three variables are essential variables that will occur in 2020. We also examined the interactive factors between genes and salience shock, genes and social media, and social media and salience shock. Thus it can be written as follows:

$$\begin{aligned}
 DE = & a_{30} + b_{31} \text{Risk\_Character} \\
 & + b_{32} \text{Salience\_Schock} + b_{33} \text{Generation} \\
 & + b_{34} (\text{Salience\_Shock} \times \text{Generation}) \\
 & + b_{35} \text{Social\_Media} + b_{36} (\text{Generation} \\
 & \times \text{Social\_Media}) + b_{37} \times \text{Influencer} \\
 & + b_{38} (\text{Social\_Media} \times \text{Salience\_Shock})
 \end{aligned}
 \tag{3}$$

In particular, we want to test concerning rumors, where there are genuine cases in the Indonesian Capital Market. The merger of Sharia Bank (BRIS), Electrical Car (ANTM),

Digital Bank (ARTO) has soared share prices up to 726%. We test it only for investors who have/sell in 2020–2021. This rumor situation should be the opposite of DE because there is hope to sell at a higher price.

$$\begin{aligned}
 DE = & a_{40} + b_{41} \text{Portoflio} + b_{42} \text{Profit} \\
 & + b_{43} \text{Generation} \\
 & + b_{44} (\text{Portfolio} \times \text{Profit})
 \end{aligned}
 \tag{4}$$

DE measurement was carried out as Odeon (1998) stated by De Winne (2021). Thus DE can be measured as follows the difference between the proportion of gains realized (PGR) and the proportion of loss realized (PLR) (Table 1).

$$\text{PGR} = \frac{\text{Realized Gains}}{(\text{Realized Gains} + \text{Paper Gains})}$$

$$\text{PLR} = \frac{\text{Realized Loss}}{(\text{Realized Loss} + \text{Paper Loss})}$$

$$\text{DE} = \text{PGR} - \text{PLR}$$

**Table 1:** Variable, Operational, Effect, and Description

No	Variables	Operational	Effect	Description
1	Sex	0 = Men	Positive	Women are more likely to DE (Breitmayer et al., 2019).
		1 = Women		
2	Generation	1 = Baby Boomer and Gen X, over 40 years old	Negative	Gen Z is less risk averter (Richard), less DE.
		2 = Millennial, ages between 25 - 40 years		
		3 = Gen Z and Gen Alpha, under 25 years old		
3	Education	1 = Senior High School	Negative	A person with higher education has a better ability to manage risk. Low DE (da Silva et al., 2020).
		2 = Diploma		
		3 = Undergraduate		
		4 = Postgraduate		
4	Risk Character	1 = Risk Averter	Negative	Investors with risk averter, high DE. Adapted BKM.
		2 = Risk Neutral		
		3 = Risk Lover		
5	Risk Management	0 = Risk Averter	Negative	The more willing to take risks, the lower the value of DE.
		1 = Risk Neutral		
		2 = Risk Averter		
6	Portfolio	1 = Less than Rp 10 million	Positive	The larger the DE value, the more careful (C. D. Frydman et al., 2015)
		2 = Less than Rp 50 million		
		3 = Between Rp 50 million to Rp 100 million		
		4 = Between Rp 100 to Rp 500 million		
		5 = Between Rp 500 million to Rp 1 billion		
		6 = More than Rp 1 Billion		

**Table 1:** (Continued)

No	Variables	Operational	Effect	Description
7	Expertise	1 = Beginner	Positive	The more experienced, the lower the DE.
		2 = Medium		
		3 = Expert		
		4 = Professional		
8	Salience Shock	0 = Decrease in both value in rupiahs and the frequency	Negative	The pandemic causes an increase in transactions, making it easier to realize transactions so that both potential gains and potential losses can be realized; DE will decrease.
		4 = Increase in both the value in rupiahs and the frequency		
9	Social Media	0 = Not joining in social media groups and/or paid training	Undefined	The more the role of social media, the lower the DE; increase transactions. However, it can also lead to an increase in DE by delaying sales and making cut losses.
		1 = Join social media groups or paid training		
		2 = Join social media groups and paid training		
10	Influencer	0 = Distrust or think negatively of social media	Undefined	The more influenced by the influencer, the more equal the decisions will be.
		1 = Neutral		
		2 = Influenced by social media		
11	Portfolio Rumor	1 = Less than 20%	Negative	Eq 4, the higher the portfolio, the lower the DE; rumor optimization.
		2 = Between 20% to 40%		
		3 = More than 40%		
12	Profit R	1 = Loss more than or up to 0%	Negative	Eq 4; optimizing profits so as to delay transactions, DE is reduced.
		2 = Loss up to 0%		
		3 = Profit up to 25%		
		4 = Profit up 50%		
		5 = Profit 100%		
		6 = More than 100%		
13	Gen * Sex		Negative	Eq 1; gen z and men reinforce each other.
14	Risk ^ 2		Negative	Eq 1; strengthens the risk character.
15	Sex * risk		Negative	Eq 2; strengthens between men and risk-takers.
16	Salience * gen		Negative	Eq 3; mutually reinforcing, shows that Generation Z is more active during a pandemic.
17	Socmed * gen		Negative	Eq 3; strengthen the impact of social media on Gen Z, thus encouraging active transactions and reducing DE.
18	PortR * ProfR		Negative	Eq 4; further strengthens the delay if: (i) has a high portfolio and (ii) earns the highest profit.

## 4. Result and Discussion

Table 2 provides information regarding the respondents associated with the disposition effect (DE). Although not significantly different, men with DE were higher in numbers than women. Gene shows that the younger a person is, the greater will be the DE. This result is not in line with the prediction, where generation Z/Y will be more risk-takers with lower DE. Concerning expertise, a positive relationship was also found where the more skilled a person is, the higher is the DE, but inversely for professionals. In the case of professionals, it was found that DE was harmful, contradictory to Crane and Hartzell (2008); Frydman et al. (2020), but consistent with Chang et al. (2014). This result indicates that professionals maintain investor funds they manage through; (i) neglecting to sell potential gains immediately; and (ii) using a stop loss, thus selling the losing portfolio immediately. This step can be taken as anticipation for risk management. However, due to the tiny number of samples, it is necessary to conduct further studies. We also tested the difference in DE between investors who have ‘rumor shares’ and do not own rumor stocks. Investors who own rumor stocks have a much lower DE than Investors who do not own rumor stocks. The result shows that investors (in rumor stocks) tend to accumulate potential gains, in line with the expectation of a considerable price increase.

### 4.1. The Impact of Investor Characteristics on DE

Table 3 shows the regression results of the effect of investor characteristics on DE. The results show that none

of the variables affects DE. Thus, it can be concluded that there is no difference in the value of each variable (investor characteristics). Sex characters, as shown in Table 2, male DE are indeed higher, so the results are negative. This result is interesting because men tend to be ‘risk-averters.’ This result can be good news for the capital market; iff, many men, invest in stocks but have caution in buying and selling transactions. Referring to Ke (2021), Aren (2019) states that men tend to be less risk-averse; But this seems to be not proven. Education was found not to match predictions; what happened was that the higher the education, the higher the DE, compared with Da Silva, (2020).

The coefficient of the risk character variable has shown relevant results, where the less risk-averse, the lower the DE, but testing that the investor’s risk character is not linear, has not found the appropriate coefficient. The variable of the size of the managed portfolio found the appropriate coefficient, where the more prominent the funds, the more DE, the more carefully they manage funds (Frydman & Wang, 2020). The largest portfolio size is more than Rp 1 billion, partially filled by professionals. In this case, it can be good news, where a professional group is careful in managing funds, applying a ‘cut-loss’ to reduce potential loss. The experience factor shows the opposite result, where expert category investors tend to have low DE. In this case, the experts ignore risk management (stop loss-target gain), perhaps due to confidence in terms of transactions. The multiplicative factor with a pessimistic coefficient prediction, which indicates that Gen Z and Men will have a more substantial ED, is appropriate.

**Table 2:** DE Comparison on Various Characteristics of Investors

Characteristics	Information	N Sample	DE	Sign
Sex	Men	183	0.067	0.148
	Women	65	0.034	
Generation	Baby Boomer and Gen X, over 40 years old	99	0.052	0.668
	Millennials, aged between 25–40 years old	112	0.060	
	Gen Z and Alpha, under 25 years old	37	0.073	
Expertise	Beginner	135	0.059	0.131
	Intermediate	87	0.067	
	Expert	19	0.071	
	Professional	7	-0.100	
Has rumor's share	Yes	118	0.015	0.004*
	No	130	0.098	

\*Significant at the  $\alpha = 1\%$ .

**Table 3:** Effect of Investor Characteristics on DE

Variables	Coefficients			t	p-value	
	Expected Sign	B	Beta			
(Constant)		0.106		0.681	0.249	$R^2 = 0.027$ $F = 0.837$
Generation	-	0.030	0.092	1.065	0.144	
Sex	+	-0.035	-0.068	-0.384	0.351	
Education	-	0.022	0.077	1.051	0.147	
Risk_Character	-	-0.107	-0.242	-0.800	0.212	
(Risk_Character) <sup>2</sup>	-	0.017	0.147	0.484	0.315	
Portfolio	+	0.012	0.080	0.946	0.173	
Expertise	+	-0.035	-0.116	-1.429	0.077***	
Generation * Sex	-	-0.003	-0.010	-0.056	0.478	

\*\*\*Significant at the  $\alpha = 10\%$ .

**Table 4:** Impact of Risk Management on DE

Variables	Coefficients			t	p-value	
	Expected Sign	B	Beta			
(Constant)		0.284		2.581	0.005	$R^2 = 0.059$ $F = 2.54^{**}$
Generation	-	-0.026	-0.079	-0.543	0.294	
Sex	+	-0.020	-0.039	-0.278	0.391	
Risk_Character	-	-0.043	-0.098	-1.561	0.060***	
Risk_Management	-	-0.103	-0.335	-1.776	0.034***	
Generation * Risk_Management	-	0.023	0.167	0.757	0.225	
Sex * Risk_Management	-	-0.008	-0.025	-0.170	0.433	

\*\*Significant at the  $\alpha 5\%$ , \*\*\*Significant at the  $\alpha = 10\%$ .

The results from Table 3 are of interest to stakeholders, especially securities companies. First, the sample of women and group Z is still low, which can be a new market concern. Efforts to introduce investment facilities for these two groups need to be emphasized again. Second, higher education groups tend to have higher DE, and these results indicate that highly educated investors tend to be risk-aversers.

On the other hand, this result shows that investors with low education tend to be risk-takers. If this happens, there needs to be a persuasive effort, introducing the risks inherent in stock investment so that the ‘nightmare story’ in the stock market does not occur massively. In general, the introduction of investment in women, generation Z, and low education needs to be encouraged as a potential new market. However, it is also followed by the introduction of risk management.

#### 4.2. Impact of Risk Management on DE

Concerning the implementation of risk management by investors, found coefficients that match predictions and are significant. This result means stop loss and gain targets can minimize DE, meaning this risk management. In this case, risk management causes the existing portfolio to be of higher quality, with various profitable stocks, to offset the losing stocks. A portfolio like this will cause investors to become more confident (Table 4).

#### 4.3. The Impact of Social Media and Salience Shock on DE

Table 5 shows the impact of the COVID pandemic era and social media on DE. It was found that the COVID coefficient was positive; the COVID situation increased DE.

**Table 5:** Regression Results of Saliency Shock and Social Media on DE

Variables	Coefficients			t	p-value	
	Expected sign	B	Beta			
(Constant)		0.138		1.146	0.127	R <sup>2</sup> = 0.023 F = 0.790
Saliency_Shock	–	0.016	0.109	0.623	0.267	
Social_Media	x	0.034	0.104	0.604	0.273	
Influencer	x	–0.043	–0.090	–1.398	0.082***	
Generation	–	0.050	0.153	1.050	0.148	
Risk_Character	–	–0.040	–0.090	–1.416	0.079***	
Saliency_Shock * Generation	–	–0.008	–0.124	–0.589	0.279	
Social_Media * Generation	–	–0.022	–0.147	–0.733	0.232	

\*\*\*Significant at the  $\alpha = 10\%$ .

**Table 6:** DE on Rumor Based Stocks

Variables	Coefficients			t	p-value	
	Expected Sign	B	Beta			
(Constant)		0.0169		1.134	0.130	R <sup>2</sup> = 0.033 F = 0.475
Portfolio*	–	–0.131	–0.370	–1.451	0.075***	
Profit*	–	–0.036	–0.205	–0.847	0.200	
Generation*	–	–0.004	–0.011	–0.119	0.453	
Portfolio * Profit*	–	0.033	0.499	1.310	0.097***	

Information: \*Only rumor-based stocks. \*\*\*Significant at the  $\alpha = 10\%$ .

This result is in line with Frydman and Wang (2020), which stated that the COVID situation increased DE by 17 percent in China. The social media coefficient, found to be positive, means that investors who follow social media (groups, paid groups) tend to increase their DE. In this case, there is the potential for viewing the info in the group to be reversed. The negative influencer coefficient shows that investors tend to respond in reverse to news provided by social media; then, the Disposition effect will be enlarged. These two things can be translated as follows: investors follow social media groups but do not fully believe the issues/rumors spread in these groups. Ordinary investors in Brazil only believe in negative news through trading transactions (De Souza et al., 2018). In Indonesia, there is also a lousy investment case, where the CFO harms the funds of a group of investors. This could be a reason for distrust of rumours.

#### 4.4. Disposition Effect on Rumor-Based Stocks

Our research specifically looks at how the impact of stock rumors on DE. In the Indonesian capital market, for

example, ARTO shares, January 2019-December 2021, where price and volume increased (price increased from Rp188 to Rp15950), increased by almost 85x (8500%); with (transaction volume of 672 thousand, to 25.7 million), an increase of 38x (3800%). We asked about the size of the investor's rumor stock portfolio and the potential profit of rumor stocks. Both of these factors are predicted to harm DE; this is because there is a tendency for investors to hold back on selling (rumor shares) for the sake of profit accumulation. This rumor stock portfolio has a significant effect; the more extensive the portfolio, the lower the DE. Investors have a desire to delay selling these shares. The amount of profit from the stock also negatively affects DE. However, these two variables were not proven mutually reinforcing against DE. There is a potential that the investor will experience only one of the following: (i) the investor has a small portfolio of rumored shares but has an enormous profit potential; and or (ii) the investor has an extensive portfolio of rumored shares, but the profit potential is small. The coefficients were found to be as predicted but not yet significant, wherein group Z; tends to have lower DE (Table 6).

## 5. Conclusion and Implications

From the results above, several conclusions can be drawn: (i) men have a higher DE but apply risk management for their investments; (ii) the application of risk management will cause DE to increase; (iii) the COVID situation tends to increase DE; (iv) social media is more likely to be responded to negatively; (v) investors who own rumor stocks tend to have higher DEs; as a result of accumulating potential gain. Some of the policy implications that can be taken are: (i) in terms of education for investors; it is necessary to apply risk management for women and generation Z (ii) respondents indicate that they are more mature (mature). Thus the market for generation Z is still comprehensive.

Four policy implications can be taken. First, regarding education for investors, applying risk management for women and generation Z. Second, respondents indicated that they were mature, and thus the market for Generation Z is still comprehensive. This result is good news for securities companies as a basis for expanding investors. Third, more efforts are needed to provide positive information (not hoaxes) and others so that information on social media can be responded to positively. Fourth, investors with low education tend to take risks. In this case, it is necessary to educate about risk management in stock investment.

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