

Conference Paper

Analysis of Volatility and Turnover on the Disposition Effect in the Indonesian Stock Exchange

Ica Rika Candraningrat¹, Ubud Salim², Nur Khusniyah Indrawati², and Kusuma Ratnawati²

¹Udayana University, Kabupaten Badung, Bali 803611, Indonesia

²Universitas Brawijaya, Malang, Indonesia

Abstract

This study aims to analyse the influence of market turnover and volatility of the company on disposition effect. Disposition effect is the tendency of investors to quickly sell their shares to gain benefit (winner stock) and the tendency of investors to hold the stocks too long, which results in a loss (losing stocks). Identifying the causes of the disposition effect is important to determine whether the disposition effect makes the market inefficient. The population in this study is comprised of the companies registered in the LQ45 index in the Indonesian Stock Exchange during the period 2010–2015. The analytical method used is the linear regression analysis. Turnover has a positive and insignificant effect, while the volatility variable has a positive and significant effect on the behaviour of the disposition effect in Indonesia's stock market. The characteristics of investors who perform disposition measures are likely to be risk averse if they are in a position of being profitable and risk-taking while in a position of loss. This is evident during the high volatility of the stock market. Large fluctuations such as significant price increases and drastic price reductions make investors in Indonesia take the right positioning of the right time in realizing profits and holding back losses. In this situation, the behaviour of investors who display the disposition effect in Indonesia's stock exchange can be found.

Keywords: behavioural finance, disposition effect, turnover, volatility

Corresponding Author:

Ica Rika Candraningrat
candraningrat@yahoo.com

Received: 29 August 2018

Accepted: 18 September 2018

Published: 11 November 2018

Publishing services provided by
Knowledge E

© Ica Rika Candraningrat et al. This article is distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use and redistribution provided that the original author and source are credited.

Selection and Peer-review under the responsibility of the ICOI-2018 Conference Committee.

1. Introduction

The main theoretical framework of standard finance is closely related to the modern portfolio theory and the efficient market hypothesis. The modern portfolio theory has been developed over the last 60 years, since the publication entitled Portfolio Selection by Harry Markowitz (1952). This theory emphasises the importance of diversification to minimise investment risk. The assumption in this theory is that investors behave rationally, are predictable, and do not deviate from the general tendencies.

 OPEN ACCESS

However, in reality, as stated by Shiller (1999), investors do not think or behave rationally. Conversely, driven by greed and fear, investors speculate on stocks between the realistic highest and lowest values. In other words, investors are influenced by emotions, subjective reasoning and the desire to follow others. The anomalies seen in the stock market show that there are abnormal returns for some investors. This clearly shows that the stock price in the market is not fair. Upon realising this, researchers start relating the phenomena that occur with the behavioural aspects (behavioural finance), which constitute one of the determining factors in making decisions in the stock market.

Behavioural finance is a study that focuses on how humans interpret and react to information available related to making relevant investment decisions (Lintner, 1998:7). Jegadeesh and Titman (1993) stated that behavioural finance is a subsection of the finance science which explains the anomaly in the market. This study started to gain recognition from many financial researchers because there are frequent contradictions to the efficient market concept. An important challenge is to find the direct relationship between investor behaviour and the dynamics of stock prices. Moreover, there are notions that state that many investors make irrational decisions. One example is when investors purchase stocks at a certain price and the stock price plunges hard. Rational investors will directly sell those stocks. However, investors still hold on to the stocks with plunging prices and hope that a reversal will occur in the future. This causes bias, which is called the disposition effect. Shefrin and Statman (1985) defined the disposition effect as a finance behaviour that has the tendency to sell winner stocks too fast and hold loser stocks too long. Disposition effect is an implication of the prospect theory extension by Kahneman and Tversky (1979), specifically in the investment market and stock market.

The disposition effect was first proven by Odean (1998), who stated that investors show significant preference in actuating profit compared to loss. Shapira and Venezia (2000) studied the disposition effect in the stock market of Israel and stated that the disposition effect not only occurs among individual investors but also at the institutional level. Hguyen et al. (2012) showed that investors tend to actuate their profit too fast and take too long in actuating their losses.

Odean (1998) and Grinblatt and Keloharju (2001) showed that investors are much faster in actuating their profits than their losses. Barber et al. (2007) analysed the market notes for all investors in the stock exchange of Taiwan during 1995-1999 by comparing the disposition effect of individual investors and institutional investors.

The research found that the disposition effects were four times stronger on individual investors and evidence has shown that all investors try to avoid the disposition effect during the transaction period. Among the individual investors in China, Feng and Seasholes (2005) documented that the disposition effect can disappear in line with the trading experience (since they first started trading).

Considering the difference in results and the variables used in various studies, this research aims to examine whether the disposition effect is evident in the stock market of Indonesia by using data and variables that are different from previous studies. The factors used in this study to view the occurrence of the disposition effect are volatility and turnover. Stock volatility is a factor that creates the opportunity for the disposition effect to occur. Volatility is the fluctuation of the stock price in the stock exchange. The movement of stock prices that rise or fall too fast within a short time period also increases the risk faced by investors. This can trigger the possibility of the disposition effect occurring. A significant volatility level shows an inefficient market condition and indicates the occurrence of bias. Volatility is closely related with stock trade volumes or turnover. This condition shows that the stock market is not yet efficient, because there are biases in the market. In an inefficient market, the level of stock price depends on the quantity of investors who sell and buy the stock in a close or short time frame. The rise and fall in stock price significantly indicates an inefficient market condition.

The sample used in this research is comprised of the stocks indexed in the LQ-45, from the period of January 2010 until June 2015. The reason these stock are selected is because the stocks in this sector are categorised as being the most liquid and preferred by investors; thus, there is the possibility that disposition effect behaviours may be found among these stocks. Furthermore, these stocks are selected because of the high frequency of trades, which increases the strength of the trials conducted. This is consistent with the research conducted by Goetzmann and Massa (2008), which used stock data that has high market capitalisation in the stock exchange.

Studies related to behavioural bias in the stock market can be categorised as very few, even though this bias can largely influence the stock market. Among the topics is the disposition effect, which shows that there are inefficiencies in the market. Based on the research background explained earlier, a study regarding the disposition effect will be conducted. The research questions formulated in this study will investigate the influence of volatility on the disposition effect of stocks in the IDX and how the influence of trade volumes on the disposition effect of stocks in IDX.

2. Literature Review

2.1. Behavioural finance

Behavioural finance is a study that focuses on how humans act in the process of making investment decisions as a response from the information obtained. Investors do not always behave rationally; they may deviate and cannot be modelled quantitatively. The purpose of behavioural finance is to understand and predict the systematic implications of the financial market from the psychological perspective.

According to Ricciardi, behavioural finance is a discipline in which the interactions of various disciplines are ingrained (interdisciplinary) and continuously integrate. Thus, isolation cannot be achieved in its discussions. Behavioural finance is developed by various assumptions and ideas from economical behaviours. The involvement of emotion, attitude, preference and various other elements ingrained in humans, as intellectual and social beings, interact and underlie the decisions to take certain actions.

2.2. Disposition effect

The disposition effect was first conveyed by Shefrin and Statman (1985) and was a development of the prospect theory by Kahneman and Tversky (1979). The disposition effect is the hasty behaviour of investors in actuating their profit and holding in the possible loss for a prolonged time. In other words, investors are not rational; they become risk averse in the face of a profitable condition and risk-taking when they are faced with a loss condition. Shefrin and Statman (1985) developed a positive theory regarding the actuation of capital gain and loss, whereby investors tend to sell winners too early and ride losers too long.

2.3. Volatility

Volatility is the statistical measurement of fluctuation in the price of certain commodities or securities (Firmansyah, 2006). One way to measure volatility is by using the standard deviation, which will explain how tightly the stock prices are dispersed around the mean or the moving average. When prices move tightly within a group, the standard deviation is small. When the price movements are largely dispersed, the standard deviation is relatively high (www.ipotnews.com).

The determining factors which give rise to the disposition effect in stock trades are the stocks that have a high volatility rate (Kumar, 2009). Having a good opportunity in this context is being able to actuate the profit from stocks that have reached the highest point of volatility and hold loser stocks that have fallen to the lowest point. Based on this explanation, the proposed hypothesis is as follows.

H1: Volatility has a positive and significant influence on the disposition effect

2.4. Turnover

Stock turnover or trade volume is an instrument that can be used to assess the reaction of the stock market towards information through the parameter of stock volume traded in the market (Wang, 2000). The volume of stocks traded is one of the indicators used in the technical analysis of stock price evaluation and is an instrument that can be used to assess the stock market's reaction towards information through the parameters of activity volume of traded stocks in the market. A large stock trade volume indicates that the stock is actively traded. If a stock is actively traded, the dealers will not hold the stocks for too long before trading it.

Smith (1996) compared the turnover rate of stocks with increasing price (winner) and the stocks with falling price (loser) and stated that the winner stocks have a high turnover rate. This indicates high stock movements for winner stocks and this has a positive effect on the occurrence of the disposition effect.

H2: Stock turnover has a positive and significant influence on the disposition effect

The research framework can be seen in Figure 1.

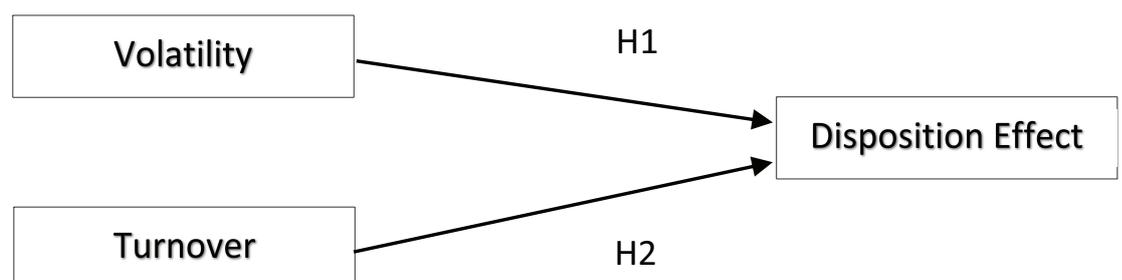


Figure 1: Research framework.

3. Research Method

The sample of this research is determined using the purposive sampling method. The research objects in this study are all of the companies listed in the Indonesian Stock Exchange and registered in the LQ45 index in the period of January 2010 – June 2015. After the collection and selection of data, there were 44 companies that fulfil the criteria. There are also other stocks that were not included in the research group because of the instability of the stocks' position in the LQ45 index, the incompleteness of available data, and also some company data were found to be outliers.

The criteria in selecting the sample from the population in this research are as follows: Availability of data in the ICMD (Indonesia Capital Market Directory); the stocks included in the latest LQ-45 index; and weekly transaction data are available from 2010 to 2015. The data collection method in this research is by indirect observation through the website www.yahooofinance.com and the database of ICMD.

Consistent with the research concept, the variables in this research are differentiated into the independent variable and the dependent variable. The independent variable in this research is volatility and turnover, while the dependent variable is disposition effect.

1. Volatility

Volatility is the statistical measurement of the fluctuation in security or commodity price over a certain period. Considering that volatility can be represented by the standard deviation or risk, the higher the level of volatility, the higher the degree of uncertainty of the stock return that can be attained.

Based on the research conducted by Duffe (1995), volatility can be measured with the following formula:

$$s = \frac{\sqrt{k \sum_{t=1}^n (R_t - \bar{R})^2}}{n - 1}$$

2. Turnover

Turnover (*wtrading*): weekly market turnover or the number of shares traded in a week. Based on the research conducted by Salma Zaiane (2013), turnover can be measured using the following formula:

$$Wtrading = \frac{Traded\ Stocks}{Total\ Outstanding\ Stocks}$$

3. Disposition Effect

To measure the strength of the disposition effect, this research utilises the average volume of stock traded from the stock that has its price increased at the end of the transaction day divided by the price of the stock that has its price decreased at the end of the transaction day. The formulation used to calculate the disposition effect according to Chang (2013) is:

$$V_t^+ = \sum_{j=1}^h V_{j,t}^+/h; V_t^- = \sum_{i=1}^k V_{i,t}^-/h$$

The data analysis technique used in this research is the multiple regression analysis. The regression analysis is used because, aside from measuring the strength of the relationship between two or more variables, it also shows the direction of the relationship between the dependent variable and the independent variable (Ghozali, 2006).

4. Results

After completing the classical assumption test – which consists of the normality test, the multicollinearity test, the autocorrelation test and the heteroscedasticity test – the next step is the linear regression test to examine the accuracy of the sample regression function in predicting actual values.

The purpose of the normality test is to test the regression model of the research, to determine whether the residuals are normally distributed or not. The Kolmogorov-Smirnov normality test results shows a value of 0,059 and is not significant at 0,000. This result shows that the residuals of the regression model are normally distributed and this model can be used for the research model. The multicollinearity test for the regression model can be conducted by viewing the variance inflation factor (VIF) value which is not greater than 10. None of the independent variables have a Variance Inflation Factor (VIF) of greater than 10. Thus, it can be concluded that the regression model in this research fulfils the multicollinearity assumption.

The basis of the analysis of heteroscedasticity is that if the points form a certain well-ordered pattern, such as a wave, widen up then become narrow, then this shows that heteroscedasticity has occurred. The autocorrelation test examines the existence of correlations between residuals in a certain period and the residuals of another period in the regression model. The method utilised is the Durbin-Watson (DW) test, which is in between the upper limit value (du) and the lower limit value ($4-du$). The results of the Durbin-Watson test can be seen in the following Table 1.

TABLE 1: Durbin-Watson test results.

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.457a	0.209	0.207	0.2630220	0.406

Note: a. Predictors: (Constant), Volatilitas, Return, Turnover

The simultaneous significance test (*F* Statistics Test) is used to examine whether all the independent variables in the model simultaneously have an influence on the dependent variable. If the significance of the *F* value is lower than 5%, then there is a significant influence between the independent variable and the dependent variable. This can be seen from Table 5.

TABLE 2: *F* test result.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	39.769	6	6,628	95.809	0.000 ^b
Residual	150.606	2177	0.069		
Total	190.375	2183			

The statistics test is essentially used to show the extent of influence of each independent variable in explaining the dependent variable. Table 3 is the result of the *t* statistics test.

TABLE 3: Statistics *t* result.

Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	3.324	0.2		16.613	0
	Volatility	0.018	0.007	0.057	2.681	0.007
	Turnover	0.039	0.027	0.031	1.425	0.154

a. Dependent Variable: Disposition
Source: SPSS Statistic 23 Output, processed secondary data, 2017.

Based on the calculation results of the aforementioned *t* statistics test, the multiple linear regression equation is as follows:

$$\text{Disposition Effect} = 3.324 + 0.018 \text{ VOLATILITY} + 0.039 \text{ TURNOVER} + e$$

Through the aforementioned multiple linear regression equation, the hypothesis test analysis is conducted and explained as follows: From the result of the partial test between volatility and disposition effect displayed in Table 3, the regression coefficient is known to be 0.018 and the significance level is 0.007. From the regression coefficient,

volatility is known to have a positive relationship with the disposition effect and the significance value is lower than 0.05. It can be concluded that the volatility variable has a positive and significant influence on the disposition effect in Indonesia. From the partial test calculation between Hence, hypothesis one is accepted. For the turnover and the disposition effect from the partial test calculation, the attained regression coefficient value is 0.039 and the level of significance is 0.154. From the regression coefficient, the turnover is known to have a positive relationship with the disposition effect. However, the level of significance is 0.154, which is greater than 0.05. This means that the turnover variable does not have a significant influence on the disposition effect variable. It can be concluded that the turnover variable has a positive but insignificant influence on the disposition effect in Indonesia. Hence, hypothesis two is not accepted.

5. Discussion

The results obtained from this research show that turnover has a positive and insignificant influence on the disposition effect in Indonesia. This shows that the higher the level of turnover in the stock market, the higher the disposition effect behaviour, although only within a certain limit. Consistent with the theory of liquidity, the higher the turnover rate, the higher the liquidity of the company stocks. The positive and insignificant influence in this research is due to the high volume of transactions that occur in the stock market so stocks are easily traded or there are frequent changes in ownership between investors. On the other hand, there are opportunities for investors to immediately actuate their profit in a good liquidity condition. However, there are also concerns in stock trading due to the disposition effect behaviour which causes the market to be inefficient.

The result obtained from this research shows that volatility has a positive and significant influence on the disposition effect in Indonesia. This shows that the higher the volatility level in the stock market, the higher the disposition effect behaviour in the stock market. The significant volatility rate in the stock market is an indication that the market is not efficient and is a sign of the occurrence of bias. This can be seen from the change in stock price, which increases and decreases significantly within a relatively short timeframe. The disposition effect is related to the emergence of many opportunities for investors to take a position in actuating their profit. Investors will observe the movement of stocks and wait for the right moment to trade in order to achieve their expected gain or profit.

6. Conclusion

The conclusions attained through analysis are as follows. The turnover variable has a positive and insignificant influence on the disposition effect behaviour in the stock market of Indonesia. The volatility variable has a positive and significant influence on the disposition effect behaviour in the stock market of Indonesia. The characteristics of investors who perform disposition actions are: tendency to be risk averse if they are in a profitable position and are risk-taking when they are in a losing position. This is clearly seen during high volatility in the stock exchange. Large fluctuations such as a significant increase in price and drastic fall in price cause the investors in Indonesia to take the right positioning in terms of time in actuating their profit and holding their loss. In this situation, disposition effect behaviour is found among investors in the Indonesian Stock Exchange.

References

- [1] Barber, B. M., Lee, Y., Liu, Y., et al. (2007). Is the aggregate investor reluctant to realize losses? Evidence from Taiwan. *European Financial Management*, vol. 13, pp. 423-427.
- [2] Bodie, Z., Kane, A., and Marcus, A. (2006). *Investment*. Jakarta: Salemba Empat.
- [3] Dhar, R. and Zhu, N. (2006). Up close and personal: Investor sophistication and the disposition effect. *Management Science*, vol. 52, pp. 726-740.
- [4] Duffe, G. R. (1995). Stock returns and volatility; A firm level analysis. *Journal of Finance*, vol. 37, no. 3, pp. 399-420.
- [5] Fama, E. (1965). The behavior of stock-market prices. *The Journal of Business*, vol. 38, no. 1, pp. 34-105.
- [6] Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, vol. 25, no. 2, pp. 383-417.
- [7] Fama, E. and French, K. (1992). The cross section of expected stock returns. *The Journal of Finance*, vol. 47, pp. 427-465.
- [8] Feng, L. and Seasholes, M. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets? *Review of Finance*, vol. 9, no. 3, pp. 305-351.
- [9] Ferris, S. P., Haugen, R. A., and Makhija, A. (1988). Predicting contemporary volume with historic volume at differential price levels: Evidence supporting the disposition effect. *Journal of Finance*, vol. 43, pp. 677-697.

- [10] Frazzini, A. (2006). The disposition effect and underreaction to news. *The Journal of Finance*, vol. 61, no. 4, pp. 2017–20246.
- [11] Ghozali, I. (2011). *Analisis Multivariate dengan Program SPSS*. Semarang: BP Undip.
- [12] Goetzmann, W. and Massa, M. (2008). Disposition matters: Volume, volatility, and price impact of a behavioral bias. *Journal of Portfolio Management*, vol. 34, no. 2, pp. 103–125.
- [13] Grinblatt, M. and Keloharju, M. (2001). What makes investors trade? *The Journal of Finance*, vol. 56, no. 2, pp. 589–616.
- [14] Hien, N. D., Duy, N., Le, V., et al. (August 2012). Empirical research of disposition effects in Vietnam's stock market. *Journal of Economics and Development*, vol. 14, no. 2, pp. 52–71.
- [15] Indrayono, Y. (September 2011). Disposition effect terhadap hubungan antara nilai fundamental dan harga saham pada periode krisis finansial. *Jurnal Keuangan dan Perbankan*, vol. 15, no. 3, pp. 315–326.
- [16] Jegadeesh, N. and Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *Journal of Finance*, vol. 48, no. 1, pp. 65–91.
- [17] Jogiyanto. (2003). *Teori Portfolio dan Analisis Investasi*. Yogyakarta: BPFÉ.
- [18] Kahneman, D. and Tversky, A. (March 1979). Prospect theory: An analysis of decision under risk. *Econometrica*, vol. 47, no. 2. (1979), pp. 263–293.
- [19] Lakonishok, J. and Smidt, S. (September 1986). Volume for winners and losers: Taxation and other motives for stock trading. *The Journal of Finance*, vol. 41, no. 4 (1986), pp. 951–974.
- [20] Manurung, A. H. *Teori Perilaku Keuangan (Financial Behaviour)*. Retrieved from <http://www.finansialbisnis.com/Data2/Riset/TeoriPerilakuKeuangan.pdf>
- [21] Odean, T. (1998). Are investors reluctant to realize their losses? *The Journal of Finance*, vol. 53, no. 5, pp. 1775–1798.
- [22] Schlarbaum, G. G., Lewellen, W. G., and Lease, R. C. (1978). Realized returns on common stock investments: The experience of individual investors. *Journal of Business*, vol. 51, pp. 299–325.
- [23] Sekaran, U. (2006). *Research Methods for Business*. Jakarta: Salemba Empat.
- [24] Sembiring, V. (2016). Analysis of bid-ask spread, turnover, volatility on disposition effect in Indonesia capital market. Retrieved from <http://ejournal-s1.undip.ac.id/index.php/dbr>, vol. 6, no. 1.
- [25] Shapira, Z. and Venezia, I. (2001). Patterns of behavior of professionally managed and independent investors. *Journal of Behavioral Finance*, vol. 25, pp. 1573–1587.

- [26] Shefrin, H. and Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of Finance*, vol. 40, no. 3; *Papers and Proceedings of The Forty-Third Annual Meeting American Finance Association, Dallas, Texas, December 28-30, 1984*, pp. 777-790.
- [27] Shiller, R. J. (1999). Human behavior and the efficiency of the financial system. NBER Working Paper No. 6375.
- [28] Sudjana. (2005). *Metoda Statistika*. Bandung: Penerbit TARSITO.
- [29] www.IDX.co.id
- [30] www.investopedia.com
- [31] *Bloomberg*