

Disposition Effect – Evidence from Vietnamese Individual Investors

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ABSTRACT

This paper aims to investigate whether or not the disposition effect exists in the Vietnam's stock market, and if so, which factors influence that effect. The authors employ the transaction data, which is from June 1, 2010 through June 30, 2012, of 100 customers of a securities company. Within this period, there are 27,591 transactions which are worth VND2,204 billion. The results reveal that the willingness to sell bullish stocks is 8.5% higher than the willingness to sell bearish ones. Male investors are less affected by the disposition effect than females. Accounts with huge transaction values rarely face this effect; meanwhile, the higher the number of transactions, the stronger the disposition effect.

Keywords: disposition effect, realized capital gains, realized capital losses, individual investors

1. INTRODUCTION

Psychological changes can impinge on the trend of stock transactions, which in its turn has certain effects on investors' gains. The disposition effect is a typical example, in which an investor sells the bullish stocks too early and retains bearish ones too long.

The disposition effect was found in the US stock market by Odean (1998) and Dhar & Zhu (2006). Chen et al. (2004) also recognized it in the China's stock market. Taiwan's stock market was within the scope of this effect as found by Barber et al. (2007).

Regarding Vietnam's stock market, there has been no research on the disposition effect thus far. Therefore, the present research aims to contribute academically to the literature of empirical researches on disposition effect and its componential factors, as well as to extend some investment implications to investors.

2. THEORETICAL BACKGROUND

The theory on normative finance assumes people are rational, want to maximize their expected utility, and are smart enough to make right decisions. In the meantime, behavioral finance theory argues that an individual's decision is often beset by psychological factors. Plenty of experimental and empirical studies on behavioral finance conclude that an individual does not behave in the direction of maximizing expected utility. The disposition effect is one of popular factors affecting the sale or purchase of an item in the investment portfolio.

a. Disposition Effect:

The disposition effect is a tendency in which an investor tends to retain bearish stocks too long and sell bullish stocks too soon. According to stop-loss rules, if an investor holds long position, he or she must sell stocks when the expected profit inches up a certain percentage. Yet in fact, plenty of investors face difficulty in complying with this rule. Instead, they tend to sell bullish stocks quickly and hold bearish ones. This is the disposition effect. In the short run, quick sale of bullish stocks can help investors satisfy desires, assert their talent and prove the accuracy of previous decision; and long retention of bearish stocks spare them the confession of their past incorrect decision. Yet in the long run, the disposition effect can hinder investors from making a precise decision, which will adversely impinge on the entire portfolio. Once the stock

market is systematically affected by the disposition effect, a difference between the market value and the internal value takes place.

b. Evidence of the Disposition Effect on Some International Stock Markets:

- The U.S. stock market:

Shefrin & Statman (1985) are the first scholars who proclaimed official analyses of the disposition effect. Accordingly, they describe the way individual investors hold their stocks within various periods of time depending on past performance of these stocks and reveal that the investors often held bearish stocks for a long time whereas bullish ones are hastily sold.

Odean (1998) also finds evidence of the disposition effect by studying a large sample of individual investors in a discount brokerage firm. On average, the proportion of gains realized (PGR) reaches 14.8% whereas the proportion of losses realized (PLR) is 9.8%; and investors realize capital gains which are 50% larger than their realization of capital losses. Additionally, Odean (1998) shows that such behavior does not derive from an appropriate motive because previous bullish stocks, in fact, perform better than bearish ones after investors sell their stocks.

According to Dhar & Zhu (2006), there are substantial variations in the disposition effect at the level of individual investors. They analyze transaction data of a big discount brokerage firm to explore the disposition effect and then try to explain its difference among different investors. Based on the findings of the experimental economics and social psychology, they hypothesize that difference in the investor's cognition of financial market and the transaction frequency can explain partly variations in the disposition effect at the individual level. Using demographic and socioeconomic variables to represent the investor's cognition, their research reaches the conclusion that being rich investors and professionals decreases disposition effect, and the transaction frequency also tends to reduce the disposition effect.

- Other stock markets outside the U.S.:

Institutional investors often invest in bullish stocks which are previously profitable. In the meantime, individual ones seem to do vice versa, that is, they would probably buy stocks whose past performance was lower than the average level (Grinblatt & Keloharju, 2000). In a more comprehensive research on transactions using the Finland's dataset, Grinblatt & Keloharju (2001) verify the presence of the disposition

effect. They also find the reference-price effect that occurs when individual investors are willing to sell their stocks if the prices reach the peak of the previous month.

Another study by Chen et al. (2004) of Chinese stock market also reveal that Chinese investors often make mistakes in stocks transactions, that is, stocks sold is more bullish than those bought and they reluctantly realize capital losses generated by bearish stocks. Additionally, their study points out that even experienced investors cannot avoid cognitive errors. The disposition effect is estimated with PGR equaling 0.519 and PLR 0.310. Accordingly, PGR is 0.209 greater than PLR. Their results show that the disposition effect in China's stock market is stronger than that in the US, where the difference between PGR and PLR found by Odean (1998) is only 0.05. Chen et al. (2007) explain that the realization of capital gains is to maintain the investor's self-esteem and the realization of capital losses is to acknowledge a wrong investment decision and thereby being avoided.

Barber et al. (2007), when studying the Taiwan's stock market, also find empirical evidence of the disposition effect. Accordingly, around 84% of Taiwanese investors hastily sell bullish stocks rather than bearish ones, as individual investors, enterprises and surfers do not like realizing losing stocks while the disposition effect on mutual funds and foreign investors is low.

Shapira & Venezia (2001) find the disposition effect in a sample of investors in Israeli stock market. They compare the disposition effect generated by investors who make investment decision independently and that by those consulted by professional brokerage firms. Their findings show that the disposition effect of the former is larger than that of the latter.

3. DATA AND METHODOLOGY

a. Data:

Vietnam's stock market is an infant one, and majority of investors are individual ones. According to the annual report of Vietnam Securities Depository (VSD), the gross number of accounts in the whole market in late 2011 is 1,170,000. A report from the State Securities Commission of Vietnam (SSC) states that accounts of individual investors constitutes 99.6% of the total number of accounts in the market. This implies that Vietnam's stock market is being dominated by individual investors, the very reason that this paper employs the transaction data of individual investors.

A transaction dataset of 100 individual investors is supplied by a securities company established in 2008 and ranked among the top fifteen leading brokerage firms due to its development strategy in connection with customers. At present, this is one of several companies that do not suffer losses.

The data are from June 1, 2010 through to June 30, 2012 with 27,591 transactions whose total value reaches VND2,204 billion (Table 1). In this period, there is a downward trend in the stock market, yet the range of fluctuation is not large.

Table 1: Overview of Data

Number of accounts	100
Period surveyed	From June 1, 2010 to June 30, 2012
Total transaction value (VND billion)	2,203.7
Buying value (VND billion)	1,120.4
Selling value (VND billion)	1,083.3
Total number of transactions	27,591

Source: Authors' survey

Transactions, in which stocks are not bought, are omitted. Next, data of buying and selling price is adjusted in accordance with the adjustment ratio, which is the quotient of the non-adjusted closing price and the adjusted closing price. Adjusted data is calculated by dividing the real transaction price by the adjustment ratio.

Next, each primary parameters are calculated to determine the disposition effect, including the sample's proportion of gains realized (SPGR), the sample's proportion of losses realized (SPLR), the proportion of gains realized of each investors (PGR), and the proportion of losses realized of each investor (PLR).

Where,

$$SPGR = \frac{\text{Sample's real gains}}{\text{Sample's real gains} + \text{Sample's paper gains}}$$

$$SPLR = \frac{\text{Sample's real losses}}{\text{Sample's real losses} + \text{Sample's paper losses}}$$

$$PGR = \frac{\text{Real gains}}{\text{Real gains} + \text{Paper gains}}$$

$$PLR = \frac{\text{Real losses}}{\text{Real losses} + \text{Paper losses}}$$

b. Methodology:

Based on the standard methodology of Odean (1998), the authors first calculate and compare SPGR and SPLR. The disposition effect will exist if SPGR is larger than SPLR. Then, the existence of the disposition effect will be tested by comparing means so as to determine whether the mean of PGR value series is larger than that of PLR value series.

It is hypothesized that:

H₀: The mean of PGR value series is smaller than or equal to the mean of PLR value series.

H₁: The mean of PGR value series is larger than the mean of PLR value series.

Odean (1998), despite being a pioneering study in disposition effect, is restricted to merely proving the existence of disposition effect. Further researches have examined several factors related to the disposition effect. For instance, Chen et al. (2004) indicate different levels of the disposition effect in different personal characteristics such as investor's age, transactions, account value, and terms of account activation. Dhar & Zhu (2006) consider the relationship between affluence, professionalism, age, experience, and the disposition effect. Barber et al. (2007) investigate the impacts of gender, individual investments, institutional investments, etc. on the disposition effect.

Based on aforementioned studies and the authors' latest data, the disposition effect in Vietnam is to be considered in connection with the following factors:

- Transaction value: is the gross buying and selling value within the researched period. Due to limitations to data collation, the authors cannot include information about the investors' annual gross income as Dhar & Zhu (2006) did. Therefore, in order to evaluate the impact of the investor's prosperity on the disposition effect, the transaction value is utilized as a representative factor based on the intuition that the higher the transaction value, the better it can reflect the investors' financial strength.

- Number of transactions: The total number of buying and selling transactions within the researched period.

- Account activation term: is calculated from a point in time when the investor has the first transaction till late June 2012.

- Age: is the investor's age.

- Gender: is the investor's gender.

The multiple variable regression model employed to analyze the relationship of stated factors to the disposition effect can be written as follows:

$$DE = a + b_1 * \text{Ingtgd} + b_2 * \text{Inslgd} + b_3 * \text{Intuoi} + b_4 * \text{Intgkh} + b_5 * \text{Dgtinh} + e_t$$

Where:

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

Ingtgd: logarithm of the transaction value

Inslgd: logarithm of the number of transactions

Intuoi: logarithm of the investor's age

Intgkh: logarithm of the account activation term

Dgtinh: a dummy variable for gender with 1 for male and 0 for female

4. RESULTS AND DISCUSSIONS

a. Sample Characteristics:

Table 2: Description of Data

Factors	N	Mean	Standard deviation	Min	Max	Total
Transaction value	100	22.04	38.51	1.3	254.7	2.203.7
Number of transactions	100	275.91	261.26	29.0	1528.0	27.591.0
Age	100	38.69	10.79	22.0	72.0	-
Account activation term	100	31.36	8.82	6.0	43.0	-

Source: Authors' calculations

As was indicated in Table 2, the lowest transaction value is VND1.3 billion and the highest one VND254.7 billion, and thus the average transaction per investor is around VND22 billion. The total number of buying and selling transactions reaches 27,591, and each investor will, on average, have around 276 transactions during the research

period. The youngest investor is 22 years old and the eldest one being 72, and the mean of investor's age is 39.

Due to the fact that the securities company providing customers' transaction data is established in 2008, the time series dataset for the activation term is rather small. The longest activation term is 43 months, and the shortest one around half of year. The average activation term is more or less than 31 months.

The proportion of male investors is 56% and females constitute 44%; and thus, the gender gap of the sample is not large. Meanwhile, in Barber et al. (2007), the male group accounts for only roughly 45%.

b. Disposition Effect in the Vietnam's Stock Market:

Table 3: Description of Dependent Variables PGR, PLR and DE

	N	Mean	Standard deviation	Min	Max
PGR	100	0.337	0.1292	0.00	0.80
PLR	100	0.252	0.1337	0.00	0.60
DE	100	0.085	0.1128	-0.20	0.30

Source: Authors' calculations

Table 3 indicates that the means of PGR and PLR are 0.337 and 0.252 respectively. It implies that investors are willing to sell 33.7% of the bullish stocks and only 25.2% of bearish ones. The mean of PGR and PLR being 0.085 can be inferred that the willingness to sell bullish stocks is 8.5% larger than that to bearish stocks.

Table 4: Values of SPGR, SPLR, PGR and PLR

(a) Total real gains, total real losses, paper gains, paper losses	
Sample's real gains	4,964
Sample's real losses	6,579
Sample's paper gains	18,390
Sample's paper losses	36,633
(b) SPGR, SPLR	
SPGR	0,213

SPLR	0,152
SPGR - SPLR	0,06
(c) Mean of PGR and PLR of the sample	
PGR	0,337
PLR	0,252
PGR – PLR	0,085
Proportion of investors with PGR larger than PLR	80%

Source: Authors' calculations

According to Table 4 [section (b)], the disposition effect is reflected by the total sample. The difference between SPGR (0.213) and SPLR (0.152) being 0.06 can be comprehended that the ratio of the sample's realized gains is 6% larger than the sample's realized losses. Section (c) of Table 4 shows that the popularity of disposition effect reaches 80%; or in other words, 80% of investors enjoy realized gains larger than realized losses. This result is not much different from Barber et al. (2007) who report a proportion of 85.5%.

However, examining the entire sample alone cannot reflect precisely the disposition effect on each investor and can easily commit large errors when several investors have much more transactions than others (i.e. the values of SPGR and SPLR cannot reflect precisely the popularity of the entire sample). In order to tackle this limitation, the authors calculate PGR and PLR for each investor and test the hypothesis of PGR mean being larger than PLR mean. The null hypothesis (H_0) can be stated that the PGR mean is smaller than or equal to the PLR mean.

Table 5: Testing the Hypothesis of PGR Mean Being Larger Than PLR Mean

Variable	N	Mean	Standard error	Standard deviation	CI = 95%	
PGR	100	0.337	0.0129221	0.1292207	0.3113598	0.3626402
PLR	100	0.252	0.0133696	0.1336965	0.2254717	0.2785283
Diff	100	0.085	0.0118386	0.1183856	0.0615097	0.1084903
diff. = mean (PGR-PLR)				t = 7.1799		
H_0 : mean (diff.) = 0				Df = 99		

Ha: mean (diff.) < 0

Ha: mean (diff.)! = 0

Ha: mean (diff.) > 0

Pr(T < t) = 1.0000

Pr(|T| > |t|) = 0.0000

Pr(T > t) = 0.0000

Source: Authors' calculations

Table 5 reveals that the PGR mean is 0.085 larger than PLR mean. With the confidence interval of 95% and p-value equaling 0.000, the null hypothesis is rejected, that is, the PGR mean is larger than PLR mean. Hence, there exists the disposition effect in Vietnam's stock market.

Table 6 shows the difference in disposition effect found in this paper and in previous researches on international markets. It is visible that Vietnam's disposition effect is larger than that in the US and Taiwan, yet smaller than China. Such difference may be due to the fact that Vietnam's stock market and characteristics of the research period are not identical to those of previous studies. Vietnam's stock market is younger than the US and Taiwan. Moreover, Vietnam's stock market in the research period is on the downward trend while Chen et al. (2004) study the China's bullish market. As Kim and Nofinger (2004) state, the investor's behavior is different in both bull and bear markets.

Table 6: Disposition Effect in Vietnam and Some other Countries

	Vietnam	US	Taiwan	China
PGR	0.337	0.148	0.094	0.519
PLR	0.252	0.098	0.0232	0.310
DE (PGR-PLR)	0.085	0.05	0.0708	0.209

Source: Author's calculation based on previous studies by Odean (1998) for the case of the US, Barber et al. (2007) for the case of Taiwan and Chen et al. (2004) for the case of China.

c. Factors Affecting the Disposition Effect in Vietnam:

Table 7 presents the results of the multiple regression model of DE (the difference between real gains and real losses), transaction value, number of transactions, age, activation term and investor's sex. Apparently, age and activation term have no correlation with the disposition effect in Vietnam's stock market having the p-values of 0.21 and 0.171, respectively.

Additionally, the gender coefficient bearing a negative sign (-0.064) at the significance of 1% implies that the investor's gender has negative impacts on the

disposition effect, and the disposition effect on female investors is larger than that on males. The negative coefficient of transaction value (-0.039) at the significance of 1% indicates that the higher the transaction value of an account, the lower its disposition effect, and this finding is congruent with that of Chen et al. (2004). The coefficient of number of transactions is positive at the significance of 1%; in other words, the larger the number of transactions of an investor, the sooner he or she sells bullish stocks. This finding is contrary to that of Dhar & Zhu (2006) and Chen et al. (2004), who state that the disposition effect of the investors with plenty of transactions is less profound than those with fewer transactions.

These factors can explain 16.26% of disposition effect. The variance analysis implies goodness of fit of the regression model with the F-stat of 4.48 and the significant level of 1%.

Table 7: Multivariable Regression Results

$$DE = a + b_1 * \ln(gtgd) + b_2 * \ln(slgd) + b_3 * \ln(tuoi) + b_4 * \ln(tgkh) + b_5 * Dgtinh + e_t$$

	(Sum of square error)	df	MS	N	100
				F-stat (5;94)	4.48
Regression	0.258189	5	0.051638	Prob > F	0.0006
Residual	1.002211	94	0.010662	R ²	0.2048
Total	1.260400	99	0.012731	Adjusted R ²	0.1626
				Standard error	0.1033
DE	Coefficient	Standard error	t-stat	P> t	CI = 95%
lngtgd	-0.039363	0.012116	-3.25	0.002	-0.063420 -0.015305
lnslgd	0.028276	0.015294	1.85	0.068	-0.002091 0.058642
lntuoi	0.050909	0.040356	1.26	0.210	0.029219 0.131038
lntgkh	0.040582	0.029449	1.38	0.171	0.017890 0.099054
Dgtinh	-0.063742	0.021260	-3.00	0.003	0.105954 -0.021531
Intercept coefficient	0.562317	0.298952	1.88	0.063	0.031259 1.155893

Source: Authors' calculations

However, the collated data and measurement scales of variables of the multiple variable regression model are not identical to those employed in previous studies, so there is concerns on the possible missing variables, which can reduce the reliability of evaluative coefficients. Therefore, after performing the above regression model, the authors also conducts tests for missing variables, heteroskedasticity, and multicollinearity. Table 8 summarizes testing results and implies that the model estimations are appropriate.

Table 8: Some Tests Employed to Test the Model's Goodness of Fit

Heteroskedasticity test

H_0 : Variance is constant.

$$\chi^2 (1) = 0.0800$$

$$\text{Prob} > \chi^2 = 0.7792$$

Missing variables test

H_0 : The model has no missing variables

$$F(3;91) = 1.6200$$

$$\text{Prob} > F = 0.1906$$

Multicollinearity test

$$\text{VIP mean } 1.2$$

Source: Authors' calculations

5. CONCLUSION

a. Primary Conclusions:

The disposition effect is found in Vietnam's stock market. Around 80% of surveyed investors usually sell bullish stocks quicker than selling bearish ones. The willingness to sell bullish stock is 33.7% whereas it is just 25.2% for bearish stocks. Apparently, investors tend to realize capital gains rather than capital losses (whose difference is about 8.5%). Accordingly, the disposition effect in Vietnam's stock market is stronger than that in the US (Odean, 1998) and Taiwan (Barber et al., 2007) and smaller than that in China (Chen et al., 2004).

The transaction value, the number of transactions, and the investor's gender have direct impacts on the disposition effect. Accordingly, accounts with huge transaction

value and male investors generate low disposition effect. Meanwhile, the number of transactions shows a tendency to sell bullish stocks rather than bearish ones quickly when the number of transactions expands. The activation term and age are not statistically significant and thus cannot explain the disposition effect.

b. Practical Implications:

The disposition effect can reduce the portfolio efficiency. According to Odean (1998) and Chen et al. (2004), stocks sold have higher price fluctuations than stocks bought. In other words, the disposition effect can cause damage to the investor's gains. Through empirical results in Vietnam and other markets, it is implied that investors should cut losses, consciously encounter losses, and not equate paper losses with realized losses in economic categories. Albeit a bearish stock can sometime re-appreciate in value to become bullish and partly solace the investor, it will hinder him or her from making an appropriate decision. The investor should not merely evaluate the portfolio profitability on the basis of the realized return; instead, they can use the return of the entire portfolio. In other words, they should look at investments in remaining stock (which can generate a tremendous loss) in the portfolio.

c. Limitations and Suggestions for Further Researches:

There are some certain limitations to this research. Even though the number of transactions is tremendous, the number of investor is quite humble. The chosen securities company was established in 2008 and is quite young and thereby affecting the level that the activation term can explain the disposition effect.

Moreover, an objective reason affecting analytical results derives from Vietnam's rules. Plenty of accounts of Vietnamese investors are not opened in their own name but in the name of an intermediary; and thus the securities company's age data, which may not precisely reflect the real age of the real account holder, might impinge on the analysis of the relation between age and disposition effect. The data about investors' actual income, which represents their affluence, has not been collated in the current context of Vietnam.

Finally, the fact that whether the tendency of realization of capital gains and losses in Vietnam's market varies depending on the size of gains and losses has not been taken into account in this paper. Thus, future researches can investigate this issue or improve the aforementioned data limitations■

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