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SELLING LOSERS AND WINNERS: A TEST OF THE DISPOSITION AND HOUSE MONEY EFFECT

Abstract:

This paper test of the disposition and house money effect across market states in the context of mutual fund investors in China, based on a sample period that extends from January 2006 to December 2017. Previous studies primarily document the existence of the disposition effect in China without addressing: first, the impact of market states (bullish, bearish and neutral market) on the investors' disposition effect; and, second, we separate the fund performance according to the different levels of gains and losses. Our results suggest that investors are characterized by a house money effect when they have extreme capital gains under a bull market, and investors are characterized by an inverse disposition effect (they redeem their losing mutual fund units) when they have moderate capital losses under a neutral market. Thus, disposition effect is not uniform; it varies across market states in China. Our findings are robust to aggregate, investor levels, and the others robustness testing factors.

Keywords:

disposition effect; mutual fund investors; market states; house money effect, China

JEL Classification: G02, G10

1. Introduction

In recent years, the topic of behavioral finance has attracted much attention, economists have come to appreciate the importance of household investment decisions for understanding both decision-making under risk and the behavior of investors in financial markets (e.g., Campbell, 2006). One of the most robust facts describing individual trading behavior is the disposition effect (hereafter DE). The DE, as suggested by Shefrin and Statman (1985) may be implicitly summed up as "sell winners too early and ride losers too long," which depicts risk aversion in the winning shares and risk seeking in the losing shares.

Many studies have indicated that many factors that determine whether investors will redeem the funds or not. The fund risk[1] is one of the key factor (e.g. Chevalier and Ellison, 1997; Liu, Longestaff and Pan, 2003; O'Neal, 2004). According to past studies, the patterns based on which investors dispose of funds might differ under different market states (e.g. Lee et al., 2002; Cooper et al., 2004; Huang, 2006; Tetlock, 2007). Lee et al. (2002) argue that investor sentiment is associated with different market states. Therefore, market state affects the investor's investment decision. They state that '...bullish (bearish) shifts in sentiment lead to downward (upward) revisions in the volatility of returns and are associated with higher (lower) future excess returns' (p. 2281). Lee et al. (2013) suggest that fund investors in Taiwan have a DE and exhibit several kinds of redemption behavior for different market states.

In an apparently puzzling contrast, the disposition effect is reversed in mutual funds, as investors have a greater propensity to being aversion in the losing shares and risk seeking in the winner shares. This fact has been known at least since Friend, Blume, and Crockett (1970), but has been discussed primarily in the context of the positive performance-flow relationship (e.g., Chevalier and Ellison, 1997; Lee et al. 2013; Aspare and Hoffmann, 2015), funds that exhibit winning shares receive lower outflows than losing shares. The other effect coined the term of house money effect, reflect evidence in the context of individuals tend to be more risk taking following winning shares, while being more risk averse following losing shares. Thaler and Johnson (1990), coined the term house money effect to reflect evidence in the context of financial gambles that individuals tend to be more risk taking following prior gains (i.e., when gambling with the casino's money rather than their own), while being more risk averse following prior losses.

Do the disposition, reverse disposition and house money effects coexist? In China, more than $4481 billion are invested in equity mutual funds in 2017[2], the vast majority

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[1] In prior research (Chevalier and Ellison, 1997; Liu, Longestaff and Pan, 2003; O'Neal, 2004) the volatility of the return in the past one year was often used. In other words, the standard deviation served as the proxy variable for the fund risk.
[2] Source: Thomson reuters Lipper.

of funds remains actively managed. According to past studies, the patterns based on which investors dispose of funds might differ under different market states, with the result that we hypothesize that the patterns of DE might differ under different market states. Studies on the DE in the case of China[3], they rarely mentioned that. We not only investigate whether fund investors have different patterns of DE differences under different market states, but also investigate whether the investors have different patterns of DE in terms of performance. Lee et al. (2013) adopts the simulation method to identify the market states according to bullish, bearish and neutral market states, and five indicators of fund performance. In our study, cite Lee et al. (2013) to examine the DE in China. The results of the data in our study include 52 funds covering 48 seasons (from Q1 2006 and Q4, 17). According to past studies, we hypothesize that the patterns of DE might be different under different market states and differences in performance.[4]

We find that fund investors redeem less when their investments have extreme capital gains under a bull market, in which case they exhibit the house money effect, and they redeem more when their investments have losses under a neutral market, in which case they exhibit an inverse DE. Likewise, they redeem more when their investments have extreme capital losses under a non-bull market, and they exhibit an inverse DE. Thus, the DE is not uniform. It differs with respect to different market conditions. In addition, the DE phenomenon also exists among China's mutual fund investors as well. It therefore seems important to be mindful of such differences when studying the investors' DEs. If the fund management decisions fail to consider the different market states and differences in fund performance, this might give rise to some bias and might reduce the effectiveness of related policies. Its benefit for the funding corporations or financial supervisory bodies in China is that it should help establish different management decisions under different market states. Therefore, it is an important issue for us to study.

2. Literature review and hypotheses development

2.1 Market states and DE

In our study, we attempt to examine the DE, i.e., that concerned with the redemption behavior of fund investors[5]. However, by drawing a comparison with past research, the study has two features: first, we have a longer sample period and investigate the DE under different market states. Past research, by contrast, considers data for only about

[3] Zhao et al., 2005; Wang, 2005; Gao and Kling, 2006; Sun et al., 2007; Vin et al., 2009; Chi et al., 2011.
[4] Past research uses data for about 14 seasons when studying fund investors in China. For example, the sample period of Chan and Yang (2010) covers 12 seasons from 2007 to 2009. In addition, most of the sample period in Feng (2009) covers a bull market, most of which is both bullish and bearish. However, it does not include a neutral market for the sample period in Chan and Yang (2010).
[5] Wang, 2005; Feng, 2009; Lee et al., 2010a, b; Zhou, 2011; Lee et al., 2013; Newton et al., 2013; Duxbury et al., 2015; Chang, 2016

14 seasons when examining fund investors in China, besides that, most of the sample period is characterized by a bullish market and most of that period is either bullish or bearish; it does not include a neutral market for the sample period. In our study, our sample for open-end equity funds in China covers the period from 2006 to 2017 and includes bullish, bearish and neutral market conditions.

Many studies find that the investor's investment will be affected by the market states[6]. In addition, Lee et al. (2013) indicated that investor sentiment is associated with the market states and, therefore, the market states affect the investor's investment decision. In order to identify the market states, following Lee et al. (2013) we adopt the SSE composite index as the indicator to classify the market state as a bull market, a bear market or a neutral market. There is little research that has been done on redemption behavior. We not only investigate the DE under differences in market states, but we also investigate the DE under differences in performance in China.

2.2 Hypotheses development

Since we study the DE under three market states, we therefore propose three hypotheses. Thaler and Johnson (1990) suggested that people will take a risk when they have capital gains. In other words, they are reluctant to redeem the funds with capital gains. According to Lee et al. (2013), under a bull market, investors are more positive than under a bear or a neutral market. Therefore, compared to a bear or a neutral market, investors expect that the probability of reversing losses into gains or limiting losses is higher. Thus, investors prefer to less actively redeem the losing mutual fund units under a bull market. Our first hypothesis is:

H1: "Mutual fund investors are more reluctant to redeem their mutual funds when the mutual funds have extreme capital gains" under a bull market than under a bear or a neutral market.

According to Lee et al. (2013), when the market is neutral, the market trend is hard to predict. Thus, investors will lock in their unrealized gains and stop their losses quickly. We expect that investors will actively redeem their mutual fund units in the cases of mutual funds that are either winners or losers in a neutral market. Our second hypothesis is:

H2: "Investors actively redeem mutual fund units that are either winners or losers" under a neutral market as opposed to under a bull or a bear market.

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[6] Lee, Jiang and Indro, 2002; Cooper, Gutierrez and Hameed, 2004; Huang, 2006; Tetlock, 2007; Lee et al., 2013, etc.

According to Lee et al. (2013), under a bull (bear) market, investors expect that the probability of reversing losses into gains or limiting losses is higher (lower). Thus, investors prefer less (more) to actively redeem mutual funds that are losers under a bull (bear) market. Our third hypothesis is:

H3: "Mutual fund investors more actively redeem their mutual funds when the mutual funds incur extreme capital losses" under a bear market or a neutral market than under a bull market.

3. Data and methods

3.1 Data

There are two data sources used to study redemption behavior in China, the first being at the investor level, which consists of the personal transactions data of investors, while the second one is at the fund level, which comprises the aggregate transactions data of funds. Based on the Law of the People's Republic of China on Securities Investment Funds (introduced in China on June 01, 2013), it is hard to obtain data at the individual level. Therefore, many studies have replaced the individual investors' data with fund data, and the fund data roughly represent the mean of the individual investors' data. Many mutual fund studies use the aggregate approach[7]. In taking the performance indicators as an example, the above studies all regard the fund's performance as the individual investors' performance.

3.2 Sample period

Compared with past research, the sample periods is shorter and only includes bull or bear markets, and does not include neutral markets. Our sample period covers the period from 1Q 2006 to 4Q 2017, or 48 quarters. There are two reasons for this sample period being chosen. First, the number of mutual funds is sufficient for the data to constitute big data. Second, this sample period has three market states, and therefore the conclusions reached are more representative. Although we have chosen fund investors as the focus of our research, the characteristics of the stock market, bond market and money market are different (Anthony and Musto, 2003). Compared to past research in other countries, which is usually concentrated on open-end fund investors as the sample (Jonathan, 2004; Lee et al., 2010a, b; Lee et al., 2013), in China the emphasis is often on the broad market fund, bond fund or hybrid fund investors which are chosen as the research sample. Our sample period extends from 2006 to 2017 using quarterly data for 52 stock funds. The data are obtained from the CSMAR solution. Using mutual fund monthly data, we investigate the disposition effect in an

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[7] Sirri and Tufano, 1998; Edelen, 1999; Bergstresser and Poterba, 2002; O'Neal 2004; Lee et al., 2010a, b; Lee et al., 2013

aggregate basis. Many mutual studies use the aggregate approach[8]. To get robust results, we also obtain the individual-level data from three mutual funds in a well-known local fund house. The individual data cover 2006 to 2017, with 15431 individuals and 78832 records of mutual fund redemption.

3.3 Identifying market states

While several studies use an 'eye-ball' approach to identify bull and bear markets in China, we use a statistical approach to do so. To obtain robust results, the classifications for a bull, a bear, and a neutral market are robust with window lengths of seven to ten months. We use a window length of eight months to conduct our study. The stock market summary statistics of the specific bull, bear, and neutral markets in Taiwan in our sampl, there are four sample periods that meet the definition of bull markets. They cover 64 months and account for 44% of the full sample period. The bear markets are three sample periods that meet the definition of bear markets. They cover a total of 28 months and account for 19% of the full sample period. The neutral market lasts for 52 months, and there are three sample periods that meets the definition of neutral markets, and accounts for 36% of the full sample period.

4.   Results and discussion

We study the DE across different market states in the context of mutual fund investors. Given that the market state affects investor psychology regarding the future market trends, we conjecture that the DE differs across different market states as well as differing in performance. In our study, the basic model follows Lee et al. (2013), with the redemption rate as the dependent variable, and the raw return, market adjusted return, Jensen's alpha, the Sharpe ratio, and the information ratio as the major independent variables. The control variables are the natural logarithm of total net assets, the mutual fund risk, the concentration rate of holding stock, and the investment rate of the institution. We follow and modify the model of Lee et al. (2010a) and Lee et al. (2013) to eliminate the turnover rate and management fee rate to prevent collinearity. In past research, there have been two ways of considering the individual effect of each fund, namely, the fixed effect and random effect, with the fixed effect being the most often used. There are three methods for dealing with the panel data fixed effect: the least squares dummy variable (hereafter LSDV), the within effects model, and the between effects model. The LSDV is most often used in past research, and involves the use of a dummy variable for a cross section to catch the difference in the individual effect, with the estimator of other independent variables still being fixed for each fund. Therefore, in our study, we follow Lee et al. (2013) and use LSDV to deal with the fixed effect in the regression panel data. The model is as follows:

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[8] Sirri and Tufano, 1998; Lee et al., 2013

$$RED_{i,t} = \sum_{i=1}^{52} \alpha_i D_i + \beta^* MAR\_A_{i,t} + \gamma^* Controls + \mu_{i,t} \qquad (1)$$

where *i* and *t* show the value of fund *i* at time *t*; *RED* is the redemption rate, which is defined as dollars of redemption divided by the total net asset value of open-end funds; *MAR_A* is the market adjusted return; *Controls* represents the control variables; α, β and γ are coefficients; and $\mu_{i,t}$ is the error term.

$$RED_{i,t} = \sum_{i=1}^{43} \alpha_i D_i + \beta_1 EXTREWIN_{i,t} + \beta_2 MODERWIN_{i,t} + \beta_3 TIE_{i,t}$$

$$+ \beta_4 MODERLOS_{i,t} + \beta_5 EXTRELOS_{i,t} + \beta_6 Controls + \varepsilon_{i,t} \qquad (2)$$

Moreover, in order to investigate the DE, we classify the mutual fund performance into five indicators, namely, extreme capital gains (*EXTREWIN*), moderate capital gains (*MODERWIN*), ineligible capital gains or losses or the same capital gain (*TIE*), moderate capital losses (*MODERLOS*) and extreme capital losses (*EXTRELOS*). As for the five performance indicators, *TIE* is the range into which *MAR_A* falls into ±10%. The remaining positive 90% is further divided into two parts, where *EXTREWIN* and *MODERWIN* fall within the range of the top 45% and the middle 45% of *MAR_A*, respectively. Similar definitions apply to *EXTRELOS* and *MODERLOS* for the remaining negative 90% of *MAR_A*. The redemption rates under each market state are different, which suggests that mutual fund investors' aggregate redemption behavior differs across different market states. For example, the mean redemption rate when mutual funds have extreme capital gains (*EXTREWIN*) in bull and bear markets is 29.07% and 14.29%, respectively. Hence, it would be interesting to examine the DE across market states.

4.2 Estimation results

First, we examine the results for testing Hypothesis 1: "Mutual fund investors are more reluctant to redeem their mutual funds when the mutual funds have an extreme capital gain" under a bull market rather than under a bear or neutral market. The results of our estimation support Hypothesis 1, for the coefficient (-0.67) of *EXTREWIN* is negative and significant at the 10% level under a bull market and smaller than the coefficient under a bear (-0.02, insignificant) and neutral market (0.19, insignificant). Therefore, our estimation results support Hypothesis 1.

Hypothesis 2: "Investors actively redeem mutual fund units that are either winners or losers" under a neutral market as opposed to under a bull or a bear market. Our estimate results only support that "Investors actively redeem mutual fund units that are

losers under a neutral market as opposed to under a bull or a bear market". The condition for supporting Hypothesis 2 is that the coefficient of a winner (*EXTREWIN* and *MODERWIN)* is positive and significant under a neutral market and higher than the coefficient under a bull or bear market; the coefficient of a loser (*EXTRELOS* and *MODERLOS)* is negative and significant under a neutral market and smaller than the coefficient under a bull or bear market. The coefficient (-0.67) of *EXTREWIN* is negative and significant at the 10% level under a bull market and smaller than the coefficient under a bear (-0.02, insignificant) and neutral market (0.19, insignificant). Therefore, our estimation results do not support Hypothesis 2 when investments have extreme capital gains. Similarly, when investments have moderate capital gains, the coefficients of *MODERWIN* are all insignificant under a bull, bear or neutral market. Therefore, our estimation results do not support Hypothesis 2 when investments have moderate capital gains. Furthermore, when investments have moderate capital losses, the coefficients of *MODERLOS* are insignificant under a bull or bear market, but significant at the 5% level under a neutral market, the coefficient being -0.78. Therefore, our estimation results support Hypothesis 2 when investments have moderate capital losses. When investments have extreme capital losses, the coefficient of *EXTRELOS* is insignificant under a bull market, but significant at the 5% and 1% levels under a bull or neutral market, in which cases the coefficients are -0.08 and -0.40, respectively. Therefore, our estimation results support Hypothesis 2 when investments have extreme capital losses.

Hypothesis 3: "Mutual fund investors more actively redeem their mutual funds when the mutual funds incur extreme capital losses" under a bear market or a neutral market than under a bull market. When investments have extreme capital losses, the coefficients of *EXTRELOS* are insignificant under a bull market, but significant at the 5% and 1% levels under a bull or neutral market, the coefficients being -0.08 and -0.40, respectively. Therefore, our results support Hypothesis 3 when investments have extreme capital losses. Hence, it is imperative to closely examine how different market states interact with the DE. We find that fund investors redeem less when their investments have extreme capital gains under a bull market, and they exhibit the house money effect. They redeem more when their investments have losses under a neutral market, and they exhibit an inverse DE. They also redeem more when their investments have extreme capital losses under a non-bull market, in which case they exhibit an inverse DE.

We summarize the results of the estimation in Table 2. We find that fund investors redeem less when their investments have extreme capital gains under a bull market, and they exhibit a house money effect, but they redeem more when their investments have losses under a neutral market, and they exhibit an inverse DE. In addition, they redeem more when their investments have extreme capital losses under a non-bull market, and they exhibit an inverse DE. Thus, the DE is not uniform. It is different with respect to different market states. In addition, the DE phenomenon also exists among

China's mutual fund investors. It therefore seems important to be mindful of such differences when studying fund the investors' DEs. If the fund management decisions fail to consider the different market states and differences in fund performance, this might give rise to some bias and might reduce the effectiveness of the policies.

5. Conclusion

We study the redemption behavior under different market states for different levels of fund performance. The sample period extends from the first quarter of 2006 to the fourth quarter of 2017, thereby covering 48 quarters and 52 open-end stock funds. Compared to past research, this study has two features. First of all, it has a longer sample period, including bull, bear and neutral market states. Second, we identify market states to study the redemption behavior under different levels of gains and losses, in order to recover different patterns of redemption behavior. To check the robustness of our empirical results, we consider the following modifications. First, we consider another proxy variable for the performance indicator employed in our empirical analysis. Second, we consider different accumulated periods of the performance indicators. Third, we use different methods to identify the market states. We find that the empirical results give rise to only insignificant differences.

We find that fund investors redeem less when their investments have extreme capital gains under a bull market, in which case they exhibit the house money effect, and they redeem more when their investments have losses under a neutral market, in which case they exhibit an inverse DE. Likewise, they redeem more when their investments have extreme capital losses under a non-bull market, and they exhibit an inverse DE. Thus, the DE is not uniform. It differs with respect to different market conditions. In addition, the DE phenomenon also exists among China's mutual fund investors as well. It therefore seems important to be mindful of such differences when studying the investors' DEs. If the fund management decisions fail to consider the different market states and differences in fund performance, this might give rise to some bias and might reduce the effectiveness of related policies.

Table 1: Estimation results

Dependent Variable: Redemption Rate (*RED*)				
	Full Samples	Market states		
		Bull Market	*Bear Market*	*Neutral Market*
EXTRAWIN	-0.26(-1.81)[a]	-0.67(-1.86)[a]	-0.02(-0.14)	0.19(1.02)
MODERWIN	-0.59(-1.06)	2.07(1.09)	0.52(0.93)	0.05(0.14)
TIE	1.31(0.27)	-1.93(-0.09)	3.80(0.89)	2.60(0.81)
MODERLOS	0.31(0.63)	1.30(0.93)	0.06(0.10)	-0.78(-2.29)[b]
EXTRELOS	-0.14(-2.98)[c]	0.03(0.30)	-0.08(-1.85)[a]	-0.40(-3.07)[c]
N	1075	301	344	430
Adjusted R Square	23.70%	21.84%	10.94%	17.18%

Note: We present the results for the full sample, and bull, bear, and neutral markets in columns (2) to (5). We need to be cautious when we interpret the coefficients for the extreme and moderate capital losses coefficients. Because these two variables are negative by nature, positive estimated coefficients mean less redemption or vice versa. EXTREWIN is the extreme capital gain, MODERWIN is the moderate capital gain, TIE is an ineligible capital gain or loss, MODERLOS is the moderate capital loss, EXTRELOS is the extreme capital loss. a, b, and c denote significance at the 10%, 5% and 1% levels, respectively. Standard errors are shown in the parentheses.

Table 2: Summary of estimation results

	Full sample	*Bull Market*	*Bear Market*	*Neutral Market*
EXTREWIN	House money effect	House money effect	-	-
MODERWIN	-	-	-	-
TIE	-	-	-	-
MODERLOS	DE	DE	DE	Inverse DE
EXTRELOS	Inverse DE	DE	Inverse DE	Inverse DE

Note: EXTREWIN is the extreme capital gain, MODERWIN is the moderate capital gain, TIE is an ineligible capital gain or loss, MODERLOS is the moderate capital loss, EXTRELOS is the extreme capital loss.

References

Aspara J. and Hoffmann A. O. I. (2016) Selling losers and keeping winners: How (savings) goal dynamics predict a reversal of the disposition effect, *Marketing Letters*, 26, 201–211.

Brown, P., Chappel, N., Da Silva Rosa, R., Walter, T. (2006) The Reach of the Disposition Effect: Large Sample Evidence Across Investor Classes. *International Review of Finance*, 6, 43-78.

Campbell, John Y. (2006) Household finance, *The Journal of Finance*, 61, 1553-1604.

Chang Y., Solomon H., and Westerfield M. (2016) Looking for Someone to Blame: Delegation, Cognitive Dissonance, and the Disposition Effect, *The Journal of Finance*, 71, 267-232.

Chevalier, J., & Ellison, G. (1997) Risk Taking by Mutual Funds as a Response to Incentives. *The Journal of Political Economy*, 105, 1167-1200.

Cooper, M. J., Gutierrez Jr, R. C. and Hameed, A. (2004) Market states and momentum, *The Journal of Finance*, 59, 1345-65.

Daniel, K., M. Grinblatt, S. Titman and R. Wermers. (1997) Measuring Mutual Fund Performance with Characteristic-Based Benchmarks, *The Journal of Finance*, 52, 1035-1058.

Duxbury D., Hudson R., Keasey K. and Yang Z. (2015) Do the disposition and house money effects coexist? A reconciliation of two behavioral biases using individual investor-level data, *Journal of International Financial Markets, Institutions & Money*, 34, 55-68.

Feng J. Y. (2009) The Endogeneity of Open-end Fund Redemption and Performance, *Security Market Herald*, 03, 28-34.

Feng, L. and Seasholes, M. S. (2005) Do investor sophistication and trading experience eliminate behavioral biases in financial markets? *Review of Finance*, 9, 305-351.

Ferris, S. P., Haugen, R. A., & Makhija, A. K. (1988) Predicting contemporary volume with historic volume at differential price levels: Evidence supporting the disposition effect. *The Journal of Finance*, 43, 677-697.

Frazzini, A. (2006) The disposition effect and underreaction to news. *The Journal of Finance*, 61, 2017-2046.

Frino, A., Johnstone, D., & Zheng, H. (2004) The propensity for local traders in futures markets to ride losses: Evidence of irrational or rational behavior? *Journal of Banking & Finance*, 28, 353-372.

Gao L. and Kling G. (2006) Regulatory changes and market liquidity in Chinese stock markets, *Emerging Markets Review*, 7, 162-175.

Garvey, R., & Murphy, A. (2004) Are professional traders too slow to realize their losses? *Financial Analysts Journal*, 60, 35-43.

Grinblatt, M., Keloharju, M. (2001) What makes investors trade? *The Journal of Finance*, 56, 589-616.

Grinblatt, M., Titman, S., Wermers, R. (1995) Momentum investment strategies, portfolio performance, and herding: A study of mutual fund behavior. *The American Economic Review*, 5, 1088-1105.

Heisler, J. (1994) Loss aversion in a futures market: An empirical test. Review of Futures Markets, *Review of futures markets*, 13, 793-826.

Huang, D. (2006) Market states and international momentum strategies, *Quarterly Review of Economics and Finance*, 46, 437-46.

Ippolito, R. A. (1992) Consumer reaction to measures of poor quality: Evidence from the mutual fund industry, *Journal of Law and Economics*, 35, 45-70.

Jensen, M. (1986) The Performance of Mutual Funds in the Period 1945–64, *Journal of Finance*, 23, 389-416.

Kahneman, D., Tversky, A. (1979) Prospect theory: An analysis of decision under risk. Econometrica, *Journal of the Econometric Society*, 47, 263-291.

Lee, J. S., Shen, C. H., Yen, P. H. (2010a) The Study of the Fund Investors' Disposition Effect vis-à-vis Herding Redemption and Non-Herding Redemption: Evidence from Quantile Regression Least Squares Dummy Variable Estimator, *Journal of Management and Systems*, 17, 1-26.

Lee, J. S., Shen, C. H., Yen, P. H. (2010b) Risk States of Funds and Fund Investors' Disposition Effects: Application of the Panel Threshold Model, *Journal of Management*, 27, 459-477.

Lee, J. S., Yen, P. H., Chan, K. C. (2013) Market states and disposition effect: Evidence from Taiwan mutual fund investors, *Applied Economics*, 45, 1331-1342.

Lee, W. Y., Jiang, C. X., Indro, D. C. (2002) Stock market volatility, excess returns, and the role of investor sentiment, *Journal of Banking & Finance*, 26, 2277-2299.

Liu, J., Longstaff, F. A. and Pan J (2003) Dynamic asset allocation with event risk, *The Journal of Finance*, 58, 231-259.

Locke, P. R., Mann, S. C. (2005) Professional trader discipline and trade disposition, *Journal of Financial Economics*, 76, 401-444.

Malkiel, B. (1995) Returns from Investing in Equity Mutual Funds 1971 to 1991, *Journal of Finance*, 50, 549-572.

Newton J., Marco, G., Cesar, C., Jurandir, M. and Sergio, S. (2013) The Disposition Effect and Investor Experience, *Journal of Banking and Finance*, 37, 1669-1675.

O'Neal, E. S. (2004) Purchase and redemption patterns of US equity mutual funds, *Financial Management*, 33, 63-90.

Odean, T. (1998) Are investors reluctant to realize their losses? *The Journal of Finance*, 53, 1775-1798.

Ormos M. and Joó I. (2014) Are Hungarian investors reluctant to realize their losses? *Economic Modelling*, 40, 52-58.

Shefrin, H., Statman, M. (1985) The disposition to sell winners too early and ride losers too long: Theory and evidence, *The Journal of Finance*, 40, 777-790.

Shu, P. G., Yeh, Y. H., Chiu, S. B., Chen, H. C. (2005) Are Taiwanese individual investors reluctant to realize their losses? *Pacific-Basin Finance Journal*, 13, 201-223.

Sirri, E. R. and Tufano, P. (1998) Costly search and mutual fund flows, *The Journal of Finance*, 53, 1589-622.

Tetlock, P. C. (2007) Giving content to investor sentiment: the role of media in the stock market, *The Journal of Finance*, 62, 1139-68.

Thaler, R. (1980) Toward a positive theory of consumer choice, *Journal of Economic Behavior & Organization*, 1, 39-60.

Thaler, R. H., Johnson, E. J. (1990) Gambling with the house money and trying to break even: The effects of prior outcomes on risky choice, *Management Science*, 36, 643-660.

Wang H., Zhang B., Zhou A. (2007) An Empirical Analysis on the Redemption Puzzle of Open-End Funds in China, *South China Journal of Economics*, 08, 65-73.

Wang M. J. (2005) The Disposition Effect of the Institutional Investors: The Duration Model Based on Transaction Data, *Journal of Sun Yat-sen University (Social Science Edition)*, 06, 122-128+141.

Wermers, R. (2003) Is money really "smart"? New evidence on the relation between mutual fund flows, manager behavior, and performance persistence. Unpublished Working Paper, University of Maryland.

Wulfmeyer S. (2016) Irrational Mutual Fund Managers: Explaining Differences in Their Behavior, *Journal of Behavioral Finance*, 17, 99-123.

Xie Y. Peng T., Ying Z. S. (2004) An Analysis on the Relationship between Open-end Fund Structure and Investor's Redemption, *The Journal of Quantitative & Technical Economics*, 06, 96-100.

Zhou M., Zhou K. G., Zhang J., Liu Y. (2011) Study on the Disposition Effect of Fund Investors in China: Evidence from a Large Size Domestic Open Fund, *Review of Investment Studies*, 10, 87-97.

Xie Y. Peng T., Ying Z. S. (2004) An Analysis on the Relationship between Open-end Fund Structure and Investor's Redemption,