Herding behavior: Overview and evidence in Vietnam stock market

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Abstract

Vietnamese stock market is considered immature and unstable as the outside influence of economy and the weakness of market system. Herding behavior tends to exist in emerging market with lack in transparency, efficient information and macro financial management. Therefore, this research is conducted to examine the existence of herding in Vietnamese stock market by using daily stock return from January 2005 to December 2013 with the approach of Chang et al. (2000). However, this research is not only test whether herding exist but also the influence of market movement on herding behavior and it is found that herding presents in both bull and bear market, but more significant in falling market. The testing period is also divided from 2005 to 2008 and 2008 to 2013 to test the affect of extreme market movement to herding. There is strong evidence that herding happened in 2008 when severe financial crisis occurred and caused serious consequences to global economy and Vietnamese market particularly. Finding empirical evidence of herding behavior in Vietnamese stock market not only helps investors to understand clearly about stock pricing but also brings benefit to policy makers to improve the liquidity and the efficiency of stock market to economy.

Key words: *herding behavior, Vietnamese stock market*

1. Introduction

Investors are no longer strange to stock market and the strength of economy showed in the stability and the development of stock market. More people taking part in stock market as investors leads to the interest in financial behavior as it significantly affects the decision of investors and price change. According to efficient market hypothesis (EMH), stock market is efficient which means that all information is available to investors and no one can get higher return than the average market return. Under semi-strong form, the market price reflects all past and current information, therefore, the price changes follow random walk and it is unpredicted. The efficient hypothesis was conducted by Professor Eugene Fama at the University Of Chicago

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Booth School Of Business in the 1960s and widely accepted until the appearance of behavioral finance in 1990s. Behavioral finance studies the effect of psychological and emotional factors on market return and stock price. There is some financial behavior influence stock market such as heuristics, anchoring, overconfidence, mental accounting, framing, representativeness, conservatism, loss aversion, regret aversion. Among these, herding behavior is considered popular in almost every stock market in the world.

With the belief that studying of psychology and social science can shed a light on unpredicted market movement to explain stock market abnormalities, bubble, and crashes, herding behavior in stock market are getting more attention from researchers that many studies have been conducted all over the world regarding both geography and development status to clarify this problem. Geographically, there are many researches in different continents such as America, Asian, Europe, Africa and Pacific Basin in Aymen & Amine (2013) proved the herding existence Europe market including France, Switzerland, and Portugal. In another research about Europe market, it is found out that herding is not only limit to emerging but also developed Europe countries (Asma & Sabur). Chang et al. (2000) found significant evidence of herding in South Korea, Taiwan, partial evidence in Japan, but no evidence in US and Hong Kong. These researches will be discussed in more detail in the next part.

This research is conducted with the hope to give full picture of herding behavior in Vietnam. It is important to understand clearly how herding influence on the decision making of investors and stock pricing model. From this investigation, both investors and policy makers can take advantage of this finding to have wise investment and create strong and stable stock market.

This section is the introduction of the thesis including background of behavior finance in general and herding behavior in detail. The current situation of Vietnam stock market and the importance of herding study in Viet Nam are also mentioned in this current session. Session 2 discusses more about behavior finance in detail and the existing literatures on herding behavior in both developed and developing countries. Research methodology and data are presented in session 3. Next session provides an empirical results and finding analysis. Finally yet importantly, session 5 gives discussion of implications of findings and conclusion.

2. Literature review

2.1. Overview of Vietnamese stock market

Vietnam started to rebuild and reconstruct economy with Doi Moi and various policies to encourage the development of such a poor and devastated country after two wars. Since the early 1990s, one of the main targets of the government is to set up a stock market and a special government committee was established to prepare strategic plans and regulations for new stock market in 1993.

On July 2000, 4 years after SSC establishment with several delays, Vietnam took a major step in starting a vigorous economy by opening Ho Chi Minh Securities Trading Center (HOSTC) – a

very first stock exchange of Vietnam. Only two companies listed on market on the first day of trading and this number increased to 45 listed companies with capitalization worth about $2.5 billion presenting for 6.5% of GDP in 2006. However, comparing with other countries in South East Asia, where average capitalization to GDP is 130%, Vietnamese stock market was considered the smallest and least liquidity market in region. Five years later, on 14 July 2005, Hanoi Securities Trading Center (HASTC) was launched in Hanoi. As the intention of government, HASTC was established as an OTC market and where IPOs happens while HOSTC acted as an official stock exchange where shares of listed companies are traded. Nonetheless, the distinguished function of HASTC and HOSTC has been impervious except for the listing requirement.

The role of HASTC as an OTC market has been diminishing as the appearance of another OTC market. This market currently includes nearly 2000 companies together trading with the main stock exchange. However, this market is identified to have low transparency because transaction price is determined by an opaque agreement between buyers and sellers taking place anywhere, anytime. Although listing companies are qualified for two-year tax free on earnings from data that are listed and the following years only taxed on the half of 28% of corporate tax rate as preference treatment from government, OTC companies have little incentives to transition to main board. The reason under this phenomenon is that listing companies are required to disclose all available information to investors. Knowing this reason, on 1 January 2007, new Securities law came into effect, which requires OTC companies to disclosure information and subject to same corporate governance as on the main board.

After seven years of operation, there are 111 listing companies on HOSTC as at August 2007. Prime Minister signed the Decision 599 to rename HOSTC to Ho Chi Minh stock exchange (HOSE) to catch up with the development of market and the reconstruction of economy. This change in model raised the influence of Vietnam stock market and brought HOSE to higher position comparing to other stock markets in the world.

On January 2009, with the Decision of Prime Minister of Vietnam, Hanoi Securities Trading Center was renamed and restructured as Hanoi Stock Exchange. The main responsibilities of HNX are to organize, manage and supervise trading on stock market. Therefore, the main goal of HNX is to make sure the transparency, public, effectiveness of stock market; develop the infrastructure and new products, enhance the attraction to domestic and foreign investors, ensure the highest profit for both investors and listed companies.

Vnindex is the market index of Ho Chi Minh Securities Exchange (HOSE) and since 2008; it has become market index of Vietnam stock market calculated using market capitalization of all trading securities in HOSE. However, VNI has weakness because it is subject to major stocks with large capitalization such as VIC, MSN, VNM and limits the influence of all others in stock market.

2.2. Theoretical evidence

The classic financial theory such as Modern Portfolio Theory (Markowitz, 1952), and Capital

Asset Pricing Model (Sharpe, 1964) have been a base for analysts or investors in pricing valuation and investment decision. Under traditional finance, investors are assumed to act rationally and consider all available information in making decision. As stated in the introduction, in behavioral finance, human decision-making process is influenced by cognitive illusions, which are psychology factors. Therefore, the term "behavioral finance" defines and helps investors to understand clearly, how emotion has an impact on decision-making and stock market pricing. Some of the emotion illusion discussed following include heuristics, anchoring, gambler's fallacy, over confidence, framing, loss aversion, regret aversion, and herding.

Herding behavior, which is mentioned briefly in the previous paragraph, refers to phenomenon when people mimic or follow others' decision without considering their own rational information. Several events, which have been found to be the result of herding behavior, are tulip mania in 17th century, 1987 stock market crisis, the late 1980's Japanese bubble economy, 1997 Asian crisis and 2008 financial crisis in USA. During stress period with high volatility and various information sources (Gleason et al. 2004), investors have tendency to ignore their own belief and knowledge to follow market consensus (Christie and Huang, 1995; Lao and Singh, 2011). Realizing that crises are happening with higher frequency and its significant impacts on entire economy, more and more research have been conducted so far.

2.3. Empirical evidence

Firstly, emerging stock market is proven more likely to exposure to herding behavior than developed market. It can be explained as lack of transparency; loose regulation, weak financial and accounting report system make investors confused about their decision and certainly lead to herding behavior. In one of the most academic research about herding, Chang et al. (2000) showed the significant of herding evidence in South Korea and Taiwan, two emerging market, and partial evidence of herding in Japan but no herding in developed market such as USA using daily stock price from 1963 to 1997 and Hong Kong. This result is relevant with the finding of Chiang and Zheng (2010) that herding does not present in USA market using stock data from 25/4/1989 to 24/4/2009. However, in the research of Chiang and Li (2011) about Pacific-Basin market, herding exists in ten Pacific-Basin markets including Australia, Hong Kong, China, Indonesia, Japan, Malaysia, South Korea, Singapore, Taiwan, Thailand and USA using data from July 2 1997 to March 23, 2009, which is contrast to the early evidence that no herding in advanced market like USA of Chang et al. (2000) and Chiang and Zheng (2010). Herding evidence is also found in other advanced markets in Europe such as UK France, German, Italy (Khan, 2011), Nordic including Finland, Denmark, Sweden and PIIGS (Greece, Portugal…) in the research of Mobarek and Mollah (2010). Belonging to South East Asia but Singapore is considered a developed market and herding is presented in this stock market according to the finding of Liu (2013). As mentioned above, emerging markets are evitable considered to be related to herding behavior and this result is reassure in many researches. In the research of Lao and Signh (2011), there is a significant evidence of herding in China and India market in sample

stock from 1999 to 2009. Beside China and India, other emerging market in BRICS including Brazil, Russia, and South Africa are also analyzed to have considerable proof of herding behavior. Nonetheless, not every emerging stock market has the existence of herding. Some researches of developing market do not obtain such evidence including Dahka-Banglades (Alsan and Sarkar, 2013), Jordanian (Al-Shboul, 2013). This research is conducted to examine herding in Vietnamese stock market as an emerging market. There are only few studies on Vietnamese herding situation. According to the investigation of Kalineratis (2007), herding is confirmed to present during period from 2002 to 2007. In a research of Tran (2011), herding in Vietnamese market is proved to exist but not during entire sample period and herding pattern is considered sensitive to chosen research period.

Secondly, regarding the market capitalization of firm, small stocks are considered more vulnerable to herding behavior than large capital stock (Bikhchandani and Sharma 2001). According to Mc Queen, Pinegar, and Thorley (1996), large stocks have intention to react quicker to good news rather than small stocks. As a result, small stocks received less recommendation because of lacking information and less interferes to market consensus. The research of Therious and Maditinos (2010) about herding in Athens stock market proves that herding for large capitalization shares is bigger than small and medium shares. However, another study about Athens market by Tessaromatis and Thomas (2009) showed that capitalization does not play a particular role in herding.

Thirdly, there are many researches suggesting that herding behavior are affected by the direction of market movement, both bull and bear market. There are several studies of different countries supporting for this argument. Lao and Signh (2010) conducted a research about China and India market also analyzing the relationship between herding and market movement. The result showed that herding behavior in Chinese stock market is greater when market is falling while in India herding is more intense in rising market. This finding also reinforces the result of Chiang et al. 2007 that herding is asymmetric in different market return in Asian market. Herding behavior is demonstrated to be more sustainable in bear market in some countries including Singapore (Liu, 2013), Vietnam (Tran, 2011). Especially, in the research of Ayhan (2011) about Istanbul-Turley market, herding is evidenced to present in both up and down market.

Finally yet importantly, herding behavior is believed to be more obvious in extreme market movement. Extreme market refers to the abnormal return in specific period such as crisis. Once again, Lao and Signh (2010) investigated the connection between herding and extreme market movements by comparing the level of herding during normal market return and extreme rising and falling market movement. They found that herding is more severe during extreme market stress movement; however, the direction of extreme market is different between China and India. Herding is proved higher in China during falling stock market but in India stock market, herding behavior is more profound in rising market. In the research of BRICS, herding appears more in negative extreme market movement. Nevertheless, not all research showed the connection

between herding and extreme market as according to Al-Shboul studying Jordanian market, herding is absent both before and after crisis.

3. Research Methodology

The goal of this study is to clarify the existence of herding and the relationship between herding and market movement, extreme market return and financial crisis in Vietnamese stock market. Both HNX and HOSE are selected, as they are the only two representatives of Vietnamese market. One hundred stocks from various fields are chosen from 1 January 2005 to 31 December 2013 to test herding situation in Vietnam.

3.1. Measurement variables

The adopted measure of herding in this research is based on the return dispersion model of Chang et al. (2000). Before coming to detail model, the comprehensive backdrop of return dispersion is provided to explain the transformation from Christie and Huang model (1995) to Chang et al. model (2000).

The first model to verify the existence of herding is proposed by Christie and Huang (1995) by estimating the connection between the dispersion of individual stock return and the market index. Dispersion measures the average deviation of individual performance from average return of the market. This value decreases when individual stocks have the same trend with market and when individuals deviates from market return, the level of dispersion reduces. Therefore, base of the theoretical of herding behavior, herding is considered to occur when investors have intention to make decision based on market consensus. These actions make the individual returns are less likely to deviate from market return and leads to falling in dispersion.

As people have tendency to hold back their own information and follow others' action when they are not sure about their decision or they feel vulnerable, investors are believed to herd during unusual market trend, market with high uncertainty and high volatility. In these situations, the presence of herding can be examined and level of dispersion is also lower than normal.

Christie and Huang (1995) estimated the cross-sectional standard deviation (hereinafter referred to as CSSD) of individual stock returns in the relationship with market return. It is expressed as:

$$CSSD = \sqrt{\frac{\sum_{i=1}^{N}(R_{i,t} - R_{m,t})^2}{N-1}}$$

$R_{i,t}$ is the observed stock return of firm i at time t, $R_{m,t}$ is the observed stock return of market portfolio at time t, N is the number of stocks in market portfolio.

As herding is believed to be more profound in extreme market period, CSSD of return was regressed against a constant and two dummies. D^U a dummy variable at time t, if the return on time t lies in the extreme 1% and 5% upper tail of the return distribution, D^U equal to 1 and 0 in otherwise. The same goes for D^L in lower tail.

$$CSSD = a + b_1 D_t^L + b_2 D_t^U + e_t$$

As the cross-sectional standard deviation of returns is influenced by outliers, cross-sectional absolute deviation (CSAD) is proposed by Chang et al. (2000).

$$CSAD = \frac{1}{N}\sum_{i=1}^{N} |r_{i,t} - r_{m,t}|$$

$$CSAD = \alpha + b_1 D_t^L + b_2 D_t^U + \varepsilon_t$$

$$CSAD = \alpha + \gamma_1 |r_{m,t}| + \gamma_2 r_{m,t}^2 + \varepsilon_t$$

Standard asset pricing model (CAPM) assumes that dispersion of individual returns are linearly related to market return, therefore, positive value of coefficient γ_2 is expected when herding is absent. However, when herding occurs, the cross-sectional dispersion of stock return is expected to decrease or increase at lower proportion with market return. As a result, the squared market return is brought up to test the nonlinear relationship though a negative estimation of γ_2.

3.2. Testing Hypothesis of Herding

Beside the main test of herding existence in stock market, other sub tests have been set up to verify more about the characteristic of herding in relation to market movement direction, extreme market return and financial crisis.

3.2.1 The main test of herding behavior in Vietnamese stock market

The basic model of Chang et al. which has been mentioned early is used to test the presentation of herding in Vietnamese stock market. Hypothesis for this test is displayed as below:

$$CSAD = \alpha + \gamma_1 |r_{m,t}| + \gamma_2 r_{m,t}^2 + \varepsilon_t \quad (*)$$

H^1: if the herding exist, it is expected that $\gamma_2 < 0$

3.2.2. Herding behavior during different directions of market movement

The previous researchers have found the evidence that directions of market return either up or down have influence on herding behavior. To test this incident, data is divided into two sets increasing and decreasing. The equation is

If:

$$CSAD_t^{Down} = \alpha + \gamma_1^D |r_{m,t}^D| + \gamma_2^D (r_{m,t}^D)^2 + \varepsilon_t \qquad r_{m,t} < 0$$

$$CSAD_t^{Up} = \alpha + \gamma_1^U |r_{m,t}^U| + \gamma_2^U (r_{m,t}^U)^2 + \varepsilon_t \qquad r_{m,t} > 0$$

H^2: if herding exists, it is expected that $\gamma_t^D < 0$ and $\gamma_t^U < 0$ with $\gamma_t^D < \gamma_t^U$ if this behavior is more pronounced during negative market return.

Where γ_2 is the coefficient of value-weighted market portfolio return at time t when market return is falling and increasing. $r_{m,t}$ is the value-weighted market portfolio return at time t when market decreases or increases.

3.2.3. Herding behavior during extreme market movements

Dummy variable is applied to this test to denote whether market return lies in the extreme upper or lower of the distribution of market return using 1%, 2% and 5% of return movement as definition of extreme market movement (Chang et al. 2000). As a result, the model and hypothesis are shown as following:

(a) If

$$CSAD_t^{Down} = \alpha + \gamma_1 |r_{m,t}| * D_t^L + \gamma_2 (r_{m,t})^2 * D_t^L + \varepsilon_t \qquad r_{m,t} < 0$$

(b) If

$$CSAD_t^{Up} = \alpha + \gamma_1 |r_{m,t}| * D_t^U + \gamma_2 (r_{m,t})^2 * D_t^U + \varepsilon_t \qquad r_{m,t} > 0$$

Where: D = 1, if the market return on day t lies in the extreme lower tail of the distribution; and equal to zero otherwise, and D = 1, if the market return on day t lies in the extreme upper tail of the distribution; and equal to zero otherwise.

H^3: if herding exist, it is expected that $\gamma_2 < 0$, and it is more severe thus γ_2(a)(b)<γ_2*

3.2.4. Herding behavior during financial crisis 2008

Under the approach of Christie and Huang (1995), herding is suggested to be prevailing during market stress period with extremely abnormal return. Moreover, these irregular occurrences are highly related to crisis period. For that reason, it is relevant to test the relationship between herding behavior and extreme market period or crisis particularly. Financial crisis in 2008 is brought out as the mark to test whether herding in Vietnamese stock market is more prevalent during this period.

Divide into 2 time series: 1/1/2005-31/12/2007 and 1/1/2008-31/12/2008

$$CSAD_t^{Before} = \alpha + \gamma_1 |r_{m,t}| + \gamma_2 (r_{m,t})^2 + \varepsilon_t \quad (1) \qquad \text{For t=1/1/2005-31/12/2007}$$

$$CSAD_t^{After} = \alpha + \gamma_1 |r_{m,t}| + \gamma_2 (r_{m,t})^2 + \varepsilon_t \quad (2) \qquad \text{For t=1/1/2008-31/12/2008}$$

H^4: if herding exist during financial crisis, it is expected that $\gamma_2 < 0$, with $\gamma_2(2) < \gamma_2(1)$, if herding is more profound during financial crisis 2008

3.3. Data

This research is conducted by using the daily data of individual stock return starting from January 2005 to December 2013. This period is chosen because it covers financial crisis year in 2008 so herding can be investigated with extreme movement of market return. Individual stocks are selected from various field such as Telecommunication, Utilities, Health care, Consumer goods… and based on the starting date of listing to ensure the amount of observation as Vietnamese stock market does not have long history of trading transitions. The market return is an equally weighted average of individual return and the daily return is calculated as:

$$R_{i,t} = \log \frac{p_t}{p_{t-1}}$$

Where p_t and p_{t-1} are the values of stock at time t and time t-1.

4. Empirical Result

4.1. Descriptive statistics

Table below provide summary of descriptive statistics for cross-sectional absolute dispersion (CSAD) and the market return (Rm) in Vietnamese stock market from 2005 to 2013 including maximum, minimum return; average daily return, median, and standard deviation.

The daily market return range from -2.16% to 3.36% and the average market return is 0.0146%. It is clear that market return does not fluctuate substantially and the average market return is exceptionally low.

Table 1. Descriptive statistics of CSAD and the market return (Rm)

	CSAD	Rm
Minimum	0.3842 %	-2.1590%
Maximum	2.2911%	3.3620%
Median	0.9428%	0.0122%
Standard deviation	0.2430%	0.7169%
Mean	0.9686%	0.0146%
Number of observation	2246	2246

4.2.Test1: Regression for the main test of herding behavior in Vietnamese stock market

In this main test, negative linear relationship between CSAD and Rm is tested to prove for the existence of herding in Vietnamese market. As can be seen from the data below, as the coefficient of R_m^2 is -10.08392, significant negative value of γ_2 show the strong evidence of herding presentation during period 2005-2013.

Equation 1: Estimated CSAD = 0.008316 + 0.349736*ABS(RM) - 10.08392* RM^2

t-stat: 73.67763, 9.879596, -4.997055

R^2 = 0.138835, Adjusted R^2= 0.137829, N= 1716

4.3. Test 2: Regression result for herding behavior in different directions of market movement

To test whether herding is more profound in bull or bear market, this sub test is conducted to answer the question. The daily returns are divided into two set: greater than zero and smaller than zero.

The equation 2 illustrates the regression result for the CSAD and Rm with negative market return. The data presents the obvious evidence of herding in bear market, as the coefficient is significantly negative with probability of 0.17%, which is smaller than 5%.

Equation 2: Estimated CSAD: 0.008323+0.378344* ABS(RM) -8.869958* RM^2

t-stat: 50.73318, 7.513261, -3.152919

R^2 = 0.197420, Adjusted R^2 = 0.195532, N= 853

Another test is run to examine whether herding happens in bull market by finding the relationship between CSAD and Rm. As can be seen from equation 3, the coefficient γ_2 is also significant with probability equal 0 and t-statistic equal -4.4. From these two tests, herding is proved to present in both bull and bear market and more pronounced during bull market as the coefficient is higher than in bear market

Equation 3: Estimated CSAD: 0.008355+0.323192* ABS(RM) -12.53810* RM^2

t-stat: 54.79160, 6.617532, -4.401911

R^2= 0.081036, Adjusted=R^2: 0.078889, N= 859

4.4. Test 3: Regression result for herding behavior for during extreme market returns

In both two-sub tests showing below, the coefficient is negative but not significant which indicates that herding does not happen in extreme market return, here is 5% of total stock returns. It indicated that individual returns diverge with the occurrence of abnormal returns; therefore, it provides no evidence of herding during exceptional returns.

Equation 4: Estimated CSAD: 0.009148+0.455904*ABS(RM)-16.60442* RM^2

t-stat: 0.920161, 0.374455, -0.453543

R^2 = 0.018517, Adjusted R^2 = -0.003294, N=93

Equation 5: Estimated CSAD: -0.001076+1.681554* ABS(RM) -58.94191* RM^2

t-stat: -0.095705, 1.212649, -1.401319

R^2 = 0.124125, Adjusted R^2 = 0.100768, N=78

4.5. Test 4: Regression result for herding behavior for during 2008 Financial crisis period

This subtest is to verify the influence of crisis on herding and how investors react to crisis period. The data is divided into two periods: before crisis (2005-2007) and during crisis 2008. From the observation, there is no evidence of herding in these two selected period. It can be explained with the previous test on herding during extreme market movements.

Equation 6: Estimated CSAD: 0.009624+0.207707*ABS(RM)+3.019289* RM^2

t-stat: 22.93881, 1.500122, 0.352787

R^2 =0.132475, Adjusted R^2 =0.124443, N=219

Equation 7: Estimated CSAD: 0.009714-0.117358*ABS(RM)+12.24622*RM^2

t-stat: 16.02490, -0.823484, 1.824565

R^2= 0.060513, Adjusted R^2= 0.052844, N=248

4.6. Checking error

The model for credit rating calculation has been worked out. However, there are many possible errors in the model whose existence needs to be checked in order to make correction promptly to keep the reasonability of the model. Among potential problems are the presence of heteroskedasticity and autocorrelation.

4.6.1. Heteroskedasticity

One of the most important assumptions of the linear regression model is that the variance of each disturbance term u_i is constant. If the conditional variances of u_i are no longer constant or E (u_i^2) = σ_i^2, heteroskedasticity exists in the model. Some methods are tried to remove this error such as weighting the variables, using log but it does not succeed. Therefore, Newey – West estimator is used as it helps to overcome autocorrelation, heteroskedasticity in error terms in the model.

Table 2. The main test with Newey – West estimator

Dependent Variable: CSAD
Method: Least Squares
Date: 05/20/14 Time: 10:15
Sample (adjusted): 1 1716
Included observations: 1716 after adjustments
Newey-West HAC Standard Errors & Covariance (lag truncation=7)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008316	0.000159	52.21619	0.0000
ABS(RM)	0.349734	0.050227	6.963108	0.0000
RM^2	-10.08382	2.723431	-3.702617	0.0002

Heteroskedasticity Test: White

F-statistic	6.725986	Prob. F(4,1711)	0.0000
Obs*R-squared	26.56486	Prob. Chi-Square(4)	0.0000
Scaled explained SS	62.97507	Prob. Chi-Square(4)	0.0000

Other tests of herding in positive market movement, extreme up market, and in crisis period does not have heteroskedasticity as the p-value in White test with cross term are higher than 5%.

Table 3. The regression result for herding in positive market returns (test for Heteroskedasticity)

Heteroskedasticity Test: White

F-statistic	1.656425	Prob. F(4,854)	0.1581
Obs*R-squared	6.613185	Prob. Chi-Square(4)	0.1578
Scaled explained SS	15.72742	Prob. Chi-Square(4)	0.0034

4.6.2. Autocorrelation

Autocorrelation arises when residuals in the model at present are related to the residuals at previous or next periods. The Durbin-Watson d-test is employed to test for autocorrelation.

Cross-sectional absolute dispersion is calculated by observing 100 stocks daily return every day; therefore, it is easy to create serial correlation. The testing for autocorrelation can be seen in Appendix. Remedy for autocorrelation: Add lagged value of Y to model.

Table 4. The regression result for herding in positive market (test for autocorrelation after adding lagged value)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.071527	Prob. F(2,852)	0.1266
Obs*R-squared	4.152041	Prob. Chi-Square(2)	0.1254

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/20/14 Time: 01:01
Sample: 1 2246 IF RM>0
Included observations: 858
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.84E-05	0.000175	-0.276975	0.7819
ABS(RM)	-0.002929	0.036580	-0.080069	0.9362
RM^2	0.267210	2.212422	0.120777	0.9039
AR(1)	0.036480	0.032225	1.132046	0.2579
RESID(-1)	-0.113254	0.055970	-2.023493	0.0433
RESID(-2)	-0.018815	0.052561	-0.357962	0.7205

4.7. Summary

Herding has been detected in Vietnamese stock market through four tests using Chang et al. (2000) approach. The very first hypothesis, also the main test, showed the present of herding in Vietnamese stock market. Then, herding is found to exist in both up and down market but more intense in the bull one. In the next test, herding is examined in the relation with extreme movements with the addition of trading volume factors. However, there is no significant evidence to prove that herding happens in these extreme periods. Lastly, financial crisis in 2008

is used to test herding appearance and from the result, herding only formed after financial crisis but not before and during that period.

4.8. Research limitation

One of the main limitations is the reduction in observations as testing. This can be explains as Vietnamese stock market have not been launched for long time comparing with other markets. Moreover, the stocks in this research are selected based on the listing day; therefore, not all the stock have trading transaction at the beginning of studying period which is 2005. For this reason, the observations for the test are lower than the estimated data at first. Another limitation is the scope of this paper cannot allow investigating more about herding in relation with other markets but it is also opportunities for the future research on herding in Vietnamese market.

5. Summary and conclusion

5.1. Summary

5.1.1. Key findings

This paper examines herding behavior in Vietnamese stock market by using daily stock returns from 2005 to 2013. From the main test, there is a significant evidence for the presentation of herding behavior during this period. Regarding market movement directions, herding is found in either bull and bear market but more intense in bull market. In the extreme market period, there is no proof of herding in neither extreme rising nor extreme falling. The impacts of financial crisis 2008 on herding are also looked into. As the results, before and during crisis, herding does not exist; nevertheless, herding is found in the period after this financial crisis.

5.1.2. Concluding remarks

In this research, herding is discussed as a financial behavior and how it presents in Vietnamese stock market. First of all, financial behavior is introduced in general to give back ground knowledge on herding and it is contrary to efficient market hypothesis. Moreover, the brief history of Vietnamese stock market is brought up to deliver a comprehensive picture of the environment, strength, and weakness of this market. It is also important to review other research of herding in the world for reference and comparison with this study's findings. This is followed by the methodology and empirical results of relationship between herding and other factors in the stock market. The paper is conducted through several hypothesizes by using the approach of Chang et al. (2000) which is based on the original model of Christ and Huang (1995). In the first

also the main hypothesis, herding existence is investigated in Vietnamese stock market; then, it is examined in the relationship with market movement directions either up or down. After that, herding is examined during extreme market movements with and without volume trading factors. Finally, herding is inspected before, during and after financial crisis 2008 to find out the interaction between herding and crisis. This is one of only few research studying on herding behavior in Vietnamese stock market; therefore, it is conducted with the hope to bring more updated information about herding situation in Vietnam and make contribution to the development of the country.

5.2. Discussion of implications of findings

5.2.1. Implications for investors

As from the findings, there is significant evidence that Vietnamese investors are exposed to herding behavior in stock market. There are several reasons for this behavior from both psychology and knowledge side. First, herding is considered a psychological factor that affects the investors' decision-making process. It is a natural emotion issue that any investor can experience even the big institutional one. However, its nature does not mean that investors cannot control their behavior. They need to be trained to be patient and rational to judge the market, information and the activities of others. Nevertheless, not everyone can evaluate and assess the precise and effectiveness of these information they get. Hence, the investors must have at least a basic knowledge of stock market to take part in trading in the most rational way. This will prevent them from being noise investors who always create the instability for the market. Moreover, having knowledge in trading will help the investors to be more rational in their decision making process which is less affected by other investors and more base on their critical and personal valuation.

5.2.2. Implications for policy makers

Some people argue that herding is the natural activities of investors and only they can fix it by themselves or the market is adjusted by the market demand and supply rule. Nonetheless, there must be reasons behind herding activities and by knowing the reasons, the government or policy makers can prevent or constraint this financial behavior. Herding behavior can be put in plain words as a result of flawed and defective investment environment and incomplete regulations in emerging countries. In theoretical evidence part, herding is proved to be more profound and tense in emerging stock market than developed ones. Investing in such market makes investors

feel unsecured and unsafe which leads to herding behavior. Therefore, to create a stable and attractive investing environment, the government has to enhance the liquidity, transparency and strengthen the regulations of stock market. In Vietnam, many companies still trade in OTC market because they do not have to reveal all the information to the market. The government even has the incentives for listing companies by reducing tax on earnings; however, investors are still confused by the different sources and the trustworthiness of information. In addition, some listed companies speculate their own stock to generate a fictitious demand for the stock, which then push up the price much higher than their fundamental value. Investors with little knowledge will find success of some investors with these stock and herd without consideration. For this reason, the policy makers should tighten the regulations and have strict punishment for these kind of opaque activities. In Vietnam, stock market has launched for almost 13 years but still new and unfamiliar with the investors as a tool of investment. Moreover, lack of knowledge and experience in trading of the investors always cause the market unpredictable and unattractive with this kind of herding activity. Vietnamese stock market is now trading with not only domestic but also foreigner investors so it will be influenced by the financial events of global economy. The recent crisis in 2008 is the clearest evidence as a result of herding behavior in not only American but also Vietnamese stock market. Therefore, the policy makers must take herding activity seriously as it already left a heavy consequence on Vietnamese stock market and Vietnamese economy in general. The development of stock market is used as a criterion to assess the advancement of a country's economy; for that reason, reducing herding behavior and creating a sound and effective stock market is one of the best way to contribute to the development of Vietnamese economy.

5.3. Future research opportunities

Due to the scope of this research, it cannot cover all main contents as mentioned in the empirical evidences. Therefore, in another study, herding should be investigated under in influence of capitalization size in Vietnamese stock market. Moreover, this research only focuses on herding behavior in Vietnam without considering the impacts of other markets. Vietnam has changed from subsidiary economy to market economy; therefore, the exchange between Vietnam and other economies in the world cannot be ignored. Perhaps, in longer research, herding will be inspected in the connection with other countries in region; here is South East Asia, and the most developed financial market in the world-the USA. In a more realistic approach, herding should

be studied under the eyes of the policy makers about how herding affects stock market and what have been done to reduce or stop herding behavior in Vietnam. Furthermore, not only herding but also other psychology factors, which have been brought up in theoretical evidence, can also be explored under the same criteria with herding behavior.

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