

An Examination of Herding Behavior in Chinese A-Share Market by Cross-Sectional Absolute Deviation (CSAD)

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Abstract

The study aims to test the existence and the continuity of herding behaviour in Chinese A-share market by the method called cross-sectional absolute deviation (CSAD). Herding behavior, defined as individuals tend to follow others when making decision, has a large impact on stock markets. The latest data from July 2016 to July 2019 in Shanghai and Shenzhen A-share markets are used. The data are divided into both three-year period and annual subperiod. The results indicate that there is a lasting influence of herding behavior on these A-share markets during these three years. Besides, the value of CSAD of Shenzhen A-share market is higher than the one of Shanghai and both of them are shown in an increasing tendency over the years. Future researches can explore more on this tendency, including its verification and explanation.

Keywords

Herding Behavior, Chinese Stock Market, A-Share Market, Cross-Sectional Absolute Deviation

1. Introduction

Since the primitive society, people have had the instinct of imitation. With the development of the society, such instinct has been applied or showed in everywhere in the daily life and its impact on investors has gained the most attention. The origin of the research about “herding behavior” in stock market can be traced to Keynes (Wang, 2016), which compared the activities in stock market to the beauty contest. To be more specific, Keynes said that in order to win the game, the individual should not bet on the one which is viewed as the best by him/herself, but bet on the one that is recommended by the crowds.

As herding behavior became a popular subject in behavioral finance, more accurate definition is required. However, the definition of herding behavior is controversial. Though it can be generally regarded as a behavior pattern that investors tend to follow the others, different scholars have different opinion. While some researchers define it as “one in which agent B always ignores his own information and follows agent A” (Scharfstein & Stein, 2000), others seek for a broader parameter, which is replacing “always” into “sometimes” (Ottaviani & Sørensen, 2000). There are also other definitions which are mainly based on the scenarios researchers talk about and do not emphasize the frequency of the behavior and the priority of “smart investors”. For instance, a more specific definition of herding behavior is provided that only the action can lead systematic erroneous and is closely related to bubbles, frenzies and other special phenomena is herding behavior (Devenow & Welch, 1996). In addition, another study which focuses on Peer-to-Peer loan auction adopts the definition that “a greater likelihood of bidding in auction with more existing bids” (Herzenstein et al., 2010). Though researchers add various restrictions to the term, the key features, such as crowds, following and interaction, are remained unchanged. Accordingly, as our examination does not focus on a specific type of transaction action, we adopt a broader definition that individuals tend to follow others when making decision (Merli & Roger, 2013).

Two types of herding behavior are categorized—rational and irrational and some studies are conducted to clarify them and provide evidence for each of the phenomena (Zhang & Chen, 2017). Relative researches are conducted not only in stock market, but also in other financial field, such as microloan markets (Zhang & Liu, 2012) and bank lending (Liu, 2011). Several reasons are listed to explain why plentiful investors conduct rational herding, which is that the investors mimic others consciously and rationally. To begin with, it is due to the direct pay-off externalities, including adverse externalities in bank runs, beneficial externalities in trading liquidity generation as well as data acquisition. Additionally, personal issues such as the managerial willingness to safeguard and the willingness to show the proficiency also lead the investors to “follow the herd” (Keynes, 1936).

Irrational herding behavior is mainly resulted from variations in data. First and foremost, the evaluations and perspective of early deciders and professional institutions may become an essential reference to the later investors. In addition, the choice made by the investors is likely to be wrong. If investors make an incorrect choice at first, when they are searching for methods to correct the decision, naturally, they will reverse their own position and turn to follow the crowds, which makes their activity becomes a herding behavior. Another feature of irrational herding is that individuals are prone to ignore their own inference and follow the market consensus (Lao & Singh, 2011).

There are abundant empirical studies aim to test herding behavior regardless the type. Primarily, the empirical study of herding behavior is limited in western countries. Gradually, the geographic range of testing expands, and the data is di-

vided into different frequencies, such as daily, monthly and yearly. Besides, more features of herding behaviour are examined including asymmetric effects.

Abundant empirical evidence in international stock markets is provided to support the existence and indicates the effect of herding behavior. For instance, a research collects stock prices from 18 countries and finds that there is herding behavior in Asia and America. Rather, no evidence is found in Latin America (Chiang & Zheng, 2010). Also, quite a few researches focus on European countries. More specifically, there is evidence of herding behavior on Portuguese mutual funds (Lobão & Serra, 2002), as well as the Italian, Spanish and Greek markets (Economou et al., 2011). Furthermore, no longer viewing European countries separately, scholars begin to explore some common points between European countries and try to view them as a whole (Ouarda, Bouri, & Bernard, 2013). United State, as one of the world's most powerful countries, is also placed emphasis on. Many parts of the America financial system, including banks and REITs (Zhou & Anderson, 2013) is conducted analysis related to herding behavior. The main focus of the study is on how herding behaviors affect the stock markets. For instance, a focus is on how market turmoil and tranquil differ from each other (Klein, 2013). Also, studies are likely to focus on its effect on mutual funds, such as how it acts differently when encounters different size of mutual funds (Patro & Kanagaraj, 2012). Rather, recently, more and more scholars began to relate herding behaviors to other factors, such as how national cultures and behavioral pitfalls influence people's tendency of herding behavior (Chang & Lin, 2015).

More explorations on Asian emerging market are done in recent years. For examples, there is a study verifies the herding behavior's existence in Indian equity market which is especially pronounced in the 2007 crash (Bhaduri & Mahapatra, 2013). On the contrary, another research finds the absence of the phenomena during 2010-2012 (Garg & Jindal, 2014). In addition, another study verifies the herding by foreign investors in Korean's stock market (Jeon & Moffett, 2010).

As the member of Asian's emerging market, naturally, China is placed increasingly emphasis on. In recent decades, China is growing to be a country that plays an increasingly important role in the international market. Additionally, the financial system of China is significantly different from that of main western countries. Therefore, plentiful scholars begin to analyze Chinese market including the role of herding behaviors. Studies have proved the existence of herding behavior in both Shanghai and Shenzhen's A-share markets by quantile regression. On the contrary, none of the B-share markets has shown the herding behavior (Chiang, Li, & Tan, 2010). Furthermore, there are also researches detail this difference in herding behavior across A and B share market (Tan et al., 2008). In addition, Lao & Singh (2014) compare the herding behavior between Chinese stock market and Indian Stock market, which are two of the largest markets in Asia.

The current study attempts to prove the existence of herding behavior in both Shanghai and Shenzhen A-share markets with the latest data, which is from July 2017 to July 2019 by using the model CSAD. Particularly, our data is divided in-

to three-year period and one-year subperiod.

2. Methodology

Two methods are widely used to test herding behavior, one of which is cross-sectional standard deviation (CSSD) (Christie & Huang, 1995) and the other is cross sectional absolute deviation (CSAD) (Chang et al., 2000). As CSSD is easier to be affected by outliers (Economou et al., 2011), we adopt CSAD as the measurement to test the herding behavior. The way to measure this dispersion is shown in equation:

$$CSAD_t = \frac{\sum_{i=1}^N |R_{i,t} - R_{m,t}|}{N} \quad (1)$$

In this formula, $R_{i,t}$ is the observed stock return of firm i on day t , which can be indicated in the Adjust Close price of the stock. Accordingly, we tested the return based on the equation: (today's price-yesterday's price)/yesterday's price = today's return. $R_{m,t}$ is the cross-sectional average return on day t . In other words, it is the mean of all the $R_{i,t}$ in a single day. N is the number of stocks in the market portfolio.

In the first set of outcomes, which is the descriptive statistic, we used the non-linear structure of Chang et al. (2000) based on Eq1 to test herding behavior. The average, medium, maximum and minimum are provided in order to show the cross-sectional absolute deviation's dispersion pattern. Then, we used the following regression model for each market to analyze the herding behavior:

$$CSAD_{i,t} = \beta_0 + \beta_1 |R_{m,t}| + \beta_2 R_{m,t}^2 + \varepsilon_t \quad (2)$$

We took all the A-share stocks of companies which went in public from Shenzhen Stock Exchange as well as Shanghai Stock Exchange before July 2016, which are 1761 and 1098 specifically. All the stocks meet these two requirements are calculated based on their daily Adjust Close price from July 2nd in 2016 to July 2nd 2019 in order to test the herding behavior of Chinese A-share market. Besides, we also want to explore specifically that whether the herding behavior lasts for three years. Thus, this three-year period is not only tested as a whole, but also divided into three groups. Each group takes a one-year period.

To ensure the accuracy and rationality of the regression model, the heteroscedasticity and autocorrelation are checked by using a Goldfeld-Quandt test and a Breusch-Godfrey test separately (Godfrey, 1978). If the p-value of the tests' results is less than 0.05, it means that these two factors have affected the regression result and the model needs some correction. Thus, we apply the Newey-West robust variance estimation to make the improvement (Newey & West, 1987).

3. Results and Discussions

The research is to test whether the herding behavior exists within Shenzhen and Shanghai A-share markets and whether it exists across the three-year period, from July 2016 to July 2019. In order to test these hypothesizes, the measure of return dispersion called CSAD is applied (Table 2) and descriptive statistics

(Table 1) is provided. Based on the result, the existence of herding behavior in these A-share markets is verified and a climbing tendency during the three years is shown. In addition, the herding behavior in Shanghai A-share market seems more profound compared to the Shenzhen one.

Descriptive statistics

Table 1 includes descriptive analysis for cross-sectional absolute deviations of all companies in the two A-share markets over the three-year period, from July 2016 to July 2019. Though not profound, there are still some variations between different periods and markets as shown in the descriptive statistics, which includes average, medium, maximum and minimum. It is shown that the companies within the sample in Shenzhen and Shanghai A-share markets reached an average value of CSAD of 0.014 and 0.013 respectively. In each year, the value of Shenzhen A-share market is higher than that of Shanghai A-share market, and both of them reveal an increasing tendency over the three-year period. The climbing tendency can be attributed to the development of the markets, since China as a whole experienced rapid progression in these years.

Besides, it can be told that several R_m , which are the cross-sectional average return are the same. On the contrary, the corresponding CSAD is various. Thus, it is reasonable to make an inference that these two values are not tightly related.

Regression analysis

Table 2 indicates the regression analysis for CSAD. As we expected, the results of both Shenzhen and Shanghai A-share markets, which involve three annual subperiods and a three-year period respectively, turn out that all of the β_1 are negative numbers, which are indicators of herding behavior.

Table 1. Descriptive statistics of cross-sectional absolute deviations (CSAD).

	Shenzhen								Shanghai							
	Total		2016-2017		2017-2018		2018-2019		total		2016-2017		2017-2018		2018-2019	
	Rm	CASD	Rm	CASD	Rm	CASD	Rm	CASD	Rm	CASD	Rm	CASD	Rm	CASD	Rm	CASD
mean	0.999	0.014	0.999	0.013	0.999	0.014	1.000	0.016	1.000	0.013	1.000	0.012	0.999	0.013	1.000	0.015
median	1.000	0.014	1.001	0.012	1.000	0.013	1.000	0.016	1.001	0.012	1.001	0.011	1.000	0.012	1.001	0.014
max	1.051	0.031	1.022	0.025	1.026	0.030	1.051	0.031	1.050	0.031	1.022	0.027	1.023	0.031	1.050	0.029
min	0.924	0.009	0.946	0.009	0.930	0.009	0.924	0.010	0.930	0.008	0.957	0.008	0.936	0.008	0.930	0.009

Table 2. Regression result for daily data.

	SZ16	SZ17	SZ18	SZ all	SH16	SH17	SH19	SH all
β_0	4.367***	4.291***	1.427***	3.069***	7.389***	4.682***	2.297***	3.845***
β_1	-8.602***	-8.474***	-2.761***	-6.032***	-14.633***	-9.235***	-4.510***	-7.581***
β_2	4.247***	4.197***	1.350***	2.977***	7.256***	4.565***	2.227***	3.748***
Gq	0.01049	3.818e-07	1.905e-06	<2.2e-16	0.1651	0.009319	4.811e-05	<2.2e-16
Bg	<2.2e-16	1.048e-09	<2.2e-16	<2.2e-16	8.556e-14	1.888e-10	<2.2e-16	<2.2e-16

Data in the Gq and Bq row are the p-value of Goldfeld-Quandt and Breusch-Godfrey tests respectively. ***Level of significance within 1%.

Specifically, as all the Breusch-Godfrey tests' and most the Goldfeld-Quandt tests' p-values are less than 0.05, the regression results that we listed are revised by Newey-West robust variance estimation. Thus, we get an empirical evidence which proves that the lasting existence of herding behavior in Shanghai and Shenzhen A-share market in the period from July 2016 to July 2019.

There are several limitations of our study that can be further explored. To begin with, we only involve the A-share market. However, B-share market is also an indispensable part in Chinese Stock Market and has different natures as the A-share one. Thus, the existence of herding behavior in B-share can also be tested.

In the second place, there is an increasing trend in both the value of CSAD and β_1 in the regression results. There is an inference that it is due to exterior factors such as volatility or turnover (Ohlson, 2010). However, as we only involve three years, the causing factors cannot be revealed or tested. Therefore, future researches can collect more annual periods' data and specify these factors.

Thirdly, the point we focus on is whether herding behavior exists in the period. Nevertheless, as vitality is one of the crucial characteristics of the stock market, the herding behavior in this three-year period can be specified. For instance, researches which test the difference of herding behavior between rising and falling markets, high trading and low trading periods can also be conducted.

4. Conclusion

In current research, we explore that herding behavior has lasting impact on Shenzhen and Shanghai A-share markets by applying the method of cross-sectional absolute deviation (CSAD). The Adjust Close price of all companies in these two markets during the three-year period, from July 2016 to July 2017 is collected. These data are tested as a whole and as annual subinterval.

All of the results reveal the existence of herding behavior. Additionally, the value of CSAD is increasing during these three years and the one of Shenzhen is higher than that of Shanghai A-share market. It can be told that herding behavior popularly exists among the investors in these two markets. Besides, accompanied by the development of markets and the change of economic environment, herding behavior is varied over times. As the current research tells the difference of herding behavior in these three years, future researches can explore more on the difference based on the effect of the changing features and important events.

Furthermore, the Shanghai and Shenzhen A-share markets have some difference on constitution. Specifically, there are mainly Medium and Large State-Owned Enterprises in China in the Shanghai stock market. On the contrary, in Shenzhen stock market, the majority are venture capital, medium and small enterprises. Therefore, future studies can explore more on how the enterprises' type influences herding behavior.

Moreover, with the limitation of the sampling, current research cannot de-

scribe the tendency of how herding behavioral changes yearly clearly and specify the effect of correlated factors. In future research on Chinese stock market, tests and explanations on this tendency may yield interesting insights.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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