HERDING BEHAVIOUR IN EMERGING MARKETS: EVIDENCE FROM BIST

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Abstract

The study investigates the herding behaviour in the Borsa Istanbul (BIST) market under different market and economic conditions, focusing on the 2008 global financial crisis and data spanning from January 2005 to December 2018. For estimating herding behaviour, two regression models are used: The Cross-Sectional Standard Deviation (CSSD) model developed by Christie & Huang (1995) and the Cross-Sectional Absolute Deviation (CSAD) model developed by Chang et al. (2000). The findings show that herd behaviour does not exist in BIST, except for special cases, based on daily stock data. The BIST determined low volatility, low trading volume, the financial crisis, and herd behaviour. It was also determined that Taper Tantrum that took place in 2013 did not trigger herd behaviour.

Anahtar Kelimeler: CSSD, CSAD, Herd Behaviour, Financial Crisis, BIST.

JEL Kodları: G41, D90, C58.

GELİŞEN PİYASALARDA SÜRÜ DAVRANIŞI: BİST ÖRNEĞİ

Öz

Çalışma, 2008 küresel finansal krizine ve Ocak 2005'ten Aralık 2018'e kadar olan verilere odaklanarak, farklı piyasa ve ekonomik koşullar altında Borsa İstanbul'daki (BİST) sürü davranışını incelemektedir. Sürü davranışını tahmin etmek için iki regresyon modeli kullanılmaktadır: Christie & Huang (1995) tarafından geliştirilen Kesitsel Standart Sapma (CSSD) Modeli; Chang ve diğerleri (2000) tarafından geliştirilen Kesitsel Mutlak Sapma (CSAD) Modeli. Günlük hisse senedi fiyat verilerinden elde edilen bulgular, BİST'te özel durumlar dışında sürü davranışının oluşmadığını göstermektedir. BİST'te düşük oynaklık, düşük işlem hacmi ve finansal krizlerin ortaya çıktığı konjonktürlerde ise sürü davranışı dinamikleri ortaya çıkmaktadır. Makalede ayrıca 2013 yılında gerçekleşen Taper Tantrum'un sürü davranışını tetiklemediği sonucu elde edilmiştir.

Keywords: CSSD, CSAD, Sürü Davranışı, Finansal Kriz, BİST.

JEL Codes: G41, D90, C58

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1. Introduction

Financial crises, significant policy changes by central banks (particularly FED's decisions), elections and social events may all cause herding behaviour in financial markets. The effects of the 2008 global financial crisis and the FED's taper tantrum decision in 2013 on Turkey's stock market -Borsa Istanbul (BIST)- motivated us to investigate the existence of herding behaviour.

Many researchers (McMahon, 2005; Bikhchandani & Sharma, 2000; Banerjee, 1992; Chevalier & Ellison, 1999; Choe et al. 1998; Kim & Wei, 2002a; Cajueiro & Tabak, 2009; Gelos & Borensztein, 2000; Wang, 2008; Demirer et al (2007) discussed the impact of herd behaviour on financial markets in the literature, both theoretically and empirically. We will focus on the empirical side of the herd behaviour literature in this study.

Three main measurement methods for the presence of herd behaviour (Lakonishok et. al. 1992; Christie & Huang, 1995; Hwang & Salmon, 2004) have been improved. Firstly, the pioneering study of Lakonishok, Schleifer, and Vishny (LSV) (1992) empirically measured herd behaviour. They claim that herd behaviour follows the stocks that other investment managers buy - sell and imitate the same transactions. The second method has been improved by Christie & Huang (1995). Their study analyzed the relationship between the cross-sectional variability of current asset return rates and the current market return rate. Christie & Huang (1995) compared the predictions of herd behaviour to those of rational asset pricing models during periods of market stress; or exaggerated price movements. They investigated the existence of herd behaviour in the US capital markets by examining the cross-sectional standard deviation of stock returns according to the market average. The results imply that no evidence of herd behaviour has been found in the markets (Christie & Huang, 1995). Thirdly, Hwang & Salmon (2004) claimed that their model is a more useful with less error margin than previous models. Compared to the results of Christie & Huang (1995), they found evidence of herding towards the market portfolio during periods of market volatility. Christie & Huang's (1995) method is used in this study. Christie and Huang (CH) allow modelling events that can create herd behaviour in BIST with the help of dummy variables. This characteristic of CH model is an important reason why we use this model.

Using these methods, many empirical studies have been conducted in the literature. Choe et. al. (1998) discovered significant herd behaviour in the Korean stock market using the LSV measurement model and then the portfolio-change measure model (PCM) developed by Wermers. Kim & Wei (2002a) discovered that there were different trading patterns of investors in various categories on the Korea Stock Exchange (KSE) before and after the foreign currency crisis. Utilizing Christie & Huang's (1995) model, Chang et al. (2000) examined herd behaviour in various capital markets. While they found no evidence of the existence of herd behaviour in the US and Hong Kong markets, they partially identified herd behaviour in Japan. They encountered obvious herd behaviour in South Korea and Taiwan. Gavriilidis & Kallinterakis (2021) analyzed the existence of herd behaviour in the St. Petersburg stock market covering the period 1865-1914, employing the same model.

Some studies investigate the existence of herd behaviour in both developed and developing financial markets. Bikhchandi & Sharma (2000) find more evidence in favour of herd behaviour in developing financial markets than in developed markets. According to Kim & Wei (2002b), foreign investors cause more herd behaviour than domestic investors. Chiang & Zheng (2010) examined the stock markets of 18 countries and found that investors in both developed countries and Asian countries behave in herds. Mobarek et al. (2014) found that herd behaviour appeared less in developed European countries than in emerging markets. Gelos & Borensztein (2000) analyzed investment fund behaviours in developing markets using data from January 1996 to March 1999. In the study, the degree of herd behaviour between funds was found to be statistically significant. In addition, it was asserted that herd behaviour in open-end funds was higher than in closed-ended funds, and that investors applied momentum strategies that could be defined as selling losers and receiving winners in the past. Besides, according to the authors, the behaviour of investors has a more complex structure than is thought. Wang (2008) used the method based on the cross-sectional variability of betas to investigate market index-oriented herd behaviour in a total of 21 developing and developed countries. Author, who has found the presence of herd behaviour in the capital markets, conclude that the effect of herd behaviour is higher in developing countries than in developed countries. Demirer et. al. (2007) used the CH model and CCK

(Chang, Cheng and Khorana) model in their studies. They examined their movements concerning the S&P 500 index, Morgan Stanley Capital International (MSCI) world index and oil prices. Herd behaviour findings were obtained in all markets except Asia and the Middle East.

Some studies investigate the presence of herd behaviour at BIST, which is the main stock market in Turkey. Altay (2008) obtained findings on the existence of herd behaviour in the market between 1997 and 2008 in the Istanbul Stock Exchange (ISE). The findings of the study suggest that herd behaviour in ISE affects prices. Kapusuzoglu (2011) finds evidences covering the period between January 2000 and January 2010 in line with these results. Contrary to these studies, utilizing CH and CCK models, Doğukanlı & Ergün (2011) find no evidence of the presence of herd behaviour in ISE. However, Doğukanlı & Ergün (2015) report evidence in favor of the existence of herd behaviour by using the Hwang & Salmon (2004) model. To the best of our knowledge, there is no study using trading volume and volatility in the literature of herd behaviour for Turkey separately. Also, we decide the FED in 2013 into account by using a dummy variable. Therefore, this study contributes to the herd literature by investigating the role of the FED's decision in 2013 on herding behaviour in a developing country.

BIST, was established in 1985. Stocks, government bonds, and treasury bills have been traded on the stock market. The BIST100 index, which includes 100 companies with the highest market value and trading volume, is an important indicator reflecting the situation of foreign investments, fluctuations in economic fundamentals, and many other economic or political factors. Changes in this index significantly affect the economic decision processes of investors and economic units. This study determines whether events affecting BIST, such as financial crises, and social events cause herd behaviour. It is important to measure the presence of herd behaviour in BIST to be able to apply the correct financial regulations in critical moments. This study used daily closing price and transaction volume data of 74 companies from the BIST 100 index between January 2005 and December 2018. The reason for using the data in that time frame is that this time frame includes the 2008 Global Crisis, large-scale social events. Thus, the effects of these events on herd behaviour have been measured. The remainder of this paper is organized as follows. The second section describes the research methodology. Then, the third part reports the empirical results. Finally, the last part is the conclusion and policy implications.

2. Research Methodology

This study investigates the herding behaviour in the Borsa Istanbul (BIST). BIST is a national indicator reflecting the results of foreign investors, portfolio investment, foreign currency inflows, and many other economic-political events. Moreover, BIST influences and directs the decisions of many domestic and foreign financial investors and economic units. Therefore, under what circumstances and how the herd behaviour phenomenon affects BIST is important for economic decision units and policymakers.

2.1. Data

The dataset used in the study comprises 74 companies listed on Borsa Istanbul under the BIST 100 and consists of daily closing stock prices and volume. The study's dataset covers the period from January 2005 to December 2018. This period has been selected based on the global financial crisis, "taper tantrum"[4], and data availability. The data are divided into two categories to show the period during the global financial crisis and after. We also have sub-categorized to set out the taper tantrum period to determine herding behaviour in the Istanbul Stock Exchange market. The stock price dataset is extracted from the Istanbul Stock Exchange website.

2.2. Methodology

In this study, we adopt two regression models, the cross-sectional standard deviation (CSSD) and cross-sectional absolute deviation (CSAD), as proposed by Christie & Huang (1995) to detect herd behaviour in the financial stock market. The CH model proposes that herd behaviour is seen when the stock market return or individual stock return dispersion is low. Christie & Huang (1995) reason that individual investors in the markets tend to adapt to the market behaviour by abandoning their investment

[4] For more information see Bernanke (2013).

information regarding the price of the existing securities throughout the high price movements. So, when investors change their behavior by adapting to market behaviour, individual security returns get closer to market returns, and the dispersion decreases. Hence, as dispersion decreases or individual security returns get closer to the market return, it indicates the existence of herding behaviour in the stock market. So, (CSSD) can be described as:

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

Whereby $R_{i,t}$ represents the returns of an individual stock (i) at the time(t), $R_{m,t}$ represents the market return at the time(t), N denotes the number of stocks in the portfolio, and $CSSD_t$ is the cross-sectional standard deviation on day(t). Additionally, Christie & Huang (1995) and Chang et al. (2000) proposed a model to detect herd behaviour in the financial market, which argues that herding is said to have existed in risky market movements.

$$CSSD_t = \alpha + \beta_L D_t^L + \beta_U D_t^U + \varepsilon_t \quad (2)$$

The model works with extreme 1%, 5%, and 10% to determine the existence and absence of herding behaviour. Hence, D_t^L represents the dummy variable, and 1 is equal to the aggregate daily return on the market portfolio at a period (t) is in the lower tail of dispersion and 0 otherwise. $D_t^U = 1$ is a dummy variable when the aggregate daily return on the market portfolio at a period (t) is in the upper tail of the market return dispersion, and it is 0 otherwise. While positive signs of coefficient β_L and β_U depict the absence of herd behaviour in the market, herding behaviour is considered to exist when there are negative signs of coefficient β_L and β_U as up and down market movements.

Chang et al. (2000) mention that the Cross-Sectional Absolute Deviation (CSAD) suggests a different model from CSSD that is more powerful in measuring and capturing herd behaviour in the stock markets. CSAD is the average of the summation difference between the expected return of a firm's stocks and the market return. The authors debate that this relationship has always been positive but is supposed to be negative and nonlinear when herding behaviour occurs because of the increase in the value of the absolute market return. We apply this method as it was also applied by Tan et al. (2008) to examine herding behaviour in the Chinese stock market. The equation can be defined as:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N} |R_{i,t} - R_{m,t}| \quad (3)$$

The variables are the same as described in CSSD the base model. Hence, Chang et al. (2000) propose the following regression model to test the non-linearity:

$$CSAD_t = \alpha + \beta_1 |R_{m,t}| + \beta_2 (R_{m,t})^2 + \varepsilon_t \quad (4)$$

On the equation (4), α is the constant, β_1 and β_2 are coefficients and ε_t is the error term at time t. Non-linearity in the relationship between market return and $CSAD_t$ is detected by the squared market return $(R_{m,t})^2$ at time t. Based on the same equation, if the β_1 and β_2 coefficient are positive and zero, respectively, then its implication is that there is no existence of herding behaviour. On the other hand, the negative value of β_2 represents the presence of herding in the financial market. This means that when the stock market return is at its extreme the CSAD at that time t can either increase or decrease at a less proportional rate concerning market returns.

Subsequently, we analyze the herding behaviour when the market is both at up and down. Chang et al. (2000) propose the following empirical regression modal:

$$CSAD_t^{UP} = \alpha + \beta_1^{UP} R_{m,t}^{UP} + \beta_2^{UP} (R_{m,t}^{UP})^2 + \varepsilon_t, \quad if\ R_{m,t} > 0 \quad (5)$$

$$CSAD_t^{Down} = \alpha + \beta_1^{Down} |R_{m,t}^{Down}| + \beta_2^{Down} (R_{m,t}^{Down})^2 + \varepsilon_t, \ if < 0 \quad (6)$$

Where, $CSAD_t^{UP}$ represents (Upmarket) Cross-Sectional Absolute Deviation at day t, β_1^{Down}, β_2^{Down} and $\beta_1^{UP}, \beta_2^{UP}$ represent the market portfolio coefficient when the market return values of a portfolio at day t lie at the risky lower and upper tail of the distribution, respectively, $|R_{m,t}^{Down}|$,

$\left(R_{m,t}^{Down}\right)^2$ and $R_{m,t}^{UP}$, $\left(R_{m,t}^{UP}\right)^2$ indicate the absolute market return at time t when the market decreases and a squared market return for capturing herding when the market values fall under the lower tail of distribution respectively. α and ε_t are defined as described in the base regression model. Under this model, herding prevails most when the coefficients β_2^{Down} and β_2^{UP} are statistically significant and negative. Additionally, Demirer & Kutan (2006) revealed that herding is likely to exist when the market is extreme up and down due to psychological reasons sourced from good and bad news. Good news is likely to affect during the upmarket while bad news has an effect during the down market.

Furthermore, in up and down markets, many previous literature has associated herding behaviour with trading volume by examining the effects of trading activity on herding. Chiang & Zheng (2010) argue in their study that if herding behaviour prevails, there should be a negative correlation between market return dispersion and the trading volume of the specified period. To the best of our knowledge, in this paper, we use the empirical regression model used by Tan et al. (2008) to study the herding behaviour in the financial market at high and low trading volume. And the criteria are set to be if the values of trading volume are greater than the values of the moving average of the last 30 days, then the trading volume is pronounced as high, otherwise low. The empirical specifications are as described below.

$$CSAD^{V-High} = \alpha + \beta_1^{V-High}\left|R_{m,t}^{V-High}\right| + \beta_2^{V-High}\left(R_{m,t}^{V-High}\right)^2 + \varepsilon_t \quad (7)$$

$$CSAD^{V-Low} = \alpha + \beta_1^{V-Low}\left|R_{m,t}^{V-Low}\right| + \beta_2^{V-Low}\left(R_{m,t}^{V-Low}\right)^2 + \varepsilon_t \quad (8)$$

Where β_1^{V-High} and β_2^{V-High} denote a coefficient of market return portfolio when the trading volume is high, the situation is the same for β_1^{V-Low} and β_2^{V-Low} which represent low.

The financial market can be affected by market volatility due to price; market volatility affects investors' psychology by suppressing their information and following market information. Tan et al. (2008) used high and low market volatility to study herding behaviour in the financial market, if the values of market volatilities on a specific day "t" are greater compared to the previous 30 days, then the market volatility is rated as high, otherwise low. The specification of the model is as follows:

$$CSAD_t^{\delta^2-High} = \alpha + \beta_1^{\delta^2-High}\left|R_{m,t}^{\delta^2-High}\right| + \beta_2^{\delta^2-High}\left(R_{m,t}^{\delta^2-High}\right)^2 + \varepsilon_t \quad (9)$$

$$CSAD_t^{\delta^2-Low} = \alpha + \beta_1^{\delta^2-Low}\left|R_{m,t}^{\delta^2-Low}\right| + \beta_2^{\delta^2-Low}\left(R_{m,t}^{\delta^2-Low}\right)^2 + \varepsilon_t \quad (10)$$

Where $\delta^2 - High$ and$\delta^2 - Low$, represent the high and low market volatility in the financial market at a specific period.

The paper also analyzes the prevalence of herd behaviour during the global financial crisis that started in 2007 (Chiang & Zheng, 2010; Khan et al., 2011; Mobarek et al., 2014; Galariotis et al., 2015; Economou et al., 2015; Guney et al., 2017). The financial crisis has been described as the critical period in herding behaviour since it has always been associated with uncertainties affecting most financial markets. So, this analysis uses a dummy variable of the financial crisis to examine the behaviour of investors during the period of crisis and otherwise. The below regression is used with the dummy variable as well.

$$CSAD_t = \alpha + \beta_1\left|R_{m,t}\right| + \beta_2\left(R_{m,t}\right)^2 + \beta_3\left(R_{m,t}\right)^2 * DM_t + \varepsilon_t \quad (11)$$

"DM" shows the dummy variable of the financial crisis from 2007 to 2009 for the Istanbul stock exchange. Kahneman & Tversky (1972) suggest that extreme events, such as uncertainties (financial crisis), might have stronger impacts on individual investors in the financial markets.

3. Empirical Results

This study uses regression analysis to examine herding behaviour in the stock market. To analyze herding behaviour, we apply three different regression models. First, the analysis is reviewed during different market conditions using the model developed by Christie & Huang (1995). Second, the analysis is conducted by applying the regression model developed by Chang et al. (2000). Third, the study

examines the herding behaviour during the global financial crisis of 2007-2009 based on the time Turkey was impacted.

3.1. Descriptive Statistics

Table 1 presents daily descriptive statistics from 2005 to 2018 of BIST based on $CSSD_t$, $CSAD_t$, and $R_{m,t}$. The CSSD daily average is 0.0244, while the minimum value is 0.0104 and the maximum value is 0.2084. Values show a significant difference between the maximum and minimum levels, indicating the existence of high volatility in CSSD. On the other hand, the value of CSAD is 0.0168 as average daily. The maximum value is 0.0645 and the minimum value is 0.0076. The average daily market return is 0.0005, while maximum and minimum values are 0.0683 and -0.0791. We examine the kurtosis and skewness to gain more insights into the analysis. The value of kurtosis for CSSD, CSAD, and RM are all positive 82.3603, 7.7284, and 5.3691, exhibiting that distribution tends to have a higher ultimate and fatter tail distribution than the normal distribution. We observe that data on the skewness side with a range from negative -1.0037 to 4.9798 indicates asymmetric and fat-tailed in market return values.

Table 1. Descriptive statistics for daily data from 2005 to 2018

Summary Stat	CSSD	CSAD	Rm
Mean	0.0244	0.0168	0.0005
Median	0.0231	0.0157	0.0013
Standard Deviation	0.0083	0.0052	0.0112
Kurtosis	82.3603	7.7284	5.3691
Skewness	4.9798	1.9978	-1.0037
Minimum	0.0104	0.0076	-0.0791
Maximum	0.2084	0.0645	0.0683

3.2. Cross-sectional standard deviation

To analyze the existence of herding behaviour in the BIST, the analysis employs the regression model of Christie & Huang (1995). Table 2 shows the findings of CSSD that are divided into three criteria: 1%, 5%, and 10% indicate the level of significance statistically. According to the model of Christie & Huang (1995), the findings show that coefficient β_U in all criterion 1%, 5% and 10% values are positive and significant, revealing that herding behaviour during 1%, 5% and 10% extreme upper market return movements is not evident. On the other hand, β_L coefficient in all the criteria, the results are negative and significant. These results show the herding behaviour in the stock market during low market return movement while using the full sample date. The results suggest any evidence of the presence of herding behaviour in line with the results of Christie and Huang (1995) and Chang et al. (2000).

Table 2. Regression of $CSSD_t$

Criterion	Constant	DU	DL	F-Stat
	0,0241	0,0399	-0,1139	
1%	(196,47)***	(32,58)***	(-9.66)***	580,67***
	0,0237	0,0226	-0,2034	
5%	(214,11)***	(46,74)***	(-20.00)***	1358,05***
	0,0235	0,0173	-0,2415	
10%	(220,41)***	(54,02)***	(-27.45)***	2026***

***indicates 1% level of significance. Parentheses show t-statistics.

3.3. Cross-sectional standard deviation

In addition to CSSD, this study employs another regression model pioneered by Chang et al. (2000) to detect the existence of herding in the BIST. Table 3 recapitulates regression findings for CSAD by applying three different ways in various conditions. First, the study uses the CSAD sample to examine herding behaviour in the stock market. Second, the study employs $CSAD_{UP}$ to detect herding in the stock market during the bull market, while the third one the study uses $CSAD_{DOWN}$ to figure out herding behaviour in the BIST during bear market phenomena. In the context of the model of Chang et al. (2000), it is accepted that herd behaviour exists in the stock market if β_2 is negative and significant, but the results of the total market [R_m^2] are positive and significant, which depicts the absence of herding behaviour during the full sample in the stock market. However, β_2 is negative and significant during an up market return. This verifies the presence of herding behaviour in the BIST. As β_2 during a down market, the return is positive and significant, implying the absence of herding behaviour in the stock market. In conclusion, results suggest no evidence of herding behaviour during total and down market return movements. However, both CSSD and CSAD report that there is significant evidence to exhibit the presence of herding behaviour in the BIST during an up market return, except during low and high extreme movement.

Table 3. Herding behaviour during up and down market

Market	Constant	$\lvert R_{mt} \rvert$	$[R_{mt}^2]$	Adj R sqr	F-Stat
	0,0137	0,3401	2,4778		
Total Market	(123,02)***	(20,39)***	(6,28)***	0,4505	1445,26***
	0,0136	0,3029	-3,8049		
Up Market	(91,07)***	(11,97)***	(-4,88) ***	0,3498	543,24***
	0,014	0,3599	1,8928		
Down Market	(80,78)***	(14,84)***	(3,67)***	0,5218	822,74***

***indicates 1% level of significance. Parentheses show t-statistics.

Table 4 reports the regression analysis of herding behaviour during high and low trading volumes. During high trading volume, β_2 is positive and significant, so there is no evidence of the presence of herding behaviour in the stock market. As β_2 is negative and significant during low trading volume, this suggests that herding behaviour exists in BIST. To sum up, herding behaviour does not trigger or influence the BIST during high trading volumes while there is herding behaviour during a low market.

Table 4. Herding Behaviour during high and low trading volume

Trading Volume	Constant	$\| R_m \|$	$[R_m^2]$	Adj R sqr	F-Stat
High Trading Vol	0,015 (81,86)***	0,3157 (12,77)***	2,1807 (3,89)***	0,4546	679,66***
Low Trading Vol	0,013 (100,88)***	0,2818 (13,14)***	-4,1431 (-7,72)***	0,40621	648,51***

***indicates 1% level of significance. Parentheses show t-statistics.

Table 5 reports the regression of herding behaviour during high market volatility and low market volatility. β_2 of high volatility is positive and significant, so it implies that absence of herding behaviour in the BIST. On the other hand, β_2 of low volatility is negative and significant, so it suggests an existence of herding behaviour in BIST during low volume. The results conclude that herding behaviour is absent during high volatility while herd behaviour exists during low market volatility in the BIST.

Table 5. Herding Behaviour during market volatility

Volatility	Constant	$\|R_m\|$	R_m^2	Adj R sqr	F-Stat
High Volatility	0,0132 (108,26)***	0,2684 (13,04)***	3,9632 (7,40)***	0,4011	694,23***
Low Volatility	0,01509 (72,73)***	0,3303 (12,37)***	-2,1102 (-3,61)***	0,4649	604,86***

***indicates 1% level of significance. Parentheses show t-statistics.

Some of the phenomena may cause financial and economic disaster to investors, so this study analyzes herding behaviour during 2008 global financial crisis as well. Table 6 shows that impact of financial crisis on herding behaviour. β_3 is negative and significant, which implies that the financial crisis weakly influences herding behaviour due to asymmetric information that exists among investors.

Table 6. Herding Behaviour during the financial crisis

Crisis	Constant	$\| R_m \|$	R_m^2	R_m^2*D	Adj R sqr	F-Stat
Financial Crisis	0,0137 (122,76)***	0,3449 (20,45)***	2,0689 (4,60)***	-0,6996 (-1,8953)*	0,4509	965,41

***indicates 1% level of significance. *indicates 10% level of significance. Parentheses show t-statistics.

As it can be noted by financial analysts and economists return's volatility in any financial market accelerates due to herding behaviour as well as tremendous volatility leading to the financial crisis. This result supports Chiang and Zheng's (2010) results of herding evident during the financial crisis due to market stress phenomena. Additionally, market vagueness turns out to be high during a market crisis (Christie and Huang; 1995).

Table 7. Herding Behaviour during FED decision in 2013

FED decision in 2013	Constant	$\mid R_m \mid$	R_m^2	R_m^2*D	Adj R sqr	F-Stat
Stock Crisis	1.0137 (121.95)***	0.3492 (20.47)***	2.1182 (5.05)***	1.5068 (2.4974)***	0.45	967.02

***indicates 1% level of significance. Parentheses show t-statistics.

Some decisions by the FED can strongly influence herd behaviour in the market. The decision made by FED in 2013 is one of these decisions. In May 2013, after talking about to finish the quantitative easing program, we noticed the effect of the decision on BIST in Turkey. Table 7 shows herding behaviour during decisions in 2013. The results don't suggest any evidence of herd behaviour in the financial market. As the β_3 is positive and significant at a confidence level of 1%, this signifies that this decision does not trigger herd behaviour.

The study concludes that investors and other human beings are not rational as the results show herd behaviour during low volatility, low trading volume, upmarket return, and financial crisis. Based on the practitioners' perspective the study has implications for financial institutions and new investors in the market.

4. Conclusion And Policy Implication

In this study, 74 stocks registered in the BIST 100 Index between January 2005 and December 2018 were analyzed by using CSSD and CSAD methods. The study aimed to diagnose the direction of the 2008 Global Financial Crisis, large-scale social events that affect herd behaviour. Herd behaviour occurred in some special cases in BIST. Herd behaviour was observed in bull markets, where the volatility and transaction volume in BIST were low, and during the 2008 Global Financial Crisis.

The results are important for investors, financial regulators, and policymakers. An investor who wants to take advantage of the impact of herd behaviour can expect low volatility and low trading volume periods in BIST, or an investor who wants to be protected from herd behaviour periods, may avoid trading during the periods when the conditions in question occur. On the other hand, financial regulators can make various interventions in the market to prevent the possible negative effects of herd behaviour when these conditions arise, as these findings may predict how conditions a possible herd behaviour may occur. As a result, the determination of herd behaviour provides a critical foresight and policymaking opportunity both for investors and the government.

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