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Asymmetrical Herding In The Up And Down Market: An Empirical Analysis From Istanbul Stock Exchange

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Abstract: *Since 1990 researchers studied the impact of herding behavior in developed and emerging countries financial markets. Herd behavior were assumed to destabilize financial markets and that is why many studies were conducted to investigate the existence of herding behavior during market stress periods. The main objective of this study is to investigate herding behavior when Istanbul stock exchange rises and falls. The study uses daily, weekly as well as monthly stock and sectoral data from the beginning of 2000 to the end of 2018. CSSD and CSAD models are used to test the existence of herding behavior in Istanbul stock exchange. The empirical finding shows that herding is more prevalent when the market falls than when it rises. This shows that herding behavior is not symmetrical in the up and down market. In addition, herding is more common in the daily data than weekly and monthly data.*

Keywords:herding behavior, CSSD, CSAD, BIST 100

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I. Introduction

Before 1979, investors were considered as a rational man, who trades and makes an investment decision based on information only. According to this view, Fama in 1970 developed an efficient market hypothesis. However, the 1979 Kahneman&Tversky's prospect theory creates loopholes to a rational theory and it initiates the study of investors' psychological impact on investment decisions.

According to efficient market hypothesis, investors made decisions based on available fundamental information (past stock price information, publically available information and privately owned information). However, there are empirical evidences that shows investors are not trading with their own information only but also trades using other investors' information. This act or behavior of an investor is called herding. Simply herding can be defined as the act of mimicking other investor(s) decision(s) by ignoring own private information (Schartstein& Stein, 1990; Demirer, Kutan, & Chen, 2010). The dependence of an investor on collective (group) information than personal information would cause share prices to deviate from fundamental value and may present a profitable trading opportunities (Tan, Chiang, Mason,&Nelling, 2008). Even if classical economic theory argued that investors make a rationally informed decision based on formed expectation; however, investment is also made by group psychology (Schartstein& Stein, 1990).Investors show a tendency to herd during a period of high market stress for the seek of comfort with other investors opinion. During a period of market stress, obtaining additional reliable information is costly and herding is a better solution for reducing the cost of limited information (Sun &Shyu, 2010).

Following the study of Schartstein and Stein (1990) about herding behavior, numerous researches have done to investigate the existence of herding behavior in different financial markets (Christie & Huang, 1995; Chang, Cheng, &Khorara, 2000; Hwang & Salmon, 2004; Altay, 2008; Tan, et al., 2008; Demirer, et al., 2010; Doğukanlı & Ergün, 2011; Kapusuzoglu, 2011; Kayalıdere, 2012; Ergün & Doğukanlı, 2015; Doğukanlı & Ergün, 2015; Özsu, 2015;Yasir, 2018). After 1990, herding behavior of investors get an enormous focus as one of the psychological phenomena to explain anomalies in the financial markets. As a result, researchers investigated herding related issues both in developed and emerging countries' financial markets for the past thirty years.

Empirical findings shows that the level of herding is different in developed countries' financial markets and emerging markets' financial markets. For example, Chang, et al. (2000) studied the herding behavior of investors in the U.S., Hong Kong, Japan, South Korea and Taiwan stock markets and they found no evidence of herding in the U.S. and Hong Kong market. However, they find a partial evidence of herding behaviorin the Japanesestock market. But, in the two emerging markets i.e. South Korea and Taiwan stock market the researchers found a significant evidence of herding. Chang, et al. (2000) also recommended a further research in other emerging markets to see whether a similar finding holds true. Nevertheless, these empirical analysis did not show us whether herding is symmetrical or not when the market rises and falls. Thus, the objective of this

study is to investigate the existence of herding behavior, in emerging market, when the market (Istanbul stock exchange) rises and falls.

To the best of my knowledge some researches were done to investigate the existence of herding behavior during market stress periods in Istanbul stock exchange (Altay, 2008; Doğukanlı&Ergün, 2011; Kayalıdere, 2012; Ergün&Doğukanlı, 2015; Doğukanlı&Ergün, 2015 and Özsu, 2015). The common objective of all these studies wasto investigate the existence of herding behavior when the market is in extreme stress period. However, the empirical evidence of these studies is inconclusive. According to Altay (2008), Kayalıdere (2012) andDoğukanlı&Ergün (2015), there is an empirical finding which shows the presence of herding towards market consensus. On the other hand, Doğukanlı&Ergün (2011), Ergün&Doğukanlı (2015) and Özsu (2015), did not found the existence of herding behavior in Istanbul stock exchange. Thus, in addition to studying herding behavior in only extreme market stress periods, there is a need to investigate herding behavior when the market return is rising and falling.

Furthermore, all the previous researches have been done to investigate the existence of herding when the market return lies in 1% and 5% of the lower and upper region of the market return distribution (Christie & Huang, 1995; Chang, et al., 2000; Hwang & Salmon, 2004; Altay, 2008; Doğukanlı & Ergün, 2011; Kayalıdere, 2012; Ergün & Doğukanlı, 2015; Doğukanlı & Ergün, 2015 and Özsu, 2015). Since the total area of the normal distribution equals to one (0.5 to the left and 0.5 to the right from the mean), the previous researches ignored to investigate herding in the major area of the market return distribution. That is, 1% and 5% is used as a cutoff point to specify the market stress period in the previous researches. In this case the remaining 0.49 (49%) or 0.45(45%) of the market return distribution remain unexplained or did not investigated. Therefore, this study investigated the existence of herding in Istanbul Stock Exchange when the market return falls below the zero or lies above the zero. Thus, the study investigated the whole return distribution rather than investigating the extreme return periods.

The remaining part of this paper is arranged as follows. The second section gives emphasis on literature reviews. The third section focuses on data and research methodology. The fourth and fifth section deals about empirical analysis and conclusions respectively.

II. Literature Review

Financial economics is about trade among agents, i.e. trading in well-functioning financial markets. At first sight, agents trade interest bearing or dividends paying securities as well as derivative instruments in financial markets. Nevertheless, from an economic perspective, on financial markets, agents trade time, risks and beliefs (Hens &Rieger, 2010).Classical financial economics assumes that people behave with a perfect rationality while trading these financial assets. According to the classical financial economics theories, investors are rational if they update their beliefs correctly when they receive new information, and given their beliefs, if they make choices that are normatively acceptable and consistent with expected utility theory (Barberis&Thaler, 2003). In the sense of rationality, the agent takes all the perceived benefits and costs into consideration while making decision (Vriend, 1995).Rationality is always connected to human action and there are two main views of a rational action. The first is the concept of preferences (which is related to making a consistent decision in situations with different possible alternatives); the second view is the concept of utility (investors' trade to maximize their own utility) (Schindler, 2007).

Thus, any investor who makes irrational decisions would be punished through poor performance and/or they would learn to either make better decisions or leave the market place. Thus, any error that market participants make are independent (not correlated) with each other and the errors do not have the power to affect market prices (Friedman, 1953; Fama, 1965). Most of the economic theories assumes that economic agents are rational but they ignored that these agents have limited capacities to process information. Most of the economics and finance models that involves the rationality assumption do not take into consideration the existence of heterogeneity in information processing ability of investors. Thus, some agents are able to process information in a very sophisticated manner, while others are much more limited in their capabilities (Haltiwanger& Waldman, 1985).

So there are two types of traders in financial markets: noise traders and smart money investors. The actions of noise traders are able to influence the stock price because of the smart money investors are risk averter (Campbell & Kyle, 1988).In addition, there is a limit of arbitrage (arbitrage is risky and costly) to exploit noise traders (irrational investors) mispricing. Accordingly, arbitrageurs are less willing to take a position against irrational investors. Although, Freidman (1953) argued that the irrational investors will lose money; De Long, Schleifer, Summers, &Waldmann (1990) counter argued that noise traders may be compensated for bearing the risk that they themselves create and so earn higher returns than rational investors.

In line with this, Khaneman&Tversky (1979) shows that investors' decisionssystematicallydeviate from the rationality assumption. Thus, they are not perfectly rational as they are expected to be. Psychologists have identified ways in which people systematically depart from optimal judgement and decision-making. For

example, investors desire to avoid regret lead them to hold losing investment too long and sell winner investment too early. This behavior is called disposition effect. Investor's overconfidence is the other way that make investors to systematically deviate from rationality. Overconfidence makes investors to trade frequently and thereby reduce their returns because it increases transaction costs. In general, human beings are overconfident about their abilities, their knowledge and their future prospects (Barber &Odean, 1999).

According to Kahneman&Tversky (1979) individual's decision on choices among risky prospects, show several pervasive effects that are inconsistent with the basic tenets of expected utility theory. First, people underweight outcomes that are merely probable in comparison with outcomes that will occur with certainty. They called this tendency a certainty effect. Individuals also exhibit a risk aversion in choices involving sure gains and risk seeking in choices involving sure losses. Second, due to isolation effect people generally discard components that are common to all prospects under consideration, then this leads to inconsistent preferences when the same choice is expressed in different forms. Third, for choices that involve both gain and lose; the preference for negative prospects is the mirror image of the positive prospects. This is known as a reflection effect. Therefore, the reflection effect implies that risk aversion for positive prospects and risk seeking for negative prospects. All the above findings shows that the violation of expected utility theory basic axioms.

In general, it is so difficult to consider investors are fully rational for the following reasons: many investors react to irrelevant information as well as trade with a noise as an information, fail to diversify, sell winning stock earlier and hold a losing stock for a long period, affected by the way choices are presented (farming), show herding, buy and sell securities actively, follow a stock price patterns and investors are not risk averse rather they are loss averse (Shleifer, 2000). In financial markets, investors act rationally towards their advantage and make a decision based on the available information as well as in coordination with the actions of other investors (Schindler, 2007).Therefore, the rest of this section focuses on one of the irrational behavior of investors, i.e. herding behavior.

III. Herding behavior

Human being by nature are influenced by other people's actions in almost all activities, particularly in financial markets. This influence is called herding behavior. Originally, the term herd was used to express the physical grouping of animals. However, economists have extended its original meaning to define the convergent behavior of human actions based on social influence. The herding behavior is understood from the same actions individuals made because of interactions with other individuals. Social influence can affect individual's thoughts, feelings and actions. The social influence arises through communication and talking with others, by observation of actions and the consequence of those actions. Social influence may not always lead to convergent behavior, it many also lead to divergent behavior. The unique feature of herd behavior is the social influence and interaction between individuals (Schindler, 2007).

The word herding or herding behavior refers to the process where economic agents are imitating each other's action(s) and/or base their decisions upon the action(s) of others. However, different researchers define the term herding with different expressions. Lakonishok, Shleifer, &Vishny (1992) define herding as a correlated trading across investors. Devenow& Welch (1996) define the term herding as behavioral patterns that are correlated across individuals (investors). De Bondt& Forbes (1999) define herding as excessive agreement among analysts prediction; Nofsinger&Sias (1999) define herding as a group of investors trading in the same direction over some period of time. Welch (2000) define it as a mutual imitation.Bikhchandani& Sharma (2001) define herding as a correlation in the positions taken by different managers. Hwang & salmon (2004) define herding as a form of correlated behavior or the suppression of private information and imitation without reference to fundamentals; Sias (2004) define herding as a group of investors following each other into or out of the same securities over some period of time. In general, herding requires a coordination mechanism.

IV. Reasons For Herding

Bikhchandani, Hirshleifer, & Welch (1998) asserts that human being, starting from childhood, is continuously influenced by the observed actions of others. Nevertheless, why do people tend to converge to similar behavior? The most basic cause of convergent behavior is that individuals face similar decision problem, i.e. individuals may have similar information, face similar alternative actions and face similar results. In such conditions, investors make identical decision and their behavior converges on average. The other cause for imitation is that investors have diverse set of information (initial information is not similar) but arrive to identical decisions. The third cause of convergent behavior is an intentional imitation of the action of other. The basic theme of rationality, in the context of financial markets, is that individuals decide by direct analysis of different alternatives. However, in reality this action is costly and time consuming, so a plausible option is to rely on the information and actions of others. There are also other causes for conformity like social convention (e.g. driving on the right or left side of the road), preference interaction and sanctions upon deviants.

In order to imitate other investors' action, an investor must be aware of and must be influenced by them (Bikhchandani& Sharma, 2001). Individuals and institutional investors engaged in herding behavior for different reasons. An individual investor who buy and sell securities may infer information from the actions of previous participants or may react to the arrival of fundamental information; analysts may herd in order to keep reputation and institutional investors may herd for remuneration purpose. Investors may be simply irrational and herd behavior can arise because of psychological and social conventions (Spyrou, 2013). Irrationality and systematic responses for fads or sentiment is the main cause for individual investors to engage in herding (Nofsinger&Sias, 1999). The investment decision of individual investor is likely to be influenced by fads and fashions or investors may give greater importance for recent news. However, for institutional investor's agency problem, security characteristics, fads, the manner in which information is impounded in the market are important (Nofsinger&Sias, 1999). Institutional herding may not relate to information. Irrational psychological factors and agency problems can encourage institutional herding.

According to Bikhchandani& Sharma (2001), investors imitate the actions of others for three reasons. First, investor's belief about other investors may know some information about the profitability of an investment more than them. Second, the incentive mechanism for managers who invest on behalf of others is the cause for herding. Third, the individual preference for conformity is the other cause for herding. When investors make a wrong decision from their imitation, then latter on with the arrival of new information and/or with experience they are likely to reverse their decision in the opposite direction from the first decision. This situation can increase volatility in the market.

Therefore, from the above analysis we can learn that there are two types of herding: spurious and intentional herding. Spurious herding occurs when a group of investors faces similar decision problems and/or similar information sets, and arrive to similar decision. It is supposed that such herding can results efficient outcomes. Spurious herding arises from fundamentally driven factors. For example, stocks become less attractive investment when interest rate rises suddenly. In such a situation investors want to hold a smaller percentage of stocks in their portfolio. This action is not herding because investors are not imitating other investors action rather they are responding to commonly known public information. However, the intentional herding results from a clear intent by a market participant to imitate the actions of other investors. Intentional herding need not bring efficiency. Rather, it can lead to excessive volatility and systemic risk (Bikhchandani& Sharma, 2001).

V. Data and Research Methodology

This section presents the source and types of data as well as the methodology employed to investigate the proposed objective.

Data

In order to test the existence of herding towards the market consensus in Istanbul Stock Exchange daily, weekly and monthly stock price data are taken from January, 2000 to December, 2018. Daily, weekly as well as monthly closing stock prices and BIST 100 indexare used to calculate their respective returns amount in the study period. BIST 100 index is used as a market indicator for this study and its closing prices are used to calculate return. All the data is collected from Finnetanaliz excel model. In addition to stock return data, sectoral index return data is also used to test the existence herding in different sectors. Like stock price data, the sectoral index data is also taken from Finnet. However, the list of firms for each sector as well as the name of the sectors is obtained from Istanbul Stock Exchange official website. Thus, to test herding in the specified market both stock return data and sectoral index return data is used.

Research Methodology

In behavioral financeliteratures, there are three different methods to test herding behavior of investors. The first method focus on the number of investors who made decisions in the same direction or it focuses on the percentage of investors who buy an asset while the other investor sells those assets and vice versa. The typical example of this method is theLakonishok, Shleifer and Vishny (LSV)model.The secondmethod measures herding based on cross sectional stock's return data. Thus, cross sectional dispersion of stock returns (CSSD) model or CH (1995) model and cross sectional absolute deviation (CSAD) of stock returns model are the models which use stock return data to test the existence of herding behavior. The third method uses the volatility of beta coefficient to test herding behavior. In this study those methods which use return data are selected.

Cross sectional dispersion of stock returns model or CH (1995) model

To measure the existence of herding in stock returns Christie & Huang (1995), hereafter CH (1995), developed a cross sectional standard deviation of stock returns model. According to CH model, the standard deviation is expected to be low when individuals herd around market consensus. In essence, dispersionquantify

the average proximity of individual returns to the mean of the market return. The lower limit of a dispersion is zero that indicates a perfect unison with the market. On the other hand, as individual returns begin to vary from the market return, the level of dispersion increases. According to CH (1995), individuals are most likely to suppress their own beliefs in favor of the market consensus during periods of unusual market movements and herd behavior would most likely emerge during market stress periods. The predictions concerning the behavior of dispersions during periods of market stress also comes from the rational asset pricing models. The rational asset pricing model relate the individual asset returns to one common factor i.e. market return. The rational asset-pricing model relates a large change in market returns to an increase in dispersion because individual assets differ in their sensitivity to the market return. In this way, herd behavior and rational asset pricing models offer conflicting predictions for the behavior of dispersions during periods of market stress.

To measure the return dispersion, CH (1995) proposed the cross-sectional standard deviation (CSSD) method, which is expressed as:

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^{N}(Ri,t-Rm,t)^2}{(N-1)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots eq(1)$$

Where N is the number of firms in the portfolio, $R_{i,t}$is the observed stock return of firm i at time t, $R_{m,t}$ is the market return at time t. This model suggests that if herding occurs, investors will make similar decisions, leading to lower return dispersions. But low dispersion by itself do not guarantee the presence of herding. According to Chang, et al. (2000), CSSD measure quantifies the average proximity of individual returns to the realized returns.

To test the existence of herding empirically, CH (1995) used the following model.

$$S_t = \alpha + \beta^L D^L_t + \beta^U D^U_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots eq(2)$$

Where S_t is the return dispersion at time t. $D^L_t$is a dummy variable at time t taking on the value of one when the market return at time t lies in the extreme lower tail of the distribution, and zero otherwise. Similarly, D^U_t is a dummy variable with a value of one when the market return at time t lies in the extreme upper tail of the distribution, and zero otherwise. The α coefficient denotes the average dispersion of the sample excluding the regions covered by the two dummy variables. The rational asset pricing models predict significantly positive coefficients for β^L and β^U; and statistically significant and negative values for β^L and β^U would indicate the presence of herding.

According to CH (1995), individuals herd to the market means that individuals suppress their own beliefs and their investment decisions; thereby only depends on the collective actions of the market, even when they disagree with its predictions. This way of herd formation implies that investors are attracted to the consensus of the market and it means that individual stock's return would not move from the market return. CH (1995) believe that individuals are more likely to imitate the market consensus during periods of unusual market movements. Thus, herd behavior would most likely emerge during market stress periods. A natural candidate for market stress periods are those trading intervals characterized by large price swings in average prices. In such periods, security returns will move along with the market returns. Market stress is defined as an abnormally large price movement. Since the definition of market stress is arbitrary CH (1995) used the following criteria.

CH (1995) investigated the presence of herding when the market is in stress period. But, they define market stress in an arbitrary ways using a 1 or 5 percent criteria. The CH (1995) model uses a 1 or 5 percent upper or lower tail of the market return distribution as a criterion to specify market stress period. However, this model ignores that the impact of investors' psychological factor is available throughout the investment decision process and herding does not only exist when a market is in a stress period. Many empirical findings revealed that during market stress period investors make decisions based on fundamentals rather than imitating an overall market consensus (Christie & Huang, 1995; Hwang & Salmon, 2004; Doğukanlı&Ergün, 2011; Ergün&Doğukanlı, 2015). In addition, Hwang & Salmon (2004) found herding when the market is quiet and investors are confident of the direction in which markets are heading. Therefore, it is important to study herding when the market return falls in the whole two half (negative and positive) of the return distribution. Using the same logic to CH (1995), this study developed the following modified version of CH (1995) model. Unlike CH (1995) model that uses a dummy variables to investigate herding, the following model uses an actual or realized stock return data.

$$CSSD_t = \alpha + \beta^n RM^n_t + \beta^p RM^p_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots eq(3)$$

Where, $CSSD_t$ is the cross sectional standard deviation at time t, α refers a constant when the market return is zero, $RM^n_t$is a realized negative market return at time t, RM^p_t is a realized positive market return at time t, β^n is the coefficient ofRM^n, β^p is the coefficientof RM^p, and $\varepsilon_t$is the error term. A negative and statistically significant coefficient shows the presence of herding towards the market consensus. To measure the return dispersion the usual cross sectional standard deviation (CSSD) method is used.

The theoretical explanation of the above model is that when the market return rises, investors' confidence will increase and they will make an independent decision. On the other hand, when the market performance falls,

investors' confidence will be eroded and they try to imitate the market consensus. The main theme of this argument is that psychological factors are available all the time when the market rises and falls.

Cross sectional absolute deviation (CSAD) of stock returns model

Chang, Cheng and Khorana (2000), afterward CCK, have extended the work of CH (1995) to measure herding and developed the cross sectional absolute deviation of stock returns model. The new model is a nonlinear model that is used to examine the relation between the level of equity return dispersions and the overall market return. CCK (2000) expect that in the presence of severe or moderate herding the return dispersion will decrease. The cross sectional absolute deviation model as a measure of return dispersion demonstrate that rational asset pricing models predict that the equity return dispersions are a linear and an increasing function of market returns. However, if investors follow (herd) the aggregate market behavior and ignore their own analysis during periods of large price movements, then the linear and increasing relation between dispersion and market return will no longer holds. In other words, the relation became non-linearly increasing or even decreasing. Thus, the CSAD model is built on this premise. However, CSAD value by itself is not a measure of herding rather the relationship between CSAD and market return is used to detect herd behavior. CCK (2000) developed the following regression equation to allow for the possibility that the degree of herding may be asymmetric in the up versus the down market.

$CSAD_t^{up} = \alpha + \gamma_1^{up}|R_{m,t}^{up}| + \gamma_2^{up}(R_{m,t}^{up})^2 + \varepsilon_t$……eq(4)

$CSAD_t^{down} = \alpha + \gamma_1^{down}|R_{m,t}^{down}| + \gamma_2^{down}(R_{m,t}^{down})^2 + \varepsilon_t$……eq(5)

Where $CSAD_t$isthe average of the absolute value deviation of each stock relative to the return of market portfolio in period t, and $|R_{m,t}^{up}|$ ($|R_{m,t}^{down}|$) is the absolute value of an equally weighted realized return of all available securities on day t when the market is up (down). In addition, the CCK model facilitates the detection of herding over the entire distribution of market return with the following specification:

$CSAD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2 R^2_{m,t} + \varepsilon_t$……eq(6)

$CSADt = \frac{1}{N}\sum_{i=1}^{N} |Ri,t - Rm,t|$ ……eq(7)

Thus, if herding exists, the coefficient γ2 is expected to be negative and statistically significant.

However, in this study I prefers to use the term positive market return (RMp) instead of 'up market' and negative market return (RMn) instead of 'down market' for the seek of simplicity. The following model is formulated by changing only up and down terms to positive and negative market return.

$CSAD_t^p = \alpha + \gamma_1^p|RMp_t| + \gamma_2^p(RMp_t)^2 + \varepsilon_t$……eq(8)

$CSAD_t^n = \alpha + \gamma_1^n|RMn_t| + \gamma_2^n(RMn_t)^2 + \varepsilon_t$……eq(9)

Where $CSAD_t$isthe average of an absolute value deviation of each stock relative to the return of the market portfolio in period t, and $|R_{m,t}^p|$ ($|R_{m,t}^n|$) is the absolute value of realized return of all available securities on day t when the market return is positive (negative). In addition, the CCK model facilitates the detection of herding over the entire distribution of market return with the following specification:

$CSAD_t = \alpha + \gamma_1|RM_t| + \gamma_2 RM^2_t + \varepsilon_t$……eq(10)

In behavioral finance literature, there are two types of herding: spurious herding and intentional herding. Spurious herding or unintentional herding occurs when independent individuals arrived similar actions or decisions induced by the movement of fundamentals. An intentional herding occurs by a clear intent of an investor to imitate the action of others. The main question here is that a negative and significant coefficient for the above regression implies a spurious or intentional herding. At this point, it is important to ask the following question. Does investors make a similar investment decision because of having similar fundamental information?

Fundamentally, investors are so diverse (heterogeneous) and each individual investor's expectation, investment horizon, risk perception and the ability to analyze the same fundamental information is different. Accordingly, the result of investors' analysis is also different. In addition, investors differ in their time horizon, information processing ability and reaction time. Day traders, for example, make many investment decisions per day requiring fast information processing abilities. Their reaction time is only a few seconds. Other investors have longer investment horizons (e.g., one or more years) (Hens &Rieger, 2010).

Therefore, even if investors get the same fundamental information, they cannot decide in the same direction and the possibility of getting spurious herding in financial markets is almost zero. Although investors have similar fundamental information, they will not arrive to a similar investment decisions for the following reasons. First, Fama (1991) argued that transaction and information costs are not zero and they affect investors' reaction to the arrival of new information. Second, investors' ability to analyze the same fundamental information is different and their expectation is also different (Hens &Rieger, 2010). According to Goldberg &Nitzsch (2001) different people evaluate the same information differently and reach various, often completely opposite conclusions. When perceiving and processing information, people are always subject to misinterpretations and false conclusions. Third, the limitation of arbitrage (i.e. arbitrage is risky and costly) prevent investors' decision to react identically for having similar fundamentals (Shleifer &Vishny, 1997).

Fourth, when macroeconomic signals convince investors in either positive or negative way, investors might overreact or underreact and become too optimistic or pessimistic compared to the equilibrium price (Tversky&Kahneman, 1974;De Bondt&Thaler, 1985;Griffin &Tversky, 1992;Jegadeesh& Titman, 1993; Daniel, Hirshleifer&Subrahmanyam, 1998;Barbaris, Shleifer &Vishny, 1998; andHong & Stein, 1999). In such situation, investors may increase mispricing of assets and increase herding. Fifth, the effect of noise traders risk also affect the decision making process based on fundamental information. Noise traders may became too optimistic or too pessimistic about a particular fundamental information and make arbitrage so difficult (Black, 1986). Sixth, investors does not have a uniform understanding on the implication of current fundamental information on the price of a security (Hens &Rieger, 2010). Seventh, although market participants have similar fundamental information and all information relevant to the investment is publicly available to all investors, individual's assessment about the quality of publicly available information is different from one investor to the other (Bikhchandani& Sharma, 2001). Individual investors are different in terms of preference, payoffs and belief on the precision of the information they receive (Bikhchandani, et al., 1998). Having all these reasons, the possibility of acting in similar fashions or the existence of spurious herding for having similar fundamental information is almost impossible. Therefore, the models used in this study are reasonable as well as valid, and they have a good ground for their applicability.

Empirical Analysis

The first part of this section presents the regression results using individual stock returns for daily, weekly and monthly data. As it is described in the methodology part, this study employed two models to test herding in Istanbul Stock Exchange. Thus, the first section presents the CSSD model results first and the later section presents the CSAD model results. Likewise, the second part presents the regression results based on sectoral index return data using the two models.

Table 1 below shows the total number of firms listed in Istanbul Stock Exchange before and after 2000. The total number of firms listed in Istanbul Stock Exchange before and after 2000 are 409 but 2 companies terminated (left) the market. Therefore, the following data only shows for firms that are active in the year between 2000 and 2018.

Table 1: Listed companies in the study period

Year	Number of companies in quotation
2000 and before	224
2001	0
2002	3
2003	2
2004	11
2005	7
2006	17
2007	8
2008	2
2009	2
2010	18
2011	22
2012	36
2013	19
2014	13
2015	8
2016	2
2017	3
2018	10
Total	**407**

Source: Finnet

Since the objective of this study is to investigate herding towards the market consensus or examining the existence of herding in Istanbul Stock Exchange for period between 2000 and 2018, I give more emphasis for the following issues to select a sample and proceeds the empirical analysis. First, a firm must be in the market since 2000 and must continue up to the end of 2018. Firms that were listed in Istanbul Stock Exchange in the latteryears (starting 2001) and firms that left the market are excluded from being selected to the sample. For example, two companies do not continue to the end of 2018 and they are excluded from the sample. At the same time, 183 firms are listed in Istanbul Stock Exchange starting from 2001 and these firms are also excluded from the sample. The main purpose of excluding the 183 firms is not to punish the CSSD and CSAD value for unavailable data. To calculate the value of CSSD or CSAD for t period, each firm's return deviation from the market is totaled and divided by the number of firms in the sample (portfolio). For example, if a company that is listed in 2010 is included in the sample, that does not have any data for the previous years (between 2000 and

2010), then the value of CSSD and CSAD become punished unnecessarily for years from 2000 to 2010. Thus, I believes that the exclusion of the 183 firms from the sample is a good decision to reach better results. Therefore, the total number of firms that fulfill the first criteria are 224 firms. Second, the selected samples should have a complete data, i.e. there should not be a missing data in the study period. From the beginning of 2000 to the end of 2018, there are 4765 daily trading days and firms that does not have 4765 days data are excluded from the sample. Accordingly, out of 224 firms, 115 firms have a complete daily data and these are the basis for analyzing the daily data. For the weekly data, firms must have 987 weekly trading data. Thus, out of 224 firms only 193 firms fulfill this requirement. Likewise, for the monthly data also firms in the sample must have 228 trading monthly data. Therefore, out of the 224 firms 211 firms fulfill the requirement. Table 2 summarizes these issues as follows.

Table 2: Features of sample firms

Frequency	Number of firms in the sample with a complete data	Number of observation
Daily	115	4765
Weekly	193	987
Monthly	211	228

Source: Finnet

Empirical analysis using CSSD method

In this section the regression result based on the first (CSSD) model is analyzed and interpreted as follows. In this study, the original CH (1995) model is modified like eq(3) above and the new model is named as modified CH (1995) model.

$CSSD_t = \alpha + \beta^n RM^n_t + \beta^p RM^p_t + \varepsilon_t$…….eq(3)

Where, $CSSD_t$ is the cross sectional standard deviation at time t, α refers a constant when the market return is zero, $RM^n_t$is a realized negative market return (when the market falls) at time t, RM^p_t is a realized positive market return (when the market rises) at time t, β^n is the coefficient ofRM^n, β^p is the coefficientof RM^p, and $\varepsilon_t$is the error term. A negative and statistically significant coefficient shows the presence of herding towards the market consensus.

In the context of herding towards a market, herding refers to the situation where investors suppress their own beliefs as well as their own analysis and make an investment decision based on the collective action(s) of the market. Herding occurs in a situation where an investor(s) imitate the action(s) of other(s) even if investor's own analysis disagree with the collective market action(s). Thus, in the presence of herding individual equity return will not stray far from the market return. To measure herding statistically CSSD and CSAD methods are used in different literatures. The CSSD or CSAD measure of dispersion quantifies the average proximity of individual stock return to the market return. Generally, the lower limit of CSSD and CSAD value is zero, which indicates that all stock returns moves in perfect unison with a market. As a stock return begin to vary from the market return, the level of dispersion increases (Christie & Huang, 1995). Table 3 below presents the average CSSD and CSAD values for daily, weekly and monthly returns. As it can be seen from all frequencies and methods, the CSSD and CSAD values are different from zero, which shows that no stocks return moves in a perfect unison with the market return. For both methods, the CSSD and CSAD values increase from daily to weekly and from weekly to the monthly return data. In the existence of herding, dispersions are predicted to be low, however, low dispersion by itself do not guarantee the presence of herding. Literally speaking, an increase in the CSSD and CSAD value from daily to monthly returns may indicate that herding is a short phenomenon. In other words, herding is more prevalent in a daily return data (because there is low value of CSSD and CSAD for daily return than other return data) and it may also indicate that herding is fragile or sensitive to the arrival of new information.

Since the value of CSSD and CSAD value is a bit close to zero for daily return, roughly speaking herding is expected on the daily return. At the same time, the CSAD values (for the three frequencies) are smaller than the value of CSSD for daily, weekly and monthly data and herding is expected in the daily, weekly and monthly return using the CSAD method than CSSD method. In both methods, the CSSDn and CSADn values are smaller than the value of CSSDp and CSADp. This may indicate that herding towards the market consensus may be prevalent when the market return is negative than when the market return is positive. However, herding towards the market consensus is empirically tested below and it is presented as well as analyzed in detail.

Table 3: The average CSSD and average CSAD results

Frequency	CSSD general	CSSDp	CSSDn	CSAD general	CSADp	CSADn
Daily	0,024824	0,012841	0,012036	0,016944	0,008907	0,008052
Weekly	0,062659	0,033788	0,028872	0,040537	0,022608	0,017958
Monthly	0,143323	0,081983	0,062479	0,090227	0,051865	0,038362

Source: Excel

The following hypothesis are the main interest of this study to test empirically in the Turkey's stock market. As table 3 presents the CSSD and CSAD values are smaller when the market falls than when the market rises. The study wants to investigate empirically the asymmetry of herding when the market rises and falls. The hypothesis are developed based on table 3 results.

Hypothesis 1:

H0: There is no herding towards the market consensus when the market is falling.

H1: There is herding towards the market consensus when the market is falling.

Hypothesis 2:

H0: There is no herding towards the market consensus when the market is rising.

H1: There is herding towards the market consensus when the market is rising.

Table 4: Summary of the regression result for modified CH (1995) model

Frequency	β^n	β^p	Prob(F-statistics)	R^2
Daily	-0.252667 p-value (0.0000)	0.254745 p-value (0.0000)	0.000000	0.246047
Weekly	-0.235188 p-value (0.0000)	0.306786 p-value (0.0000)	0.000000	0.088776
Monthly	-0.092045 p-value (0.2412)	0.244532 p-value (0.0001)	0.000395	0.067573

Source: Eviews

Table 4 above shows the summary regression result for daily, weekly and monthly return data using regression equation 3 ($CSSD_t = \alpha + \beta^n RM^n_t + \beta^p RM^p_t + \varepsilon_t$). The F-statistics for daily, weekly as well as monthly data shows a statistically significant value at 1% and 5% level. Thus, the F-statistics clearly presents that the model as a whole is valid and statistically significant at 1% and 5% level. The R-square's value or explanatory power is significantly decreases from daily to weekly and from weekly to monthly data. The main emphasis of regression equation 3 is on the coefficient (β^n and β^p) of the independent variables ($RM^n$and RM^p). Thus, according to CSSD model the coefficient of β^n is negative for daily, weekly as well as monthly data; whereas, the coefficient of β^p is positive for the three frequencies.

As it is presented in table 4 the coefficient of β^n is -0.252667 with a p-value of 0.0000 for a daily data, the coefficient of β^n is -0.235188 with a p-value of 0.0000 for weekly data andthe coefficient of β^n is -0.092045 with a p-value of 0.2412 for the monthly data. A negative and statistically significant coefficient shows the presence of herding towards a market consensus (CH, 1995). Therefore, since the β^n coefficient is negative and statistically significant at 1% and 5% level for both daily and weekly data, it shows the existence of herding towards the market consensus in Istanbul Stock Exchange in daily and weekly data when the market falls. Thus, the null hypothesis (in the first hypothesis) is rejected and there is herding towards the market consensus when the market falls. This means the daily and weekly individual stock return moves towards or closes to the market return when the market is falling. In other words, investors imitate the market consensus when the market falls in the daily and weekly data. However, for the monthly data even if the coefficient of β^n is negative it is not statistically significant either in 1% or 5% level. Thus, there is no strong reason to mention the existence of herding towards the market in the monthly data when the market return is negative.

On the other hand, the coefficient of β^p is 0.254745 (p-value 0.0000), 0.306786 (p-value 0.0000) and 0.244532 (p-value 0.0001) for daily, weekly and monthly data respectively. The coefficient of β^p is positive and statistically significant at 1% and 5% level for daily, weekly and monthly data. Thus, this finding shows that the daily, weekly as well as monthly individual stock return moves further away from the market return when the market is rising. In other words, investors make independent decision when the market return is positive. Therefore, the null hypothesis (in the second hypothesis) is failed to be rejected and there is no herding in the market when the market is rising.

The finding of table 4 can be strongly explained by two factors. First, the market return is significantly affected by change in either positive or adverse macroeconomic news or systematic risk. Thus, change in macro-economic news has a potential to affect investors' confidence. For example, if investors fear that an economy will worsen and a market will fall, andif they fear that they will lose money, then they sell stocks. Eventually, a market will fall (Chen, 2011) and the reverse is true. According to Chen (2011) lack of confidence has an

asymmetric effect on stock returns and the impact of confidence is greater in the bear market than the bull market. Chen conclude that lack of confidence leads stock markets to fall.

Second, change in macro-economic data or a change in systematic risk has also a potential to create the second factor. Since Istanbul Stock Exchange is among the most liquid capital market, it attracts foreign investors and between 60% and 70% of the market capitalization is owned by foreigners (Avcı, 2015). Therefore, when the macro economic news is positive or good then making investment in Istanbul Stock Exchange become attractive to foreigner and to local investors to invest more in it (more demand increases stock(s) price and a rise in price increases return) and when the risk of investment in this market increases, then foreign investors invest less or leave the market (less demand brings price reduction and price reduction again results low or negative return). It is logical to expect that foreign investors sells or reduce their investment when the systematic risk to invest in Turkey rises relative to other markets and to think the worst that foreign investors may leave the market when investment condition become bad.

When bad macro-economic news reaches the market either in correlated or independent manner, then such news has a potential to affect local as well as foreign investors' confidence and investment decision. As the above empirical finding shows, herding in Istanbul Stock Exchange is not symmetrical. This herding asymmetry may be explained by investors' psychological factor, i.e. investor confidence. When the market rises due to good or positive news, then investors' confidence rises and as a result investors make an independent decision based on their own beliefs and analysis. However, when the market falls due to bad news (a rise in systematic risk), the game may changes and investors' confidence about their ability and the correctness of their own analysis may decrease and lead them to imitate the crowd or the market consensus. Therefore, the existence of herding in the down market can be explained by investors' confidence and by the decision of foreign investors.

The empirical finding of this paper is consistent to the finding of CH (1995). According to CH (1995), the cross sectional standard deviation increase much more dramatically during up market than down market. That means herding is available in the down market than the up market. Therefore, the above empirical finding shows that herding in Istanbul Stock Exchange is prevalent when the market falls.

Empirical analysis using CSAD method

The CSAD model is developed by CCK in 2000 to detect herding in the market and non-linearity is the main feature of this model. Thus, table 5, 6 and 7 presents the nonlinear regression model results when the market return is positive, negative and for the entire market return respectively.

The probability of F-statistics (0.0000) in table 5 clearly shows that the regression equation is statistically significant and valid at 1% and 5% level of significance for daily, weekly and monthly data. The value of R-square is 0.652803, 0.665075 and 0.692339 for daily, weekly and monthly data respectively. The main focus of table 5 is on the coefficient of γ_2 because CCK (2000) says that a negative and a statistically significant value for γ_2 is an indication of herding. As it can be seen below, the coefficient of γ_2 is negative and statistically significant at 1% and 5% level. Thus, the negative coefficient of γ_2 indicates that for any change in $(R_{m,t}{}^p)^2$ makes the value of$CSAD_t{}^p$decreaseby the magnitude of γ_2. This means that a decrease in value $CSAD_t{}^p$ refers that investors decision is close to the general market return movements or investors are imitating the market consensus. Therefore, the null hypothesis (in the second hypothesis) is rejected and it shows there is herding in the market. However, the coefficient of γ_2 decreases by large amount from daily data (-4.210913) to weekly data (-1.952468) and to monthly data (-1.291706). This shows that even if the coefficient of γ_2 is negative and statistically significant for the three frequencies, herding is more prevalent in the daily data because the coefficient of γ_2 is relatively larger than weekly and monthly data. Therefore, unlike the modified CH (1995) model, the nonlinear CCK model's finding shows that herding is available in Istanbul Stock Exchange in the daily, weekly and monthly data when the market is rising. On the other hand, the coefficient of γ_1 ispositive and statistically significant at 1% and 5% in the three frequencies. This means that the value of $CSAD_t{}^p$ increases for every increases in the value of $|R_{m,t}{}^p|$. However, the coefficient of γ_2 is higher than the coefficient of γ_1 and $CSAD_t{}^p$ decrease for a rise in market return.

Table 5: Regression result using CCK model when the market return is positive[1]

Frequency	γ_1	γ_2	Prob(F-statistics)	R^2
Daily	0.822360 p-value (0.0000)	-4.210913 p-value (0.0000)	0.000000	0.652803
Weekly	0.900868 p-value (0.0000)	-1.952468 p-value (0.0000)	0.000000	0.665075

[1] $CSAD_t{}^p = \alpha + \gamma_1{}^p|R_{m,t}{}^p| + \gamma_2{}^p(R_{m,t}{}^p)^2 + \varepsilon_t$

Monthly	0.947713 p-value (0.0000)	-1.291706 p-value (0.0000)	0.000000	0.692339

Source: Eviews

Table 6 presents the summary of regression result of CCK model when the market return falls for the daily, weekly and monthly data. For the three data the probability of F-statistics is 0.0000 which shows the regression model is valid and statistically significant at 1% and 5% level. At the same time, the R-square value is 0.628731, 0.625329 and 0.691560 for daily, weekly and monthly data respectively. As it is mentioned above, the main focus of this regression is on the coefficient of γ_2. As it can be seen from table 6, the coefficient of γ_2 is negative and statistically significant at 1% and 5% level for daily, weekly and monthly data. Thus, this empirical finding clearly shows that there is an imitation or herding towards the market consensus in Istanbul Stock Exchange for the daily, weekly and monthly data when the market return falls. It means the null hypothesis (in the first hypothesis) is rejected and the finding shows the existence of herding in the market. Nevertheless, the coefficient of γ_2 decreases from daily data (-5.703096) to weekly data (-3.781811) and to monthly data (-3.597381). Therefore, like the modified CH (1995) model, when the market falls the CCK (2000) model also gives a statistically significant coefficient for the three frequencies. However, the magnitude of γ_2 coefficient is larger when the market return is negative (-5.703096, -3.781811 and -3.597381 for daily, weekly and monthly data respectively) than when the market return is positive (-4.210913, -1.952468 and -1.291706 for daily, weekly and monthly data respectively) for the three frequencies. Thus, from this finding we can conclude that herding is more prevalent in the daily data and especially when the market falls.

Table 6: Regression result using CCK model when the market return is negative[2]

Frequency	γ_1	γ_2	Prob(F-statistics)	R^2
Daily	0.855958 p-value (0.0000)	-5.703096 p-value (0.0000)	0.000000	0.628731
Weekly	0.992920 p-value (0.0000)	-3.781811 p-value (0.0000)	0.000000	0.625329
Monthly	1.296858 p-value (0.0000)	-3.597381 p-value (0.0000)	0.000000	0.691560

Source: Eviews

Table 7 presents the summarized regression result using CCK (2000) model for the entire market return for daily, weekly and monthly data. According to F-statistics (0.0000) value,the regression equation is valid and statistically significant at 1% and 5% level for daily, weekly and monthly data. The value of R-square is 0.420786, 0.427302 and 0.331049 for daily, weekly and monthly data respectively. The coefficient of γ_2 is negative and statistically significant at 1% and 5% level only for the daily data. Like the result of table 5 and 6, this finding shows the existence of herding towards the market consensus in the daily data. Nevertheless, the weekly data shows that the coefficient of γ_2 is positive and statistically significant at 1% and 5% level, which means there is no herding towards the market in the weekly data. Likewise, for the monthly data there is no significant evidence to conclude there is herding or not.

Table 7: Regression result using CCK model for the entire market return[3]

Frequency	γ_1	γ_2	Prob(F-statistics)	R^2
Daily	0.303773 p-value (0.0000)	-0.749547 p-value (0.0000)	0.000000	0.420786
Weekly	0.228250 p-value (0.0000)	0.362051 p-value (0.0022)	0.000000	0.427302
Monthly	0.205533 p-value (0.0000)	0.052262 p-value (0.6720)	0.000000	0.331049

Source: Eviews

[2] $CSAD_t^n = \alpha + \gamma_1^n|R_{m,t}^n| + \gamma_2^n(R_{m,t}^n)^2 + \varepsilon_t$

[3] $CSAD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2 R^2_{m,t} + \varepsilon_t$

Comparison of the empirical results of the two models

If we see the R-square values, CSAD model gives the highest R-square value than the CSSD model. That means in terms of explanatory power CSAD model has a better explanatory power than the CSSD model. However, both models have a statistically significant F-statistics at 1% and 5% level that shows the validity of the model. Therefore, both models are statistically correct and valid. The CSSD model only gives a negative and statistically significant coefficient when the market is declining. In other words, the CSSD model provides the presence of herding towards the market consensus when the market declines and when the market rises, the model shows the absence of herding towards the market consensus in Istanbul Stock Exchange.

The CSAD model gives a bit different empirical result than the CSSD model. According to the CSAD model, there is herding towards the market consensus when the market rises and falls. In both market situation, the regression result shows a negative and statistically significant coefficient for γ_2 and it refers the existence of herding in Turkey's stock market. However, the coefficient of γ_2 is larger when the market falls than when it rises. In addition, the coefficient of γ_2 is larger in daily data in both rising and falling market than weekly and monthly data. Thus, the CSAD model's finding shows that herding is more prevalent when the market falls and from the three data type herding is dominant in the daily data when the market rises and falls. This finding is supported when the entire market return (without separating it in to rising and fallingmarket) is regressed using the CCK model, and this regression result shows a negative and statistically significant γ_2 coefficient for the daily data only.

Test of herding towards market consensus using sector index data

So far the empirical finding focused on testing the existence of herding towards the market using individual stock returns data. As we can remember from the above explanation, firms that were listed in Istanbul stock exchange since 2001 were not included in the above analysis. As a result, some stocks' data were not taken in to consideration to test herding because these firms' share price data were not completely available during the study period. As a result, in this section I want to test the existence of herding by using sectoral index data. The use of sectoral index data allows the inclusion of all stocks price data in to the index and it helps to include firms which were not used above due to the unavailability of some return data. Therefore, the following pages focus on the empirical analysis based on sector index data obtained from Finnet and the data about the number of firms in each sector is obtained from Istanbul Stock Exchange website. According to this website there are a total of 23 sector indexes in the market. However, Sports index started in 2004 and three indexes (construction, mining, and small and medium enterprise industrialsindexes started in 2013, and these indexes are excluded from the analysis. This is because the objective of the research is to test herding using data starting from 2000 and the excluded four indexes do not fulfil the specified criteria. Therefore, the following analysis are based on the daily, weekly and monthly data for the remaining 19 sector indexes. Therefore, herding is tested using the two models mentioned above.

Empirical analysis using sector index data for CSSD model

Table 8 presents the coefficient of β^n (when the market falls)andβ^p (when the market rises) with their respective P-values for daily, weekly and monthly data for all sample sectors. According to the CSSD model regression result, the coefficient of β^n is negative and statistically significant at 1% and 5% level for all sample sectors for the daily and weekly data. However, the coefficient of β^p is positive and statistically significant at 1% and 5% level for all sample sectorsin the daily and weekly data. For the monthly data there is a mixed results. In the monthly data there is a statistically significant finding for both β^n and β^p for the following sectors: food and beverage, telecommunication, chemical, petrol and plastic, metal products machine, non-metal mining products and tourism. Other sectors have a mixed results for the coefficients specified above.

The negative and statistically significant coefficient for β^n for daily, weekly and partially on monthly data shows the existence of herd behaviour towards the market consensus when the market is falling. But the positive and statistically significant coefficient for β^p in the daily and weekly data shows that non-existence of herding towards the market when the market is rising. This empirical finding clearly shows that herding behaviour is asymmetrical and herd behaviour is more prevalent when the market is falling. Thus, the null hypothesis (in the first hypothesis) is rejected but the null hypothesis (in the second hypothesis) is failed to be rejected.

Generally, the empirical finding using sectoral data is similar to the empirical finding using individual stock return data. The empirical finding presented in table 8 is consistent with the findings of CCK (2000) for the two emerging markets (South Korea and Taiwan) using the CSSD model. But most of the previous researches (CH, 1995; CCK, 2000; Altay, 2008; Ergün, 2013; Ergün & Doğukanlı, 2015; Özsu, 2015) did not find a negative and statistically significant results for extreme market returns. According to table 8 regression results, there is a clear evidence which shows the existence of herding in Istanbul Stock Exchange in the daily and weekly data. But there is a mixed finding for monthly data.

Table 8: Summary of CSSD model regression results

Name of a sector	Coefficient	Daily data	Weekly data	Monthly data
BIST BANKS	β^n	-0.032215 p-value (0.0000)	-0.037167 p-value (0.0000)	-0.016639 p-value (0.1369)
	β^p	0.041256 p-value (0.0000)	0.064257 p-value (0.0000)	0.051386 p-value (0.0000)
BIST ELECTRICITY	β^n	-0.071574 p-value (0.0000)	-0.090506 p-value (0.0000)	-0.011889 p-value (0.6632)
	β^p	0.088444 p-value (0.0000)	0.126214 p-value (0.0000)	0.112120 p-value (0.0000)
BIST LEASING FACTORING	β^n	-0.074558 p-value (0.0000)	-0.052927 p-value (0.0159)	-0.110348 p-value(0.0966)
	β^p	0.093903 p-value (0.0000)	0.096731 p-value (0.0000)	0.112623 p-value(0.0300)
BIST REAL EST. INV. TRUSTS	β^n	-0.026625 p-value (0.0000)	-0.031331 p-value (0.0000)	-0.008859 p-value (0.3411)
	β^p	0.032961 p-value (0.0000)	0.050626 p-value (0.0000)	0.020547 p-value(0.0049)
BIST FOOD BEVERAGE	β^n	-0.050260 p-value (0.0000)	-0.049115 p-value (0.0000)	-0.058257 p-value (0.0000)
	β^p	0.060109 p-value (0.0000)	0.071605 p-value (0.0000)	0.062840 p-value (0.0000)
BIST HOLD. AND INVESTMENT	β^n	-0.008567 p-value (0.0000)	-0.012084 p-value (0.0000)	-0.010059 p-value (0.0674)
	β^p	0.010497 p-value (0.0000)	0.015153 p-value (0.0000)	0.019396 p-value (0.0000)
BIST TELECOMMUNICATION	β^n	-0.193760 p-value (0.0000)	-0.231755 p-value (0.0000)	-0.398989 p-value (0.0000)
	β^p	0.224009 p-value (0.0000)	0.219946 p-value (0.0000)	0.449431 p-value (0.0000)
BIST CHEM. PETROL PLASTIC	β^n	-0.021992 p-value (0.0000)	-0.025679 p-value (0.0000)	-0.024331 p-value(0.0046)
	β^p	0.027920 p-value (0.0000)	0.029728 p-value (0.0000)	0.035511 p-value (0.0000)
BIST INVESTMENT TRUSTS	β^n	-0.082110 p-value (0.0000)	-0.069975 p-value (0.0000)	-0.016713 p-value(0.5335)
	β^p	0.093108 p-value (0.0000)	0.118278 p-value (0.0000)	0.085082 p-value(0.0001)
BIST BASIC METAL	β^n	-0.016439 p-value (0.0000)	-0.023615 p-value (0.0003)	0.000116 p-value(0.9944)
	β^p	0.022873 p-value (0.0000)	0.026523 p-value (0.0000)	0.022961 p-value(0.0758)
BIST METAL PRODUCTS MACH.	β^n	-0.003131 p-value (0.0000)	-0.015211 p-value (0.0000)	-0.022000 p-value(0.0093)
	β^p	0.004163 p-value (0.0000)	0.019306 p-value (0.0000)	0.014637 p-value(0.0262)
BIST WOOD PAPER PRINTING	β^n	-0.034488 p-value (0.0000)	-0.032174 p-value (0.0000)	-0.014007 p-value(0.4330)

	β^p	0.059389 p-value (0.0000)	0.088747 p-value (0.0000)	0.028031 p-value(0.0449)
BIST INSURANCE	β^n	-0.066251 p-value (0.0000)	-0.076139 p-value (0.0000)	-0.034120 p-value(0.1388)
	β^p	0.073511 p-value (0.0000)	0.092449 p-value (0.0000)	0.054561 p-value(0.0026)
BIST NONMETAL MIN. PRODUCT	β^n	-0.039229 p-value (0.0000)	-0.036695 p-value (0.0000)	-0.031572 p-value (0.0004)
	β^p	0.051058 p-value (0.0000)	0.059251 p-value (0.0000)	0.034947 p-value (0.0000)
BIST TECHNOLOGY	β^n	-0.006978 p-value(0.0286)	-0.030475 p-value (0.0000)	-0.009015 p-value(0.5737)
	β^p	0.006215 p-value(0.0400)	0.054968 p-value (0.0000)	0.032741 p-value(0.0092)
BIST TEXTILE LEATHER	β^n	-0.051688 p-value(0.0000)	-0.047010 p-value(0.0000)	-0.016603 p-value(0.3089)
	β^p	0.069823 p-value(0.0000)	0.077254 p-value(0.0000)	0.063219 p-value (0.0000)
BIST W. AND RETAIL TRADE	β^n	-0.045046 p-value(0.0000)	-0.037852 p-value(0.0000)	-0.016721 p-value(0.1717)
	β^p	0.050947 p-value(0.0000)	0.073877 p-value(0.0000)	0.052565 p-value(0.0000)
BIST TOURISM	β^n	-0.092917 p-value(0.0000)	-0.098700 p-value(0.0000)	-0.100928 p-value(0.0113)
	β^p	0.107682 p-value(0.0000)	0.155050 p-value(0.0000)	0.100744 p-value(0.0012)
BIST TRANSPORTATION	β^n	-0.074239 p-value(0.0000)	-0.091511 p-value(0.0000)	-0.004308 p-value(0.8851)
	β^p	0.077666 p-value(0.0000)	0.109257 p-value(0.0000)	0.029914 p-value(0.1988)

Source. Eviews

The findings in table 4 and 8 shows a consistent finding with the reflection effect of Kahneman and Tversky's (1979) prospect theory. According to this theory, investors are risk averse in the gain domain but they are risk seekers in the lose domain. That means investors give more emphasis for losses than gains. The finding of this study shows that the coefficient of β^n is negative and statically significant, which refers investors imitate the market consensus when the market is in lose. In other words, investors are taking more risks by imitating the market when it is in lose than when it is in gain. However, a positive and statistically significant coefficient for β^p shows that investors are not imitating the market when it is rising. That means investors are making independent decision at this market condition.This indicate that investors' general risk level is different from the market risk level. Because they are not imitating the market.

Table 9 below presents the summarized regression results using CSAD model when the market is rising. Like in the CSSD model, the CSAD model uses19 sector index data to test the existence of herding towards the market consensus. According to this model a negative and statistically significant coefficient for γ_2 shows the presence of herding in the market.

The empirical finding in table 9 shows that the coefficient of γ_2 in the daily data is statistically significant and negative for all sectors. In the weekly data also except three sectors (Banks, Real estate investment trust, and Tourism), all other sectors' γ_2 ccoefficient is statistically significant and negative. At the same time, in the monthly data except two sectors (leasing and factoring, and wholesale and retail sales), others' γ_2 coefficient is negative and statistically significant. Unlike the CSSD model, the CSAD model reveals the existence of herding towards the market when the market return is positive. Even if the coefficient of γ_2 is negative in almost all sectors, the size of the coefficient is significantly different among the three data. The coefficient of γ_2 decreases significantly from daily data to weekly data for all sectors. This shows that herding behaviour is predominant in the daily data than for weekly data when the market return is positive.

This finding is similar to the finding of Altay (2008), Kapusuzoglu (2011), Kayalıdere (2012) and Yasir (2018) who study the presence of herding towards a market consensus during market stress period in Istanbul Stock Exchange. Altay found that herding exists in Istanbul Stock Exchange when the market return is in the extreme positive market return distribution region. In addition, this finding is also consistent with the finding of Tan et al. (2008) in the Chinese markets.

Table 9: Summary of CSAD model regression when the market rises

Name of a sector	Coefficient	Daily data	Weekly data	Monthly data
BIST BANKSp	γ_1	0.026487 p-value(0.0000)	0.024133 p-value(0.0000)	0.028131 p-value(0.0000)
	γ_2	-0.126286 p-value(0.0000)	-0.002431 p-value(0.7862)	-0.025189 p-value(0.0089)
BIST ELECTRICITYp	γ_1	0.087452 p-value(0.0000)	0.096532 p-value(0.0000)	0.107534 p-value(0.0000)
	γ_2	-0.440931 p-value(0.0000)	-0.191310 p-value(0.0000)	-0.139858 p-value(0.0000)
BIST LEASING FACTORINGp	γ_1	0.106297 p-value(0.0000)	0.111205 p-value(0.0000)	0.103240 p-value(0.0000)
	γ_2	-0.494523 p-value(0.0000)	-0.212488 p-value(0.0000)	-0.058775 p-value(0.2958)
BIST REAL EST. INV. TRUSTSp	γ_1	0.015548 p-value(0.0000)	0.013529 p-value(0.0000)	0.017196 p-value(0.0000)
	γ_2	-0.078725 p-value(0.0000)	-0.003484 p-value(0.4886)	-0.030843 p-value(0.0000)
BIST FOOD BEVERAGEp	γ_1	0.029167 p-value(0.0000)	0.026625 p-value(0.0000)	0.024105 p-value(0.0000)
	γ_2	-0.122045 p-value(0.0000)	-0.030335 p-value(0.0006)	-0.020325 p-value(0.0082)
BIST HOLD. AND INVESTMENTp	γ_1	0.007705 p-value(0.0000)	0.008484 p-value(0.0000)	0.009763 p-value(0.0000)
	γ_2	-0.047157 p-value(0.0000)	-0.026058 p-value(0.0000)	-0.015336 p-value(0.0000)
BIST TELECOMMUNICATIONp	γ_1	0.361492 p-value(0.0000)	0.341783 p-value(0.0000)	0.053115 p-value(0.2049)
	γ_2	-2.132519 p-value(0.0000)	-0.932238 p-value(0.0000)	0.859175 p-value(0.0000)
BIST CHEM. PETROL PLASTICp	γ_1	0.016952 p-value(0.0000)	0.019092 p-value(0.0000)	0.082234 p-value(0.0000)
	γ_2	-0.091128 p-value(0.0000)	-0.057158 p-value(0.0000)	-0.077073 p-value(0.0047)
BIST INVESTMENT TRUSTSp	γ_1	0.068987 p-value(0.0000)	0.067289 p-value(0.0000)	0.095454 p-value(0.0000)
	γ_2	-0.345819 p-value(0.0000)	-0.082554 p-value(0.0006)	-0.167803 p-value(0.0000)
BIST BASIC METALp	γ_1	0.028786 p-value(0.0000)	0.032631 p-value(0.0000)	0.040649 p-value(0.0000)
	γ_2	-0.184553 p-value(0.0000)	-0.110213 p-value(0.0000)	-0.081102 p-value(0.0000)
BIST METAL PRODUCTS MACH.p	γ_1	0.014716 p-value(0.0000)	0.011771 p-value(0.0000)	0.013761 p-value(0.0000)
	γ_2	-0.089686 p-value(0.0000)	-0.026496 p-value(0.0000)	-0.024398 p-value(0.0000)
BIST WOOD PAPER PRINTINGp	γ_1	0.037848 p-value(0.0000)	0.039254 p-value(0.0000)	0.029709 p-value(0.0000)
	γ_2	-0.160442 p-value(0.0000)	-0.034730 p-value(0.0193)	-0.029189 p-value(0.0000)
BIST INSURANCEp	γ_1	0.002041 p-value(0.0000)	0.001939 p-value(0.0000)	0.002188 p-value(0.0000)
	γ_2	-0.009493 p-value(0.0000)	-0.002534 p-value(0.0000)	-0.003348 p-value(0.0000)
BIST NONMETAL MIN. PRODUCTp	γ_1	0.018431 p-value(0.0000)	0.018340 p-value(0.0000)	0.016356 0.018340
	γ_2	-0.072656 p-value(0.0000)	-0.020192 p-value(0.0002)	-0.018629 p-value(0.0002)
BIST TECHNOLOGYp	γ_1	0.025537 p-value(0.0000)	0.036152 p-value(0.0000)	0.029888 p-value(0.0000)
	γ_2	-0.166348 p-value(0.0000)	-0.074027 p-value(0.0000)	-0.030369 p-value(0.0098)
BIST TEXTILE LEATHERp	γ_1	0.039413 p-value(0.0000)	0.161695 p-value(0.0000)	0.041309 p-value(0.0000)
	γ_2	-0.178431 p-value(0.0000)	-0.277327 p-value(0.0000)	-0.047060 p-value(0.0002)
BIST W. AND RETAIL TRADEp	γ_1	0.030290 p-value(0.0000)	0.030269 p-value(0.0000)	0.025743 p-value(0.0000)
	γ_2	-0.143618 p-value(0.0000)	-0.033793 p-value(0.0029)	-0.015744 p-value(0.0954)
BIST TOURISMp	γ_1	0.111199 p-value(0.0000)	0.094831 p-value(0.0000)	0.137473 p-value(0.0000)

	γ_2	-0.617868 p-value(0.0000)	-0.059436 p-value(0.2480)	-0.252583 p-value(0.0000)
BIST TRANSPORTATIONp	γ_1	0.079490 p-value(0.0000)	0.082606 p-value(0.0000)	0.083482 p-value(0.0000)
	γ_2	-0.413775 p-value(0.0000)	-0.149953 p-value(0.0000)	-0.143494 p-value(0.0000)

Source: Eviews

Table 10 presents the summary regression results using the CSAD model when the market is falling. This table result shows that the coefficient of γ_2 is negative and statistically significant for all sectors and for the three data types. Therefore, the null hypothesis is rejected. Thus, this finding shows that herding is available in the daily, weekly and monthly data when the market is falling. At the same time, the CSAD value is also decreases when the market falls. For almost all sectors, the coefficient of γ_2 is larger in the daily data than the weekly and monthly data. This shows that herding behaviour is also more prevalent in the daily data than others.

This finding is similar to the finding of Altay (2008), Kapusuzoglu (2011) and Kayalıdere (2012) who studied the presence of herding towards a market during market stress period in Istanbul Stock Exchange. Altay also found that herding exists in Istanbul Stock Exchange when the market return falls in the extreme negative market return distribution region. In addition, this finding is also consistent with the finding of Tan, et al. (2008) in the Chinese markets. Furthermore, the empirical finding presented in table 9 and 10 is consistent with the findings of Chang, et al. (2000) for the two emerging markets (South Korea and Taiwan) using the CSAD model.

Table 10: Summary of regression results using CSAD model when the market falls

Name of a sector	Coefficient	Daily data	Weekly data	Monthly data
BIST BANKSn	γ_1	0.025970 p-value(0.0000)	0.028663 p-value(0.0000)	0.034022 p-value(0.0000)
	γ_2	-0.175860 p-value(0.0000)	-0.114106 p-value(0.0000)	-0.110844 p-value(0.0000)
BIST ELECTRICITYn	γ_1	0.085301 p-value(0.0000)	0.104556 p-value(0.0000)	0.108448 p-value(0.0000)
	γ_2	-0.550449 p-value(0.0000)	-0.402807 p-value(0.0000)	-0.336246 p-value(0.0000)
BIST LEASING FACTORINGn	γ_1	0.118771 p-value(0.0000)	0.119617 p-value(0.0000)	0.231089 p-value(0.0000)
	γ_2	-0.900604 p-value(0.0000)	-0.502876 p-value(0.0000)	-0.707872 p-value(0.0001)
BIST REAL EST. INV. TRUSTSn	γ_1	0.015671 p-value(0.0000)	0.017557 p-value(0.0000)	0.021560 p-value(0.0000)
	γ_2	-0.104483 p-value(0.0000)	-0.071063 p-value(0.0000)	-0.067055 p-value(0.0000)
BIST FOOD BEVERAGEn	γ_1	0.029967 p-value(0.0000)	0.031481 p-value(0.0000)	0.031225 p-value(0.0000)
	γ_2	-0.186477 p-value(0.0000)	-0.120990 p-value(0.0000)	-0.058435 p-value(0.0000)
BIST HOLD. AND INVESTMENTn	γ_1	0.008115 p-value(0.0000)	0.007892 p-value(0.0000)	0.007583 p-value(0.0000)
	γ_2	-0.063024 p-value(0.0000)	-0.026844 p-value(0.0000)	-0.014722 p-value(0.0094)
BIST TELECOMMUNICATIONn	γ_1	0.350130 p-value(0.0000)	0.324174 p-value(0.0000)	0.487734 p-value(0.0000)
	γ_2	-2.364984 p-value(0.0000)	-0.763722 p-value(0.0000)	-1.191151 p-value(0.0000)
BIST CHEM. PETROL PLASTICn	γ_1	0.016499 p-value(0.0000)	0.016349 p-value(0.0000)	0.019789 p-value(0.0000)
	γ_2	-0.113474 p-value(0.0000)	-0.045164 p-value(0.0000)	-0.045952 p-value(0.0000)
BIST INVESTMENT TRUSTSn	γ_1	0.067179 p-value(0.0000)	1.43E-17 p-value(0.0000)	0.090666 p-value(0.0000)
	γ_2	-0.408427 p-value(0.0000)	1.000000 p-value(0.0000)	-0.309661 p-value(0.0000)
BIST BASIC METALn	γ_1	0.029174 p-value(0.0000)	0.034843 p-value(0.0000)	0.043014 p-value(0.0000)
	γ_2	-0.226984 p-value(0.0000)	-0.144760 p-value(0.0000)	-0.130781 p-value(0.0000)
BIST METAL PRODUCTS MACH.n	γ_1	0.013590 p-value(0.0000)	0.014481 p-value(0.0000)	0.021119 p-value(0.0000)
	γ_2	-0.097469 p-value(0.0000)	-0.057750 p-value(0.0000)	-0.059621 p-value(0.0000)
BIST WOOD PAPER	γ_1	0.034936	0.037747	0.055070

PRINTINGn		p-value(0.0000)	p-value(0.0000)	p-value(0.0000)
	γ_2	-0.238962 p-value(0.0000)	-0.160736 p-value(0.0000)	-0.173056 p-value(0.0000)
BIST INSURANCEn	γ_1	0.001946 p-value(0.0000)	0.002065 p-value(0.0000)	0.002647 p-value(0.0000)
	γ_2	-0.012453 p-value(0.0000)	-0.006909 p-value(0.0000)	-0.006898 p-value(0.0000)
BIST NONMETAL MIN. PRODUCTn	γ_1	0.017126 p-value(0.0000)	0.017299 p-value(0.0000)	0.018818 p-value(0.0000)
	γ_2	-0.099018 p-value(0.0000)	-0.055719 p-value(0.0000)	-0.034797 p-value(0.0022)
BIST TECHNOLOGYn	γ_1	0.029068 p-value(0.0000)	0.039373 p-value(0.0000)	0.053595 p-value(0.0000)
	γ_2	-0.228939 p-value(0.0000)	-0.174835 p-value(0.0000)	-0.176420 p-value(0.0000)
BIST TEXTILE LEATHERn	γ_1	0.038448 p-value(0.0000)	0.041456 p-value(0.0000)	0.055876 p-value(0.0000)
	γ_2	-0.266012 p-value(0.0000)	-0.164053 p-value(0.0000)	-0.193440 p-value(0.0000)
BIST W. AND RETAIL TRADEn	γ_1	0.032564 p-value(0.0000)	0.031647 p-value(0.0000)	0.038176 p-value(0.0000)
	γ_2	-0.212425 p-value(0.0000)	-0.124805 p-value(0.0000)	-0.119016 p-value(0.0000)
BIST TOURISMn	γ_1	0.111401 p-value(0.0000)	0.116353 p-value(0.0000)	0.124681 p-value(0.0000)
	γ_2	-0.736217 p-value(0.0000)	-0.411766 p-value(0.0000)	-0.219212 p-value(0.0108)
BIST TRANSPORTATIONn	γ_1	0.080991 p-value(0.0000)	0.085223 p-value(0.0000)	0.105493 p-value(0.0000)
	γ_2	-0.476175 p-value(0.0000)	-0.227369 p-value(0.0000)	-0.286873 p-value(0.0000)

Source: Eviews

Table 11 presents a summarized regression result for the specified sectors and the regression equation result shows a statistically significant finding for daily and weekly return data.However, for the monthly data in some sectors the model is not statistically significant at 1% and 5% level. For daily data the coefficient of γ_2 is negative and statistically significant for 17 sectors (except forest, paper and printing sector and transportation sector) at 1% and 5% significance level. For most of the weekly return data, there is a positive and statistically significant results but for the monthly return data there is mixed results. The main finding of table 11 is that there is herding towards the market consensus in the daily data. This sectoral based finding is consistent with the empirical finding based on individual stock return.

Tan, et al. (2008) investigated the existence of herding in the Chinese financial markets without dividing the market return in to up and down market return. Their finding shows the existence of herding in the two Chinese markets (Shangai and Shenzhen), especially in the daily data. However, they also documented the presence of herding in the weekly and monthly data but the magnitude of the coefficients is lower than the daily data coefficients. Thus, the finding presented in table 9, 10 and 11 is consistent with the finding of Tan, et al. (2008) in the Chinese markets.

Tan, et al. (2008) found a statistically significant and negative coefficient for γ2 in both rising and falling market conditions using daily data. Our result presented in table 9, 10 and 11 is also consistent with the findings of Tan, et al. (2008). But in our finding we get a statistically significant and negative coefficients for γ2 in the daily, weekly and monthly data.

Generally, the empirical findings of this study using individual stock return and sector index data gives consistent results. This is the strength of this study.

Table 11: Summary of the regression result for the entire market return

Name of a sector	Coefficient	Daily data	Weekly data	Monthly data
BIST BANKS	γ_1	0.008844 p-value(0.0000)	0.008949 p-value(0.0000)	0.010443 p-value(0.0250)
	γ_2	-0.026888 p-value(0.0516)	0.031439 p-value(0.0034)	0.001396 p-value(0.9127)
BIST ELECTRICITY	γ_1	0.035968 p-value(0.0000)	0.042812 p-value(0.0000)	0.031296 p-value(0.0379)
	γ_2	-0.100711 p-value(0.0016)	-0.028772 p-value(0.4929)	-0.008333 p-value(0.8399)

BIST LEASING FACTORING	γ_1	0.039640 p-value(0.0000)	0.008327 p-value(0.5207)	0.021055[4] p-value(0.5758)
	γ_2	-0.103736 p-value(0.0358)	0.130129 p-value(0.0704)	0.064386 p-value(0.5336)
BIST REAL EST. INV. TRUSTS	γ_1	0.007250 p-value(0.0000)	0.004649 p-value(0.0000)	0.007696 p-value(0.0022)
	γ_2	-0.025255 p-value(0.0000)	0.017623 p-value(0.0047)	-0.014618* p-value(0.0336)
BIST FOOD BEVERAGE	γ_1	0.013527 p-value(0.0000)	0.010627 p-value(0.0000)	0.012399 p-value(0.0008)
	γ_2	-0.025433 p-value(0.0047)	0.013912 p-value(0.1980)	0.001251 p-value(0.9006)
BIST HOLD. AND INVESTMENT	γ_1	0.002601 p-value(0.0000)	0.003002 p-value(0.0000)	0.004028 p-value(0.0038)
	γ_2	-0.013284 p-value(0.0000)	-0.004722 p-value(0.1517)	-0.004066 p-value(0.2841)
BIST TELECOMMUNICATION	γ_1	0.169258 p-value(0.0000)	0.101308 p-value(0.0004)	0.199360 p-value(0.0063)
	γ_2	-0.825494 p-value(0.0000)	0.072872 p-value(0.6413)	-0.140806 p-value(0.4751)
BIST CHEM. PETROL PLASTIC	γ_1	0.006572 p-value(0.0000)	0.005895 p-value(0.0000)	0.004032 p-value(0.1080)
	γ_2	-0.022482 p-value(0.0001)	-0.003380 p-value(0.3666)	0.006691 p-value(0.3310)
BIST INVESTMENT TRUSTS	γ_1	0.039187 p-value(0.0000)	0.029836 p-value(0.0000)	0.052670 p-value(0.0001)
	γ_2	-0.149661 p-value(0.0000)	0.003151 p-value(0.9129)	-0.101071 p-value(0.0045)
BIST BASIC METAL	γ_1	0.007558 p-value(0.0000)	0.009190 p-value(0.0001)	0.013535[5] p-value(0.0194)
	γ_2	-0.038984 p-value(0.0002)	-0.021820 p-value(0.0967)	-0.030776 p-value(0.0527)
BIST METAL PRODUCTS MACH.	γ_1	0.006034 p-value(0.0000)	0.001951 p-value(0.0698)	0.007547 p-value(0.0013)
	γ_2	-0.030510 p-value(0.0000)	0.007889 p-value(0.1858)	-0.013931 p-value(0.0296)
BIST WOOD PAPER PRINTING	γ_1	0.013341 p-value(0.0000)	0.008566 p-value(0.0051)	-0.001941[6] p-value(0.7815)
	γ_2	-0.013303 p-value(0.2830)	0.049352 p-value(0.0036)	0.025141 p-value(0.1920)
BIST INSURANCE	γ_1	0.001124 p-value(0.0000)	0.000764 p-value(0.0000)	0.001377 p-value(0.0000)
	γ_2	-0.003952 p-value(0.0000)	0.001091 p-value(0.1263)	-0.002004 p-value(0.0083)
BIST NONMETAL MIN. PRODUCT	γ_1	0.010846 p-value(0.0000)	0.007387 p-value(0.0000)	0.005753 p-value(0.0249)
	γ_2	-0.029085 p-value(0.0000)	0.012030 p-value(0.0618)	0.002037 p-value(0.7714)
BIST TECHNOLOGY	γ_1	0.012957 p-value(0.0000)	0.009858 p-value(0.0002)	-4.32E-05 p-value(0.9942)
	γ_2	-0.050160 p-value(0.0000)	0.004661 p-value(0.7455)	0.019205 p-value(0.2350)
BIST TEXTILE LEATHER	γ_1	0.021170 p-value(0.0000)	0.014581 p-value(0.0000)	0.014604 p-value(0.0215)
	γ_2	-0.075988 p-value(0.0000)	0.008235 p-value(0.5889)	-0.007331 p-value(0.6727)
BIST W. AND RETAIL TRADE	γ_1	0.014157 p-value(0.0000)	0.008999 p-value(0.0001)	0.002165 p-value(0.6157)
	γ_2	-0.040427 p-value(0.0000)	0.026866 p-value(0.0367)	0.023035 p-value(0.0530)
BIST TOURISM	γ_1	0.051540 p-value(0.0000)	0.017339 p-value(0.0907)	0.073103 p-value(0.0006)
	γ_2	-0.211024 p-value(0.0000)	0.179105 p-value(0.0016)	-0.117896 p-value(0.0413)
BIST TRANSPORTATION	γ_1	0.029339	0.020093	0.004323[7]

[5]The model in the monthly return is not significant at 1% and 5% level but it is significant at 10% level
[6]The model in the monthly return is not significant at 1% and 5% level but it is significant at 10% level

		p-value(0.0000)	p-value(0.0044)	p-value(0.7742)
	γ_2	-0.054254 p-value(0.0720)	0.085596 p-value(0.0284)	0.009375 p-value(0.8209)

Source: Eviews

VI. Conclusions

So far we investigated the existence of herding towards the market consensus using individual stock return as well as sector index returns. In addition, we have tested herding using daily, weekly and monthly data for both individual stock return and sectoral index returns. In order to test herding the CSSD and CSAD models are used. According to the CSSD model, herding towards the market consensus only exists when the market falls. However, when the market rises there is no herding at individual stock level as well as at the sectoral level. However, the CSAD model (the nonlinear model) presents the existence of herding when the market rises and falls, especially in the daily data. Even if the magnitude of herding decreases in the weekly and monthly data, there is a statistically significant finding which shows herding is available in the weekly and monthly data.

Accordingly, there are seven implications of these findings. First, the existence of herding shows that investors are not valuing securities based on fundamentals rather the finding shows investors buy and sell securities based on crowd psychology. Therefore, the first implication of the finding is related to stock price implication, i.e. especially when the market falls and in the daily data stock prices are not traded based on their fundamental values. Thus, it is possible to say, there is a deviation in the fundamental value of stocks when the market falls and in the daily data. This finding indicates that traders are acting irrationally while pricing securities. Herding towards the market consensus also shows the inability of rational arbitrageurs to correct the irrational investors herding behaviour. According to Barbaris, et al. (1998), movements in investor sentiment are unpredictable and betting against mispricing create a risk for arbitrageur. Especially, in the short run, investor sentiment becomes extreme and prices move even further away from fundamental value. In our finding we get a weak evidence of herding in the monthly return data. According to Karolyi &Stulz (1996) longer horizon returns are closely related to macroeconomic variables. Thus, the aboveempirical finding is consistent with these findings.

The second is the efficient market implication. If stock prices are not valued based on their fundamentals, then market will deviate from its efficiency level. Thus, we can conclude that in the daily data and when the market falls Istanbul Stock Exchange is not efficient because stock prices are not evaluated based on their fundamentals.

The third implication of the finding is related to fundamental (intrinsic value) analysis of stock price valuation. According to our empirical result, stocks are not valued based on fundamentals in the daily data. Thus, when the regression method (market model) is used to estimate systematic risk (beta) and expected return of a stock, the best return interval is to use the monthly data. According to Damodaran (2015), the use of daily returns to estimate beta or expected return exposes the estimation process to a significant biases. Therefore, our finding is consistent with Damodaran's conclusion.

The fourth implication of the finding is that herding is not fragile as expected to the arrival of new information to the market. Especially the nonlinear model shows that herding is observed in the daily, weekly and monthly data. Therefore, this shows that when news comes to the market investors formulate herding or noise after news, but when other news comes the previous herding disappears and a new herding is formulated, and so on. Thus, herding is a continuous phenomenon.

The fifth implication of the above finding is related to over and under reaction of investors to news. The previous literatures relate under reaction to conservatism behavior of an investor and overreaction to representativeness bias of an investor. However, these explanations did not explain well why investors overreact to one news and underreact to the other news. Therefore, there should be another explanation that may address this issue both correctly and clearly. Thus, negativity bias explain well this behavior of an investor. Human beings give more emphasis as well as react more to negative news and events than positive news and events (Kahneman&Tversky, 1979; Cacioppo, Crites, Gardner, & Bernston, 1994; Ito, Larsen, Smith, &Cacioppo, 1998; Baumeister, Bratslavsky, Finkenauer, &Vohs, 2001; Rozin&Royzman, 2001; Soroka& McAdams, 2015). Thus, we can conclude that investors overreact to negative news and underreact to positive news. The sixth implication of the finding is that investors give different weights to information when the market falls and rises. In other words, investors' psychology and sentiment to positive and negative news is not symmetrical.

The last implication of this study is towards the capital asset pricing model, Fama-French two, three and five factor model as well as the four factor model. These asset pricing model assumes that investors pricing behavior is symmetric whether the market return falls or rises. The finding of this study shows that investors' pricing behavior is not symmetrical when the market return is down and when it is up. The finding of this study

[7]The model in the monthly return is not significant at 1%, 5% and 10% level

shows that investors give more emphasis when the market is down and they behave similarly, than when the market return rises.

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