Does the Egyptian Exchange Market Still Have Herd Behavior?

By

Dr. Mohamed Hussien Abd El-Razeek

Lecturer, Department of Finance and Accounting
International Academy for Engineering and Media Science (IAEMS), Egypt

moh.hussien@iams.edu.eg

Dr. Ahmed Sayed Abd Elbaseet

Assistant Prof., Department of Finance and Accounting
International Academy for Engineering and Media Science (IAEMS), Egypt

ahmadabdelbaset@hotmail.com

Scientific Journal for Financial and Commercial Studies and Research (SJFCSR)

Faculty of Commerce – Damietta University

Vol.4, No.1, Part 1., January 2023

APA Citation:

Abd El-Razeek, M. H. and **Abd Elbaseet**, A. S. (2023). Does the Egyptian Exchange Market Still Have Herd Behavior? ***Scientific Journal for Financial and Commercial Studies and Research***, Faculty of Commerce, Damietta University, 4(1)1, 183-228.

Website: https://cfdj.journalsekb.eg

Does the Egyptian Exchange Market Still Have Herd Behavior?

Dr. Mohamed Hussien Abd El-Razeek and Dr. Ahmed Sayed Abd Elbaseet

Abstract

This paper examines the existence of herding behavior in the Egyptian exchange market during different market conditions, starting from the revolution period to the pandemic period. Using daily stock price data, the empirical test looks for the existence of herding for the whole period and five different sub-periods (Egyptian Revolution, Pre and Post economic shifting, and Pre and post-Pandemic phases). Results fail to provide evidence of herding behavior in the Egyptian exchange market. The main models used in this paper provide evidence of adverse herding behavior exhibiting nonlinearity. Furthermore, the results also show that herding behavior is a short-lived phenomenon considered from sub-periods and observed with sorting in a bullish, bearish market, High volatility, and low volatility. Nevertheless, with aggregated models, the herding exited with bulling, high volatility markets, and the adverse herding in the bearing and low volatility markets.

Keywords

Herd behavior, Egyptian exchange market, EGX100, EGX70, EGX30

1. Introduction

The great discrimination between academics in explaining market inefficiencies (anomalies) as a risk exposure or mispricing (behavioral driver) remains. In the 1980s, a behaviorist tried to propose a framework for explaining stock price movements. Many studies found some indicators driven by emotional factors and concluded that the excessive market volatility is caused by the fed and not guided by objectivity. Then the asset pricing should contain two variable components, the random walk and the fed. Two different types of biases drive the latter: those in behavior and information processing. The paper has not focused on the former bias but still tries to answer the famous bias in the latter. Also, the fact that financial markets are constrained institutionally and structurally creates arbitrage opportunities for informed and superior investors. Following this, many market anomalies create excess return opportunities for

some investors (Godfred Aawaar, Nicholas Addai Boamah, Joseph Oscar Akotey, 2020). Because of this, it is unlikely that all investors will get the same return on their investments, no matter what they do.

Herding has been a frequent explanation presented by behavioral finance research to explain exchange market price deviations from fundamental pricing and efficient market theory. Herding occurs. When investors face a high degree of uncertainty, they tend to mimic the trading behavior of others. They believe to be more knowledgeable and skilled and less influenced by rumors, panic, fear, greed, regret, and sentiment toward more objectivity backed by knowledge, analytical, and skill-able framework. At the same time, they were ignoring their own opinions and private information.

When investing in stocks, investors run the chance of taking on additional risk since they do not fully grasp the nature of the capital market and may thus make a mistake in where they place their money. Many financial markets have additional risks, such as herding.

This paper adds to the literature by explicitly evaluating investor herd behavior (Christie, W.G. and Huang , R.D., 1995) CH is then calculated using cross-sectional standard deviation (CSSD) and (Chang, 2000) CCK; after that, through cross-sectional absolute deviation (CSAD). The analysis of herding behavior under different market conditions, the bullish and bearish days analysis, and the joint analysis proposed (Chiang, Dazhi Zheng, 2010), Finally, as a joint analysis proposed (Lin Tan, Thomas C. Chiang, Joseph R. Mason, Edward Nelling,, 2008), demonstrate volatility differences with high and low volatility (Palak Dewan, Khushdeep Dharni, 2022). The study also examines whether asymmetric herd behavior in different market conditions. It looks at the Egyptian revolution, the economic shifting-deflation national currency period as an endogenous event, and the COVID-19 pandemic as an exogenous shock to the financial system that caused an abnormal market condition.

This paper organizes around three primary research questions. First, are there any changes in the imitating behavior observed by investors at different times in the Egyptian exchange markets? Second, is there any difference in the herding behavior observed in periods of financial instability to periods of

different origins, such as economic shifts (deflation of national currency) and pandemics? Third, are there any differences between days with positive and negative returns, or do days of high volatility differ somewhat from others? The answers to these questions would assist in clarifying whether recent exchange market disasters may link to the occurrence of herding behavior. The remainder of this paper organizes as follows: Section 2 presents the literature review, Section 3 presents the details of the dataset employed in the analysis with some descriptive statistics and describes the method of the multivariate analysis; Section 4 is the results of the analysis, section 5 the discussion of the results; and lastly is the conclusions and suggestions for future research.

2. Literature Review

The financial theory relies heavily on models to explain market behavior among agents. However, as rigorous science, it relies on analytical techniques with less regard for model flaws. The random walk process with the efficient market hypothesis (EMH) explains the market based on two hypotheses. First, the logic of investor behavior in financial markets is assumed. Even if some investors are irrational, their transactions will cancel each other out and have no market impact. Second, the EMH states that arbitrageurs would eliminate price disparities and revert prices to their optimal levels (Burton G. Malkiel,Eugene F. Fama, 1970). Following the Efficient Market Hypothesis (EMH), arbitrageurs would promptly adjust any market asset mispricing since financial assets price at their fair value. Therefore, active traders and portfolio managers cannot achieve superior returns to the market over time. Instead of attempting to outperform the market, investors should buy the market as a whole.

When market participants are considered rational, and their behaviors are consistent with the maximization of utility, they are not confused by the display of information and are not distracted by their emotions. (Byrne, 2013). Since the 1980s, empirical data has augmented intuition in supporting the idea. Anomalies identify utilizing joint test hypothesis detectors (EMH with Capital Asset Pricing Model-CAPM). Researchers noticed that traditional finance was incapable of explaining the phenomenon. Because some agents are irrational due to their preferences, incorrect beliefs, our biases, the theory's assumptions must be

changed. Thus, the emphasis shifted from conventional financial theories to behavioral finance models, which blend how individuals think with how financial markets function. In addition, according to (Nicholas Barberis, Richard Thaler , 2003), behavioral finance analysis depends on two pillars: the limitations of arbitrage and the importance of psychology. In practice, an arbitrage involves balancing risk, return, and expenses. Thus, arbitrageurs may or may not intervene to correct mispriced assets. Consequently, psychological studies of investor behavior may shed light on investing choices that cannot be explained or anticipated by conventional finance theory (Shleifer, 2000).

The field of psychology has identified various decision-making practices known as Cognitive biases. These biases may influence decision-making, which may have particular financial and investment ramifications (Khanthavit, 2019). The biases relate to how we process information to make decisions and our preferences (Byrne, 2013). (Laopodis, 2021). For processing information, various biases impact all types of decision-making for both group and individual investors. Some recognized biases are overconfidence, cognitive dissonance, representativeness, regret aversion, and herding. These biases may cause the investor to make useless or even harmful investing choices (DeBondt, 2010).

2.1 Herding Behavior

Mimicking is a kind of investing behavior that has received particular attention. To appreciate realistic realities, this mimicking behavior introduced by (Christie, W.G. and Huang , R.D., 1995) as herding is the behavior of investors who disregard their analysis and personal convictions in favor of copying the behavior of other investors and market sentiment. The author argues that individual investors prefer to imitate others' activities. Thus, herding behavior has been the subject of extensive research. Results for returns inconsistent with the presence of herding during periods of large price movements and conclude that this herding magnitude are matching with the rational asset pricing models, Experimental social psychology demonstrates that most individuals will comply with group decisions even if they do not fully agree. The social conformity phenomenon happens as a consequence of investors' desire to imitate the trading activities of others they think to be more

informed, neglecting their own opinions and private (Demirer R. &., 2006; Prosad, J. M., Kapoor, S., & Sengupta, J., 2012; Lee, 2013; Setiyono, 2013). These studies analyze the behavior of return dispersions during periods of unusually large upward and downward changes in the market index. And find that equity return dispersions are significantly higher during periods of large changes in the aggregate market index. However, comparing return dispersions for upside and downside movements of the market, however, observe that return dispersions during extreme downside movements of the market are much lower than those for upside movements, indicating that stock returns behave more similarly during down markets. The findings support rational asset pricing models and market efficiency. Discussed. However, the herding tendency of market participants exacerbates market volatility and creates market instability (Bikhchandani, S. and Sharma, S, 2000; Chiang, T. C., & Zheng, D., 2010; Asma Mobarek, 2014). According to (Caparrelli, 2004), the occurrence of herding behavior refutes the EMH. Not just due to a lack of knowledge, and The tests support Christie and Huang's conclusions that herding is present in extreme market conditions.

Nevertheless, also to the accompanying biases lead assets to misprice. According to (Hirshleifer, D., & Teoh, S. H., 2003), investors' behavior affect by many factors, including market conditions, investors' background and education, the surrounding economic and political situation, analytical skills, confidence in one's judgment, fear of making a mistake, time, the difficulty of a situation, forecasts, and the actions of other investors (mimicking) (Charilaos Mertzanis, and Noha Allam, 2018). The behavior of investors affects by rumors, declarations, witnessed acts, or observed effects of an activity. Important triggers of herding include false information, reputational concern, and reward systems.

According to the informational cascade argument proposed by (Zhou, R. T., & Lai, R. N., 2009). investors who have access to more trustworthy and accurate information are likely to take the lead, and others who are less informed are likely to follow in their footsteps. Information used by early adopters may come from various sources, including self-research and data scraping. Individuals may arrive at different conclusions and degrees of certainty based on the same facts.

Other investors could only infer what kind of knowledge the early adopters had based on their behavior. They would not know what kind of information the early adopters expose to; they would only be able to see what kind of behavior the early adopters displayed. However, the choice may be a bad one for investors overall. Market volatility will increase if most investors follow the herd's lead, but early adopters often change their minds. From a different angle, (Shu-Fan Hsieh, 2013) argues that emotional impulses promote herd behavior in individuals, which may disrupt markets.

In contrast, private knowledge drives institutional herd behavior, which may help prices respond more quickly. Individual investors are not the only ones who may demonstrate herding behavior; financial institutions and institutional investors are also susceptible to it. Their actions could cause bias in the market, which would make it less efficient and less predictable.

Theoretical and empirical herd behavior research segregate (Daxue Wang, 2008). Theoretical research concentrates on the reasons and consequences of herding behavior and shed light on the calculation of beta and on the financial policy to understand the dynamics of herding in financial markets. (Scharfstein, David and Jeremy Stein, 1990; Bikhchandani, S. and Sharma, S, 2000; Welch, Ivo, Journal of Finance; Welch, Ivo, 2000). at the same time, empirical studies quantify herding in a purely statistical sense and do not examine particular theoretical theories of herding. According to the consensus, herd behavior may be reasonable or irrational (Chang, 2000). This irrational approach emphasizes investor psychology when investors overlook their knowledge and past beliefs and blindly follow other investors. The rational perspective focuses on the principal-agent dilemma, in which institutional investors like fund managers neglect their intimate knowledge and emulate the acts of others to retain their financial market reputation (Scharfstein, David and Jeremy Stein, 1990; Froot, Kenneth, David Scharfstein, and Jeremy Stein, 1992; Froot, Kenneth, Paul G. J. O'Connell and Mark Seasholes, 2001; Bikhchandani, S. and Sharma, S, 2000; Welch, Ivo, 2000). define this investor behavior as an informational cascade that may lead to biased investment judgments. Investor rationality Individual investments, meanwhile, are usually anonymous (Otchere, I. and Chan, J., 2003). They refer to a consensus as herding behavior, which might be either

sentiment-driven intentional herding that can destabilize security prices and impair the efficiency of financial markets, which occurs when investors are ready to copy others. Alternatively, unintentional (spurious) herding—drive by widespread identical responses to public information and signals. (Scharfstein, David and Jeremy Stein, 1990; Hirshleifer, 2003; Hwang, S., & Salmon, M., 2004; Simon Jurkatis, Stephanie Kremer, Dieter Nautz, 2012), Argue that unintentional herd behavior can also lead to market inefficiency if the activities of market players that connect are not motivated by fundamental values. In terms of empirical research, (Lakonishok, J., Shleifer, A., & Vishny, R. V., 1992) defined herding as the average propensity of fund managers to purchase (sell) the same stocks as other fund managers, compared to what anticipate if they acted independently. The research shows no indication of herd behavior among 769 equity fund managers. (Mark Grinblatt, Sheridan Titman and Russ Wermers, 1995) Apply the methodologies of (Lakonishok, J., Shleifer, A., & Vishny, R. V., 1992) to 155 mutual funds' 1984–1994 investing strategies and discover 120 momentum traders. The analysis shows a link between a fund's inclination to herd and its willingness to purchase former winners (momentum stocks). (Mark Grinblatt, Sheridan Titman and Russell Wermers, 1995) It gives a portfolio change metric called "herding" to measure how fund managers' portfolio weights tend to cluster together.

Second, empirical herd behavior, a market-wide approach focusing on participant behavior, leads to simultaneous asset purchases or sales. Empirical research assesses the behavior of herding. (Christie, W.G. and Huang , R.D., 1995) Pioneered a new path in the field of research when they presented a returns-based measure of herding found in the Capital Asset Pricing Model (CAPM). In order to quantify herding behavior in the broader market, this field of research investigates the extent to which asset returns vary from market returns during times of considerable price volatility. Specifically, the focus is on the degree to which asset returns underperform market returns. In severe or moderate herd behavior, equity return dispersion should decrease (or expand slowly). The absence of herding increases equity return dispersion. (Hwang, S., & Salmon, M., 2004) tested herding with beta dispersion. The authors distinguish herding from "spurious herding," which is driven by economic

fundamentals and does not induce market inefficiencies. Studies on the investment behaviors of financial market participants have surged because of the link between such behaviors, security price movements, and their consequences on financial market functioning.

Evidence of herding behavior across asset markets and nations remains elusive after over three decades of study. It is challenging to show herding behavior since it depends on the investigated financial market, the time involved, and the testing technique used to determine it (Bikhchandani, S. and Sharma, S, 2000).

2.2 Herding Behavior in the Egyptian Exchange market

Egypt's exchange market is an emerging market, which today is considered inefficient due to insufficient public information, weak market awareness among investors, and low market liquidity (El-Erian, M., & Kumar, M., 1995; Ezzat, H., 2012). The prices are closer to random traffic standards, showing that the price changes are random. Thus, there may be shares presented at less than their actual value. Additionally, the consequence of the inefficiency of the Egyptian exchange market on the weak level is that, given that the prices of stock do not reflect all historical information, market participants can achieve unusual returns by using the historical prices of stocks (Mai Ahmed Abdelzaher, 2021).

This inefficient market with non-random prices is a general conclusion for most studies that examined the existence of herding in the Egyptian exchange market. (Nader Alber and Ehab Ezzat, 2021) (Mostafa Hussein abd-alla, 2020) the former from 2002 to 2018 and the latter during the COVID-19 crisis; however, other studies have reached different conclusions. These findings show that herding does not exist and that the market is not always inefficient and influenced by factors other than prices, on the other hand (Dalia El-Shiaty, and Ahmed Abdelmotelib Badawi, 2014), (Charilaos Mertzanis, and Noha Allam, 2018). The former examined EGX 100 from 2006-2010, and the last, taking the political effect of the Egyptian revolution as an event of political instability, to conclude that there was no evidence of herding behavior in the Egyptian exchange market in general for all tested periods.

Based on the above discussion, this paper extends the previous literature, where it attempts to close the gap on the ground that:

(i). The sample period will be as long as 12 years with different phases, affected by different shocks in the Egyptian exchange market (political, economic, and pandemic),

(ii). The sample data are semi-high frequency data with daily observations, with statistical characteristics to explain daily variations in market and asset returns,

(iii). The empirical investigation uses multivariate analysis to exclude heteroscedasticity and test a hypothesis, applied to the standard herding models like CSSD and CSAD and augmented with asymmetric and different market conditions, and

(iv). Applied to the different main indexes in the Egyptian exchange market, with different index structures, EGX 100 and EGX 70 are equally weighted, but the EGX 30 are value weighted.

3. Research Method

3.1. Sample Selection and Data Collection

The sample period covers the trading days from June 1, 2010, till June 30, 2021, comprising 2,667 trading days. A long-time window is selected to consider different market phases of the Egyptian Exchange Market (EGX) in the analysis, as shown in Figure (1).

The time from June 1, 2010, to June 30, 2013, represents the period during which the EGX was affected by the Egyptian Revolution -January 25, 2011, and June 30, 2013- as a political instability of the Egyptian exchange market.

After that, the market showed rapid growth and economic expansion through different applied policies from July 3, 2013, to June 30, 2016. The subsequent period of the Economic expansion was affected by an event on November 3, 2016 – leading to an economic shift in the Egyptian economy by deflating the national currency- this shift changed raise from July 3, 2016, to June 28, 2018. After the economic shift phase, the market experienced a decline mainly due to the effects of the country's economic shift.

The new Coronavirus disease (COVID-19), an infectious disease caused by the SARS-CoV-2 virus, affected the world's transactions, and most countries were on lockdown as a defensive strategy. At the beginning of 2020, the World Health Organization announced this disease as a pandemic. This period runs from January 2, 2020, to June 30, 2021.

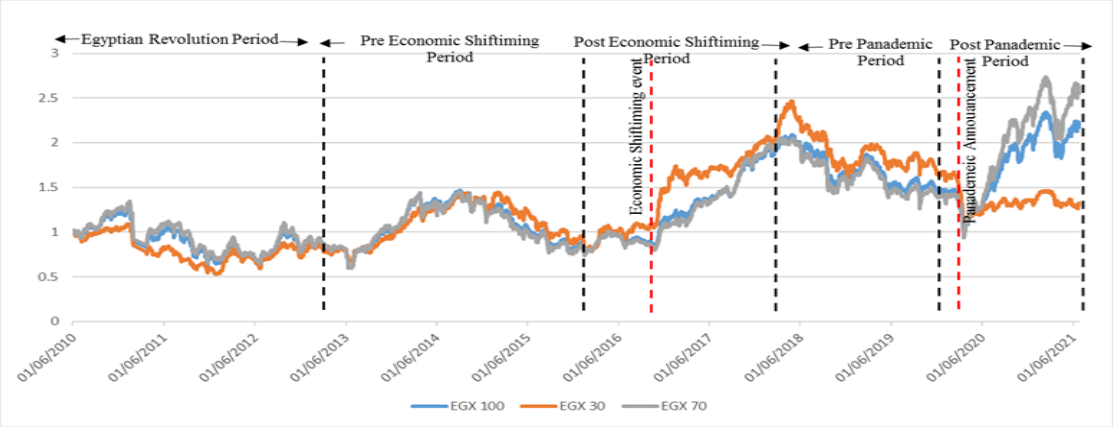


Figure (1) Movements of Main Egyptian Exchange Market Indices during the Sample Period

***Source**: Egyptian Exchange Market Historical Data (Made by the author)*

The data set includes daily closing prices of (73) listed common stocks with 197,425 daily price observations., which are available in the Data Library of the EGX. Only the active stocks during the sample period were included in the sample to alleviate possible survivorship bias affecting the results. The considered Stock prices in the dataset are only for the days traded so that no trading or thin trading would have no effects on the results. Expect that such a long time of different events and conditions affecting the market provide a reasonable ground for examining the evolutionary nature of herding. The individual stock returns is calculated as follows:

$$R_{i,t} = \frac{P_{i,t} \quad P_{i,t\ 1}}{P_{i,t\ 1}} \qquad (1)$$

Where $P_{i,t}$ the ending price for asset i in time t, $P_{i,t-1}$ the beginning price of the same asset i in time t.

Table (1) shows the descriptive statistics of market returns it can be noted that. In the period under study, the market returns show some dissimilarities (the mean return for the market return of EGX 70 is more extensive than that of EGX 100 and EGX 30. The median is higher in EGX 100 than in other indices, thus indicating the existence of more extreme observations in EGX 70 and EGX 30). The spread between the maximum and minimum values is more excellent in EGX 70 than in EGX 30, and the same for the standard deviation is more significant than in others. Regarding asymmetry and kurtosis, the asymmetry coefficient is negative for all indexes but higher in EGX 100, and both markets show a leptokurtic distribution of returns. However, EGX 70 coefficient is much more significant than the EGX 100 and EGX 30. Finally, Jarque-Bera, as a normality test, indicates that errors exited for all indexes, then non-normal distribution.

Table 1: Descriptive statistics for market return, $CSSD_t$, and $CSAD_t$ series (EGX 100, 70, and 30)

	Mean	Median	Minimum	Maximum	St. deviation	Skewness	Kurtosis	Jarque-Bera
$R_{m,t}$								
EGX 100	0.00042	0.001554	0.091593	-0.146242	0.01564	-0.928383	9.99953	5827.507
EGX 70	0.000488	0.001474	0.092271	-0.153555	0.01605	-0.94401	10.17348	6114.481
EGX 30	0.000207	0.000825	0.080883	-0.106789	0.014355	-0.578332	8.825002	3919.214
$CSSD_t$								
EGX 100	0.028523	0.020042	5.737812	0.007344	0.12742	38.3593	1614.918	2.89E+08
EGX 70	0.027515	0.020105	5.561002	0.007409	0.123547	38.79286	1628.995	2.94E+08
EGX 30	0.028406	0.020775	5.565854	0.007651	0.123605	38.79872	1629.891	2.95E+08
$CSAD_t$								
EGX 100	0.016195	0.014234	1.412932	0.005083	0.031937	35.9601	1458.427	2.36E+08
EGX 70	0.016147	0.014333	1.248697	0.005167	0.029324	34.01333	1299.068	1.87E+08
EGX 30	0.016845	0.014806	1.261028	0.005561	0.029602	33.81267	1293.134	1.85E+08
$R^2_{m,t}$								
EGX 100	0.000245	0.000245	0.000245	0.000245	0.000245	0.000245	0.000245	9648571.
EGX 70	0.000258	6.59E-05	0.023579	0.00000	0.000775	13.87317	337.2772	12502799
EGX 30	0.000206	5.59E-05	0.011404	5.02E-11	0.000575	9.201615	123.9461	1663166.

Note: This table reports descriptive statistics of daily market returns ($R_{m,t}$), daily cross-sectional standard deviations ($CSSD_t$), and daily cross-sectional absolute deviations ($CSAD_t$) for the period 2010-2021.

3.2. Research Models

3.2.1. Herding Behavior Main Empirical models

Two pioneering studies have proposed methods to detect herding behavior using stock returns, such as CH, through cross-sectional standard deviation (CSSD) and CCK, through cross-sectional absolute deviation (CSAD). The intensity of herding behavior assesses through two different measures based on the dispersion of stock returns. The daily market returns worked with throughout the study calculated the average return of all the stocks listed on the market on day t. CH suggests that return dispersion is a suitable measure of herding behavior. The dispersion measures the average proximity of individual returns to the market returns. They also say that how people make decisions about investments depends on how the market is doing. They say that rational asset pricing models predict that, during standard times, the differences in returns will get more significant as the absolute value of the market return goes up. Individual investors trade based on their private information, which is different.

In this paper, first will use the herding measure proposed by CH. These authors calculate the cross-sectional standard deviation (CSSD) of the returns of the stocks listed on a given market as seen in equation (2) and suggest that in the presence of herding, this dispersion would be lower than expected if such behavior did not exist.

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

Where $R_{i,t}$ is the observed return of stock i at time t and $R_{m,t}$, t is the equally-weighted average return of the N stocks listed on the market at time t.

Herding only happens under stressful market situations, when investors cannot reason their actions and find it simpler to follow others. Tail returns characterize market stress or difficult situations. CH suggests the following regression to see whether market participants replicate others' behavior during instances of extreme returns:

$$CSSD_t = \gamma_0 + \gamma_1^L D_t^L + \gamma_2^U D_t^U + \varepsilon_t \quad (3)$$

Where D^L_t is a dummy variable that takes a value of 1 if $R_{m,t}$, t locate at the lower tail (5%, 1%) of the distribution of returns (i.e., when $R_{index} < -2\sigma R_{index}$ and $R_{index} < -3\sigma R_{index}$), and 0 otherwise. D^U_t is a dummy variable that takes a value of 1 if $R_{m,t}$, t locate at the upper tail (5%, 1%) of the distribution of returns (i.e., when $R_{index} > 2\sigma R_{index}$ and $R_{index} > 3\sigma R_{index}$), and 0 otherwise.

Suppose the coefficients of the dummies are negative and statistically significant at a 95% and 99% confidence interval. In that case, they will be unable to reject the null hypothesis and must infer that herding occurs under stressful market circumstances. Nonetheless, if the coefficients are positive and statistically significant, they will reject the null hypothesis and infer that unfavorable herding occurs under stressful market circumstances. Additionally, adhere to Chang, Cheng, and Khorana (2000) to account for all market situations and not limit the model to stressful circumstances. Because the CSSD could be prone to "outliers," they looked at how far apart the answer was.

The second measure I use is that proposed by CCK based on the cross-sectional absolute deviation of the returns (CSAD). To define this variable, the authors start from the conditional version of CAPM (Fischer Black, 1972):

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N}\left|R_{i,t} - R_{M,t}\right| \quad (4)$$

Where $R_{i,t}$ is the observed return of stock i at time t and $R_{M,t}$ is the equally-weighted average return of the N stocks listed on the market at time t. authors argue that if investors follow the market consensus during periods of sharp price changes, herding will increase the correlation of stock returns, and the linear relationship proposed by the CAPM between an individual stock's return (CSAD) and the market return would become nonlinear. For this reason, they use a nonlinear specification using a parameter that captures these nonlinearities in the

relationship between dispersion and market return. Lee, Chen, and Hsieh (2013). introduces The modified regression model is shown below:

$$CSAD_t = \gamma_0 + \gamma_1 R_{M,t} + \gamma_2 \left|R_{M,t}\right| + \gamma_3 R_{M,t}^2 + \varepsilon_t \qquad (5)$$

Where $R_{M,t}$ is the average return of the sample at time t. This term add by Lee, Chen, and Hsieh (2013) to consider asymmetric behavior under different market states, $|R_{M,}|$ is the absolute market return at time t to account for the magnitude and not the direction of the market, and $R^2_{M,t}$ captures the nonlinear relationship that would arise due to herding. A negative, significant γ_3 coefficient would indicate the presence of herding behavior. Because the relationship between $CSAD_t$ and $R_{M,t}$ can be asymmetric in bull and bear markets.

3.2.2. Asymmetric Herding Behavior in Bull and Bear

CCK also analyzes the asymmetry in investors' responses and suggests that greater herding observes at times when the market falls as opposed to the bullish periods, given the different psychological implications of falling prices compared to moments in which the market has a positive change in prices. Thus, we have carried out the joint analysis proposed by (Chiang, T. C., & Zheng, D., 2010), differentiating between both scenarios to see whether the results hold for these markets.

First, separate the Asymmetric Herding model into the following two equations to measure herd behavior in bull and bear markets.

- Bull - Bullish – Market days:

$$CSAD_t^{UP} = \gamma_0 + \gamma_1^{UP} \left|R_{M,t}^{UP}\right| + \gamma_2^{UP} R_{M,t}^{UP^2} + \varepsilon_t, \text{ if } R_{M,t} > 0 \qquad (6)$$

- Bear - Bearish – Market Days:

$$CSAD_t^{DOWN} = \gamma_0 + \gamma_1^{DOWN} \left|R_{M,t}^{DOWN}\right| + \gamma_2^{DOWN} R_{M,t}^{DOWN^2} + \varepsilon_t, \text{ if } R_{M,t} < 0 \qquad (7)$$

The negative, significant γ_2^{UP} coefficient would indicate the presence of herding behavior in a bullish market, and the negative, significant γ_2^{Down} coefficient would indicate the presence of herding behavior in a bearish market.

Second, Aggregate the Asymmetric Herding model into the following single equations to measure herd behavior in bull and bear markets.

$$CSAD_t = \gamma_0 + \gamma_1 D^{UP} \left|R_{M,t}\right| + \gamma_2 \left(1-D^{UP}\right)\left|R_{M,t}\right| + \gamma_3 D^{UP} \left(R_{M,t}\right)^2 + \gamma_4 \left(1-D^{UP}\right)\left(R_{M,t}\right)^2 + \varepsilon_t \quad (8)$$

D^{UP} is a dummy variable that takes a value of 1 if the equally weighted average market return on day t is positive and 0 otherwise.

3.2.3. Herding Behavior for different market conditions (High and low volatility)

Following (Tan, L., Chiang, T. C., Mason, J. R., & Nelling, E., 2008), the author assumes that the market presents high volatility at a specific moment t if that day exceeds the previous 30-day moving average. Then can be classified as high and low volatility.

First, separate the different market conditions herding model into the following two equations to measure herd behavior in High and low volatility markets.

- High Volatility market:

$$CSAD_t^{\sigma 2HIGH} = \gamma_0 + \gamma_1^{\sigma 2HIGH} \left|R_{M,t}^{HIGH}\right| + \gamma_2^{\sigma 2HIGH} R_{M,t}^{HIGH^2} + \varepsilon_t, \text{ if } R_{M,t} > 0 \quad (9)$$

- Low Volatility market:

$$CSAD_t^{\sigma 2LOW} = \gamma_0 + \gamma_1^{\sigma 2LOW} \left|R_{M,t}^{LOW}\right| + \gamma_2^{\sigma 2LOW} R_{M,t}^{LOW^2} + \varepsilon_t, \text{ if } R_{M,t} < 0 \quad (10)$$

A negative, significant $\gamma_2^{\sigma 2\ HIGH}$ coefficient would indicate the presence of herding behavior in High Volatility market, and a negative, significant $\gamma_2^{\ \sigma 2\ LOW}$ coefficient would indicate the presence of herding behavior in a Low Volatility market.

Second, aggregate the different market conditions herding model into the following single equations to measure herd behavior in High and Low volatility markets.

$$CSAD_t = \gamma_0 + \gamma_1 D^{Vol} \left|R_{M,t}\right| + \gamma_2 \left(1-D^{Vol}\right)\left|R_{M,t}\right| + \gamma_3 D^{Vol} \left(R_{M,t}\right)^2 + \gamma_4 \left(1-D^{Vol}\right)\left(R_{M,t}\right)^2 + \varepsilon_t \quad (11)$$

D^{vol} is a dummy variable that takes a value of 1 during the days characterized by high volatility and 0 in any other case.

4. Analysis of Results:

Before analyzing the empirical results, the stationary properties of the return series was, verified using the two classical unit root tests; the augmented Dickey-Fuller and Phillips-Perron. Table 2 presents the results of the unit root tests. Compelling results observe as $CSSD_t$, $CSAD_t$, and $R_{M,t}$ return series were stationary at levels for all methods. The results essentially became more significant after the first difference. The stationarity of the series means the existence of a stationary stochastic process containing constant mean and variance over time with a non-serially correlated covariance.

Table 2: Results of Unit root tests

Exchange market(Variable)	Test equation	ADF unit root test		PP unit root test	
		$CSSD_t/CSAD_t/R_{m,t}$		$CSSD_t/CSAD_t/R_{m,t}$	
		Levels	1st difference	Levels	1st difference
$CSSD_t$					
	None	-2.565830***	-2.565835***	-2.565830***	-1.616620*
	Intercept only	-3.432610***	-3.432625***	-3.432610***	-2.567286*
	Intercept and trend	-3.961485***	-3.961506***	-3.961485***	-3.127606*
$CSAD_t$					
	None	-2.565833***	-2.565835***	-2.565830***	-1.616620*
	Intercept only	-3.432610***	-3.432625***	-3.432610***	-2.567286*
	Intercept and trend	-3.961485***	-3.961506***	-3.961485***	-3.127606*
$R_{m,t}$					
	None	-2.565830***	-2.565834***	-2.565830***	-2.565830***
	Intercept only	-3.432610***	-3.432622***	-3.432610***	-3.432611***
	Intercept and trend	-3.961485***	-3.961502***	-3.961485***	-3.961487***

*Note: This table reports the unit root tests for $CSSD_t$, $CSAD_t$, and $R_{m,t}$ for different estimation methods.. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels.*

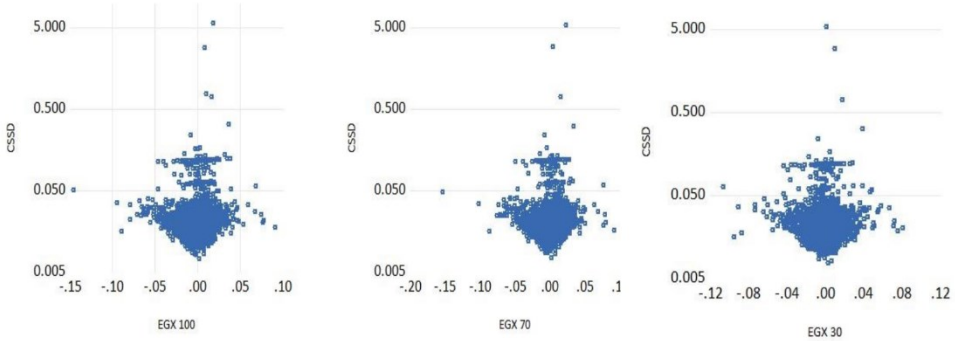
It considered of interest to graphically represent the relationship between CSSD and market return in EGX 100, EGX 70, and EGX 30 for complete samples and subsamples. In general, the ends of the graph should show a descending line, reflecting the lower cross-sectional dispersion at moments of extreme market movements. Looking at the graphs, notice a positive relationship exists between returns (in absolute value) and CSSD in all market indexes. Dispersion increases on extreme movements' days, anticipating the non-existence of herding in all indices. However, observe from the figure a clear difference between them. In the case of the Pre-Economic Shifting period in Figure 2 panel C, see the dispersion is slightly higher than that observed in the complete period and Egyptian Revolution period in panels A, and B, for similar levels of return.

On the other hand, looking at the Post-Economic Shifting period in panel D, The point cloud is flatter, pointing to lower dispersion. The graphs point to the Pre-Pandemic period in panel E, as the one for the Pre-Economic Shifting period seems to show higher levels of dispersion for the same return levels than the Post-Economic Shifting period. The graphs for the post-Pandemic period have more dispersion than any other sub-period, but the EGX 100, EGX 70, and EGX 30 in the EGX markets show very different characteristics.

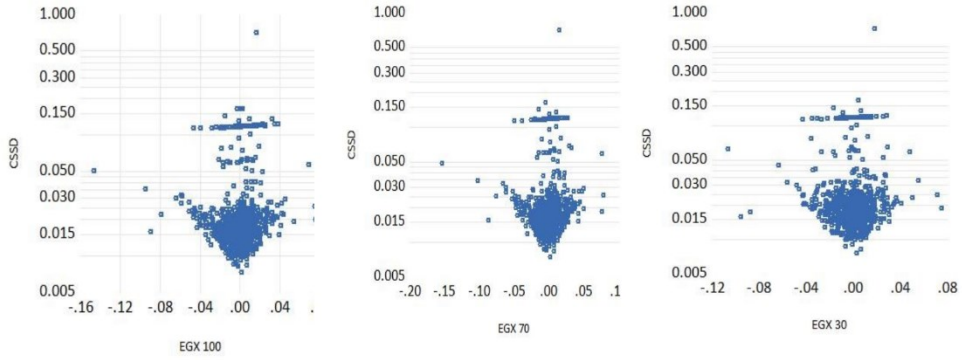
The comparisons between Figure 2 with Figure 3 would help in determining. That the exact visualization, but in Figure 3 CSAD explains more for herding behavior in EGX Market with nonlinear relation. The relation estimate and understanding more than with CSAD then (Tan, L., Chiang, T. C., Mason, J. R., & Nelling, E., 2008; Chiang, T. C., & Zheng, D., 2010) benefited with adjusted the original model to explain herding behavior.

Panel (A) CSSD Model for an aggregate time

EGX 100 ***EGX 70*** ***EGX 30***



Panel (B) CSSD Model for the Egyptian Revolution period



Panel (C) CSSD Model for Pre-Economic Shifting period

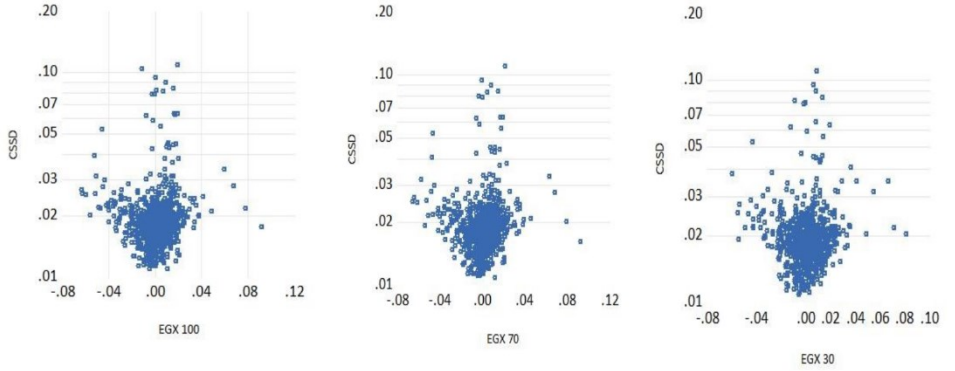
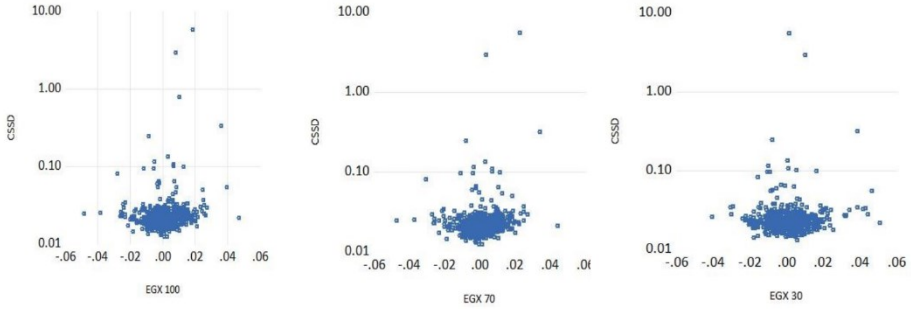
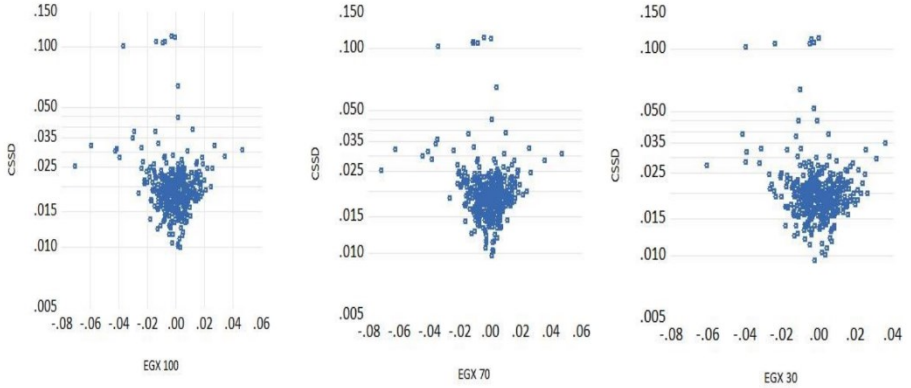


Figure (2): CSSD-Returns

Panel (D) CSSD Model for Post-Economic Shifting period



Panel (E) CSSD Model for Pre-Pandemic period



Panel (F) CSSD Model for Post-Pandemic period

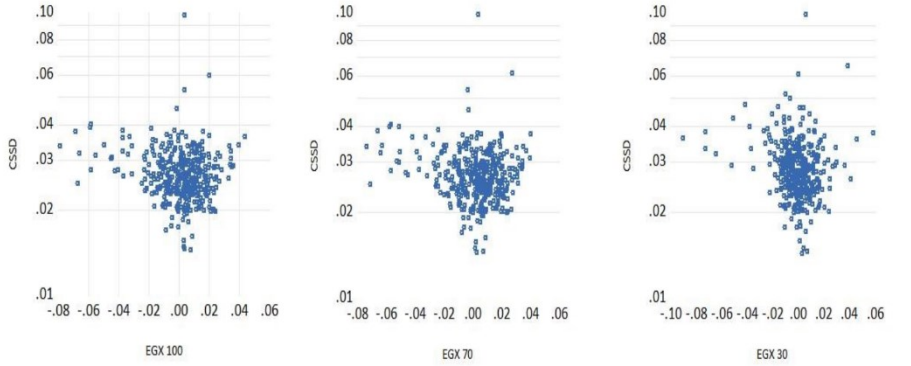


Figure (2): (Continued)

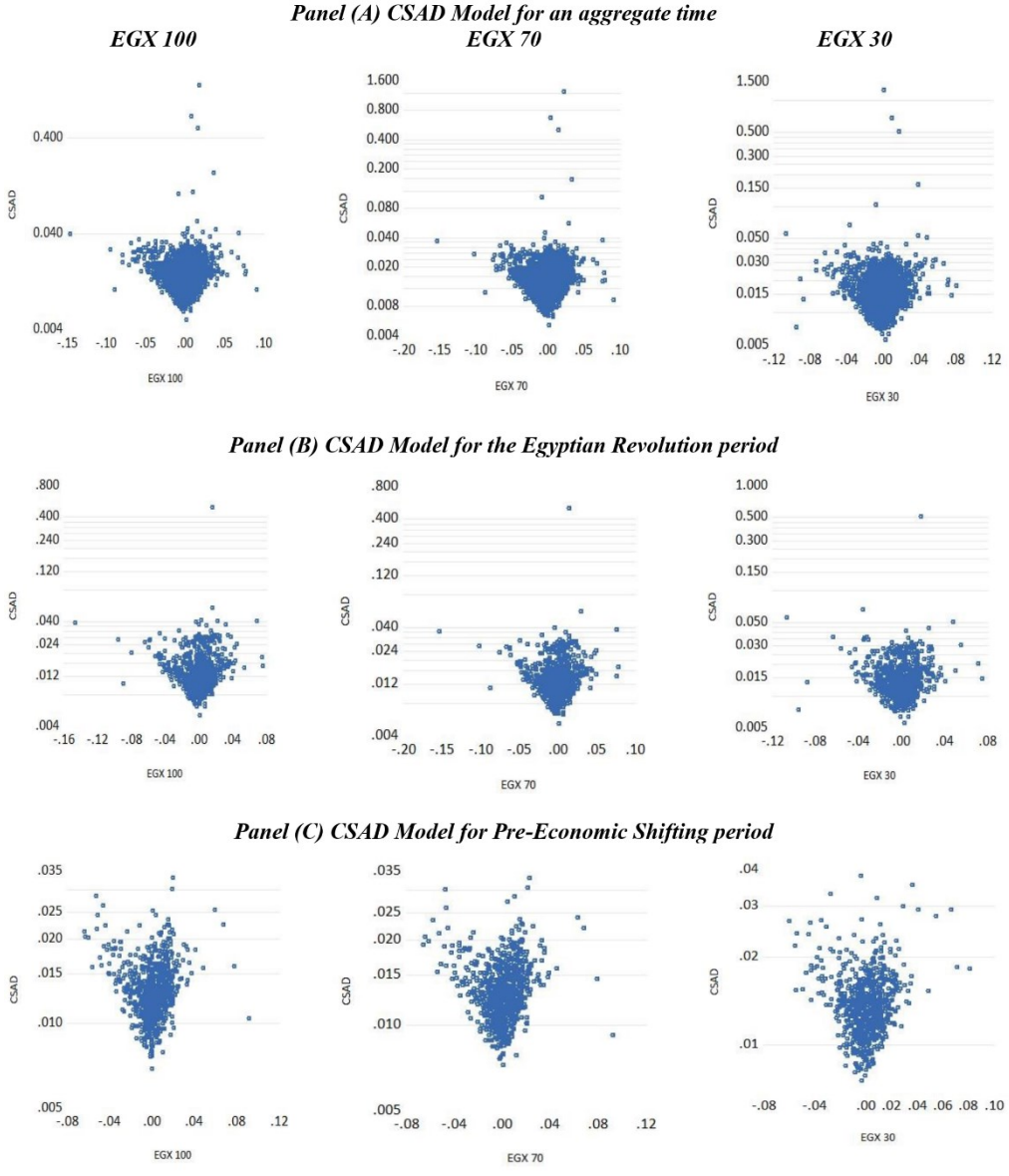
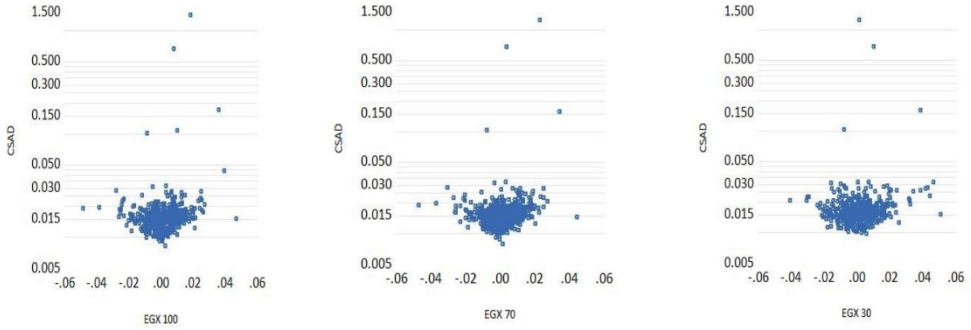
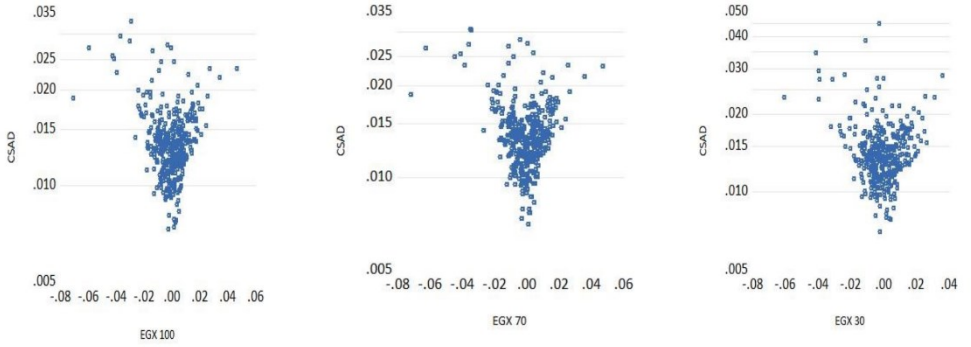


Figure (3): CSAD-Returns

Panel (D) CSAD Model for Post-Economic Shifting period



Panel (E) CSAD Model for Pre-Pandemic period



Panel (F) CSAD Model for Post-Pandemic period

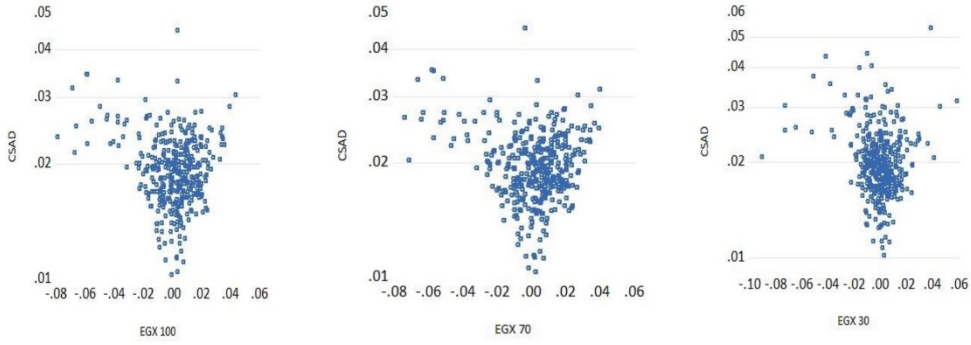


Figure (3): (Continued)

Table 3: Estimates of the herding behavior with the $CSSD_t$ measures.

Panel A: EGX 100		γ_0	γ^{L}_1 5%	γ^{U}_1 5%	γ_0	γ^{L}_2 1%	γ^{U}_2 1%
Complete Sample	**Coef.**	**0.017939*****	**-0.017648*****	**-0.016640*****	**0.016548*****	**-0.016107*****	**-0.016495*****
	t.stat	**(1.347326)**	**(-0.303660)**	**(-0.286316)**	**(1.297085)**	**(-0.125272)**	**(-0.128289)**
Egyptian revolution	**Coef.**	**0.001843*****	**-0.001326*****	**-0.000525*****	**0.00175*****	**-0.000971*****	**-0.001664*****
	t.stat	**(2.592016)**	**(-0.517331)**	**(-0.214003)**	**(2.629075)**	**(-0.197336)**	**(-0.282136)**
Pre-Economic Shifting	**Coef.**	**0.000108*****	**-0.000068*****	**-0.0000961*****	**0.000101*****	**-7.68E-05*****	**-7.03E-05*****
	t.stat	**(4.664400)**	**(-0.750952)**	**(-0.852318)**	**(4.588618)**	**(-0.364594)**	**(-0.3126)**
Post-Economic Shifting	**Coef.**	**0.089497*****	**-0.089052*****	**-0.083295*****	**0.087067*****	**-8.68E-02*****	**-8.71E-02*****
	t.stat	**(1.267713)**	**(-0.142371)**	**(-0.201711)**	**(1.251788)**	**(-0.080485)**	**(-0.113914)**
Pre-Pandemic	**Coef.**	**0.000135*****	**0.000404*****	**-0.000114*****	**0.000151*****	**-1.51E-04*****	**-1.40E-04*****
	t.stat	**(2.73E+00)**	**(1.29E+00)**	**(-0.321246)**	**(3.006399)**	**(-0.157578)**	**(-0.205863)**
Post-Pandemic	**Coef.**	**0.0000446*****	**-0.0000249*****	**-0.0000252*****	**4.22E-05*****	**-4.08E-05*****	**-1.50E-05*****
	t.stat	**(2.858603)**	**(-0.398738)**	**(-0.452976)**	**(2.879286)**	**(-0.208608)**	**(-0.152001)**
Panel B: EGX 70		γ_0	γ^{L}_1 5%	γ^{U}_1 5%	γ_0	γ^{L}_2 1%	γ^{U}_2 1%
Complete Sample	**Coef.**	**0.004119*****	**-0.003882*****	**0.225131*****	**1.56E-02*****	**-1.55E-02*****	**-1.55E-02*****
	t.stat	**(0.333678)**	**(-0.072039)**	**(4.178288)**	**(1.291755)**	**(-0.127774)**	**(-0.127521)**
Egyptian revolution	**Coef.**	**0.001677*****	**-0.001316*****	**-0.000797*****	**1.57E-03*****	**-1.49E-03*****	**-1.46E-03*****
	t.stat	**(2.314645)**	**(-0.509675)**	**(-0.324398)**	**(2.311591)**	**(-0.249033)**	**(-0.302329)**
Pre-Economic Shifting	**Coef.**	**8.78E-05*****	**-4.45E-05*****	**-6.58E-05*****	**8.43E-05*****	**-7.10E-05*****	**-5.55E-05*****
	t.stat	**(4.297387)**	**(-0.538103)**	**(-0.660477)**	**(4.327243)**	**(-0.331292)**	**(-0.279667)**
Post-Economic Shifting	**Coef.**	**1.85E-02*****	**-1.81E-02*****	**2.97E+00*****	**8.17E-02*****	**-8.16E-02*****	**-8.17E-02*****
	t.stat	**(0.371015)**	**(-0.040661)**	**(8.170937)**	**(1.246369)**	**(-0.098051)**	**(-0.056771)**
Pre-Pandemic	**Coef.**	**0.000137*****	**0.000418*****	**-0.000118*****	**1.53E-04*****	**-1.43E-04*****	**-1.53E-04*****
	t.stat	**(2.716775)**	**(1.309938)**	**(-0.276883)**	**(2.999464)**	**(-0.206166)**	**(-0.157215)**
Post-Pandemic	**Coef.**	**4.18E-05*****	**-2.09E-05*****	**1.20E-05*****	**4.28E-05*****	**-1.65E-05*****	**-3.50E-05*****
	t.stat	**(2.617092)**	**(-0.344832)**	**(0.229637)**	**(2.867282)**	**(-0.174149)**	**(-0.215579)**
Panel C: EGX 30		γ_0	γ^{L}_1 5%	γ^{U}_1 5%	γ_0	γ^{L}_2 1%	γ^{U}_2 1%
Complete Sample	**Coef.**	**1.69E-02*****	**-0.016479*****	**-0.016044*****	**0.015539*****	**-0.015164*****	**-0.012393*****
	t.stat	**(1.342208)**	**(-0.299937)**	**(-0.292032)**	**(1.288299)**	**(-0.124741)**	**(-0.101947)**
Egyptian revolution	**Coef.**	**1.65E-03*****	**-0.000935*****	**-0.001113*****	**1.53E-03*****	**-6.55E-04*****	**-1.38E-03*****
	t.stat	**(2.287519)**	**(-0.370706)**	**(-0.397846)**	**(2.260363)**	**(-0.10886)**	**(-0.216022)**
Pre-Economic Shifting	**Coef.**	**9.07E-05*****	**-4.38E-05*****	**-5.84E-05*****	**8.45E-05*****	**8.74E-06*****	**-2.46E-05*****
	t.stat	**(4.47226)**	**(-0.520904)**	**(-0.733576)**	**(4.404626)**	**(0.053478)**	**(-0.126341)**
Post-Economic Shifting	**Coef.**	**8.59E-02*****	**-8.59E-02*****	**-8.21E-02*****	**0.082642*****	**-0.082641*****	**-0.072752*****
	t.stat	**(1.275713)**	**(-0.156657)**	**(-0.255455)**	**(1.251091)**	**(-0.099113)**	**(-0.132726)**
Pre-Pandemic	**Coef.**	**1.23E-04*****	**6.92E-04*****	**-9.39E-05*****	**0.000158*****	**-0.000158*****	**-0.000145*****
	t.stat	**(2.581574)**	**(2.775332)**	**(-0.331733)**	**(3.120604)**	**(-0.163789)**	**(-0.26082)**
Post-Pandemic	**Coef.**	**5.41E-05*****	**-2.34E-05*****	**5.88E-05*****	**5.39E-05*****	**-3.47E-05*****	**0.000158*****
	t.stat	**(3.546853)**	**(-0.34766)**	**(0.747987)**	**(3.723754)**	**(-0.309447)**	**(1.154406)**

*Note: This table reports the estimated coefficients for the benchmark Eq(3). The sample periods are from June 2010 June 2020. Eq (3) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Equation (3) estimated for all indexes through the least squares method, with White's variance and covariance matrix since heteroscedasticity detect. The results obtained for the EGX 100 are in Panel A. EGX 70 is in Panel B, and EGX 30 is in Panel C of Table 3. Herding is not detected in any index for any period for the $CSSD_t$ at different significant levels of 5% and 1%; the herding existed for the gamma coefficients to be negative and significant. That means the model constraints focus on extreme moments and do not detect the herding behavior in the frontier market. However, it could identify in developed and developing exchange markets with high liquidity as previous studies are prove that, and this can identify why empirical analysis in the emerging and frontier market apply only CSAD model.

The CSAD Model in this paper uses the market return factor estimate for all indexes through two approaches: first with the least squares' method only; second, the least squares method with White's variance and covariance matrix. Since the former excludes the market return factor, the results obtained for the EGX 100 are shown in Panel A, the EGX 70 is in Panel B, and the EGX 30 is in Panel C of Table 4. Herding existed only in EGX 100 in the pre-economic shifting phase, EGX 70 in the Pre-economic shifting and pre-pandemic phases, and EGX 30 in the post-pandemic sub-period. Furthermore, that explained the necessity of different strategies for every index and augmented the herding behavior in the Egyptian exchange is only a short-lived phenomenon and can be observed along different periods forced by different weighted companies in the index.

Furthermore, observe that adverse herding highly existed in it. In particular, a negative, significant γ^3 coefficient would indicate the presence of herding behavior. In some cases, negative γ^3 but not statistically significant since the least, considering the presence of heteroscedasticity, has been detected. The results obtained for the EGX 100, the EGX 70, and the EGX 30 are in Table 5. Herding none detected in any index for any period. Then this can conclude with the same result from the CSSD Model illustrated in table 3.

Table 4: Estimates of the herding behavior with the $CSAD_t$ measures

Panel A: EGX 100		γ_0	γ_1	γ_2	γ_3
Complete Sample	**Coef.**	**0.013306*****	**9.49E-02*****	**2.85E-01*****	**-1.115744*****
	t.stat	**(12.79762)**	**(2.296890)**	**(2.727309)**	**(-0.682221)**
Egyptian revolution	**Coef.**	**0.013180*****	**0.076175*****	**0.145849*****	**0.399791*****
	t.stat	**(11.08198)**	**(1.858236)**	**(1.467477)**	**(0.316812)**
Pre-Economic Shifting	**Coef.**	**0.011596*****	**0.011370*****	**0.196871*****	**-1.276509*****
	t.stat	**(58.30518)**	**(1.636916)**	**(8.930775)**	**(-3.238309)**
Post-Economic Shifting	**Coef.**	**0.010666*****	**0.615893*****	**1.332123*****	**-13.51565*****
	t.stat	**(1.698326)**	**(2.000284)**	**(1.255125)**	**(-0.414286)**
Pre-Pandemic	**Coef.**	**0.011492*****	**-0.012083*****	**0.320369*****	**-1.640017*****
	t.stat	**(40.82096)**	**(-0.836000)**	**(8.117050)**	**(-1.883563)**
Post-Pandemic	**Coef.**	**0.017674*****	**-0.010886*****	**0.152662*****	**-0.038513*****
	t.stat	**(45.48494)**	**(-0.765094)**	**(3.485164)**	**(-0.045815)**
Panel B: EGX 70		γ_0	γ_1	γ_2	γ_3
Complete Sample	**Coef.**	**0.013385*****	**0.088263*****	**0.262035*****	**-0.849287*****
	t.stat	**(14.15524)**	**(2.388422)**	**(2.849253)**	**(-0.610008)**
Egyptian revolution	**Coef.**	**0.013070*****	**0.065401*****	**0.131622*****	**0.367782*****
	t.stat	**(10.93957)**	**(1.649277)**	**(1.376239)**	**(0.317003)**
Pre-Economic Shifting	**Coef.**	**0.011704*****	**0.016184*****	**0.199891*****	**-1.489586*****
	t.stat	**(57.71768)**	**(2.304514)**	**(9.034588)**	**(-3.815616)**
Post-Economic Shifting	**Coef.**	**0.014255*****	**0.688933*****	**0.273756*****	**27.87471*****
	t.stat	**(2.523085)**	**(2.371687)**	**(0.273870)**	**(0.848716)**
Pre-Pandemic	**Coef.**	**0.011416*****	**-0.013006*****	**0.361483*****	**-2.445336*****
	t.stat	**(41.74521)**	**(-0.898521)**	**(9.366281)**	**(-2.954169)**
Post-Pandemic	**Coef.**	**0.017990*****	**0.001315*****	**0.127657*****	**0.623514*****
	t.stat	**(42.92855)**	**(0.094741)**	**(2.747880)**	**(0.692371)**
Panel C: EGX 30		γ_0	γ_1	γ_2	γ_3
Complete Sample	**Coef.**	**0.015298*****	**0.044129*****	**0.138094*****	**0.671588*****
	t.stat	**(15.31696)**	**(1.081090)**	**(1.211619)**	**(0.329716)**
Egyptian revolution	**Coef.**	**0.013073*****	**0.053624*****	**0.290334*****	**-1.004312*****
	t.stat	**(10.34844)**	**(1.160666)**	**(2.334450)**	**(-0.523906)**
Pre-Economic Shifting	**Coef.**	**0.012315*****	**0.013583*****	**0.161200*****	**0.008381*****
	t.stat	**(52.75499)**	**(1.613890)**	**(5.818277)**	**(0.015308)**
Post-Economic Shifting	**Coef.**	**0.023304*****	**0.175721*****	**-0.554354*****	**16.05682*****
	t.stat	**(4.051821)**	**(0.625281)**	**(-0.606439)**	**(0.618411)**
Pre-Pandemic	**Coef.**	**0.012846*****	**-0.006440*****	**0.148028*****	**3.126436*****
	t.stat	**(33.94771)**	**(-0.340609)**	**(2.542835)**	**(1.979237)**
Post-Pandemic	**Coef.**	**0.017765*****	**-0.035963*****	**0.363459*****	**-3.325996*****
	t.stat	**(39.94854)**	**(-1.792570)**	**(6.742393)**	**(-3.672621)**

*Note: This table reports the estimated coefficients for the benchmark Eq(5). The sample periods are from June 2010 – June 2020. Eq (4) estimated using OLS. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Table 5: Estimates of the herding behavior with the $CSAD_t$ measures.

Panel A: EGX 100		γ_0	γ_1	γ_2
Complete Sample	**Coef.**	**0.000837*****	**0.074599*****	**0.612335*****
	t.stat	**(1.046976)**	**(1.482022)**	**(0.567557)**
Egyptian revolution	**Coef.**	**0.000333*****	**0.017900*****	**0.116394*****
	t.stat	**(0.967525)**	**(0.951956)**	**(0.362973)**
Pre-Economic Shifting	**Coef.**	**8.32E-06*****	**-1.57E-05*****	**0.010130*****
	t.stat	**(8.465649)**	**(-0.272813)**	**(6.861287)**
Post-Economic Shifting	**Coef.**	**0.001810*****	**0.655704*****	**17.49253*****
	t.stat	**(0.400502)**	**(1.702383)**	**(0.975963)**
Pre-Pandemic	**Coef.**	**9.11E-06*****	**5.47E-05*****	**0.027610*****
	t.stat	**(5.792209)**	**(0.400784)**	**(6.726967)**
Post-Pandemic	**Coef.**	**1.46E-05*****	**6.44E-05*****	**0.008519*****
	t.stat	**(5.813723)**	**(0.442905)**	**(2.307727)**
Panel B: EGX 70		γ_0	γ_1	γ_2
Complete Sample	**Coef.**	**0.000668*****	**0.065612*****	**0.616295*****
	t.stat	**(1.050446)**	**(1.682016)**	**(0.763241)**
Egyptian revolution	**Coef.**	**0.000348*****	**0.015222*****	**0.076339*****
	t.stat	**(0.983651)**	**(0.819796)**	**(0.251964)**
Pre-Economic Shifting	**Coef.**	**8.74E-06*****	**-5.87E-06*****	**0.009371*****
	t.stat	**(8.389635)**	**(-0.097279)**	**(6.156477)**
Post-Economic Shifting	**Coef.**	**-0.000348*****	**0.675125*****	**31.30159*****
	t.stat	**(-0.097070)**	**(2.166064)**	**(2.007321)**
Pre-Pandemic	**Coef.**	**9.63E-06*****	**0.000100*****	**0.025077*****
	t.stat	**(6.444500)**	**(0.756107)**	**(6.583150)**
Post-Pandemic	**Coef.**	**1.55E-05*****	**-1.77E-05*****	**0.008315*****
	t.stat	**(5.984992)**	**(-0.130407)**	**(2.324787)**
Panel C: EGX 30		γ_0	γ_1	γ_2
Complete Sample	**Coef.**	**0.000915*****	**0.018609*****	**-0.210002*****
	t.stat	**(1.407938)**	**(0.429310)**	**(-0.194099)**
Egyptian revolution	**Coef.**	**0.000320*****	**0.025383*****	**0.259633*****
	t.stat	**(0.895091)**	**(1.184417)**	**(0.566861)**
Pre-Economic Shifting	**Coef.**	**9.64E-06*****	**1.63E-06*****	**0.020340*****
	t.stat	**(6.225893)**	**(0.017122)**	**(7.481324)**
Post-Economic Shifting	**Coef.**	**0.004834*****	**0.127152*****	**-6.942561*****
	t.stat	**(1.325120)**	**(0.404448)**	**(-0.544317)**
Pre-Pandemic	**Coef.**	**1.23E-05*****	**-0.000143*****	**0.042911*****
	t.stat	**(3.409912)**	**(-0.464380)**	**(3.605304)**
Post-Pandemic	**Coef.**	**2.40E-05*****	**0.000725*****	**0.025624*****
	t.stat	**(5.300491)**	**(2.234127)**	**(3.751563)**

*Note: This table reports the estimated coefficients for the benchmark Eq(5). The sample periods are from June 2010 June 2020. Eq (5) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Table 6: Estimates of the herding behavior with the $CSAD_t^{UP}$, $CSAD_t^{Down}$ measures

Panel A: EGX 100		γ_0	γ_1^{UP}	γ_2^{UP}	γ_0	γ_1^{Down}	γ_2^{Down}
Complete Sample	**Coef.**	**0.003308*****	**1.470869*****	**-19.39370*****	**0.003158*****	**0.820816*****	**-6.475038*****
	t.stat	**(4.162100)**	**(11.51374)**	**(-6.502770)**	**(23.84309)**	**(43.44103)**	**(-21.20675)**
Egyptian revolution	**Coef.**	**0.003220*****	**1.249809*****	**-16.46506*****	**0.002931*****	**0.630483*****	**-3.677579*****
	t.stat	**(3.536695)**	**(8.807976)**	**(-5.232573)**	**(11.84192)**	**(22.40021)**	**(-10.39486)**
Pre-Economic Shifting	**Coef.**	**0.002885*****	**1.023307*****	**-11.77795*****	**0.002434*****	**0.989373*****	**-13.44086*****
	t.stat	**(13.22851)**	**(31.78599)**	**(-19.13935)**	**(12.71312)**	**(25.97036)**	**(-14.93320)**
Post-Economic Shifting	**Coef.**	**0.002064*****	**3.140448*****	**-42.05346*****	**0.002272*****	**1.877859*****	**-40.48785*****
	t.stat	**(0.478437)**	**(3.210593)**	**(-1.140973)**	**(6.679214)**	**(19.22954)**	**(-11.24948)**
Pre-Pandemic	**Coef.**	**0.002483*****	**1.544191*****	**-29.93318*****	**0.002659*****	**1.279083*****	**-16.02029*****
	t.stat	**(8.860587)**	**(21.64473)**	**(-11.07942)**	**(9.063262)**	**(22.72790)**	**(-12.84496)**
Post-Pandemic	**Coef.**	**0.003732*****	**1.800405*****	**-38.30233*****	**0.003069*****	**1.400271*****	**-16.51014*****
	t.stat	**(8.276405)**	**(19.73021)**	**(-12.00455)**	**(8.166345)**	**(21.02419)**	**(-13.67758)**
Panel B: EGX 70		γ_0	γ_1^{UP}	γ_2^{UP}	γ_0	γ_1^{Down}	γ_2^{Down}
Complete Sample	**Coef.**	**0.003450*****	**1.391151*****	**-17.73622*****	**0.003162*****	**0.791678*****	**-5.937657*****
	t.stat	**(4.729551)**	**(12.18535)**	**(-6.780372)**	**(23.82195)**	**(43.27877)**	**(-20.89249)**
Egyptian revolution	**Coef.**	**0.003073*****	**1.178790*****	**-15.02756*****	**0.003039*****	**0.595442*****	**-3.288886*****
	t.stat	**(3.361822)**	**(8.624748)**	**(-5.159535)**	**(12.39167)**	**(22.28137)**	**(-10.27265)**
Pre-Economic Shifting	**Coef.**	**0.003016*****	**1.016372*****	**-11.71497*****	**0.002425*****	**0.973404*****	**-13.05502*****
	t.stat	**(13.61663)**	**(31.49713)**	**(-19.16848)**	**(12.49847)**	**(25.93395)**	**(-15.01316)**
Post-Economic Shifting	**Coef.**	**0.003580*****	**1.936089*****	**19.76428*****	**0.002523*****	**1.917653*****	**-42.48151*****
	t.stat	**(0.003879)**	**(0.933954)**	**(39.75260)**	**(0.000353)**	**(0.104958)**	**(3.915839)**
Pre-Pandemic	**Coef.**	**0.002782*****	**1.546422*****	**-29.49135*****	**0.002444*****	**1.328021*****	**-16.52783*****
	t.stat	**(9.406592)**	**(20.81756)**	**(-10.73433)**	**(8.881766)**	**(24.91608)**	**(-14.48602)**
Post-Pandemic	**Coef.**	**0.003977*****	**1.830766*****	**-40.21848*****	**0.002360*****	**1.443273*****	**-17.26197*****
	t.stat	**(8.821443)**	**(20.10364)**	**(-12.72944)**	**(6.547287)**	**(22.35141)**	**(-14.53561)**
Panel C: EGX 30		γ_0	γ_1^{UP}	γ_2^{UP}	γ_0	γ_1^{Down}	γ_2^{Down}
Complete Sample	**Coef.**	**0.004103*****	**1.353329*****	**-18.21722*****	**0.003328*****	**1.076102*****	**-10.80024*****
	t.stat	**(5.624777)**	**(10.47993)**	**(-5.713092)**	**(22.27177)**	**(44.33632)**	**(-23.41190)**
Egyptian revolution	**Coef.**	**0.003002*****	**1.419977*****	**-19.07458*****	**0.003008*****	**0.902567*****	**-7.129629*****
	t.stat	**(3.302019)**	**(9.425651)**	**(-5.394105)**	**(10.63233)**	**(23.50673)**	**(-11.64107)**
Pre-Economic Shifting	**Coef.**	**0.003192*****	**1.062742*****	**-12.60971*****	**0.002294*****	**1.147506*****	**-17.13751*****
	t.stat	**(13.72067)**	**(28.57912)**	**(-15.77909)**	**(11.14608)**	**(26.92374)**	**(-15.48969)**
Post-Economic Shifting	**Coef.**	**0.007608*****	**1.692647*****	**-28.15993*****	**0.002359*****	**2.188308*****	**-57.50977*****
	t.stat	**(1.952158)**	**(2.063006)**	**(-1.156312)**	**(6.487179)**	**(19.46689)**	**(-11.48919)**
Pre-Pandemic	**Coef.**	**0.001974*****	**1.740868*****	**-41.24522*****	**0.003379*****	**1.335873*****	**-19.21104*****
	t.stat	**(7.209847)**	**(20.84741)**	**(-10.78806)**	**(9.110956)**	**(17.01088)**	**(-8.982243)**
Post-Pandemic	**Coef.**	**0.004581*****	**1.750184*****	**-27.78536*****	**0.004208*****	**1.672964*****	**-18.69003*****
	t.stat	**(9.429248)**	**(16.95611)**	**(-9.536896)**	**(9.446560)**	**(22.22922)**	**(-15.57676)**

*Note: This table reports the estimated coefficients for the benchmark Eq(6),(7) The sample periods are from June 2010 – June 2020. Eq (6),(7) estimated using OLS with white's variance and covariance matrix due to heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Equation (6) and (7) estimates all indexes through bull and bear market days—results for the EGX 100, the EGX 70, and the EGX 30 in Table 6. Herding existed in the complete sample and sub-samples in EGX 100, EGX 30, and EGX 70. In the complete sample, Egyptian revolution, pre-economic shift, pre-pandemic, and post-pandemic, which means the Egyptian exchange market was highly affected by bull and bear market days classification. Then can be detected this behavior for the main indexes at the same periods. A negative, significant γ_2^{UP}, γ_2^{Down} coefficient would indicate the presence of herding behavior.

Table 7: Estimates of the herding behavior with the $CSAD_t$ measures

Panel A: EGX 100		γ_0	γ_1^{Down}	γ_2^{UP}	γ_3^{Down}	γ_4^{UP}
Complete Sample	**Coef.**	**0.012837*****	**0.149721*****	**0.571303**	**0.152133*****	**-6.609468*****
	t.stat	**(12.06952)**	**(1.287868)**	**(3.970421)**	**(0.087137)**	**(-2.117337)**
Egyptian revolution	**Coef.**	**0.012547*****	**0.068182*****	**0.422951**	**0.768484*****	**-4.668243*****
	t.stat	**(10.05746)**	**(0.619625)**	**(2.642985)**	**(0.600471)**	**(-1.413124)**
Pre-Economic Shifting	**Coef.**	**0.011805*****	**0.059901*****	**0.232086**	**2.013032*****	**-2.233550*****
	t.stat	**(60.03651)**	**(2.037789)**	**(9.787446)**	**(3.105349)**	**(-5.407068)**
Post-Economic Shifting	**Coef.**	**0.010668*****	**0.724601*****	**1.941456**	**-13.90890*****	**-13.18952*****
	t.stat	**(1.696427)**	**(0.564087)**	**(1.660075)**	**(-0.323712)**	**(-0.329456)**
Pre-Pandemic	**Coef.**	**0.011559*****	**0.334431*****	**0.269535**	**-1.798758*****	**0.045085*****
	t.stat	**(39.76004)**	**(7.686086)**	**(4.622833)**	**(-2.026532)**	**(0.022337)**
Post-Pandemic	**Coef.**	**0.017913*****	**0.161520*****	**0.055434**	**-0.153149*****	**3.145898*****
	t.stat	**(43.03565)**	**(3.201378)**	**(0.812303)**	**(-0.181885)**	**(1.443133)**
Panel B: EGX 70		γ_0	γ_1^{Down}	γ_2^{UP}	γ_3^{Down}	γ_4^{UP}
Complete Sample	**Coef.**	**0.012950*****	**0.140310*****	**0.521056**	**0.186933*****	**-5.651225*****
	t.stat	**(13.37011)**	**(1.369600)**	**(4.073080)**	**(0.126240)**	**(-2.070801)**
Egyptian revolution	**Coef.**	**0.012460*****	**0.065052*****	**0.384329**	**0.695513*****	**-4.174667*****
	t.stat	**(9.949350)**	**(0.612728)**	**(2.496562)**	**(0.591071)**	**(-1.366796)**
Pre-Economic Shifting	**Coef.**	**0.011905*****	**0.059363*****	**0.242935**	**1.728010*****	**-2.501292*****
	t.stat	**(59.53479)**	**(2.033891)**	**(10.19994)**	**(2.736967)**	**(-6.072835)**
Post-Economic Shifting	**Coef.**	**0.014472*****	**0.198675*****	**0.371345**	**-1.355857*****	**60.46562*****
	t.stat	**(2.561370)**	**(0.164930)**	**(0.335804)**	**(-0.033118)**	**(1.416723)**
Pre-Pandemic	**Coef.**	**0.011437*****	**0.375290*****	**0.336091**	**-2.497682*****	**-1.911049*****
	t.stat	**(40.52225)**	**(8.789050)**	**(5.954837)**	**(-2.953003)**	**(-0.999492)**
Post-Pandemic	**Coef.**	**0.018211*****	**0.122134*****	**0.056550**	**0.572186*****	**3.202297*****
	t.stat	**(39.80743)**	**(2.272711)**	**(0.765789)**	**(0.635050)**	**(1.376004)**
Panel C: EGX 30		γ_0	γ_1^{Down}	γ_2^{UP}	γ_3^{Down}	γ_4^{UP}
Complete Sample	**Coef.**	**0.015205*****	**0.075320*****	**0.235123**	**1.253045*****	**-0.946344*****
	t.stat	**(15.04682)**	**(0.589113)**	**(1.605021)**	**(0.556944)**	**(-0.282632)**
Egyptian revolution	**Coef.**	**0.012658*****	**0.210553*****	**0.514469**	**-0.101814*****	**-5.769198*****
	t.stat	**(9.787628)**	**(1.540047)**	**(2.958994)**	**(-0.050618)**	**(-1.532187)**
Pre-Economic Shifting	**Coef.**	**0.012422*****	**0.076803*****	**0.192033**	**2.074231*****	**-0.678075*****
	t.stat	**(52.86586)**	**(2.092131)**	**(6.347670)**	**(2.346216)**	**(-1.145985)**
Post-Economic Shifting	**Coef.**	**0.023665*****	**-1.049731*****	**-0.340847**	**32.08099*****	**13.78658*****
	t.stat	**(4.045712)**	**(-0.802345)**	**(-0.345390)**	**(0.607402)**	**(0.514571)**
Pre-Pandemic	**Coef.**	**0.013062*****	**0.157309*****	**-0.005699**	**2.566468*****	**10.42513*****
	t.stat	**(33.52102)**	**(2.446752)**	**(-0.063914)**	**(1.611070)**	**(2.793578)**
Post-Pandemic	**Coef.**	**0.018105*****	**0.411564*****	**0.160000**	**-3.818692*****	**2.075996*****
	t.stat	**(39.76197)**	**(6.780620)**	**(2.045212)**	**(-4.186444)**	**(1.008062)**

*Note: This table reports the estimated coefficients for the benchmark Eq(8). The sample periods are from June 2010 June 2020. Eq (8) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Equation (8) estimates all indexes through bull and bear market days. The results are shown in Table 7, for that herding existed in the EGX 100 shown in Panel A. In the complete sample, Pre-economic sub-period only in γ_4^{UP}, and pre-pandemic subsample for γ_3^{Down}. Then can identify the market day's direction and observe the herding behavior for buying and selling power to identify new short-lived opportunities for investment decision makers during EGX 100. EGX 70 shown in the herding results were in the complete sample, the pre-economic sub-period only in γ_4^{UP}, and the pre-pandemic subsample for γ3Down. Then EGX 70 matched with EGX 100; this depends on the weighted of construct both index as an equally weighted version and EGX 30 in Panel C. The herding results were in the post-pandemic subsample for γ_3^{Down} but did not exist in γ_4^{UP}. Then these results augmented the awkwardness for this index in investment decisions making, supported by value-weighted companies then cannot detect herding along the periods but observed only in the great bull days, and a gain the adverse herding behavior observed and existed in it.

Table 8: Wald tests for equality of the herding behavior Coefficients with the $CSAD_t$ measures.

		$H_0: \gamma_3^{Down} = \gamma_4^{UP}$		
		EGX 100	***EGX 70***	***EGX 30***
Complete Sample	$\gamma_3^{Down} - \gamma_4^{UP}$	**-6.622305*** **	**-5.664175*** **	**-0.961549*** **
	Chi-Sq	**(4.501949)**	**(4.309275)**	**(0.082492)**
Egyptian revolution	$\gamma_3^{Down} - \gamma_4^{UP}$	**-4.680790*** **	**-4.187127*** **	**-5.781857*** **
	Chi-Sq	**(2.008391)**	**(1.880031)**	**(2.358678)**
Pre-Economic Shifting	$\gamma_3^{Down} - \gamma_4^{UP}$	**-2.245356*** **	**-2.513197*** **	**-0.690497*** **
	Chi-Sq	**(29.56058)**	**(37.24940)**	**(1.362394)**
Post-Economic Shifting	$\gamma_3^{Down} - \gamma_4^{UP}$	**-13.20019*** **	**60.45115*** **	**13.76292*** **
	Chi-Sq	**(0.108735)**	**(2.006407)**	**(0.263940)**
Pre-Pandemic	$\gamma_3^{Down} - \gamma_4^{UP}$	**0.033525*** **	**-1.922486*** **	**10.41206*** **
	Chi-Sq	**(0.000276)**	**(1.011118)**	**(7.785325)**
Post-Pandemic	$\gamma_3^{Down} - \gamma_4^{UP}$	**3.127985*** **	**3.184086*** **	**2.057891*** **
	Chi-Sq	**(2.059421)**	**(1.872356)**	**(0.998757)**

*Note: This table reports the Chi-square statistics corresponding to the Wald tests for the null hypothesis.. $\gamma_3^{Down} = \gamma_4^{UP}$ in the model estimated in Eq(8). The sample periods are from June 2010 – June 2020. Eq (8) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

In addition, the results of the Wald test for the null hypothesis that the herding coefficients (γ_3^{Down} and γ_4^{UP}) are equal on days with rising-bullish- and falling-bearish- market prices. The hypothesis is rejected, thus indicating that such asymmetry is significant in EGX 100 from the complete sample to the post-economic phase. The EGX 70 for the complete sample, pre-economic, and post-economic phases, and the EGX 30, the herding coefficients (γ_3^{Down} and γ_4^{UP}) are not equal on days with rising. With falling market prices, the hypothesis cannot reject. When comparing these results with those collected in Table 6, although showing a negative coefficient in the quadratic term for bearish days, investors behave differently when the market is trending downwards. These investors could be showing a more substantial loss aversion bias, so they would be more concerned about the risk in a down market and more likely to exhibit herding behavior.

Table 9: Estimates of the herding behavior with the $CSAD_t^{\sigma 2\ HIGH}$, $CSAD_t^{\sigma 2\ LOW}$ measures.

Panel A: EGX 100		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ HIGH}$	γ_0	$\gamma_1^{\sigma 2\ LOW}$	$\gamma_2^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**0.001784*****	**1.962403*****	**-27.68909*****	**0.005792*****	**0.643196*****	**-4.836948*****
	t.stat	**(2.581823)**	**(13.58131)**	**(-9.069646)**	**(39.56907)**	**(35.71964)**	**(-17.03534)**
Egyptian revolution	**Coef.**	**0.001970*****	**1.841483*****	**-26.73954*****	**0.005268*****	**0.474307*****	**-2.386292*****
	t.stat	**(2.503961)**	**(11.23069)**	**(-7.804469)**	**(21.95852)**	**(19.68671)**	**(-8.158708)**
Pre-Economic Shifting	**Coef.**	**0.001533*****	**1.235752*****	**-15.84408*****	**0.004525*****	**0.757678*****	**-9.509976*****
	t.stat	**(8.405550)**	**(33.37466)**	**(-20.91116)**	**(21.13820)**	**(25.33648)**	**(-14.52104)**
Post-Economic Shifting	**Coef.**	**0.000150*****	**5.809466*****	**-111.2229*****	**0.005985*****	**1.316960*****	**-28.24319*****
	t.stat	**(0.042806)**	**(4.479649)**	**(-2.253859)**	**(13.43216)**	**(14.78216)**	**(-8.958523)**
Pre-Pandemic	**Coef.**	**0.001251*****	**1.407608*****	**-17.86667*****	**0.004700*****	**1.300689*****	**-31.56897*****
	t.stat	**(5.167769)**	**(25.34972)**	**(-14.57946)**	**(14.48455)**	**(16.58069)**	**(-8.700161)**
Post-Pandemic	**Coef.**	**0.002922*****	**1.553712*****	**-19.13064*****	**0.004828*****	**1.195599*****	**-16.08978*****
	t.stat	**(7.148990)**	**(22.84268)**	**(-14.29894)**	**(11.60194)**	**(18.81104)**	**(-10.93842)**
Panel B: EGX 70		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ HIGH}$	γ_0	$\gamma_1^{\sigma 2\ LOW}$	$\gamma_2^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**5.76E-06*****	**0.986801*****	**-0.024486*****	**-2.53E-06*****	**0.992750*****	**0.135032*****
	t.stat	**(0.805481)**	**(1911.676)**	**(-51.87246)**	**(-0.48395)**	**(819.0392)**	**(2.039632)**
Egyptian revolution	**Coef.**	**1.99E-05*****	**0.969409*****	**0.049721*****	**-3.28E-06*****	**0.999368*****	**-0.568371*****
	t.stat	**(1.973308)**	**(1013.036)**	**(23.66841)**	**(-0.26293)**	**(387.8993)**	**(-4.064895)**
Pre-Economic Shifting	**Coef.**	**7.67E-07*****	**1.005390*****	**-0.833867*****	**-6.95E-07*****	**0.993393*****	**0.071385*****
	t.stat	**(0.127653)**	**(441.0756)**	**(-7.157398)**	**(-0.07169)**	**(325.6820)**	**(0.351052)**
Post-Economic Shifting	**Coef.**	**0.000104*****	**0.970565*****	**-0.012107*****	**5.99E-08*****	**0.987955*****	**0.506050*****
	t.stat	**(6.768299)**	**(1186.999)**	**(-17.53819)**	**(0.006342)**	**(426.7873)**	**(4.018972)**
Pre-Pandemic	**Coef.**	**-7.97E-07*****	**1.027713*****	**-2.039498*****	**-2.58E-06*****	**0.996648*****	**-0.163547*****
	t.stat	**(-0.108560)**	**(378.0814)**	**(-16.45092)**	**(-0.24610)**	**(338.5062)**	**(-0.874982)**
Post-Pandemic	**Coef.**	**3.91E-07*****	**1.006456*****	**-0.532974*****	**-1.92E-06*****	**1.000096*****	**-0.108464*****
	t.stat	**(0.032666)**	**(325.5692)**	**(-4.586556)**	**(-0.14784)**	**(240.9798)**	**(-0.522731)**

Panel C: EGX 30		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ HIGH}$	γ_0	$\gamma_1^{\sigma 2\ LOW}$	$\gamma_2^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**5.87E-06*** **	**0.987373*** **	**-0.024521*** **	**-2.56E-06*** **	**0.995495*** **	**-0.046255*** **
	t.stat	**(0.819946)**	**(2000.228)**	**(-54.58203)**	**(-0.52270)**	**(967.4507)**	**(-0.873425)**
Egyptian revolution	**Coef.**	**1.26E-05*** **	**0.973741*** **	**0.041325*** **	**-3.22E-06*** **	**0.996554*** **	**-0.204277*** **
	t.stat	**(1.172988)**	**(1043.224)**	**(19.82478)**	**(-0.27078)**	**(477.6043)**	**(-2.095826)**
Pre-Economic Shifting	**Coef.**	**1.74E-06*** **	**0.995785*** **	**-0.239494*** **	**-3.03E-06*** **	**1.001879*** **	**-0.535949*** **
	t.stat	**(0.281640)**	**(527.1972)**	**(-2.741227)**	**(-0.34716)**	**(354.5759)**	**(-2.871025)**
Post-Economic Shifting	**Coef.**	**0.000104*** **	**0.970656*** **	**-0.011855*** **	**1.55E-06*** **	**0.987342*** **	**0.527558*** **
	t.stat	**(6.540571)**	**(1170.533)**	**(-17.10059)**	**(0.146622)**	**(457.0685)**	**(4.889402)**
Pre-Pandemic	**Coef.**	**3.80E-06*** **	**0.995948*** **	**-0.380885*** **	**-1.79E-06*** **	**0.993093*** **	**0.104746*** **
	t.stat	**(0.392937)**	**(390.0705)**	**(-3.843826)**	**(-0.15853)**	**(321.7408)**	**(0.550077)**
Post-Pandemic	**Coef.**	**1.54E-06*** **	**0.991218*** **	**0.060133*** **	**-2.61E-06*** **	**1.006337*** **	**-0.604472*** **
	t.stat	**(0.162787)**	**(524.3142)**	**(0.977224)**	**(-0.24086)**	**(307.5147)**	**(-3.724243)**

*Note: This table reports the estimated coefficients for the benchmark Eq(9),(10). The sample periods are from June 2010 – June 2020. Eq (9),(10) estimates using OLS with white's variance and covariance matrix due to heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Equation (9) estimates for all indexes through High volatility Market days $\gamma_2^{\sigma 2\ HIGH}$—the result obtained for the EGX 100. The herding existed in the complete sample and all sub-samples, the EGX 70. The herding existed in the complete sample and the sub-samples, excluding the Egyptian revolution phase. Furthermore, the EGX 30 that herding existed in the complete sample and the sub-samples exclude the Egyptian revolution and the post-pandemic phases. Moreover, this explains more the paradigm between indexes to support the herding studies must take the higher constructed index with most stocks in the market to give clear explanations for the herding. As illustrated above, the EGX 30 and 70 cannot detect the herding behavior with a small effect with volatility measurement. However, EGX 100 can observe it with a weak signal of normal volatility during some periods like the Egyptian revolution.

Equation (10) estimates all indexes through low volatility Market days $\gamma_2^{\sigma 2\ LOW}$. The fact that herding existed in the complete sample and sub-samples in EGX 100, in EGX70 herding, excited only in the Egyptian revolution phase, and EGX 30 in the Egyptian revolution and post-pandemic phases.

Table 10: Estimates of the herding behavior with the $CSAD_t$ measures.

Panel A: EGX 100		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ LOW}$	$\gamma_3^{\sigma 2\ HIGH}$	$\gamma_4^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**0.013546*** **	**0.972010*** **	**0.019238*** **	**-13.83075*** **	**1.129628*** **
	t.stat	**(12.83316)**	**(6.119088)**	**(0.167482)**	**(-4.346599)**	**(0.669194)**
Egyptian revolution	**Coef.**	**0.012973*** **	**0.989368*** **	**-0.044629*** **	**-15.15526*** **	**1.804487*** **
	t.stat	**(10.84629)**	**(5.646434)**	**(-0.414603)**	**(-4.350161)**	**(1.465162)**
Pre-Economic Shifting	**Coef.**	**0.011783*** **	**0.363748*** **	**0.097815*** **	**-3.686123*** **	**-0.608102*** **
	t.stat	**(66.17295)**	**(14.28513)**	**(4.521624)**	**(-7.523713)**	**(-1.389723)**
Post-Economic Shifting	**Coef.**	**0.011072*** **	**4.264998*** **	**0.618599*** **	**-72.80449*** **	**-12.28934*** **
	t.stat	**(1.777556)**	**(2.858250)**	**(0.566115)**	**(-1.379222)**	**(-0.345857)**
Pre-Pandemic	**Coef.**	**0.012310*** **	**0.466553*** **	**0.022601*** **	**-4.533774*** **	**7.112020*** **
	t.stat	**(43.18289)**	**(11.37798)**	**(0.370596)**	**(-5.417241)**	**(2.730898)**
Post-Pandemic	**Coef.**	**0.018039*** **	**0.343472*** **	**-0.057152*** **	**-2.886001*** **	**2.872127*** **
	t.stat	**(53.50958)**	**(8.517918)**	**(-1.348606)**	**(-3.947916)**	**(3.216243)**
Panel B: EGX 70		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ LOW}$	$\gamma_3^{\sigma 2\ HIGH}$	$\gamma_4^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**3.40E-05*** **	**0.985966*** **	**0.987806*** **	**-0.023805*** **	**0.292319*** **
	t.stat	**(1.656258)**	**(1240.769)**	**(264.7316)**	**(-34.58879)**	**(1.618248)**
Egyptian revolution	**Coef.**	**0.000473*** **	**0.949329*** **	**0.934027*** **	**0.087484*** **	**1.477481*** **
	t.stat	**(7.958044)**	**(337.1815)**	**(106.5327)**	**(16.06474)**	**(4.417521)**
Pre-Economic Shifting	**Coef.**	**0.000119*** **	**0.992978*** **	**0.975200*** **	**-0.528788*** **	**0.737169*** **
	t.stat	**(0.852664)**	**(66.21674)**	**(45.29620)**	**(-1.330284)**	**(0.896907)**
Post-Economic Shifting	**Coef.**	**0.000565*** **	**0.963160*** **	**0.916731*** **	**-0.006378*** **	**2.674135*** **
	t.stat	**(18.96575)**	**(1195.692)**	**(146.5325)**	**(-9.603235)**	**(8.235387)**
Pre-Pandemic	**Coef.**	**-0.000420*** **	**1.069560*** **	**1.057771*** **	**-3.010867*** **	**-2.325190*** **
	t.stat	**(-2.795324)**	**(69.58249)**	**(47.33074)**	**(-7.876818)**	**(-2.812647)**
Post-Pandemic	**Coef.**	**-0.000232*** **	**1.024016*** **	**1.025749*** **	**-0.848430*** **	**-0.805703*** **
	t.stat	**(-0.881938)**	**(50.54126)**	**(34.27762)**	**(-2.184528)**	**(-0.941596)**
Panel C: EGX 30		γ_0	$\gamma_1^{\sigma 2\ HIGH}$	$\gamma_2^{\sigma 2\ LOW}$	$\gamma_3^{\sigma 2\ HIGH}$	$\gamma_4^{\sigma 2\ LOW}$
Complete Sample	**Coef.**	**3.48E-05*** **	**0.986543*** **	**0.990840*** **	**-0.023852*** **	**0.088907*** **
	t.stat	**(1.699133)**	**(1294.875)**	**(294.5048)**	**(-36.47427)**	**(0.586684)**
Egyptian revolution	**Coef.**	**0.000261*** **	**0.963613*** **	**0.964442*** **	**0.060268*** **	**0.660061*** **
	t.stat	**(4.347562)**	**(366.1151)**	**(123.6111)**	**(11.81604)**	**(2.577490)**
Pre-Economic Shifting	**Coef.**	**7.34E-05*** **	**0.988766*** **	**0.990346*** **	**-0.081890*** **	**-0.115915*** **
	t.stat	**(0.595477)**	**(80.22982)**	**(52.26226)**	**(-0.276412)**	**(-0.159625)**
Post-Economic Shifting	**Coef.**	**0.000576*** **	**0.963151*** **	**0.921319*** **	**-0.006110*** **	**2.332245*** **
	t.stat	**(18.11586)**	**(1144.960)**	**(163.6199)**	**(-8.903464)**	**(8.785268)**
Pre-Pandemic	**Coef.**	**0.000523*** **	**0.950722*** **	**0.917959*** **	**0.482299*** **	**2.700289*** **
	t.stat	**(3.537186)**	**(72.04128)**	**(42.37455)**	**(1.772390)**	**(3.385410)**
Post-Pandemic	**Coef.**	**-1.03E-05*** **	**0.992022*** **	**1.007175*** **	**0.047466*** **	**-0.626804*** **
	t.stat	**(-0.056263)**	**(78.43438)**	**(49.14589)**	**(0.223808)**	**(-1.074030)**

*Note: This table reports the estimated coefficients for the benchmark Eq(11). The sample periods are from June 2010 – June 2020. Eq (11) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

Equation (11) estimates all indexes through high and low volatility market days. The results obtained are shown in table 10, for that herding existed in the EGX 100 shown in Panel A, in the complete sample, and all sub-periods only in $\gamma_3^{\sigma 2\ HIGH}$, and pre-economic shifting phase for $\gamma_4^{\sigma 2\ LOW}$, EGX 70 is shown in Panel B. The herding results were in the complete sample, post-economic, pre, and post-pandemic sub-period only in $\gamma_3^{\sigma 2\ HIGH}$, and post-economic shifting subsample for $\gamma_4^{\sigma 2\ LOW}$ and EGX 30. The herding results were in the complete sample and post-Economic shifting subsample for $\gamma_3^{\sigma 2\ HIGH}$ but non-exist in $\gamma_4^{\sigma 2\ LOW}$.

Table 11: Wald tests for equality of the herding behavior Coefficients with the $CSAD_t$ measures.

		$H_0: \gamma_3^{\sigma 2\ HIGH} = \gamma_4^{\sigma 2\ LOW}$		
		EGX 100	***EGX 70***	***EGX 30***
Complete Sample	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**-1.116081*****	**-0.292285*****	**-0.088873*****
	Chi-Sq	**(0.437408)**	**(2.618409)**	**(0.343974)**
Egyptian revolution	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**-1.791514*****	**-1.477008*****	**-0.659800*****
	Chi-Sq	**(2.118114)**	**(19.50730)**	**(6.640591)**
Pre-Economic Shifting	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**0.619885*****	**-0.737050*****	**0.115988*****
	Chi-Sq	**(2.007713)**	**(0.804440)**	**(0.025521)**
Post-Economic Shifting	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**12.30042*****	**-2.673570*****	**-2.331669*****
	Chi-Sq	**(0.119856)**	**(67.79732)**	**(77.14976)**
Pre-Pandemic	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**-7.099711*****	**2.324770*****	**-2.699767*****
	Chi-Sq	**(7.432913)**	**(7.910833)**	**(11.46046)**
Post-Pandemic	$\gamma_3^{\sigma 2\ HIGH} - \gamma_4^{\sigma 2\ LOW}$	**-2.854088*****	**0.805471*****	**0.626794*****
	Chi-Sq	**(10.21887)**	**(0.886599)**	**(1.154161)**

*Note: This table reports the Chi-square statistics corresponding to the Wald tests for the null hypothesis.. $\gamma_3^{\sigma 2\ HIGH} = \gamma_4^{\sigma 2\ LOW}$ in the model estimated in Eq(11). The sample periods are from June 2010 – June 2020. Eq (11) estimates using OLS with white's variance and covariance matrix due to the presence of heteroscedasticity. The T-statistics has reported in parentheses. ***, ** and * represent statistical significant at the 1%, 5%, and 10% levels.*

In addition, the results of the Wald test for the null hypothesis that the herding coefficients ($\gamma_3{}^{\sigma 2\ HIGH}$ and $\gamma_4{}^{\sigma 2\ LOW}$) are equal on days with rising. With falling market prices, the hypothesis was rejected, thus indicating that such asymmetry is significant in EGX 100 in the pre and post-pandemic phases. The EGX 70 for the Egyptian revolution and post-economic phases. Furthermore, the EGX 30, the Egyptian revolution, and post-economic phases, When comparing these results with those collected in Table 9, which shows a negative coefficient in the quadratic term for low volatility days, investors behave differently when the market is trending downwards. These investors could be showing a more substantial loss aversion bias than those in the market indexes, so they would be more concerned about the risk in a down market and more likely to exhibit herding behavior.

5. Discussion of Results

This paper can introduce some findings to answer the paper's main question; does the Egyptian exchange market still have herd behavior? These results are exciting and surprising for several reasons.

- The First observation is that the use of the (Christie, W.G. and Huang , R.D., 1995)and (Chang, 2000) models provided similar results. Nevertheless, the least illustrate the existence of herding behavior affected according to the different time phases. The fit improvement came after sorting variables based on asymmetric herding behavior for bull and bear market days (Chiang, T. C., & Zheng, D., 2010). Herding Behavior for different market conditions (High and low volatility) by (Tan, L., Chiang, T. C., Mason, J. R., & Nelling, E., 2008). The latter may provide better results for Egypt's exchange market as a frontier market.
- The second observation is that, the Egyptian revolution phase the only phase can't explain any herding behavior, but detect only adverse herding behavior, this results supported from (Charilaos Mertzanis, and Noha Allam, 2018), the pandemic period supported by (Nader Alber and Ehab Ezzat, 2021), but augmented with more clarification for the herding behavior which detecting by different models in the

pre-pandemic phase, but not detected in the post and in all period from 2018-2021, then can conclude the same result with (Sandra Ferreruela , Tania Mallor, 2021) show that herding behavior is a short-lived phenomenon considered from sub-periods and observed with sorting in a bullish, bearish market, High volatility, and low volatility.

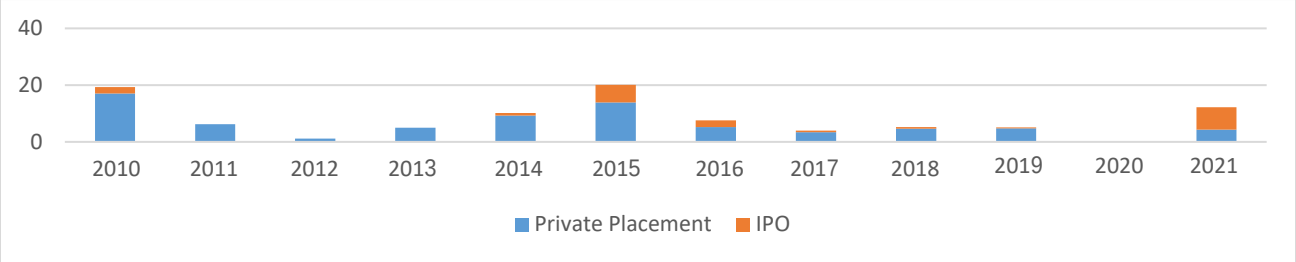
- The third observation is that the various market indexes provide further explanations for herding behavior on the Egyptian stock exchange. In EGX 30, the herding exit does not occur at various times. Because blue-chip firms influence this index, this can explain why the herding non-existed in it, supported it with the value-weighted construction, weighed some assets with higher weights than others, and then affected and biased with it. Its behavior over various periods anticipate. The EGX 70, the highest index for documented herding behavior over many periods, is influenced by small companies. The EGX 100 does not show herding behavior because made up of stocks from the EGX70 and EGX30 indices. The EGX30 is not affected by the EGX70, so the EGX100 does not show herding behavior.
- The Fourth observation is that, based on the relevant literature, herding behavior would be evident during extreme market conditions, but the empirical analysis finds evidence of only adverse herding in the market, suggesting that investors actually may act rationally during extreme market times. Interestingly, these results stand in contrast with international evidence in developed markets but tend to conform to evidence in other emerging markets (Riza Demirer and Ali Kutan, 2006; Vasileios Kallinterakis, Nomana Munir, Mirjana Radovic-Markovic, 2010; Ifeoma Patricia Osamor, Edwin C. Anene, Qudus Ayotunde Saka, 2013). The failure to detect evidence of herding behavior in the Egyptian exchange market explained that, following periods of panic, investors enter a cooling-off period and become more cautious and analytical in their investment decisions. Thus, they may not be able to make personal decisions but rely on institutional investors to make higher informal judgments. In the case

of Egypt, domestic equity investors hold a disproportionate number of stocks and either have significant inside information on the actual value of their companies or refuse to follow the herd. Which made people with limited financial -literacy- education react irrationally to even the slightest fluctuations in the market. This paper's findings suggest that investors might engage in adverse herding behavior under these circumstances. There may also be a role for the country's strict microstructure rules, which include limits on how much prices can change each day, frequent trading halts, and restrictions on margin financing and short selling.

That can affect the number of trading companies. The number of traded companies in 2021 was 216. This number reduced from 218 in 2018 and has not increased. The average for the traded companies during the entire period is 211—the aggregate market transactions as the illiquid market with low depth and breath for the microstructure market level. Panel (A) of Figure 4 illustrates that the total value of IPOs has increased during the pre-economic shifting phase but reduced after that. Affected by some economic factors like deflation of the national currency and COVID-19. Then announcements and new issues canceled.

On the other hand, Panel (B) in Figure 4 shows the total value of IPOs. The high opportunities in the Egyptian exchange market observed by foreign institutional investors (institutional) to make additional investments after economic shifting. As an opportunity to get abnormal returns affected by the change in foreign currency value information and analytical framework. The explanations show why cannot observe herding as irrational behavior, cannot be observed during stressful times, or cannot be explained by the different methods used in this paper, but can only observe by sorting.

Panel (A)
Private placement and IPO in the Egyptian exchange market (in Billion)



Panel (B)
Equity ratio and total turnover % for Foreigner Investors

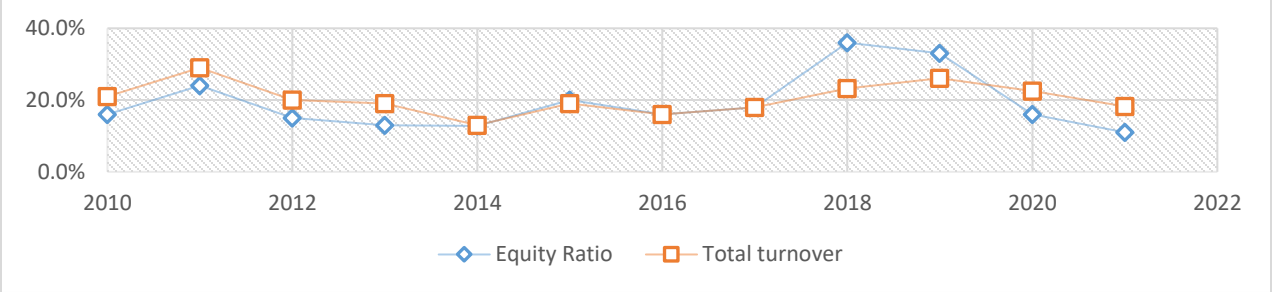


Figure (4): the effect of foreign investors on the Egyptian exchange market.

Source: Egyptian Exchange Market Yearly Reports

6. Conclusions and Suggestions for Future Research:

6.1. Conclusions

This paper investigates herding behavior in the Egyptian exchange markets for the leading market indexes (EGX 30, EGX 70 EW, and EGX 100 EW) in different market periods, including the extreme events of 2011 and 2013 as political instability as an Egyptian revolution phase, the economic shifting this period affected by macro-level deflation national currency, and lastly the recent Covid-19 pandemic. Herding under different market conditions (rising vs.

declining markets and high volatility vs. standard volatility days). Finally, it tested whether joint herding forces exist across these market indexes in the Egyptian exchange market. The empirical results show that herding effects are present in different market indexes, but differences observe regarding the subsamples analyzed and the market conditions. Empirically market indexes prove that herding existed in the subsamples before and after the pre-economic shifting period but not during the post.

The main differences between the market indexes arise from the year 2020 onwards, as herding non detected in EGX 30 during the complete sample and most of the sub-sample phases. However, pre-pandemic appears more robust than ever after it, while in EGX 70 and EGX 100, there is herding during the entire period and most of the sub-sample, but decreasing from the Covid-19 subsample period but not after it. These results suggest that in times of crisis, investors would negotiate following their information and highlight the differences between investor response to the turmoil caused by the outbreak of an Egyptian revolution and that initiated by a global pandemic. Additionally, different market conditions also cause variations in investor behavior. Herding effects present significant asymmetries when considering rising and falling markets in EGX 70, and EGX 100, with herding appearing to be especially strong during bearish days (pre and post-economic shifting). In the EGX 30, this result also found for the herding behavior are toward high adverse herding, and finally with the High volatility Market days. The result was obtained for the EGX 100. The fact that herding existed in the complete sample and all sub-samples, the EGX 70. The fact that herding existed in the complete sample and the sub-samples excluding the Egyptian revolution phase and the EGX 30. The fact that herding existed in the complete sample and the sub-samples excludes the Egyptian revolution and the post-pandemic phases. In addition, through the low volatility Market days. The fact that herding existed in the complete sample and sub-samples in EGX 100, in EGX70 herding, excited only in the Egyptian revolution phase, and EGX 30 in the Egyptian revolution and post-pandemic phases.

Finally, this paper studied the degree of co-movement in the cross-sectional returns' dispersion across the market indexes in the Egyptian exchange market. Furthermore, a strong positive significant relationship finds in between the CSADs of the market indexes in the Egyptian exchange market for the entire period and all the subsamples except the 2010 Egyptian revolution. Also, the situation in one market contributes to explaining herding in the other, as the squared return of the other country has a significant coefficient. However, this relationship weakened or disappeared during the Egyptian revolution and the Covid-19 subsamples. These results, although expected, are worrying due to the contagion effect that the existence of this relationship can imply. In any case, the results confirm the intuition that the periods of the Egyptian revolution and the pandemic have different characteristics.

6.2. Suggestions

1. Policymakers may use the findings of this study to build regulatory frameworks and market monitoring techniques to improve the functioning of the Egyptian exchange market. Furthermore, make further investments through new public offerings from new firms and seasoned public offerings from companies already listed.

2. Policymakers should assess the possible effects of foreign economic measures on the degree of market volatility in Egypt and devise regulations to safeguard the Egyptian exchange market from the potential effects of these actions.

3. Detecting herding behavior for short-term phases can introduce good signals for the Egyptian exchange market after sorting with different levels, and then can introduce good insights for investment decision makers. Furthermore, market transactions will get a new depth and breadth on the microstructure level. The Egyptian Market Report of 2019 augments this suggestion. The report announced that the market canceled six as an initial and seasoned offering for new or existing companies. Panel (A) and Panel (B) from Figure 4 showed the report reflections in 2020.

6.3. Future Research

1. Future research for market microstructure and asset pricing must focus on the time-varying models to detect the different market phenomena and variations in asset pricing.

2. The MENA area and other growing markets like Turkey, South Africa, and India might benefit from more research

References

Asma Mobarek, S. M. (2014, September). A cross-country analysis of herd behavior in Europe. *Journal of International Financial Markets, Institutions and Money, 32*, 107-127.

Bikhchandani, S. and Sharma, S. (2000). Herd behavior in financial markets. *IMF Staff Papers, 74*(3).

Burton G. Malkiel,Eugene F. Fama. (1970). Efficent Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance, 25*(2), 383-417.

Byrne, A. &. (2013). Behavioral finance. Retrieved. Retrieved from Retrieved from https://www.vanguard.co.uk/documents/portal/literature/behavourial-finance-guide.pdf

Caparrelli, F. D. (2004). Herding in the Italian exchange market: A case of behavioral finance. *The Journal of Behavioral Finance, 5*(4), 222–230.

Chang, E. C. (2000). An Examination of Herd Behavior in Equity Markets: An International Perspective. *Journal of Banking &Finance, 24*, 1651-1679.

Charilaos Mertzanis, and Noha Allam. (2018). Political Instability and Herding Behaviour: Evidence from Egypt's Exchange market. *Journal of Emerging Market Finance, 17*(1), 29–59.

Chiang, T. C., & Zheng, D. (2010). An empirical analysis of herd behavior in global exchange markets. *Journal of Banking & Finance, 34*(8), 1911–1921.

Christie, W.G. and Huang , R.D. (1995). Following the Pied-Piper: Do Individual Returns Herd Around the Market? *Financial Analyst Journal*, 31-37.

Dalia El-Shiaty, and Ahmed Abdelmotelib Badawi. (2014, January). Herding Behavior in the Exchange market: An Empirical Analysis of the Egyptian Exchange. *Working Paper, 37*.

Daxue Wang. (2008, December). Herd Behavior Towards the Market Index: Evidence from 21 Financial Markets. *IESE Business School Working, 776*.

DeBondt, W. F. (2010). finance teach us about finance? *Qualitative Research in Financial Markets, 2*(1), 29–36. doi:doi:10.1108/17554171011042371

Demirer, R. &. (2006). Does herding behavior exist in Chinese exchange markets? *Journal of International Financial Markets Institutions and Money, 16*(2), 123–142.

Demirer, R. &. (2018). Industry herding and the profitability of momentum strategies during market crises. *Journal of Behavioral Finance, 20*(2), 195–212. doi:doi:10.1080/15427560.2018.1505728

El-Erian, M., & Kumar, M. (1995). Emerging equity markets in Middle Eastern countries. *IMF Staff Paper, 42* (2), 313–343.

Ezzat, H. (2012). The application of GARCH and EGARCH in modeling the volatility of daily stock returns during massive shocks: The empirical case of Egypt. *International Research Journal of Finance and Economics, 78*(96), 143–154.

Fang, H. S.-H.-H. (2017). The dynamic and asymmetric herding behavior of US equity fund managers in the exchange market. *International Review of Economics & Finance, 49*, 353-369.

Fischer Black. (1972). Capital Market Equilibrium with Restricted Borrowing. *The Journal of Business, 45*(3), 444-55.

Froot, Kenneth, David Scharfstein, and Jeremy Stein. (1992). Herd on the Street: Informational Efficiencies in a Market with Short-term Speculation. *Journal of Finance, 47*, 1461–84.

Froot, Kenneth, Paul G. J. O'Connell and Mark Seasholes. (2001). The Portfolio Flows of International Investors. *Journal of International Economics, 59*(2).

Godfred Aawaar, Nicholas Addai Boamah, Joseph Oscar Akotey. (2020). Investor Herd Behaviour in Africa's Emerging and Frontier Markets. *International Journal of Economics and Financial Issues, 10*(6), 194-205.

Grinblatt, M. T. (1995). Momentum investment strategies, portfolio performance, and herding: a study of mutual fund behaviour. *American Economic Review, 85*, 1088-1105.

Hirshleifer, D. &. (2003). Herding behavior and cascading in capital markets: A review and synthesis. *European Financial Management, 9*(1), 25–66.

Hirshleifer, D., & Teoh, S. H. (2003). Herding behavior and cascading in capital markets: A review and synthesis. *European Financial Management, 9*(1), 25–66.

Huang, W. G. (1995). Do Individual Returns Herd around the Market? *Financial Analysts Journal, 51*(4), 31-37.

Hwang, S., & Salmon, M. (2004). Market stress and herding. *Journal of Empirical Finance, 11*(4), 585–616.

Ifeoma Patricia Osamor, Edwin C. Anene, Qudus Ayotunde Saka. (2013). Impact of Exchange market Liquidity on Herding Behaviour: A Comparative Study of Conglomerate and Consumer Goods Sectors. *Journal of Applied Business and Economics, 14*(2), 11-19.

Khanthavit, A. (2019). Weather, investor sentiment, and stock returns in the stock exchange Thailand. *ABAC Journal, 39*(1), 1–14.

Lakonishok, J., Shleifer, A., & Vishny, R. V. (1992). The impact of institutional trading on stock prices. *Journal of Financial Economics, 32*(1), 23–43.

Laopodis, N. (2021). *Understanding investments theories and strategies.* London: Routledge.

Lee, C.-C. C.-P.-M. (2013). Industry herding and market states: Evidence from Chinese exchange markets. *Quantitative Finance, 13*(7), 1091–1113.

Lin Tan, Thomas C. Chiang, Joseph R. Mason, Edward Nelling,. (2008). Herding behavior in Chinese exchange markets: An examination of A and B shares,. *Pacific-Basin Finance Journal,, 16*(1-2), 61-77.

Lindhe, E. (2012). Herd behavior in exchange markets: A Nordic study. *Ph.D. thesis, Lunds Universitet, Lund.*

Mai Ahmed Abdelzaher. (2021). Study the Efficiency Hypothesis in the Egyptian Exchange market. *International Journal of Economics and Financial, 11*(1), 18-25.

Mark Grinblatt, Sheridan Titman and Russell Wermers. (1995). Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior. *American Economic Review, 85*(5), 1088-1105.

Mostafa Hussein abd-alla. (2020). sentimental Herding: tHe role of covid-19 crisis in tHe egyptian exchange market. *Copernican Journal of Finance & Accounting, 9*(3), 9-23.

Nader Alber and Ehab Ezzat. (2021). The Impact of Herding Behavior on Stock Mispricing: The Case of Listed Companies at the Egyptian Exchange. *European Journal of Business and Management Research, 6*(4), 7-10. doi:http://dx.doi.org/10.24018/ejbmr

Nicholas Barberis, Richard Thaler . (2003). A Survey of Behavioural Finance. In M. H. Edited by G.M. Constantinides, *Handbook of the Economics of Finance* (pp. 1052-1121). Elsevier Science B.V.

Otchere, I. and Chan, J. (2003). Short-term overreaction in the Hong Kong exchange market: can a contrarian trading strategy beat the market? *Journal of Behavioral Finance, 4*(4), 157-171.

Palak Dewan, Khushdeep Dharni. (2022). Herding and spillover effects in the Indian commodity futures market. *Journal of Agribusiness in Developing and Emerging Economies*.

Prosad, J. M., Kapoor, S., & Sengupta, J. (2012). An examination of herding behavior: An empirical evidence from Indian equity market. *International Journal of Trade, Economics and Finance, 3*(2), 154–157.

Riza Demirer and Ali Kutan. (2006). Does herding behavior exist in Chinese exchange markets? *Journal of International Financial Markets Institutions and Money, 16*(2), 123-142.

Sandra Ferreruela , Tania Mallor. (2021). Herding in the bad times: The 2008 and COVID-19 crises. *North American Journal of Economics and Finance, 58*, 1-19.

Scharfstein, David and Jeremy Stein. (1990). Herd Behavior and Investment. *American Economic Review*(80), 465–79.

Setiyono, T. E. (2013). Detecting the existence of herding behavior in intraday data: Evidence from the Indonesia stock exchange. *Gadjah Mada International Journal of Business, 15*(1), 27–44.

Shleifer, A. (2000). *Inefficient markets: An introduction to behavioral finance.* Oxford, UK: Oxford University Press.

Shu-Fan Hsieh. (2013). Individual and institutional herding and the impact on stock returns: Evidence from Taiwan exchange market. *International Review of Financial Analysis, 29*(issue C), 175-188.

Simon Jurkatis, Stephanie Kremer, Dieter Nautz. (2012). Correlated Trades and Herd Behavior in the Exchange market. *SFB 649 Discussion Paper working paper*.

Tan, L., Chiang, T. C., Mason, J. R., & Nelling, E. (2008). Herding behavior in Chinese exchange markets: An examination of A and B shares. *Pacific-Basin Finance Journal, 16*(1-2), 61–77.

Thomas C.Chiang, D. Z. (2010). An empirical analysis of herd behavior in global exchange markets. *Journal of Banking & Finance, 34*(8), 1911-1921.

Vasileios Kallinterakis, Nomana Munir, Mirjana Radovic-Markovic. (2010). Herd Behaviour, Illiquidity and Extreme Market States: Evidence from Banja Luka. *Journal of Emerging Market Finance, 9*(3), 305–324.

Welch, Ivo. (2000). Herding Among Security Analysts. *Journal of Financial Economics, 58*(3), 369–96.

Welch, Ivo. (Journal of Finance). Sequential Sales, Learning and Cascades. *1992, 47*, 695–732.

Wermers, R. (1999). Mutual fund herding and the impact on stock prices. *Journal of Finance, 54*.

Wiener, R. (2006). Do birds of a feather flock together? Speculator herding in the world oil market. *Discussion Paper, 6*(31).

Zhou, R. T., & Lai, R. N. (2009). Herding and information based trading. *Journal of Empirical Finance, 16*(3), 388–393.

هل ما زال يوجد سلوك القطيع في سوق الأوراق المالية المصرية؟

د.محمد حسين عبد الرازق؛ د.أحمد سيد عبد الباسط

الملخص باللغة العربية

تناولت الدراسة في التأكد من وجود سلوك القطيع في سوق الأوراق المالية المصرية خلال ظروف السوق المختلفة، بدءًا من فترة الثورة وحتى فترة الوباء. باستخدام بيانات أسعار الأسهم اليومية، باستخدام أدوات الاختبار التجريبي عن وجود سلوك القطيع لفترة الدراسة بالكامل إضافة إلى تقسم فترة الدراسة إلى خمس فترات فرعية مختلفة (مرحلة الثورة المصرية، مرحلة قبل وبعد التحول الاقتصادي، ومرحلة ما قبل وبعد الجائحة). وكانت النتائج تؤكد عدم القدرة على رصد سلوك القطيع وفي تقديم دليل على وجود هذ السلوك في سوق الأوراق المالية المصرية. ولكن قدمت النماذج الرئيسية المستخدمة في هذه الدراسة الدليل علي وجود سلوك القطيع المعاكس والذي يؤكد على عدم الخطية للعلاقة فيما بين العوائد السوقية وعوائد الأوراق المالية. علاوة على ذلك، تظهر النتائج أيضًا أن سلوك القطيع هو ظاهرة قصيرة العمر تم أخذها في الاعتبار من فترات فرعية ويتم ملاحظتها باستخدام أساليب التصنيف من خلال كل من السوق صاعد والهابط والتصنيف وفقاً لمعاملات التذبذب من خلال رصد التقلبات عالية والتقلبات منخفضة. ومع ذلك، مع النماذج المجمعة، لم يتم تأطير وجود سلوك القطيع، بل تم رصده في ظل الأسواق الصاعدة وعالية التقلب، والسلوك المعاكس في أسواق هابطة وذات التقلبات المنخفضة.

الكلمات الدالة:

سلوك القطيع – سوق الأوراق المالية المصرية – مؤشر EGX 100 – مؤشر EGX70 – مؤشر EGX30