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Herding behavior in Tunisian Mutual Funds Under Asymmetric Conditions: Quantile regression approach

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ABSTRACT This paper investigates the Tunisian mutual funds herding behavior under different market conditions, by using the cross-sectional standard deviation (CSSD) model, cross-sectional absolute deviation (CSAD) model and the Quantile Regression approach. We test for the existence of herding for the whole period, as well as for the pre- and post-Tunisian uprising period. For the whole period, we find evidence of herding behavior based on the CSAD model only in down market conditions. Although, by considering for Tunisian 2011 uprising, this analysis report that when we applying CSSD and CSAD approach in different market conditions, there exist no evidence of herding neither before nor after uprising. We find that the mutual funds did not change their behavior following political and social events. Finally, by applying quantile regression analysis, we find evidence of herding behavior in high and low quantiles, under only down market. Conversely, during upper market, we show an absence of herding behavior in all different quantiles. When the market is down, managers afraid of uncertainty, neglecting their own information, avoid to act independently and follow other mutual funds. When the market is up, managers become rational, and act independently.

KEYWORDS: behavioral finance, herding behavior, quantile regression, cross-sectional dispersion, investment funds, Tunisian uprisings,

I. INTRODUCTION

Behavioral finance investigates the cognitive bias and emotional issues that influence the decision-making strategy. Its pay particular attention to the fact that investors are not always rational, have limits to their self-control, and are influenced by their own bias. In contrast to the efficient market hypothesis, Behavioral finance try to find a highlight situation in which markets are not rational and try to explain the causes by investors psychology. The academic excitement for behavior finance and the popularity of the hypothesis of inefficient markets come from two main factors. First, the appearance of theoretical and empirical frameworks about the herding behavior like the perspectives theory, developed by Kahneman and Tversky (1979), how consider that the investor is irrational and that their feelings are subject to judgment errors. Since these pioneering work the herding behavior has become the most widespread behavior bias in stock market. Second factor is the accumulation of anomalies on the financial markets this recent years, especially financial crisis. These anomalies on the market contradict the efficiency theory, amplifies volatility, destabilizes the financial markets and increased the fragility of the financial system. Since the pioneering works on herding behavior, there has emerged a large number of empirical studies which attempt to measure the herding behavior through different models and others concerned with evidence of impact of herding on stock market. However, this subject become an exciting topic when the researches including, Batmunkh et al. (2020), Ferrouhi (2020), and Choi et al (2020) highlight the implications different exogenous events on the herding behavior and the presence of this bias under different market conditions. Despite the great number of studies investigating the presence of herding behavior in the stock market in the Tunisian context, including Boubaker and Bouattour (2008); Ben Mrad and chaouachi (2013), there is no study investigating the herding behavior of Tunisian mutual funds during abnormal market conditions or in political or social crisis.

In light of this shortcoming, we propose to investigate the herding behavior of investment funds during different market conditions. Despite the augmentation the number of investors and the investment volumes in recent years, but the performance of Tunisian funds still considered moderate comparing with the international funds. The objective of the mutual funds is to maximize the return relative to the risk taken or simply to outperform the benchmark while changing the structure of the fund and the share of a security in the fund. Hence, fund performance largely depends on the managers' behavior when making investment decisions and his ability to manage investors' capital. In this paper, first aims is to detect the possible presence of a herding behavior adopted by Tunisian funds managers. We are looking for determine whether mutual funds are stakeholders who act with or against the market trend. Then, we study the preponderant role played by the 2011 social and political uprising on mutual funds herding behavior. We determine whether the Tunisian uprising pushed investment funds towards

behaving gregariously or even engaging in a new herding behavior pattern. Moreover, we examine asymmetric herding behavior under different market conditions. Finally, we investigate herding behavior at different quantiles of return distribution for detecting this behavior in the extreme (low or up) quantiles of return distribution. We believe that the contribution of this study consists first to conclude about market efficiency through analyzing of herding behavior, because the psychological bias, error and mistakes (as well as herding behavior) may result in an inefficient assets pricing. Second, the results help to avoid psychological traps associated to investment and are important for both managers, investors, and regulatory institutions responsible for ensuring the strength of Tunisian financial systems. Third, this study helps investors and academicians to knowing how social uprising might affect investor's behavior, which allows them to determine risk factors, and to make the most appropriate decisions during political and social crisis. The rest of this paper is structure as follows: section 1 reviews the literature and presents empirical foundations of mutual funds herding behavior, section 2 presents an overview of Tunisian Political instability, section 3 present the methodology in terms of sample, models and the used empirical tests, section 4 presents the results and discussions. section 5 concludes the paper.

II. LITERATURE REVIEW

The herding behavior is sums up a correlation between investor behavior that can be observed when they are independently influenced by common factors and information. According to Shih et al. (2015) herding is the attitude to imitate the behavior of another individual. In the literature, we distinguish between two currents of research that opposing the form of herding behavior. The first current assumed that herding is rational (Bikhchandani et al., 1992). Investors have very broad access to information and have the ability to process and interpret information using objective and subjective probabilities established in an unbiased manner. These rational investors are in better position to evaluate the fundamental value of financial assets, so they herd others, in order to satisfy an constrained optimization. According to Mensah and Yang (2007), it is more rational to imitate the choice of predecessors since this is less risky than making a random decision. If the chosen decision proves to be incorrect, it will be considered as a bad signal for all operators. In fact, if the chosen decision is in accordance with the collective choices, the investor constructs a conventional and mimetic reality, and he cast out the fear of the uncertain and herding becomes the rational choice, and avoiding predictions and speculations. The second current supposed that herding is irrational (Black, 1986; Shleifer and Vishny, 1997). According to Black (1986) the strategies of noise traders are likely to be based on incorrect perceptions. According to Shleifer and Vishny (1997), investors formed an irrational expectations and based on recent stock price trends. Although, Hassairi and Rajhi (2014) fixed that whether the investors are rational or not, better informed or not, adopting this herding behavior becomes a reasonable solution for logical and practical reasons. The previous works emphasized some reasons for herding. The first reason is the endogenous factors including reputational concerns and the payoff externalities (secure a good remuneration of investors). The investor seeks to minimize the risk of being isolated, sanctioned and losing money so he should not derivate from others (Scharfstein and Stein, 1990; Hung et al., 2010). The second reason is informational externalities. The exogenous information push investors to doubt the reliability of their sources of information and sometimes even their ability to interpret which increases their aversion to loss and decrease their self-confidence. In this case, herding could be useful and also more rational because it helps to make sense of the event and reduce fear, stress, lack of confidence and risk. The third reason is the exogenous events including financial scandals, market turmoil, speculative bubbles, disasters, political and social events that led investor to copy the behavior of other agents (Economou et al.,2016). Ben Mrad and Chaouachi (2013),

Hanafi and Abaoub (2016), and Chaffai and Madhioub (2018) stated that herding takes place during abnormal conditions, mainly economic, financial or socio-political instability. Thus, the authors concluded that high volatility increases this behavior. Chang et al. (2000) found significant evidence of herding in Taiwan and South Korea during extreme market volatility. In the same way, Dimic et al. (2015) found that herding is more prominent during periods of market stress. He argued that high volatility will sooner or later leads to herding. Demirer and al. (2010) measured herding behavior on the Taiwan Stock Exchange by using Christie and Huang (1995), Chang et al. (2000) model and found a divergent conclusion. Based on Christie and Huang (1995) model, the authors failed to provide evidence of herding. Howbeit, based on Chang et al. (2000) model, their results provided evidence of herding. Additionally, they concluded that herding behavior is more likely to be present during periods of market stress, where irrationality has an important influence on behavior. Using the quantile regression method, Zhou and Anderson (2013) analyzed U.S. equity REIT market for herding behavior. The results provide evidence of herding behavior in the high quantile of the REIT return dispersion especially during under turbulent market conditions. The authors support the asymmetry of herding behaviors, and proved that herding is stronger in declining markets than in rising markets. Malik et al. (2014) used the quantile regression analysis for both normal market conditions and under up and down market. The author concluded that herding exists in lower quantile but

did not exist in upper quartiles during the sample period. This may be due to herd behavior by the investors for the return dispersions at the lower level. Yousaf and al. (2018), analyzed the existence of herding behavior on the Pakistani stock exchange under different market conditions, especially the crisis periods and the Ramadan effect. Using Christie and Huang (1995) model, the results showed an absence of herding behavior, but when the author used Chang et al. (2000) model, the results illustrated that there is no evidence of herding behavior on the Karachi stock market during high or low stock market volatility. Furthermore, the herding behavior is detected only during the low trading volume and the behavior of investors is not influenced by month of Ramadan. Additionally, Pakistani Stock Market exhibits herding behavior only during subprime crisis due to asymmetry of information between investor. The difference in results in two methodologies is due to the dissimilarity in approaches of these two methodologies. Some other studies showed that there is no evidence of herding behavior during higher market volatility as well as Christie and Huang (1995) and Chang et al. (2000). Zouaoui and Bellouma (2018) studied some psychological bias in Tunisian context before and after Tunisian uprising. The authors showed that only a small portion of the Tunisian mutual funds managers tend to herd before and after uprising. Using quintile regression analysis, in Islamic GCC countries, Medhdoubi and Chaffai (2019) provide evidence of herding in different sectors (including banking, insurance and hotels, restaurants and food) only during the down market. Nevertheless, in the insurance and industry sector, the herding behavior is present only during upward market period. According to these authors, generally, herding behavior is more likely to occur and becomes stronger during stress periods and during large drops in oil price. The authors confirmed that the Islamic GCC market is exposed to irrational herding due to many factors like oil price volatility which can reduce investors' behavior anticipation effects. Ferrouhi (2020) found that the herding behavior of investors is represents in overall Casablanca Stock Exchange and in all size-based portfolios for the period 2007–2017. The author took the liquidity variable into account in his study. The findings illustrated a positive impact of liquidity and volatility on investors' herding behavior. This result can be interpreted as the herding behavior is higher for the most actively traded stocks and can be interpreted as risk aversion to operate alone. The herding behavior is more apparent in times of high volatility because it reduces risk. Choi et al. (2020) investigated the connection between herding behavior and investor sentiment. Appling (CSAD) and the quantile regression approach to analyzed the existence of herding behavior in Korean stock market. The results provide evidence of herding only during down-market. Using quantile regression, they confirmed the presence of herding behavior in the low and high quantiles. Finally, they concluded that investor sentiment can be the essential cause of herding behavior in the Korean stock market. Conversely, Batmunkh et al. (2020) tested herding behavior Mongolian Stock Market in bull and bear market periods especially during important events, using CSAD approach. They confirmed the herding behavior in all market situations. Even if research indicated that herding is significant across financial markets worldwide, the results of research on several markets still oscillate between the existence or absence of this behavior in different market conditions.

Overview of Tunisian Political instability: It's evident that the waves of the 2011 Tunisian uprising has an effect on stock markets behavior. Since 2011, a chain of political, social, and economic events has not stop to tremble Tunisia. The stock market has been influenced by several events, which show changes in the monthly returns of the TUNINDEX index since 12/2010.7. The first event began in December 2010 with new wave and series of anti-government protests and social troubles, which provoked a retrospective crisis of confidence with a fall in the TUNINDEX index of (-12.74%). These series of street demonstrations which took place in Tunisia, led to the ousting of longtime Tunisian president in 14 January 2011. Since this date we distinguish among the stock market falls a phase of decline most remarkable, corresponding to the event of the Tunisian uprising. The Tunisian stock market has been exposed to a climate of uncertainty that has influenced the entire financial and economic sphere. Tunisia has experienced its first recession since 25 years. Since the end of 2012, the country has experienced two political assassinations (in February 2013 and July 2013) and two terrorist attacks (in March and June 2015). In 2013, after political assassinations TUNINDEX registered a decrease by −4.33%. However, in 2014 after Tunisian election, the TUNINDEX increase by 16.7%. In 2014 Tunisia's political transition saw a strong improvement in the TUNINDEX and gained new momentum and the economy was recovered with 2.81% GDP growth. Although, after the terrorist attacks on November 2015 with the presidential bus bombing, the performance of the TUNINDEX market was deceased and volatility was increases was significantly affected. Though, the effect of political and terrorist events on the behavior of the stock market was lower for the period before the Tunisian uprising (Moussa and Talbi,2019).

Data and Methodology First, we propose to study the mutual funds herding behavior under different market conditions between 2005 and 2016. Hence, this period is centered on January, 2011 the social movement starting date in Tunisia. Second, further analysis is addressed by dividing the sample period into two sub-periods (before and after January 2011) to investigate the role of Tunisian uprising on herding behavior.

Sample: The dataset used in this study contains monthly net asset values of all Tunisian mutual funds, collected from the Financial Market Council (Conseil du Marché Financier (CMF)). We employ survivor bias free dataset of all mutual funds from January 2005 to December 2015. We considered in our study the population that includes only the surviving funds on our study period and excludes from our sample those created after January 2005, or liquidated before the end of the study. We obtain the 22 mutual funds.

III. METHODOLOGY

Herding Behavior-Standard model: In this study, the cross sectional standard deviation (CSSD) and cross sectional absolute deviation (CSAD) proposed respectively by Christie and Huang (1995) Chang et al. (2000) is used to measure herding behavior of 22 mutual funds. In order to assess dispersion between assets returns, the measure of Christie and Huang (1995) is written as follows:

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

(1) Where the market return of market portfolio at time t is denoted as Rm,t. The observed returns of the stock of the firm i at time t is denoted $R_{i,t}$. According to Christie and Huang (1995), during periods of high price movements, asset returns are not too far from market average. This implies that investors tend to ignore their own beliefs and follow market movements. Christie and Huang (1995) then propose the following regression:

$$CSSDt = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$$

(2) Where the CSSD is coefficient is the mean dispersion of returns, excluding the two distribution ends taken into account by the dummy variables. D_t is a dummy variables representing the large dispersion of returns, in the upper distribution tail D_t^U and lower distribution tail D_t^U. D_t^L=1 if market returns on day "t" is in the lower end of the distribution; D_t^L=0 otherwise. D_t^U=1 if market returns on day "t" is in the upper end of the distribution; D_t^U=0otherwise. The presence of herding behavior is indicated by negative sign of β_1 and β_2. If the profitability of the stock is very dispersed, then herding is high (no herding). In case of herding behavior, it is better to compare the stock returns of different companies to those of the market average yield.

On the other hand, Chang et al. (2000) extended the CSSD model and, developed a another test of herd behavior dimensions: cross-sectional absolute deviation (CSAD). The CSAD is the average of an absolute value for the difference between individual stock returns and market returns. The equation is:

$$CSADt = 1/N \sum_i^n |Rit - Rmt| \quad (3)$$

By using CSAD, Chang, et al. (2000) formed the herding equation as:

$$CASD_t=\alpha + \gamma_1|Rm_t| + \gamma_2(Rm_t)^2 + \varepsilon_t \quad (4)$$

This regression allows to detecting the stylized fact representing investors' tendency to herd market behavior. The non-linearity between CSAD and ($R_{m,t}$) is captured by the coefficient γ_2. If γ_2 is negative, an clear presence of herding. If γ_2 is insignificant or positive, an clear absence of herding behavior.

Herding behavior in up and down market: To investigate, whether herding behavior during abnormal market conditions (bullish (up) and bearish (down)) differs from the herding behavior under normal market conditions, we investigate the following equation (5)

$$CASD_t =\alpha+\gamma_1(1-D)Rm_t + \gamma_2 D\, Rm_t + \gamma_3 (1-D)(Rm_t)^2 + \gamma_4\, D\, Rm_t{}^2 + \varepsilon_t \quad (5)$$

Where D is a proxy of market condition. If the market return is negative, D=1. Otherwise, D=0. The negative sign of γ_3 (γ_4) means that herding behavior occurs when the market goes up (when the market goes down).

Quantile regression Under Asymmetric Conditions: Apart from the traditional OLS method, we further examine different quantiles to analyze herding effects during different market return distribution. Quantile Regression (QR) examine the effects in different points of market return distribution and can be used to obtain estimates for herding in the tails of market return distribution. Chiang, Li and Tan (2010) investigated the herding behavior in Chinese stock market with OLS and QR method. The authors confirmed that QR is stronger than OLS

and as a result gives more efficient results due to its coverage of different quantiles. In this case we examine the coefficients of model (5) for different quantiles of the dependent variable. we investigate the following model:

$$CASD_t(\tau|x)=\alpha+\gamma_1(1-D)Rm_t(\tau)+\gamma_2 D\,Rm_t(\tau)+\gamma_3(1-D)(Rm_t(\tau))^2+\gamma_4 D\,Rm_t(\tau)^2+\varepsilon_t \quad (6)$$

With varying values for τ. To confirm the analysis results in various quantiles, this study estimates quantiles with 10% intervals ranging from 10% to 90%.In this study we do not use absolute values for, because QR enables the examination of effects in different points of market return distribution.

IV. RESULTS AND DISCUSSION

Dispersion Return : Table 1 below reports the descriptive statistics of the average monthly returns of the studied portfolios, CSSD of returns and CSAD of returns before and after January 2011.

Table 1 Descriptive Analysis Of Returns Absolute Standard Deviation Before And After January 2011

	Before January 2011			After January 2011		
	Rm,t	**CSSD**	**CSAD**	***Rm,t***	**CSSD**	**CASD**
Mean	0,0079	0,0142	0,0115	-0,0004	0,0135	0,01
SD	0,018	0,0069	0,0058	0,012	0,0053	0,004
Skewnes	-0,168	1,234	1,35	0,0871	0,8719	0,917
Kurtosis	4,3325	5,263	5,42	2,391	5,043	5,5053

Notes: *, ** and *** means that there is a high likelihood (90%, 95% and 99%, respectively) that there is a significant relationship between the two variables.

Table 1 show that before January 2011, average monthly returns of all mutual funds are positive. However, after January 2011, the monthly returns became negative. Then, the 2011 shock has an impact on average returns Tunisian mutual funds. Since, the uprising has a negative effect on the performance of mutual funds, then we are agreeing with Gul et al. (2013), who suggested that the event of different nature like: political, natural calamities and terrorism have a negative influence on the share prices. These results indicate that herding behavior in Tunisia is less prevalent during periods of large market movements.

Table 2 CSSD regression before and after 2011 uprising

	Before January 2011				After January 2011			
	α	**β^L**	**β^U**	**R^2**	**α**	**β^L**	**β^U**	**R^2**
5%	0,0142	-0,0016	0,0002	0,0014	0,01254	-0,00062	0,0001	0,0004
10%	0,0142	-0,0010	-0,0002	0,0007	0,01253	-0,00003	-0,0002	0,0001
20%	0,0143	-0,00147	-0,0004	0,0021	0,0125	0,0001	0,0002	0,0001

Notes: This table presents the estimated coefficients of the following model: $CSSD = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$. Above table shows results of the equation (2). D_t^U present upper distribution tail and D_t^U present lower distribution tail. ***,**,* statistically significant at 1%, 5% and 10% level, respectively.In the Table 2, the coefficient of determination R2, issued from estimating Christie and Hwang (1995) model is very low during the studied period and significant at the 5%, 10% and 20% levels. Hence, fluctuation of the independent variables is not significant. This indicates that there is no herding behavior in mutual funds before and after 2011. This indicate that mutual fund managers pay no attention to the information delivered in line with price movement. In second step, we estimate the Chang et al. (20000) model under different market return condition.

Table 3 Estimates of herding behavior in up- and down-market periods.

	c	γ_1	γ_2	γ_3	γ_4	R^2
Panel A: Overall						
	0,0066	0,1608	-0,4307	5,4838	-0,9850	0,639
	(0,0000)***	(0,0000)***	(0,0000)***	(0,0000)***	(0,0193)**	
Panel B: Before Junary 2011						
	0,0096	-0,0785	0,0000	10,1607	5,4507	0,2855
	(0,0000)***	0,54	(0,0000)***	(0,0000)***	(0,0036)***	
Panel C: After Junary 2011						
	0,0067	0,0003	-0,3230	12,2795	1,6198	0,6256
	(0,0000)***	0,9922	(0,0000)***	(0,0000)***	(0,0016)***	

Notes: This table presents the estimated coefficients of the following model : $CASD_t = \alpha + \gamma_1(1-D)Rm_t + \gamma_2 D\, Rm_t + \gamma_3 (1-D)(Rm_t)^2 + \gamma_4 D\, Rm_t{}^2 + \varepsilon_t$. Above table shows results of the equation (5)for Overall period, before, and after uprising. R2 is the adjusted R2. t-statistics are shown in parentheses. ***,**,* statistically significant at 1%, 5% and 10% level, respectively.

In the literature review, it is a clear consensus that herding behavior may be different under up and down market conditions. For this reason, it is important to measure separately herding behavior different market conditions.

Table 3 present the estimation results based on CSAD regression under up and down market based on Equation (5). In Panel A, $\gamma 3$ is positive and statistically significant at 1%, but $\gamma 4$ is negative and significant at 5%, thus indicative of herding only in bear markets during 2006 to 2016 period. When we divide the overall period into two sub-periods, before and after uprising we obtain some divergent conclusions. Panel B and C show that coefficients (γ_3, γ_4) are positive and statistically significant. According to these results there is no herding behavior during the up-market period before and after uprising. Given the results we have observed that the managers did not change their behavior following political and social events. These findings are in line with the results of Boubaker and Bouattour (2008) who found no herding behavior among Tunisian investors.

The divergent results obtained from Panel 1 and those from panel B and C push us to estimate the quantile regression method for obtaining more efficient results and considering different curves of independent variables against each quantile of dependent variable CSAD.

Quantile Regression Analysis Results Under Up and Down Market : The Least Squares Method (OLS) method is considered as a measure of location and does not consider the tail information of return distribution. With the OLS we were only able to detect herding behavior in whole, before and after uprising period. For this reason, we use the quantile regression method for consider different curves of independent variables (like R_m) against each quantile of dependent variable like CSAD. To obtained the extremely low returns, quantile estimates at $\tau = 0.1$ to $\tau = 0.3$. Similarly, setting t = 0.70 to t = 0.90 quantile estimates for the extremely high returns can be obtained. Table 4 presents the estimated results for using the quantile regression method.

Table 4 present the estimation of quantile regression for up- and down-market periods based on Equation (6). Accordingly, the coefficient of γ_3 is positive and statistically significant in all quantiles except for (30% and 40%) where the coefficient is insignificant. This indicates that there is no evidence of herding in the up-market. In this respect, mutual fund managers is rational and act independently only during up market condition. The sign and significance of coefficient γ_4 change across different quantiles. For the extremely low returns presented by lower quantile (20%, 30%, 40%) the coefficient γ_4 are negative and statistically significant. This indicate that under down conditions, mutual fund managers try to follow the market and, therefore, the dispersion of returns decreases during this period

Table 4 Quantile Regression Results

Quantile	c	γ_1	γ_2	γ_3	γ_4	R^2
τ=10	0,0030	0,2340	-0,4296	2,4305	-0,4101	0,4219
	(0,0000)***	(0,0000)***	(0,0000)***	(0,0000)***	(0,1329)	
τ=20	0,0032	0,3122	-0,5068	0,7802	-1,9883	0,4113
	(0,0000)***	(0,0000)***	(0,0000)***	(0,0079)***	(0,0000)***	
τ=30	0,0035	0,3340	-0,5084	0,3528	-2,1271	0,3801
	(0,0000)***	(0,0000)***	(0,0000)***	(0,2552)	(0,0000)***	
τ=40	0,0046	0,3105	-0,4381	0,8901	-1,1647	0,3505
	(0,0000)***	(0,0000)***	(0,0000)***	(0,7333)	(0,0030)***	
τ=50	0,0067	0,1425	-0,2908	4,6998	1,5507	0,3346
	(0,0000)***	(0,0003)***	(0,0000)***	(0,0002)***	(0,0000)***	
τ=60	0,0080	0,0331	-0,2692	9,5317	1,4846	0,3468
	(0,0000)***	(0,2043)	(0,0000)***	(0,0000)***	(0,0050)***	
τ=70	0,0086	0,0689	-0,3136	8,5507	0,4099	0,3568
	(0,0000)***	(0,0002)***	(0,0000)***	(0,0000)***	(0,4116)	
τ=80	0,0090	0,1121	-0,5132	7,5195	-3,5353	0,3967
	(0,0000)***	(0,0000)***	(0,0000)***	(0,0000)***	(0,0004)	
τ=90	0,0113	-0,0142	-0,6371	13,0121	-5,4331	0,4845
	(0,0000)***	(0,8606)	(0,0000)***	(0,0000)***	(0,0932)*	

Notes: Above table shows results of the different quantiles under up(γ_3) and down (γ_4) market conditions. R2 is the adjusted R2 . t-statistics are shown in parentheses. ***,**,* statistically significant at 1%, 5% and 10% level, respectively.

In medium quantile (50%, 60%), the coefficient γ_3 and γ_4 are statistically significant but positive. This indicates that there is no evidence of herding in medium quantile under both up and down market conditions. We can conclude that in the normal condition, mutual funds managers place more emphasis on the equity fundamentals than CAPM suggests, when the Tunisian mutual funds industry posts mean stable returns. These results are contradiction with Chiang, Li and Tan, (2010) where indicate that herding exists in the median and lower quantiles of the stock return dispersions. For the extremely high returns presented by quantile (80% and 90%), the coefficient γ_4 are (-3.5353) and (-5.4331) respectively with being negative and statistically significant. Consequently, the herding exists in extremely high quantile under down markets condition. We find that the herding behavior for the Tunisian mutual funds managers is stronger in the down-market than in the up-market. However, the coefficient γ_4 of downer quantile (10%) and upper quantile (70%) are insignificant. This indicates that herding does not exist in 10% and 70% quantiles during the whole period. This finding can be interpreted as when the market declines, managers become pessimistic and afraid of uncertainty, they follow other managers. These results are consistent with the results of Zhou and Anderson (2013), that suggested that herding is attribute to high-quantile dispersion. In general, herding exists in lower and extreme upper quantiles (20%, 30%,40 and 80, 90%), except for the lower quantile 10% and the upper quantiles 70% during down condition for market returns. This finding is in line with Choi and Yoon (2020). The authors showed that herd behavior can occur in high and low quantiles and this behavior is exhibited only during down-market periods. The presence of revere herd behavior is due to the presence of noisy and irrational traders. When the noise trader' transactions based on their own information and not on correct information and fundamental values, the return dispersion increases even as

trading assets are in the incorrect direction. Moreover, these results slightly differ from Batmunkhetal. (2020) where they found that herding is obvious in all market situations.

V. CONCLUSION

This study examines herding behavior of Tunisian mutual funds between 2005 and 2016. The testing methodology is based on the CSSD and CSAD developed by Christie and Hwang (1995) and Chang et al. (2000) respectively, and quantile regression methodology.

Since the results of Christie and Hwang (1995) estimation are not significant and inconclusive before and after uprising, we estimate Chang et al. (2000) model, in whole period as well as for the pre- and post-uprising under different market condition. For the whole period, based on the CSAD model, we find evidence of herding behavior only in bear markets. Although, when the pre- and post-uprising period are considered separately, we fail to provide evidence of herding in mutual fund. We document that the mutual funds managers do not change their behavior after 2011 uprising. Consequently, the political and social event have any impact on the mutual fund behavior. This suggests that the managers did not follow average market opinion and rational investment choices conditioned by the economic and financial conditions.

To obtain more efficient results, we use quantile regression approach under different conditions for market returns, and the finding become very conclusive. We find herding behavior high and low quantiles under down market condition. When the market decline, mutual fund managers become pessimistic and afraid of uncertainty, neglecting their own information and follow other mutual funds managers. Conversely, this analysis shows an absence of herding behavior during upper market between 2006-2016 in all different quantiles. This indicate that, when the market is up, mutual fund managers become rational, and act independently. We can conclude that the presence of herding behavior in Tunisian mutual funds is related to the extreme price movements and the different market condition and not affected by political and social events. These findings have a significance for regulators and investors. For investors, this results allows them to know the efficiency and the rationality of Tunisian mutual funds and can be helpful in hedging. Moreover, this results allows to regulators to find solutions on inefficiency and imperfection into the mutual funds sector by introducing new reforms and strict regulation for efficient control of mutual funds.

This research has some limitations. First, the choice of measurement of herding bias, which is a simple regression remains primarily subjective and can't be exhaustive. Then, it would be interesting to shed more light on the relationship between fund characteristics and herding behavioral bias.

REFERENCES

1. Batmunkh, M.U.. Choijil,E. Vieito, J.P. Méndez, C.E. and Wong, W.K. (2020) Does herding behavior exist in the Mongolian stock market? Pacific-Basin Finance Journal, Volume 62, 101352.
2. Ben Mrad, D. F,. W. and Chaouachi, O,. (2013). Herding Behaviour before and after the Tunisian Uprising. International Journal of Multidisciplinary Sciences And Engineering, 4, 16-20.
3. Bikhchandani, S., Hirshleifer, D. and Welch, I,. (1992). A theory of fads, fashion, custom, and cultural change as informational cascades. Journal of Political Economy,.100, 992-1026.
4. Black (1986),'noise' Journal of Finance vol 41(3), pp.529-543.
5. Boubaker, A,. and Bouattour, B,. (2008). Détection du comportement mimétique sur le marché boursier tunisien. Revue Tunisienne d'Economie et de Gestion, 26, 293-319.
6. Chaffai, M,. and Madhioub, I,.(2018). Herding behavior in Islamic GCC stock market: a daily analysis. international Journal of Islamic and Middle Eastern Finance and Management, 11 , pp.182-193
7. Chang, E.; Cheng, J. W,. and Khorana, A. (2000). An examination of herd behavior in equity markets: an international perspective. Journal of Banking and Finance, 24,1651-1679.
8. Choi, K.-H.; Yoon, S.-M. Investor (2020) Sentiment and Herding Behavior in the Korean Stock Market. Int. J. Financial Stud. 2020, 8, 34.
9. Chiang, T.C. and Li, J.(2010), Empirical investigation of herding behavior in Chinese stock markets: Evidence from quantile regression analysis, Global Finance Journal, 21(1):111-124
10. Christie, W. G,. and Huang, R. D,. (1995). Following the pied piper: do individual returns herd around the market? Financial Analysts Journal, 51, 31-37.
11. Demirer, R., Kutan, A. M., and Chen, C. D. (2010). Do investors herd in emerging stock markets? Evidence from the Taiwanese market. Journal of Economic Behavior & Organization, 76(2), 283-295.

12. Dimic, N,. ; Vitaly, O,. and Vanja, P,. (2015). The political risk factor in emerging, frontier, and developed stock markets. Finance Research letters, 15, 239-245.
13. Economou, F,. Katsikas, E,. and Vickers, G,. (2016). Testing for herding in the Athens Stock Exchange during the crisis period, Finance Research Letters, 18, 334–341.
14. Ferrouhi, E. M. (2020). Herding Behavior in the Moroccan Stock Exchange. Journal of African Business, 1–11.
15. Gong, P. and Dai, J. (2017), Monetary policy, exchange rate fluctuation, and herding behavior in the stock market, Journal of Business Research 76, 34-43.
16. Gul, S,. Khan, M. T,. Saif, N., Rehman, S. U., and Roohullah. (2013). Stock Market Reaction to Political Events (Evidence from Pakistan). Journal of Economics and Sustainable Development, 4(1).
17. Hanafi, C. and Abaoub, E. (2016). Do Investors Herd in Tunisian Financial Market during Political Crisis Period? Journal of Multinational Financial Management, 7,113-121.
18. Hassairi, S. and Rajhi, w. (2014). Mimétisme et marchés financiers européens, Bulletin français d'actuariat, 14, 29-49.
19. Hung, W. ; Lu, C. C. and Lee, C. F. (2010). Mutual fund herding its impact on stock returns: Evidence from the Taiwan stock market, Pacific-Basin Finance Journal,18, 477-493.
20. Kahneman, D. and Tversky, A., (1979). Prospect Theory: An Analysis of Decision under Risk. Econometrica,47, pp.263-291.
21. Malik, U and Elahi, M.A. (2014.) Analysis of Herd Behavior Using Quantile Regression: Evidence from Karachi Stock Exchange (KSE), MPRA Paper 55322, University Library of Munich, Germany.
22. Medhioub, I and Mustapha Chaffai,M.(2019) Islamic Finance and Herding Behavior Theory: A Sectoral Analysis for Gulf Islamic Stock, International Journal of Financial Studies, 7 (4), 65-75.
23. Mensah, Y.M.and Yang, R. (2007). An Empirical Evaluation of Analysts' Herding Behavior Following Regulation Fair Disclosure.Journal of Accounting and Public Policy, 27(4), 317-338
24. Mertzanis, C., and Allam, N. (2018). Political Instability and Herding Behaviour: Evidence from Egypt's Stock Market. Journal of Emerging Market Finance, 17(1), 29-59
25. Moussa, M. And Talbi, M. (2019), Stock Market Reaction to Terrorist Attacks and Political Uncertainty: Empirical Evidence from the Tunisian Stock Exchange, International Journal of Economics and Financial Issues, Econjournals, vol. 9(3), pages 48-64.
26. Scharfstein, D. S. and Stein J.C. (1990) . Herd Behavior and Investment. The American Economic Review, 80, pp.465-479.
27. Shih, T. L.; Hsu, A.C. ; Yang, S.J. and Lee, C. (2015). Empirical investigation of herding behavior in the East Asian stock markets towards the U.S. market. International Journal of Business and Finance Research,9, pp. 19-32.
28. Shleifer, A. and Vishny, W.S. (1997) The Limits of Arbitrage, The Journal of Finance, vol52, 1,PP. 35-55
29. Yousaf, I., Ali, S and Shah, S. Z. A. (2018). Herding behavior in Ramadan and financial crises: the case of the Pakistani stock market. Financial Innovation ,4(1), 16.
30. Zhou, J. and Anderson, R.I (2013) An Empirical Investigation of Herding Behavior in the U.S. REIT Market. The Journal of Real Estate Finance and Economics, 47, pp. 83
31. Zouaoui. M. and Bellouma, M. (2018). Impact of Psychological Biases on the Performance of UCITS before and after the Tunisian Uprising, Global Journal of Management and Business Research, 18,4, pp. 14-51.