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The Herding Behavior of Investors in the New Financial Markets in Iran (Case Study Sukuk Murabahah)

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Abstract: The aim of this study was to analyze the herding behavior of investors in new markets of financing in the capital market of Iran (Sukuk Murabahah) in the period 1390-1394 using daily data and applying models in the Iranian capital market. The research was conducted by using correlation method and regression analysis. The results showed the absence of herding behavior among investors of Sukuk Murabahah in the studied period. The results also showed that investors in this market have not shown herding behavior in the periods of stress.

Key words: Herding behavior, Islamic bonds, Sukuk Murabahah, regression analysis, capital market

INTRODUCTION

"Financing" is one of the most important factors of each country's financial system. In many cases, severevolatility happens in pricesin the stock market without issuing any specific and reliable information about them in the market. In herding behavior, unconditional adherence to other investors is the basis for decision making. Such decisions cause the influx of investors to buy or sell stocks and lead to volatility of the prices. The consequence of which is the instability and fragility of the market. Institutional investors are the most important players in the capital market, especially the stock market whose activities have direct impact on the indexes and the trading of other participants of the stock market. If institutional investors trading are not based on adequate information and merely based on adherence to other investors, herding behavior will happen which is one of pervasive behaviors in financial markets and it can explain some parts of the financial market volatilities especially in the stock exchange. The present study sought to answer the question whether the behavior of investors in this market during the period of issuance of the securities was herding behavior or not?

Statement of the problem: Investors are under the influence of their investment environment and often feel a pressure to blend in with the environment. For example, 'fashion' is a mild form of herding behavior. Herding behavior is the most widely recognized objective phenomenon in financial markets that shows the extreme tendency to the performance of the winners. There are two different views about herding behavior; rational view of the herding behavior and irrational herding behavior. Irrational herding behavior focuses on investor psychology. According to this view, managers simply turn blind imitation of one another without consideringrational analysis so wiser investors are able to profit more from this behavior. In contrast, rational herding focuses on optimum decisions that are destroyed by the disorders of intelligence or motivation such as herding on the basis of fame (Devenow and Stickland, 1996). Regardless of whether the herding behavior is rational or irrational, many researchers argue that herding behavior is thesub product of information asymmetry in the market. In theory, herding refers to people chosen to imitate one another's actions and observed output of other's behavior.

Venezia *et al.* (2008) showed that tendency to herding behavior is higher among inexperienced investors due to the financial illiteracy and lack of experience (Chang and Lin, 2015). In general, herding behavior in financial markets is expected by three main groups participating in the market; individual investors, managers of investment, large investment institutions such as pension funds and public insurances. Understanding the weaknesses of investors in decision-making is so important without which the stock market development would be impossible. Many researches have been done in recent years about herding behavior in Iran's Stock Exchange. Since, Iran is a Muslim country and given the importance of Sukuk bonds we investigated the question

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whether there is herding behavior in Islamic securities like Iran's Stock Exchange or not. For this purpose, herding behavior is studied in companies that issued Islamic bonds in the period 1390-1394.

Theoretical foundations of the research: In the capital market, the investors and fund managers engage in risky measures for profit without having enough information and seeing the first signs of crisis they rush to the safe havens. This is mainly due to the lack of appropriate analyzes, the lack of informational and transactional transparency, lack of information asymmetry, lack of adequate laws and regulations, lack of information disclosure requirements and wining the investor's confidence thereby and ultimately the lack of efficiency in thecapital market. If the market is efficient precisely there is not herding behavior.

In fact, herding behavior leads to market inefficiency. Limited attention of the investor to the interest causes systematic errors that affects stock market prices. The stock price of the company which has reported high interest is determined over the intrinsic value and then revealing the real information, the stock price drops to the actual price. According to financial analysts, financial statement items value according to their degree of predictability in decision-making. Islamic Republic of Iran provided the regulations governing the issuance of securities in 1373 and Tehran municipality as the publisher issued the 1st securities to finance the project of Nawab Safavi highway. Since Islamic finance researchers were unaware of this innovation, the idea of using Islamic financial instruments is attributed to as early 1376 i.e., 3 year after the approval of the governing regulations about issuing the bonds in Iran. Therefore, Iran became the first country to engage in designing and issuing of such tools.

Of course the development and design of various types of financial instruments has been done by other Islamic countries, especially Arabic countries and Malaysia (the company of Central Asset Management of Capital Market). Murabaha bonds one of the sales contracts is the Murabaha sale which has been common since ancient times among the people so that the seller informs the customer about the final price of the good including purchase price, transportation and maintenance costs and other related costs then he demands an additional amount or percentage as the profit. If the seller lies about the purchase price or related costs, the customer has the option to cancel the transaction. Sale of Murabaha can be made in cash or credit and if in credit its interest rate is normally higher (Musavian, 1972) (Fig. 1).

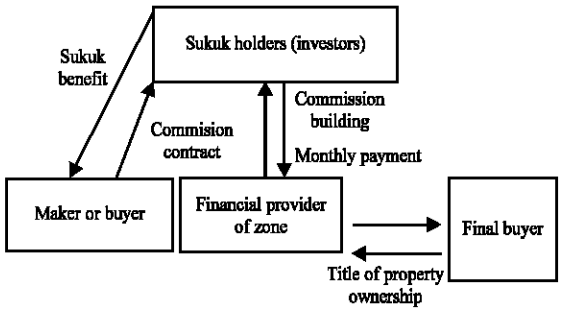

Fig. 1: Dynamic stochastic general equilibrium model and Kalman filter

Literature review: Marzban and Farahani in their study entitled "Modeling of Sukuk Technology in the Banking Industry of Iran", studied the Sukuk technology as powerful tool for financing in Islamic and non-Islamic countries using Dynamic Stochastic General Equilibrium Model and Kalman filter. The results indicate that financing through Islamic sukuk due to the specific characteristics of these securities may lead to non-inflationary financing and according to oil-based economy of Iran this kind of financing works like a buffer facing with monetary shocks (for producers as entrepreneurs and investor as well).

Poorzamani investigated herding behavior of institutional investors using Christie and Huang Model in the Tehran Stock Exchange, deviation of stock returns of companies from market returns in daily and weekly intervals in the total distribution of market returns and also during increased and decreased volatility periods of market in the institutional investors group. The results showed no herding behavior in the Tehran Stock Exchange when there was a boom in the market but using daily data of returns, evidence of herding behavior found during the market downturn. Another point is that using weekly data no evidence of herding behavior was found which could have an emphasis on Christie and Huang (1995) findings that indicate herding behavior is a short-term phenomenon.

Shams and Golbabaei Pasandi studied the relationship between herding behavior and volatility in selected industries in the Tehran Stock Exchange over the period 1388-1392 using the model by Chang and Lin (2015) and calculating the cross-sectional standard deviation and stock returns. The results based on dynamic model show that in all sectors herding is associated with high volatility and no low volatility observed in any studied industry sectors. Chang and Lin (2015) investigated the effects of national culture and behavioral problems of investors in decision-making and behavior in international

stock markets through using method. The results showed that for the first time herding behavior has occurred in only 18 cases of the 50% of market share. They also found that behavioral problems including excessive optimism and overconfidence significantly influenced the herding behavior of investors.

Choi and Skiba (2015) studied the herding behavior of institutional investors in international markets in the 41 countries. Evidence suggests that asymmetry of information of institutional investors in specified markets is higher in low levels. Herding behavior of institutional investors is more likely guided by correlated signals of the fundamental information. Eventually, faster price adjustment is in the transparent informational markets.

The main hypothesis of the research: Existence of herding behavior in Sukuk Murabaha investors in the capital market of Iran.

MATERIALS AND METHODS

The research was conducted by using correlation and regression analysis and models of Christie and Huang (1995) in 4 companies issuing Sukuk Murabahah from 1390-1394 (252 working days (daily). Christie and Huang (1995) applied cross-sectional standard deviation to measure the dispersion of stock returns. This parameter can indicate the return dispersion of companie's securities from the mean of the market. For testing the herding, regression specification model was used to determine the level of return deviation of each share from total return at the time of market stress. Data collection is documentary. The applied data has been collected through the authorities and official websites of capital market data such as Central Asset Management Company of Iran capital market. Software eviews 9 was used to estimate regression models and to test hypotheses.

Variables

Independent variables: D_L and D_U; D_L is a variable specifies portfolios decline tension periods and D_U is portfolios rising tension periods using daily returns. Both are dummy variables and are 0 or 1. If the daily return of portfolio securities using the criteria of 1, 5 and 10% is at the left end of the portfolio return distribution diagram, $D_L = 1$ and otherwise = 0. As for D_U, if the listed criteria are at the right end of the graph, it = 1 and otherwise considered 0.

The criterion 1% determines the return in periods of stress in the portfolio. To determine the criterion; first daily returns of the securities of each portfolio is determined in the 4 year of the study (252 day of Sukuk Murabahah transactions). Then, scatter plot is drawn and the 2 ends of the left and right (up and down) is considered in such a way that 1% of the chart volume is on the left (up) and 1% is on the right (down) separated from the rest. The periods that fit in these 2 areas are called periods of stress. The criteria 5 and 10 is like 1% criterion to determine the returns in periods of stress in the portfolio with the deference of replacing 1 with 5 and 10%. Stress period refers to a period in which changes in bond returns is significantly higher than the mean changesof the total period. In other words, the average return of available securitiesin the portfolio during that period issignificantly lower or higher than the average returns of portfolios in any other period. In order to determine the difference between the two hypotheses, we must determine the dispersion level of returns distribution in both ends of the distribution of securities return in the sample companies. In fact, this practice separates stress periods of market (portfolio) from normal periods (Fig. 2).

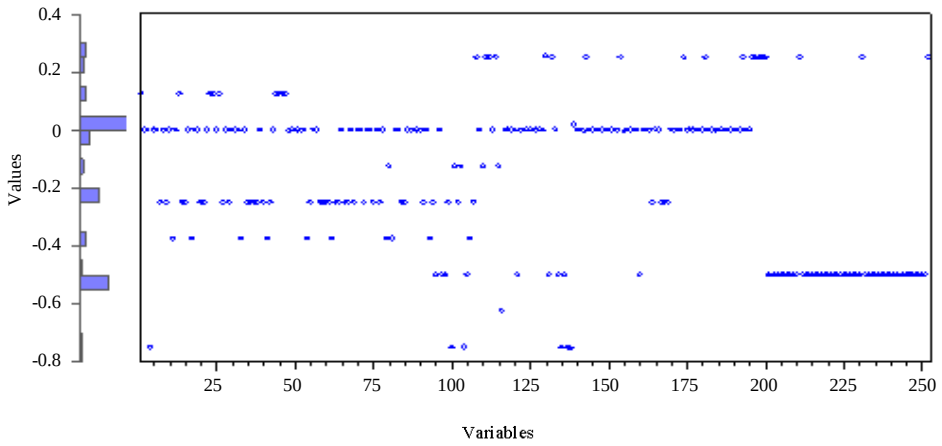

Fig. 2: Data distribution for average return in Sukuk Murabahah trading and benchmarking

The horizontal axis shows the distribution of transactions in 1099 working day and the vertical axis represents the density of the trading around the mean.

Dependent variable: Cross-sectional standard deviation of the bond returns: is the standard deviation of the bond return of available companies in the portfolio during the studied period regardless of their weight coefficients. It is based on the Eq. 1 and is shown by the symbol SD:

$$S.D_t = \sqrt{\frac{\sum_{j=1}^{N}\left(r_{j,t} - \bar{r_t}\right)^2}{n-1}} \quad (1)$$

Where:

$S.D_t$ = Cross-sectional standard deviation of returns in the period

$t; r_{j,t}$ = Bondreturn of the company j in the period t

n = Number of companies included in the portfolio in period

$t; \bar{r_t}$ = The cross-sectionalmean of published bond return in portfolio in the period t

Daily returns of bonds of a portfolio: in order to calculate the average of n return in each portfolio the following formula is used:

$$\bar{r_t} = \frac{\sum_{j=1}^{N} r_{j,t}}{n} \quad (2)$$

Daily returns of securities of a company: in order to measure the rate of investment return, earnings from the investment is divided by the initial amount of the investment. Return on investment in a study of sukuk in a period includes price changing of the securities in that day. To calculate the above (variable related to thebond return) Eq. 3 and 4 are used. Calculating thereturns of the bonds in the case that capital increase is a combination of reserves and receivables and cash and the Assembly still has not been held:

$$r_{i,t} = \frac{(i + \alpha_1 + \alpha_2)(P_{i,t} + D_{i,t}) - P_{it-1} - 1000\alpha_1}{P_{i,t-1} + 1000\alpha_1} \quad (3)$$

Calculating thereturns in the case that capital increase is a combination of reserves and receivables and cash and the assembly has been held:

$$r_{i,t} = \frac{(1 + \alpha_1 + \alpha_2)P_{i,t} + D_{i,t} - P_{i,t-1} - 1000\alpha_1}{P_{i,t-1} + 1000\alpha_1} \quad (4)$$

Where:

r_{it} = Bond returns of the company i in the period t

P_{it-1} = The price of bonds in the period t

P_{it-1} = The price of bond during the t-1

$D_{i,t}$ = Cash profit for the period t

α_1 = Percentage of capital increase from receivables and cash

α_2 = Percentage of capital increase from the reserves. With regard to the structure of the issuance of Islamic securities (Sukuk Murabahah) α_1 and α_2 are considered as = 0

Functional model of the research: The equation of cross-sectional standard deviation of bond returns: this model of the research has been the practice of many researchers. The main idea of this research approach is based on the assumption that when there is herding behavior in the market, security returns of variouscompanies deviate significantly from the overall return of the islamic securities market (Sukuk) because people ignore their own opinions in the decision-making and act only on the basis of similar decisions of other investors. In this study, there are two basic equations: one is the standard deviation and the other is one-variable regression equation.

Herding behavior in the stress period: Although, the structure of Sukuk issuance in Islamic markets has been designed so that it has fixed returns, its transaction in secondary markets is the basis for investigating herding behavior in this market. This methodology suggests that herding behavior is more likely to occur during periods in which unusual volatility happens in the market, i.e., the periods that too big or too small returns take place in the market. So, we examine the level of the deviations in the two extreme of the distribution of market returns to determine whether the returns of bonds are significantly lower than average or not during periods of market volatility?

Calculating the regression for the cross-sectional standard deviation of the bonds returns: After identifying the periods of stress we can examinethe predictions and pricing model of the capital assets of herding behavior by the following regression equation. The following two dummy variable (D_L and D_U) is related to the recession and boom. In other words, the level of deviations is considered as a variable dependent to the time of the stress. The second variable that is in fact the estimation of the standard deviation is estimated by the folloeing linear regression:

$$CSSD_t = \alpha + \beta_L D_L + \beta_U D_U + \varepsilon_t \quad (5)$$

Where:

$CSSD_t$ = The cross-sectional standard deviation in the period t dummy variables of this regression model include

D_L = 1 if the market return in period t is on the left end of the return distribution and for the rest of the cases is equal to zero

D_U = 1 if the market return in period t is on the right end of the return distribution and for the rest of the cases is equal to zero

Estimated regression is always univariate. In this regression, there are three modes for cross-sectional standard deviation: values D_L and D_U are both zero due to the falling of the returns of portfolios in the normal range (outside the two ends of returns distribution spectrum). Therefore, in the regression equation only α estimates the standard deviation of that specified period. $D_L = 1$ due to the falling of the portfolio return at the left end of thedistribution. Therefore, regression equation includes α and β_L.

$D_U = 1$ due to the falling of the periodic return at the right end of the distribution. So, the regression equation includes α and β_u. The coefficient α indicates the average deviation from market returns is in an area which is not covered by two dummy variables.

RESULTS AND DISCUSSION

Herding behavior usually occurs at short intervals. The longer the time periods to be considered, the harder the probability of finding a herding behavior. Further information will be published in long periods and the practice of imitating the others will be investigated by published information. In the current study interval is considered as daily. The descriptive statistics of the study including return and the mean of bonds in a period are as follows in (Table 1).

Analysis: The results of the estimation of the functional model coefficients for 4 companies issuing sukuk murabaha and daily data in the period 1390-1394 are as follows: α is the correlation coefficient of the dependent variable. β_L and β_U are the estimation of the independent correlation coefficients. In the t-test, p-value is the value of its probability for the estimated coefficients. If the probability is <0.05, H_0 (the existence of herding behavior) is rejectedand if it is >0.05 (p>0.05) H_0 (the significance of the herding) is confirmed, i.e., the opposite assumption. As can be seen in Table 2-4 probability is close to zero and so H_0, i.e., the assumption of the existence of herding behavior in Sukuk Murabahah is rejected in both dummy variables D_U and D_L. Except about the D_L at 99% whose value is >0.05 and confirms the existence of herding behavior. Durbin-Watson test is a measure for autocorrelation or serial correlation. If its value is between 1.5 and 2.5 (1.5<DW<2.5) shows the lack of autocorrelation. Summary of the results of the testing of hypothesis in 3 levels of 1, 5 and 10% is as follows: In the table, coefficients for the dummy variable of D_U are negative for the three criteria which indicates the rejection of the assumption H_0 (existence of herding behavior). D_L coefficients are positive on all three measures which represents that H_0 assumption is confirmed and can confirm the H_1 which represents the absence of herding behavior. Coefficients of D_U and D_L represent the herding criterion in conditions of unusual low and high volatility in the market. D_L variable positivity in confidence levels of 90, 95 and 99% indicates that it is significant. So, the hypothesis which arguesherding behavior reduces the return deviationof Islamic securities from overall return of the market of institutional investors is not confirmed on three criteria at the level of daily data. D_U negativity implies an increase in cross-sectional standard deviation of the portfolio in the stress period. According to this pattern, it is expected with increasing volatilities on the

Table 1: Descriptive statistics summarizes of companies issuing Sukuk Murabahah in the period 94-91 year

Portfolio	Description	Number	Mean	Median	Min.	Max.	SD
4 Murabeha companies	Return of bonds	252	-0.167013	-0.000388	-0.753712	0.254024	0.255885

Table 2: The results of data analysis of 4 companies for dummy variable of β_L at three levels 1, 5 and 10%

99% Murabeha portfolio	t-statistic	p-values	95% Murabeha portfolio	t-statistic	p-values	90% Murabeha portfolio	t-statistic	p-values
α	6.072504	0.0000	α	6.072504	0.0000	α	6.072504	0.0000
B_L 99%	25.75150	0.0000	B_L 95%	25.75150	0.0000	B_L90%	25.75150	0.5640
F-statistic	663.1399	0.0000	F-statistic	663.1399	0.0000	F-statistic	663.1399	0.0000
Durbin watson	1.217422	-	Durbin watson	1.217422	-	Durbin watson	1.245837	-

Table 3: The results of data analysis of 4 companies for dummy variable of β_u at three levels 1, 5 and 10%

99% Murabeha portfolio	t-statistic	p-values	95% Murabeha portfolio	t-statistic	p-values	90% Murabeha portfolio	t-statistic	p-values
α	40.14852	0.0000	α	40.14852	0.0000	α	40.59054	0.0000
B_U 90%	-25.75150	0.0000	B_U99%	-25.75150	0.0000	B_U 95%	-26.06436	0.0000
Determination coefficient	0.726219	-	Determination coefficient	0.726219	-	Determination coefficient	0.730995	-
F-statistic	663.1399	0.0000	F-statistic	663.1399	0.0000	F-statistic	679.3508	0.0000
Durbin watson	1.217422	-	Durbin watson	1.217422	-	Durbin watson	1.245837	-

Table 4: Test results of the hypothesis of the herding behavior in Sukuk Murabahah

Criterion	Regression equation
Criterion (1%)	SD = 0.375449930899×-0.432682286711 99 D_U
	SD = 0.374519204365×+0.0591395860863 99 D_L
Criterion (5%)	SD = 0.374519204365×-0.433658790451 95 D_U
	SD = 0.374519204365×+0.0591395860863 95 D_L
Criterion (10%)	SD = 0.374519204365×-0.433658790451 90 D_U
	SD = 0.374519204365×+0.0591395860863 90 D_L

return mean the dispersion of return will increase in the whole portfolio due to the difference in the sensitivities of the returns of bondsin relation with the return of the portfolio. Looking at D_U and D_L coefficients shows that D_L coefficient related to the growing market is far more than D_U coefficient related to declining market in all three criteria. This represents the consensus of most market participants in the downturn periodof the market. Therefore, the alternative hypothesis that suggests "if return deviations of Islamic securities from market returns is significant for institutional investors, the deviations of recession will be lower than that of boom" is confirmed for daily data of D_L. However, the hypothesis is rejected for daily data due to the lack of significance in D_U coefficient.

So, existence of herding behavior is confirmed. As for D_L, coefficients are positive and opposite mode is expected, i.e., with reducing the volatility on the mean of the return, the dispersion of the returns of the bonds decreases in the overall portfolio. According to Christie and Huang (1995) if the estimation of the regression for the coefficient of D_u and D_L is positive it indicates that in theperiods of extreme volatility in the sukuk bond return, the portfolio's standard deviation has also increased. Because in the regression equation a positive number added to α which is equal about the mean of daily cross-sectional standard deviations. As a result, the prediction of capital asset pricing model which expresses the standard deviation of the portfolio should be increased during the tension is correct. So, there is no herding behavior in the portfolio. But if the secoefficients are negative, indicates the reduction of the standard deviation in stress periods of the portfolio because α which is about the mean of the daily cross sectional standard deviations get reduced and thus it confirms the existence of herding behavior. It should be noted that in all cases the obtained values for the coefficients have to be statistically significant.

CONCLUSION

According to Christie and Huang (1995), herding behavior among market participants cause them to follow the consensus of the market and it makes company returns similar to the market and the level of the deviation of company returns get reduced comparing market returns. The herding behavior is likely to occur during periods of market stress. In the research, first the returns of Islamic bonds of the companies issuing Murabaha sukuk in the period 1390-1394 was calculated and then cross-sectional standard deviation and cross sectional mean of the companies examined according to daily data. Then, univariate regression was used to calculate the herding test and to test the hypotheses. According to the findings, the hypothesis of the existence of herding behavior in Sukuk Murabahah was not confirmed based on three levels of 1, 5 and 10% except for the D_L 1%. Although, similar research has not been done in the case of herding behavior in the secondary securities markets, the results are in line with the study by Izadi *et al*. (1969) that denies the existence of herding behavior in selected industries in the Stock Exchange.

In foreign studies, Christie and Hung (1995) in America, Chang and Lin (2015) in Japan and America, Dmirer and Coutant in China market have shown that no evidence of the existence of herding behavior in these markets have been confirmed. However, in some emerging markets such as South Korea and Thailand the tendency to exhibit herding behavior has been confirmed due to the unorganized market structure and the lack of informing and comprehensive laws.

The first evidence of Tehran Stock Exchange (the primary market) indicates that investors in the Tehran Stock Exchange show emotional and sometimes irrational behavior about queues to buy and sell stocks and also to growth and decline of the market. It can lead them to follow frequency because they believe that due to their final information, they know earlier than others the best time to enter and exit the market in relation to certain stocks. Some of these reasons are as follows: desire to speculation in the stock market as a result of fluctuations in the market, lack of transparency and efficiency, being influenced highly by political developments. According to the obtained results that are related to the secondary market of Islamic securities, behavior are rational and they were not on the base of feelings and lack of adequate information.

SUGGESTIONS

In order to develop this tool in the country, it is necessary to attempt to consider essential legal and economical infrastructures. In this regard; providing the necessities to develop Sukuk in the domestic and international markets can be useful to collect the domestic dollars and at the international level it can be considered by Muslim investors in other countries and it can improve Iran's share of international Murabaha Sukuk market that is currently very little, providing the necessities for the establishment and development of ranked companies is

oneother necessity for the development of the Islamic security market in the country, since the conducted studies about herding behavior in Iran have been done separately on the investors and various industries in the stock exchange, a comparative study should be done about the herding behavior of investment managers on the three main groups of market participants, i.e., individual investors, investment managers and large investment institutions.

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