

Investors' herd behavior related to the pandemic-risk reflected on the GCC stock markets*

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Abstract

The purpose of this study is to examine the causal association between expectations of pandemic risk and herding behavior. The study was undertaken in two stages. First, it was felt necessary to obtain a broad overview of the effect of the pandemic related risk of COVID-19 on investors' herding in the GCC. This was achieved by analyzing secondary data (i.e. daily historic prices on five GCC country market indices). In analyzing the secondary data, the study follows Christie and Huang (1995) and employs the cross-sectional standard deviation (CSSD) of returns to detect investors' herding behavior. Second, in an attempt to obtain a more precise understanding of the impact of pandemic related risk, a questionnaire survey was distributed and collected from 318 investors from the GCC stock markets. A confirmatory factor analysis (CFA) was also used as the primary analysis between the two variables: i.e. expectations of pandemic risk and herding behavior. The findings reveal that expectations of pandemic risk have a significant positive impact on the herding behavior in the GCC stock markets during the coronavirus crisis in the first quarter of 2020. Finally, the results of this study are robust to a range of model specifications.

Key words: COVID-19, GCC Stock Markets, Investor Herding, Pandemic-Risk, Cross-Sectional Standard Deviation (CSSD), Confirmatory Factor Analysis (CFA)

JEL classification: G11, G15, G18, I18

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1. Introduction

Herding impact is obvious when individuals do what others are doing as opposed to utilizing their data or settling on autonomous choices. Herding has a long history in principle and gathering mind science. It is particularly appropriate in the region of reserve, where it has been discussed equivalent to the total unreasonableness of money related experts, including protections trade bubbles (Banerjee, 1992). In different territories of dynamic, for example, governmental issues, science, and mainstream society, crowd conduct is in some cases alluded to as 'data falls' (Bikhchandi et al., 1992). Herding behavior can be expanded by different variables, for example, dread (for example Economou et al., 2018), vulnerability (for example Lin, 2018), or a mutual character of leaders (for example Berger et al., 2018).

The coronavirus emergency has uncovered buyer conduct at its generally extraordinary, as lack fears have brought about individuals storing tissue and food. Nevertheless, among investors, we see the inverse to accumulating. There has been far-reaching dumping of risked resources and a trip to quality in resources like gold and government securities, trailed by times of sharp market rises. In any case, the COVID 19 impact is comparative. Pictures of uncovered store racks feed more frenzy purchasing among customers, while steep decreases in advertising lists and the apparition of circuit breakers being activated – which happened a few times in March 2020—sparkle further selling.

The purpose of this study is to examine the causal association between expectations of pandemic risk and herding behavior in the GCC stock markets. The main question of this research effort is: "would we be able to assume that investor behavior is correspondingly unreasonable?" In this study, The general hypothesis can be stated in the null form as follows: "Pandemic-Risk Related has no statistically significant impact on Investors Herding Behavior in the GCC Stock Markets"

This study will make a valuable and important contribution to the literature at both the theoretical and practical levels. At the theoretical level, the results of this research will provide empirically based information on the impact of pandemic risk related on investors' herding behavior in the GCC stock markets. This study also contributes to the larger area of economic and behavioral finance theories by highlighting the effect of pandemic risk related on investors' herding behavior in the GCC stock markets. At a practical level, this research may also contribute to Gulf policy makers' evaluation of the effectiveness of the stock markets, as well as contributing to the improvement of management and corporate governance practices. After all, the results of this study will have implications for improvements in practices of economic and finance and may be used as a guide towards advancing the management and performance of the GCC stock markets.

Furthermore, the findings of this study will have a clear economic significance as these results would contribute to advance the accumulated international literature

of the herding phenomenon in developing countries in general, and the GCC in particular. Our study has significant commonsense ramifications for investors, strategy producers, budgetary controllers, just as organizations. It ought to be noticed that, during the financial crisis, objective valuation happens to principal significance for organizations, which try to source value capital. Our study additionally will add to the continuous open discussion, which spins around the compromise between general wellbeing also, the economy.

The rest of this paper is organized as follows: Literature review is presented in section 2. Section 3 introduces the methodology. Discussion and results of statistical analysis are explained in section 4, while conclusions are in section 5.

2. Literature review

While the coronavirus pandemic is unsettling, we have survived some wild occasions in the course of recent decades, including multiple sickness flare-ups (SARS in 2002-2003, avian influenza in 2006, Swine influenza in 2009, Ebola in 2014, Zika in 2016, among a few others) such as: the Black Monday financial exchange crash in 1987; the blasting of the tech-stock air pocket in 2000; September 11, 2001 fear monger assaults; the 2008-2009 worldwide financial crisis and Great Recession; the 2016 Brexit vote; and the U.S. – China exchange war. Every one of these occasions activated extreme market stuns that went on for a considerable length of time or years. However, during this time from 1980 to 2019, the S&P 500 record has posted a normal yearly return of 11.8%. The worldwide markets likewise showed their flexibility during that time, with the MSCI World list posting an 8% normal yearly return and the MSCI Emerging Markets list posting a 10.7% normal yearly return (Abdeldayem and Aldulaimi, 2020).

History has demonstrated the benefit of staying contributed during earlier scenes of market unrest. The COVID-19 pandemic presents an incredibly troublesome transient emergency, however almost all drawn out investors will have a venture skyline past this pandemic. Concentrating on that skyline, will assist financial specialists with utilizing risk models better; and will eventually assist them with performing better as well. Markets in chaos are the place long haul financial specialists bring in their cash. Contributing counter consistently, when numerous others without long haul liquidity are selling, is a reasonable preferred position for long haul financial specialists. Financial specialists that play out the best over the drawn-out will have faced determined and intentional challenges and set cash to work during emergencies like this one. During circumstances such as the present, a drawn-out investor will comprehend that the world has moved outside of likelihood and that human conduct will influence both the reaction to the pandemic and the risk and return that monetary markets produce. Long haul investors perceive that

this emergency presents an administration chance to add to results that would satisfy their associations' motivations.

For the most part, financial specialists bought out-of-the cash alternatives to support against surprising business sector moves (this is the point at which the hidden resource's cost is underneath the strike cost). In any case, as the market fell strongly huge numbers of these alternatives became at-the-cash (ATM) choices – as such, the ones with the most noteworthy gamma (which means the cost of the choice is the most receptive to changes in the cost of the hidden resource). Regardless of whether investors decided to clutch ATM choices or expected to get them to consider the risk of their portfolios, the cost of alternatives comparative with their strike cost demonstrated that financial specialist interest for ATM choices was higher than expected – something that brought about a supercharged market. The higher the volume of choices extraordinary, the higher the measure of delta supporting required by the choice vender. At the end of the day, whatever heading the market takes on some random day, its developments are probably going to be raised by the delta supporting of alternatives dealers. This elevated transient energy is to some extent liable for the size of the day-by-day swings we have seen. In the result of steep market falls, the cost of choices, like any protection after an occasion, has expanded pointedly, which should quiet their enhancing impact going ahead (see Abdeldayem and Sadeek, 2018; Abdeldayem and El-Sherbiney, 2018; Shaker and Abdeldayem, 2018).

To start with, the exploration that inspects the impacts of pandemic emergencies on monetary resource valuations has been an early stage (Baker et al., 2020). Two prominent special cases are (i) Donadelli et al. (2017), who study if the financial specialist state of mind, driven by news on internationally risky maladies (for example SARS, Influenza A (H1N1), Polio and Ebola) is evaluated in 2 pharmaceutical stocks in the US and (ii) Ichev and Marinc (2018), who report that the Ebola episode occasions were trailed by raised apparent risk in the US monetary markets. According to the COVID-19, just barely as of late, Onali (2020) looks at the COVID-19 cases and passing on the US securities exchange and finds that there is no effect on the US financial exchange returns. Baker et al. (2020) and that the instability connection between the Chinese securities exchanges and cryptographic forms of money advanced essentially during the pandemic. In a comparable Salisu et al. (2020) recommend that COVID-19 does not enhance crowding in digital currency markets. Uddin et al. (2020) inspect the associated elements of Asian monetary markets and find solid, positive reliance among the explored showcases because of the flare-up of COVID-19. Such uncommon occasions give an unedited chance to find out about investor behavior. Along these lines, our exploration intends to this void by considering 5 Gulf financial exchanges during the COVID-19 pandemic. In particular, we ask whether the ongoing far-reaching securities exchange breakdown is related to the nearness of herding behavior in Gulf financial exchanges.

Second, in contrast to past examinations on herding behavior in universal financial exchanges (e.g., Chiang and Zheng, 2010; Gebka and Wohar, 2013; Lin, 2018; Chen et al., 2019; Yarovaya et al., 2020), this investigation gauges the conceivable effect of pandemic-related risk (COVID-19 pandemic) on herding behavior in the GCC securities exchanges.

3. Methodology

At the point when investors are completely sound, CAPM expects a direct connection between the rates of return of securities. Such market risk of securities probably won't be the suitable answer for achieve market balance or equilibrium. In any case, CAPM, as proposed by financial specialists, for example, Treynor (1961), Sharpe (1964) Lintner (1965) and Mossin (1966), has bombed various exact tests as investors in the market frequently show herding behavior with the end goal that individual stock returns veer off altogether from market returns. In this part, we present the most widely recognized proportion of profits scattering, specifically the Cross-Section Standard Deviation (CSSD), and present the exact model to be utilized in testing for herding behavior in the GCC stock markets.

The goal of this study is to explore the impact of the pandemic related danger of COVID-19 on financial investors' herding in the Gulf Cooperation Council (GCC) securities exchanges. To this end, we center around five financial exchange files from the GCC (see Table 1 below). Day by day memorable costs on five GCC nation advertise records were made accessible by Reuters Middle East, Shuaa Capital in UAE, and from some online sources, for example, Bayan speculation organization: <http://www.bayaninvest.com> and MENAFN.COM: <http://www.MENAFN.com>. The information extend is from 1 January 2020, when the COVID-19 pandemic began spreading far and wide, to 31 March 2020 for the securities exchanges of Bahrain (BAX), Kuwait (KWSE), Oman (MSM30), Saudi Arabia (TASI), and the United Arab Emirates (ADX and DFMG).

Table 1: GCC Stock Market Indices

Gulf Country	Index	Description
Bahrain	BAX	It includes 39 listed stocks
Saudi Arabia	TASI	It includes 168 listed stocks
UAE	DFMGI	It includes 33 listed stocks
	ADX	It includes 41 listed stocks
Kuwait	KWSE	It includes 187 listed stocks
Oman	MSM30	It has the most liquid 30 stocks in the market

Source: prepared by authors

3.1 Measuring Herding Behavior

To measure investor herding, we follow Christie and Huang (1995), who recommend the utilization of cross-sectional standard deviation (CSSD) of profits to distinguish investors' herding behavior in a global market setting. In particular, CSSD_{i,t} for the nation I on day t is characterized as:

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

Where $R_{i,t}$ is the arrival in the nation I on day t and $R_{m,t}$ is the GCC advertise return, which is determined as the cross-sectional worth weighted normal come back from the 5 Gulf nations. $CSSD_{i,t}$ is a unique proportion of herding behavior in the nation I, which is determined as a 20-day ($N=20$) moving window standard deviation of nation's I come back from the Gulf showcase return m on day t. Within the sight of herding behavior, during huge swings in stock costs and returns, the nation's I return should go astray 'less' from the worldwide market return than during less unstable periods. As such, 'little' $CSSD_{i,t}$ values signal more grounded proof of crowding conduct, though 'enormous' values signal more fragile proof.

In addition, the instrument used to collect the primary data is an online questionnaire survey. The questionnaire is consisting of 14 items to assess the two subscales (6 items to measure expectations of pandemic risk and 8 items to measure herding behavior). Further, there are 5 items to measure the demographic variables of the participants. The participants received an electronic version of the questionnaire using the google doc. online format. Several emails were sent to participants including the invitation to participate along with a link of the web page to guide them to the questionnaire survey.

Since all individual investors in the GCC Stock markets have been remembered for the second phase of the study embraced through an online questionnaire survey, completed by utilizing the convenience sampling strategy, comprising of 420 respondents in the sample. The 6-points Likert scale was employed. The surveys were disseminated on the web, with explicit purposes, through directors of financier firms of five GCC Stock Exchanges being considered capable to send arbitrarily to investors (respondents). The time limitations constrained us to choose just individual financial specialists in the study. Out of 420 questionnaires circulated to the respondents, just 318 surveys were discovered to be substantial, being finished in each regard were gotten back for breaking down of the study. This result in a response rate of 75.7 % which found to be acceptable for this research effort

By utilizing Cronbach's Alpha scale, the substantial questionnaires were introduced for appropriate reliability tests. At the point when combined construct validity

coefficient is applied, at that point Cronbach's Alpha must surpass 0.7. At exactly that point the scale is without a doubt viewed as valid, right and dependable (Arteaga-Ortiz and Fernández-Ortiz, 2010). As per our test outcomes, generally Cronbach's alpha remained at 0.832, while independently, it indicated figures as 0.711, and 0.750 for the two factors to be specific, expectations of pandemic risk and herding behavior. Cronbach's alpha shows that these elements are solid, since its subsequent figure ($\alpha = 0.863$) surpasses the base degree of adequacy. There is additionally an unmistakable sign that mean and standard deviations of the apparent multitude of four variables, which impact the behavior of investors in the GCC Stock Exchanges. The effect of different degrees of behavioral variables in venture choices are assessed by the basic figuring of mean estimation of every determinant. Since we have utilized the 6-direct scales toward figure and measure their effect levels, the estimations of mean are chosen in like manner, based on the accompanying existing standards (Rodriguez et al., 2014).

- Mean qualities under 2 shows that factors have low effects
- Mean qualities between 2 to 3 shows that the factors have low effects
- Mean qualities between 3 to 4 shows that the factors have moderate effects
- Mean qualities between 4 to 5 shows that the factors have high effects, and
- Mean qualities in excess of 5 shows that the factors have high effects.

4. Empirical data and analysis

Previous research in this area revealed that investors' herding behavior may vary with the level of economic development of countries (see Avery and Zemsky, 1998; Gill et al., 2018; Kizys et al., 2020). Therefore, the investors' herding behavior paradigm of developed countries does not appropriately reflect the problems of developing countries and thus cannot be applied to developing countries. Unlike investors' behavior in developed countries, investors' herding behavior in developing countries is usually prescribed by the International Donor agencies such as the World Bank and the International Monetary Fund (IMF), as a prerequisite for development and for obtaining structural adjustment consultancy and loans. Thus, these facts make research into the investors' behavior experience in the GCC the more interesting to evaluate.

Table 2 reports elucidating insights into the factors utilized. CSSD shows that an arrival on the financial exchange record of the nation I go astray on normal from the GCC showcase return by 0.6232%. The standard deviation of CSSD is 0.2077%. The GCC Index takes on values from 0 to 100. It midpoints 11.6921index focuses and goes amiss from the mean on normal by 14.6152 file focuses. We additionally note that both Ri and Rm highlight negative normal qualities, - 0.2926% and -

0.2956%, individually, which delineates the emergency of value estimation of organizations over the globe. Estimations of R_i and R_m veer off from the GCC advertise return on normal by 1.6204% and 0.9398%, separately. Thinking about individual Gulf nations. Since, 'little' $CSSD_i$ values signal more grounded proof of herding behavior, and 'huge' values signal more vulnerable proof, these outcomes demonstrate that there is a proof of investors' herding behavior in the GCC securities exchanges during the coronavirus emergency in the first quarter of 2020. This finding concurs with past research, for example, Miller (1977), Avery and Zemsky (1998), Gill et al., (2018); Kizys et al., (2020).

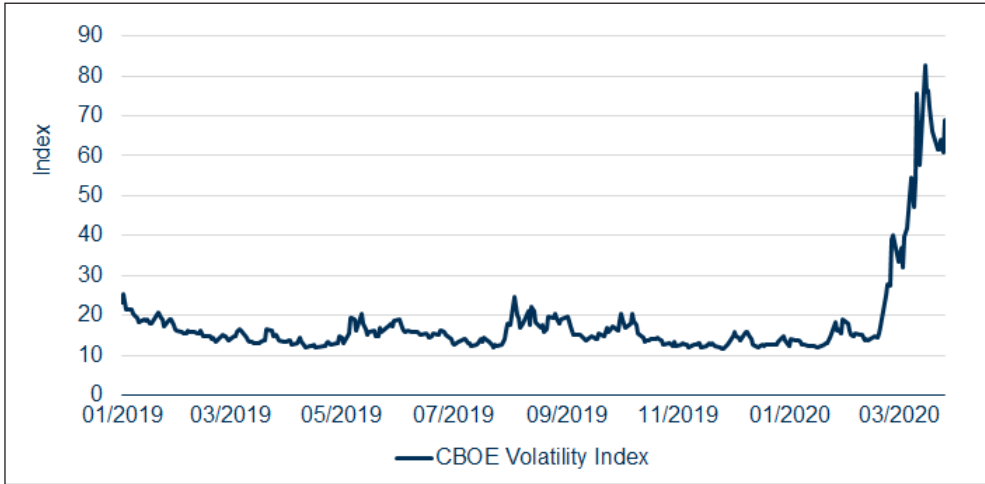
Table 2: Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Minimum	Maximum
CSSD	2,493	0.6232	0.2077	0.1038	4.1557
GCC index	1,670	11.6921	14.6152	0	100
R_i	2,368	-0.2926	1.6204	-10.6561	8.2885
R_m	2,420	-0.2956	0.9398	-4.2352	1.8150

Source: prepared by authors

In this regard, Abdeldayem et al. (2020) argue that during the COVID 19 pandemic time, volatility has dialed down to some degree in the course of the most recent seven day stretch of March 2020. Figure 1 shows that volatility has increased significantly in March 2020. This could be because of market weakness or ebbing vulnerability as the new reality becomes standardized and most pessimistic scenario situations are evaluated in. As indicated by specialists who are following how responsive market risk is to reports of new coronavirus cases, the flexibility of instability will in general die down in light of infection news or on the other hand, maybe, the mix of the expanded gravity of the infection and the "no restrictions" responsibility of specialists to relieving the monetary impact is having a nonpartisan mental effect.

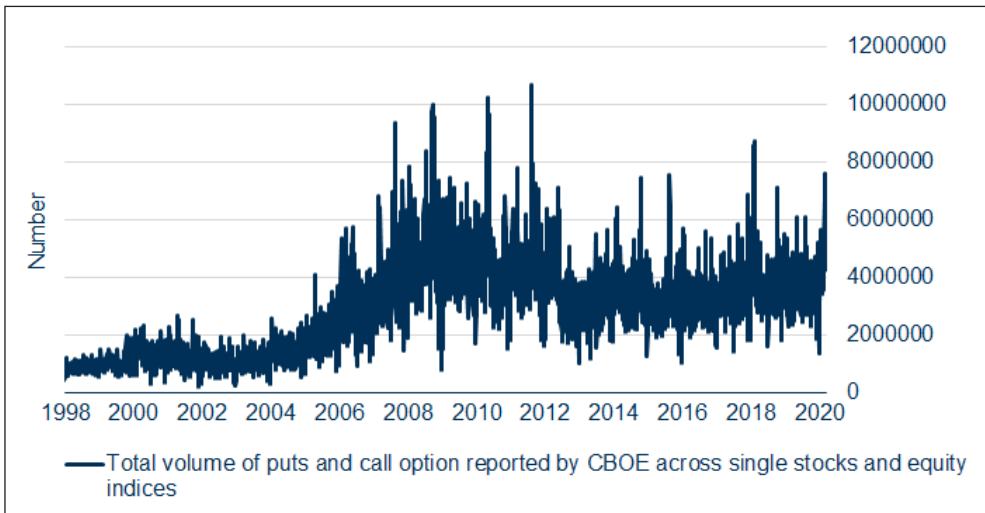
Figure 1: Volatility has Subsided in March 2020



Source: Bloomberg, as at March 2020.

Another explanation behind the sharp beginning swings could be the significant increment in alternatives being used before the COVID 19 pandemic as illustrated in figure 2 below. In February 2020, investors utilized more alternatives either to support their portfolios or addition convexity.

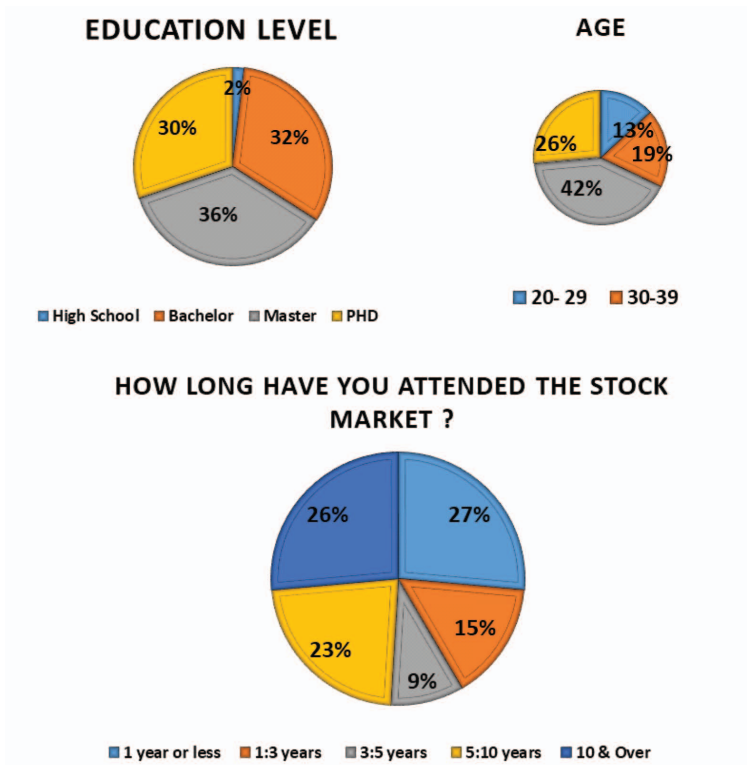
Figure 2: The Volume of Options in Use Soars



Source: Wei et al., 2020

As far as the primary data is concerned, a questionnaire survey was distributed and collected from 318 investors from the GCC stock markets (Bahrain, Kuwait, Saudi Arabia, UAE, and Oman). The demographics of the 318 investors who participated in this research effort are shown in figure 3 below. Figure 3 shows that 68% of participants are females (216) and 32% males (102). 67% of the respondents (213) are highly qualified (having a Master or PhD). 26.4% (84) have attended the stock markets for 10 years or more and 41.5% (132) are with an average age of 45 ± 5 .

Figure 3: Demographic Variables of Respondents



Source: prepared by authors

In addition, a confirmatory factor analysis (CFA) has been considered as a proper method for estimating to assessing the two variables: i.e. expectations of pandemic risk and herding behavior utilizing AMOS 25 software. “The going with six fundamental measures were used to assess the model’s general respectability of fit: Chi-Square/Degree of Freedom extent, Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMSR)” (Kline, 2010; Hair et al., 2010: 19). Moreover, the study utilized structural equation

modeling (SEM) for the factual examination of information gathered to look at collaborations between the two subscales: SEM result presents the way examination of the guessed model of desires for pandemic risk and herding behavior.

The first step of analysis is the reliability test of items which was conducted using Cronbach's alpha Coefficient for every construct and it should be equal to or higher than 0.6 (Nunally,1994). Table 3 shows the value of Cronbach's alpha of every construct. It can be seen from this table that all values of Cronbach's alpha are acceptable indicating a high-reliability level to all constructs ($\alpha > 0.80$).

Table 3: Results of Reliability Test: Cronbach Alpha (N=318)

Scale items Statistics n=318	M	Std. Dev.	Cronbach Alpha
"I think that the spread of COVID 19 directly affects stock prices in stock market".	4.30	.861	.892
"I think it is not the right time to invest in stocks when COVID 19 in the country is dominating life"	3.90	1.138	.894
"COVID 19 which affecting international financial market will also affect local share prices".	4.26	.781	.893
"I think that the future return on the stock, from a company with strong performance during the COVID 19 pandemic, is likely to be higher".	3.60	1.089	.893
"I think that the future return on the stock, from a company with weak performance during the COVID 19 pandemic, is likely to be lower".	3.62	1.069	.882
"I think that there is a high probability of investment loss during the COVID 19 pandemic"	4.00	.972	.887
"Other investors' decisions of choosing stock types have impact on my investment decisions".	3.92	.774	.883
"Other investors' decisions of the stock volume have impact on my investment decisions".	3.84	.899	.883
"Other investors' decisions of buying and selling stocks have impact on my investment decisions".	3.75	.868	.886
"I usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market".	3.62	.996	.884
"I feel myself NOT qualified enough to make investment decisions alone".	3.69	1.003	.887
"I feel others can predict future share prices better than me"	3.49	1.094	.889
"I feel uncertain m my ability to do better than others in picking stocks do".	3.56	.963	.889
"I feel always afraid that my investment will pay lower dividends as compared to others' investment".	3.60	.998	.879

Source: prepared by authors

4.1. Employing the SEM Model

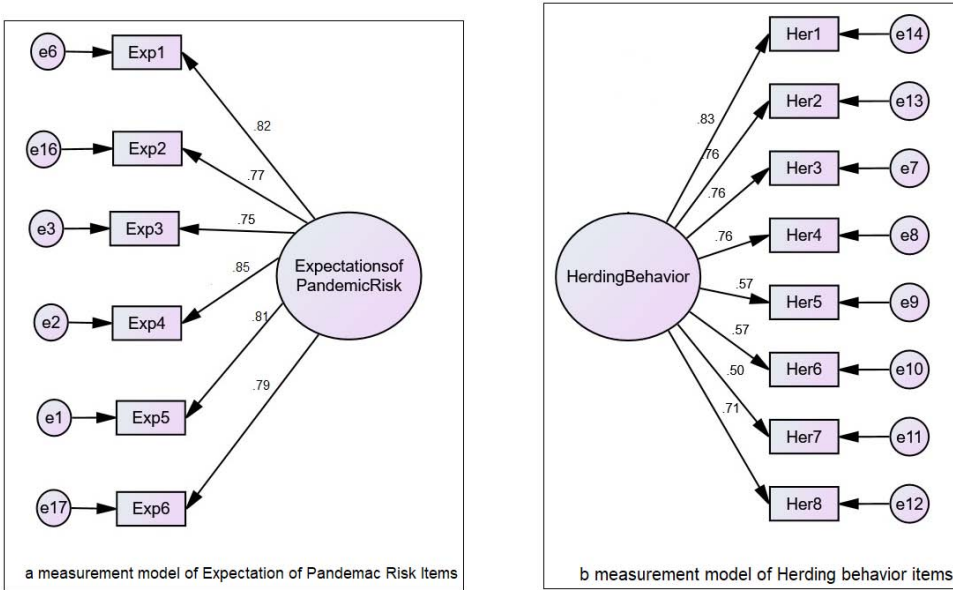
Structural Equation Modeling (SEM) is composed of the measurement model and the structural model.

4.1.1. Measurement Model

The objective of the measurement model is to describe how the indicators have seen work as a tool for measuring underlying variables, and the emphasis analysis is used to estimate the adequacy of the measurement model for each structure, and the efficiency and indicator (square-Chi) is determined to align the model from the defect of several indicators for good conformity. A confirmatory factor analysis was conducted using AMOS 25 software to validate the instruments.

In terms of the validity test, this study uses the factor loading and it must be equal to or higher than 0.5 (Argyris and Schön 1997). The evidence of confirmative factor analysis CFA contains two types: convergence and covariance. The results of the measurement model are shown in figure 4 below. We simply notice the ideal factor loading of the items. Referring to figure 5 design (a) represents the measurement model of expectations of pandemic risk, while the design (b) represents the herding behavior. All items are valid as the results of the factor loading is equal to/ or higher than 0.5.

Figure 4: Primary and Modified Measurement Model of the Two Main Variables



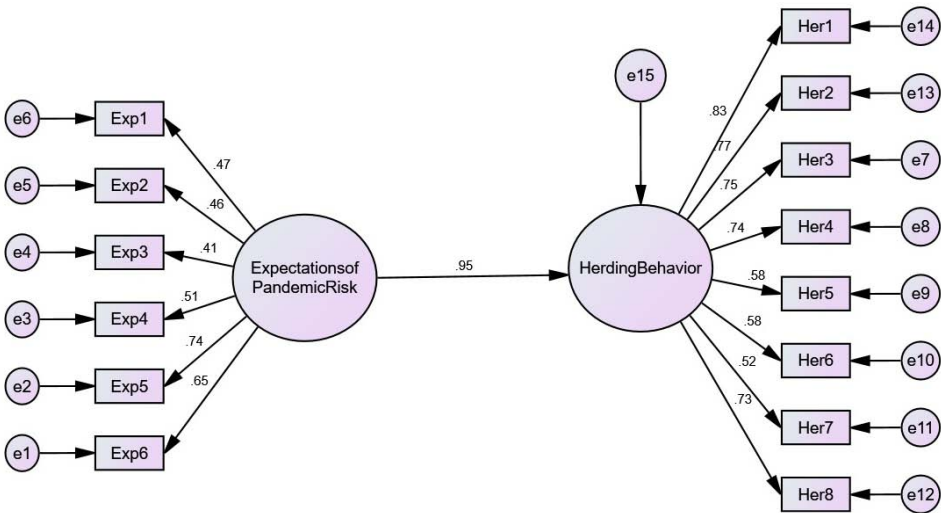
Source: computed data prepared by authors by using AMOS software

Measurement models in figure (4) are created and tested using confirmatory factor analysis (CFA) to evaluate the constructs validity of exogenous variables (Six dimensions of Expectations of Pandamic Risk), and endogenous variables (eight dimensions of Herding Behavior). The results shows high model Fit (Chi-Square: 2560,607 with degree of freedom=512; GFI = .906; CFI=921). All items factor loading are above the accepted level 0.5 therefore according to Kline (2010, 139) all items are valid.

4.1.2. Structural Model

Structural modeling is applied next to identify the hypothesized connection among research constructs (exogenous or endogenous), which is linked to the assumed model's concept. The main hypothesis is tested to examine whether the expectations of pandemic risk is affecting herding behavior. This relation of exhibits perfect model fit to the given data ([NFI] = 0.935, [CFI] = 0.926, [TLI] = 0.915, [IFI] = 0.906, [GFI] = 0.889, and [RMSEA] = 0.085). As presented in Figure 5, expectations of pandemic risk have a significant positive impact on herding behavior ($\beta = 0.95$; p-value < 0.001). Several modifications have been suggested by the AMOS software to improve the model fit.

Figure 5: A Primary Structural Model



Source: computed data prepared by authors by using AMOS software

To test hypothesis, the sturctural model created and the results of the path analysis of the influence of expectations pandamic risk on herding behavior as shown in Figure 5. At the first attempt in running the model, it seems that the model wasn't fit. Therefore, we remove all items have factor loading below 0.5.

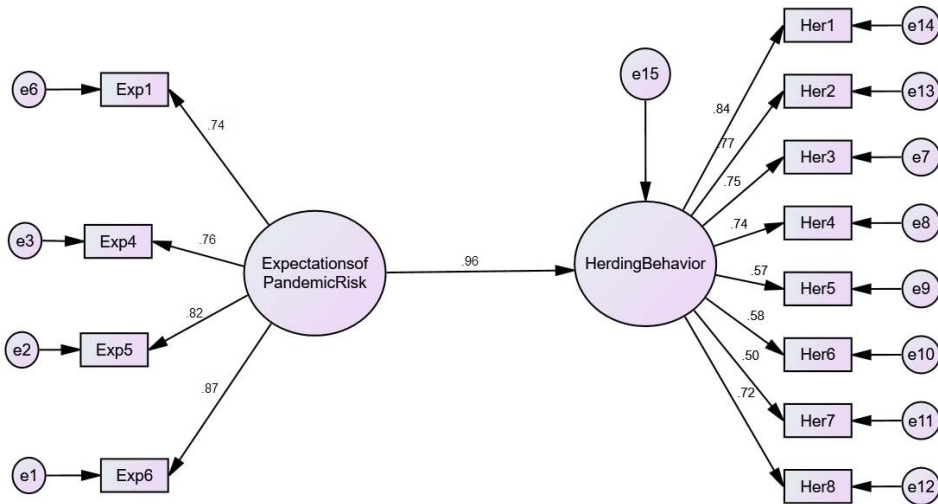
Table 4: Model Fitting Analysis and Modified Measurement Model of Herding Behavior and Expectations of Pandemic Risk

Fit Index	Primary Model	Critical (Acceptable) Value	Modified Model
“Normed fit index” (NFI)	0.935	>/=0.9	0.987
“Comparative fit index” (CFI)	0.926	>/=0.9	0.989
“Tucker Lewis index” (TLI)	0.915	>/=0.9	0.978
“Incremental fit index” (IFI)	0.906	>/=0.9	0.965
“Goodness of fit index” (GFI)	0.889	>/=0.9	0.954
“Root means square error of approximation” (RMSEA)	0.085	<0.08	0.065

Source: computed data prepared by authors by using AMOS software

To improve the model fit, two items was removed. Table 4 illustrqate the model fit measure score high in values of (CFI, GFI,NLI) and low in RMSEA. Which indicate the model become fit and all results are accepted.

Figure 6: Modified Structural Model



Source: computed data prepared by authors by using AMOS software

The objective of the structural model analysis is to test path analysis using SEM because it is a powerful analytical tool that is well-suited to the evaluation of complex models as well as the significance testing of hypotheses (Kline, 2010). The path analysis result shown in figure 6 indicate that there great and significant influence of expectations pandemic risk on herding behavior (0.96).

5. Results and discussion

After data collection and analysis of both secondary data and primary data, the researchers reject the null hypothesis and accept the alternative hypothesis that “Pandemic-Risk Related has a statistically significant impact on Investors Herding Behavior in the GCC Stock Markets”. The secondary data analysis using cross-sectional standard deviation (CSSD) demonstrates that there is a proof of investors herding behavior in the GCC securities exchanges during the coronavirus emergency in the first quarter of 2020. This finding concurs with past research, for example, Miller (1977), Avery and Zemsky (1998), Gill et al. (2018) and Kizys et al. (2020). In addition, the primary data analysis (i.e. the views of 318 investors from the GCC stock markets) offers a further investigation for an assessment of the impact of the pandemic related risk of COVID-19 on investors' herding in the GCC stock markets. A confirmatory factor analysis (CFA) was used as the primary analysis between the two variables: i.e. expectations of pandemic risk and herding behavior. Further, structural modeling is applied next to identify the hypothesized connection among research constructs (exogenous or endogenous), which is linked to the assumed model's concept. The main hypothesis is tested to examine whether the expectations of pandemic risk is affecting herding behavior. The results revealed that there is a statistically significant impact of the pandemic-risk related on investors herding behavior in the GCC stock markets.

This study will make a valuable and important contribution to the literature at both the theoretical and practical levels. At the theoretical level, the results of this research will provide empirically based information on the impact of pandemic risk related on investors' herding behavior in the GCC stock markets. This study also contributes to the larger area of economic and behavioral finance theories by highlighting the effect of pandemic risk related on investors' herding behavior in the GCC stock markets. At a practical level, this research may also contribute to Gulf policy makers' evaluation of the effectiveness of the stock markets, as well as contributing to the improvement of management and corporate governance practices. After all, the results revealed from this study may have implications for improvements in practices of economic and finance and may be used as a guide towards advancing the management and performance of the GCC stock markets.

Furthermore, the findings of this study have a clear economic significance as these results contribute to advance the accumulated international literature of the herding phenomenon in developing countries in general, and the GCC in particular. our study has significant commonsense ramifications for investors, strategy producers, budgetary controllers, just as organizations. It ought to be noticed that, during the financial crisis, objective valuation happens to principal significance for organizations, which try to source value capital. Our study additionally adds to the continuous open discussion, which spins around the compromise between general wellbeing also, the economy. Our findings show that the legislature and

administrative restrictions forced to control the transmission of COVID-19 inside and across nations can lighten the nearness of financial specialist herding behavior in the GCC stock markets.

The secondary data provided in this study, which relied on daily historic prices on five GCC country market indices i.e. Bahrain (BAX), Kuwait (KWSE), Oman (MSM30), Saudi Arabia (TASI), and the United Arab Emirates (ADX & DFMG), proved very helpful and informative. CSSD shows that an arrival on the financial exchange record of nation I goes astray on normal from the GCC showcase return by 0.6232%. The standard deviation of CSSD is 0.2077%. The GCC Index takes on values from 0 to 100. It midpoints 11.6921 index focuses, and goes amiss from the mean on normal by 14.6152 file focuses. We additionally note that both R_i and R_m highlight negative normal qualities, - 0.2926% and - 0.2956%, individually, which delineates the emergency of value estimation of organizations over the globe. Estimations of R_i and R_m veer off from the GCC advertise return on normal by 1.6204% and 0.9398%, separately. Thinking about individual Gulf nations. Since, 'little' CSSD_{i,t} values signal more grounded proof of grouping conduct, and 'huge' values signal more vulnerable proof, these outcomes demonstrate that there is a proof of financial specialist herding behavior in the GCC securities exchanges during the coronavirus emergency in the primary quarter of 2020. This finding concurs with past research, for example, Miller (1977), Avery and Zemsky (1998), Gill et al. (2018) and Kizys et al. (2020).

6. Conclusion

The purpose of this study is to examine the causal association between expectations of pandemic risk and herding behavior. This study, therefore, seeks to add to our knowledge of the herding phenomenon in developing countries in general, and the GCC in particular. The study was undertaken in two stages. First, it was felt necessary to obtain a broad overview of the effect of the pandemic related risk of COVID-19 on investors' herding in the GCC. This was achieved by analyzing secondary data (i.e. daily historic prices on five GCC country market indices). In analyzing the secondary data, the study follows the cross-sectional standard deviation (CSSD) of returns to detect investors' herding behavior. Second, in an attempt to obtain a more precise understanding of the impact of pandemic related risk, a questionnaire survey was distributed to the GCC stock markets.

To conclude, contributing is not generally agreeable. In any case, it is critical to recollect that, without risk, there are no profits. In this condition, on the off chance that we move our cash into money, we are probably going to pass up the best gains in the market, making it considerably harder to recuperate our misfortunes. Presently like never before, it is fundamental for all investors to follow the essential

precepts of contributing: i.e. to remain diversified, remain focused, and remain calm especially in the time of crisis.

The first limitation is the use of secondary data to obtain a broad overview on the effect of the pandemic risk related on investors' herding behavior in the GCC stock markets. An inherent disadvantage of secondary data in general is that it is not designed specifically to meet the study's needs; secondary data should apply to the population of interest, the time period must be consistent with the researcher's needs and secondary data must appear in the correct units of measurement. Therefore, despite a great deal of attention being paid to overcome these disadvantages, a caveat should be given in generalizing the results of the secondary data analysis.

Another limitation of this study is the methodology employed in analysing the secondary data (i.e. the cross-sectional standard deviation (CSSD) of profits to distinguish investors' herding behavior in the GCC stock markets between 1st January and 31st March 2020) which affected the number of observations included in this stage of the study. This also could probably affect generalizability. However, it is hoped that the representativeness of the sample and the concentration of this study only on those really important period of the COVID 19 pandemic would suffice.

A further limitation is that the study considered the views of limited number of people from the GCC stock markets in the second stage of this research (i.e. in the online questionnaire survey).. However, due to severe access problems as well as the time scale to which the researchers was working, this proved not to be possible. It was only due to the intervention and effort by other investors that eventual access was realized. In spite of the above limitations, this study has shown that several future research could be undertaken such as:

Before identifying directions for future research as indicated by this study, it is crucial to address the urgent need to establish an advanced database for the stock markets in the GCC, which would be useful for both researchers and policy makers. Such data should be maintained via databases to enable researchers to more adequately assess stock markets' performance. Hence, the availability of data would encourage future research and this would also allow the governments to see how things went and facilitate the tasks of decision-makers.

A useful starting point for future research would be to incorporate the perceptions and experiences of other investors of the impact of of the pandemic risk related on investors' herding behavior in the GCC stock markets. This could be undertaken by distributing the questionnaire utilized in this study to a much larger sample of investors and specialists. A greater understanding could then be obtained of these accumulated experiences. Face to face interviews might also be undertaken with officials holding strategic posts in many of the stock markets. This should lead to

a broader understanding of the impact of the pandemic risk related on investors' herding behavior in the GCC stock markets. A study of this nature should perhaps be undertaken in collaboration with the World Bank or IMF, as this would have the benefit of making the study official as well as making access to stock markets much more easier.

A comparative research that covers the impact of pandemic risk related on investors' herding behavior in different developing countries is needed. In particular, in the Middle East region and North Africa, as this part of the world seems to be much neglected in terms of research. These countries have also embarked on the road of COVID 19 pandemic dilemma and a study, which compares this, would be extremely useful and would shed important light on the impact of pandemic risk related on their stock markets behaviors.

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Psihologija stada investitora i pandemijski rizik na tržištu dionica zemalja arapskog zaljeva

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Sažetak

Svrha ove studije je ispitati uzročno-posljedičnu povezanost između očekivanja u svezi pandemijskog rizika i masovne reakcije ponašanja prema zakonu stada. Studija je provedena u dvije faze. Prvo, smatralo se potrebnim dobiti široki pregled učinka rizika od pandemije COVID-19 na masovnu reakciju investitora u ponašanju po zakonu stada u zemljama arapskog zaljeva. To je postignuto analizom sekundarnih podataka (povijesne dnevne cijene na tržištu pet zemalja arapskog zaljeva). Analizirajući sekundarne podatke, studija slijedi Christie i Huang (1995) i koristi presjek standardne devijacije (CSSD) prinosa kako bi otkrila fenomen "stada" u ponašanju ulagača. Drugo, u pokušaju da se dobije preciznije razumijevanje utjecaja rizika povezanog s pandemijom, distribuirano je anketno istraživanje koje je prikupljeno od 318 ulagača s tržišta dionica zemalja arapskog zaljeva. Konfirmativna faktorska analiza (CFA) koristi se također kao primarna analiza između dvije varijable: tj. očekivanja od pandemijskog rizika i ponašanje stada. Rezultati potvrđuju da očekivanja od pandemijskog rizika imaju značajan pozitivan utjecaj na ponašanje stada na tržištima dionica zemalja arapskog zaljeva tijekom krize s koronavirusom u prvom tromjesečju 2020. Napokon, rezultati ove studije robusni su nizu specifikacija modela.

Ključne riječi: *tržišta dionica zemalja arapskog zaljeva; psihologija stada; rizik pandemije, presjek standardne devijacije, pandemijski rizik, konfirmativna faktorska analiza (CFA)*

JEL klasifikacija: *G11, G15, G18, I18*

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