The Gulf 2017 political crisis and its effects on the Qatar stock exchange

أزمة الخليج السياسية 2017 وأثرها على سوق الأوراق المالية القطرية

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Abstract:

This paper has studied the effects of 2017 gulf political crisis on the Qatar stock exchange, by testing its impacts on the QSE efficiency and the QSI price levels. Analyzing 52 weekly observations before the crisis, and 52 after it, using Unit root tests to test the efficiency weak form of QSE, and examining the crisis' effects on QSI using mean comparison tests.

The results showed that the crisis had affected the efficiency of the QSE, and the QSI price levels were negatively affected by the crisis.

Keywords: 2017 gulf political crisis, Qatar Stock Exchange, Qatar Stock Exchange index, Stock market efficiency, Tests for equality of means.

Jel Classification Codes: G14, F51, E44, C22.

ملخص:

تهدف هذه الدراسة إلى تحليل أثر أزمة الخليج السياسية لسنة 2017 على سوق الأوراق المالية القطرية (*QSE*)، وذلك باختبار تأثيرها على كفاءته ومستويات أسعار مؤشر السوق (*QSI*)، من خلال تحليل 52 مشاهدة أسبوعية قبل الأزمة، و52 مشاهدة أخرى بعدها، بالاعتماد على اختبارات الجذر الوحدوي، واختبارات مقارنة المتوسطات للفترتين قبل وبعد الأزمة. وبينت نتائج الدراسة أن الأزمة كان لها تأثير على كفاءة السوق، وكذلك فإن مستويات أسعار مؤشر السوق قد تأثرت سلبيا.

كلمات مفتاحية: أزمة الخليج السياسية لسنة 2017، سوق قطر للأوراق المالية، مؤشر سوق قطر للأوراق المالية، كفاءة سوق الأوراق المالية، اختبار مقارنة المتوسطات.

تصنيفات JEL: G14, F51, E44, C22

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1. INTRODUCTION

Since its establishment in 1981 the Gulf Cooperation Council (GCC) has made good progress on regional integration. Integration efforts have gained considerable momentum following the ratification of the Unified Economic Agreement in 2001, the signing of the Customs Union Agreement in 2003, and the adoption of the Common Market Agreement in 2008. In addition to a planned establishment of a monetary union that was decided to put it in GCC single currency in 2010, but has been postponed (World Bank, 2010, p. 24).

At the other hand and during more than three decades of existence, the GCC has faced many regional crises, starting with the Iran-Iraq war (1980-88), the Oman-Yemen (1982-1987) crisis , Bahrain-Qatar (1982-1995) crisis, Iraq-Kuwait- second Gulf war (1990-91)-, Qatar- Saudi Arabia (1997) crisis, Qatar failed coup (1996), the third Gulf war (2003-) (Pinfari, 2009, p. 15), and the Arab spring revolutions those have affected many of the middle east and north African countries as well. These crisis have shacked the stability and the harmony of the council, showing the weakness of the union between its members. And that what leads to the current diplomatic rift between the members, Saudi Arabia and its allies on one side and Qatar on the other side (Arab Center for Research and Policy Studies, 2017, p. 1).

1.1 The 2017 Gulf political crisis

On Monday of June 5th, 2017 Saudi Arabia, United Arab Emirates, Bahrain, Egypt, Yemen (Abd AlHadi Mansour Government), and Libya (Government of National Accord) along with Maldives have decided to cut diplomatic ties with Qatar and suspend land and sea travel to and from Qatar over what they claimed Qatar’s support for terrorism, including ISIS, Al-Qaeda, and the Muslim Brotherhood and its ties with Iran. Qatar was also removed from the Arab coalition fighting the Houthis in Yemen. Two members of the Gulf Cooperation Council, Kuwait and Oman, haven't joined the Saudi-led sanctions against Qatar, with Kuwait trying to mediate talks between Qatar and Saudi Arabia to ease the tension (Identity Center, 2017, p. 1).

The exact reasons for the diplomatic break-offs is unclear, but when we read the history we can see that Tensions between Qatar and other members of the GCC date back to 1995, when the son of Qatar's emir replaced his father in a palace coup. Back then some GCC countries attempted to restore the father to power in a failed countercoup the following year (Kablan, 2017, p. 1). Then it came the Arab spring revolutions and the region-wide political revolts of 2011, however, Qatar and the rest of the GCC were largely able to paper over their differences. And following the revolts, tensions and mutual recrimination have been brewing between Saudi Arabia, the UAE, and Bahrain on the one hand and Qatar on the other (Center for American Progress, 2017, p. 1). And the final result was a diplomatic crisis that has never been experienced by the GCC members since its creation date (Ulrichsen, 2018, p. 49).

One of the immediate consequences was that the Qatar's QE Index for stocks tumbled 8 percent, the most since 2009 at 10:13 a.m. in Doha (Identity Center, 2017, p. 5), This immediate consequence led us to focus on the consequences of the June 2017 gulf diplomatic rift on the Qatari financial market, and discuss the impact of regional political uncertainty on the stock exchange.

1.2 Problematic of the study:

In this paper we are going to discuss the impact of the 2017 GCC political rift on the QSE, and we've put a problematic as below:

Are there any impacts of the June 5th, 2017 Gulf political crisis on the Qatar stock exchange?

1.3 Literature review

Afef Trabelsi and Aida Kammoun (2015) studied the impact of political uncertainty (during and after the Arab spring) on stock market crisis for MENA countries (Tunisia, Egypt, Morocco, UAE –Dubai-, Jordan, Lebanon). The two researchers found that Arab spring has affected the stock market activity (Trabelsi & Kammoun, 2015, p. 267).

Hisham Handle Abdelbaki (2013) in his paper investigated the impact of political instability, economic instability and external events associated with the Egyptian revolution that started on 25th January, 2011 on the stock market performance, The results lend support to the view that political instability effects the stock markets' function (Abdelbaki, 2013, p. 169).

Irshad Hira (2017) investigated the relationship of political instability with the stock prices. Results of the study indicated the negative relationship of stock prices with political instability (Hira, 2017, p. 70).

Hesham I. Almujamed (2018), investigates the performance of moving-average strategies and tests the validity of the weak form of the Efficient Market Hypothesis for the Qatari Stock Exchange. The analysis shows that the QSE is not weak form efficient (Almujamed, 2018, p. 1).

Umar Farooq Awan, Muhammad Subayyal (2016), examined the weak form efficiency of Gulf stock markets –QSE was one of them- for the period of five years. The results of the study prove that Gulf Markets are inefficient in the Weak form (Awan & Subayyal, 2016, p. 218).

Lanouar Charfeddine, Karim Ben Khediri, 2016, studied the weak-form market efficiency for the GCC stock markets – QSE was within them- from May 2005 to September 2013. The results show that GCC markets have different degrees of time-varying efficiency, and have experiencing periods of efficiency improvement (Charfeddine & Khediri, 2016, p. 487).

2. Methods

Our study will be in two stages, first we will examine the weak form efficiency of Qatar stock exchange before and after the political rift, and we will see whether there is any effects on it or not, the second step will be a comparison between the QE Index before and after the diplomatic crisis to see whether it was impacted or not.

2.1 Sample and data:

First we will talk briefly about the QSE and the Qatar Exchange Index.

2.1.1 Qatar Stock Exchange (Qatar Stock Exchange, 2018)

The Qatar Stock Exchange is the principal stock market of Qatar. QSE is a full member of the World Federation of Exchanges and was recently upgraded by the MSCI and the S&P Dow Jones Indices.

Established in 1995, the Doha Securities Market (DSM) officially started operations in 1997. Since then the exchange has grown to become one of the leading stock markets in the GCC region.

In June 2009, Qatar Holding, the strategic and direct investment arm of Qatar Investment Authority (QIA), and NYSE Euronext, the world’s leading exchange group, signed an agreement to form a major strategic partnership to establish the Exchange as a world-class market. The DSM was renamed the Qatar Stock Exchange on the conclusion of the deal.

2.1.2 Qatar Exchange Index: It's the important Index provided by Qatar Stock Exchange, and it gives a good image about the Qatar stock exchange situation.

Table 1. Qatar Exchange Index

Full Name	**Qatar Exchange Index (formally DSM 20 Index)**
Base Date	**January 1st, 1998**
Launch Date	May 6th 2010
Calculation Formulas	$$\textbf{Price Index Level}_t = \frac{[\sum_{i=1}^{N} P_{i,t} * Q_{i,t} * C_{i,t}]}{\textbf{Divisor}_t}$$ Where: t: day of calculation N: Number of the Index constituents i: i varying between 1 and N P: Closing Price of the ith constituent at the day t Q: Number of Free Float Shares of the ith constituent at the day t C: Capping Factor of the ith constituent at the day t The divisor was determined on the base capitalization of the index and the base level. The divisor is adapted as a result of corporate actions and composition changes.

Source: (Qatar Stock Exchange, Qatar Exchange Index, 2018, pp. 3,4)

2.1.3 The data: The QEI data was taken from the Qatar Stock Exchange official website (Qatar Stock Exchange, 2018)

2.2 Statistical tools: Statistical tools are explained as bellow:

2.2.1 Efficiency test: First, we will give a brief explanation of stock market efficiency.

2.2.1.1 Stock market efficiency: (Campbell, Lo, & MacKinlay, 1997, pp. 20-24)

Bachelier (1900) is the first researcher who developed the notion of the efficient market hypothesis. He demonstrates and models the random walk in security prices. Fama (1970) in his alternative important paper investigates the EMH to that date and indicates that a market is called efficient if prices fully reflect all existing information. Furthermore, he suggests three categories of the efficient market hypothesis. *The weak-form Efficiency* asserts that all available information involving past prices is already reflected in prices. This form states that the information regarding historical prices cannot be used to forecast upcoming changes in prices, and therefore technical analysis will not help to obtain abnormal profits. *The semi-strong form* of EMH suggests that abnormal returns cannot be achieved by using public information since it is already reflected in the stock price. Finally, a market is called *strong-form efficient* when the stock prices adjust quickly to all kinds of information (past, public and inside information), and investors cannot earn abnormal profits.

Fama (1970 and 1991) and other researchers indicate that if the stock market is semi-strong efficient, this implies that the market is weak-form efficient. Moreover, if the stock market is strong efficient, this infers that the market is semi-strong and weak efficient. If EMH in the weak-form is rejected, this leads to a rejection of both the semi and strong forms of the EMH.

2.2.1.2 QSI Weak form Efficiency tests: We are going to use the following statistical techniques: Unit root test (the Augmented Dickey-Fuller – ADF 1979- test), Runs test (Bradley, 1968), and Variance Ratio test of Lo and MacKinlay (1988). These test methodologies are designated to examine the random walk hypothesis and hence the market efficiency in the weak form in QEI.

The rationale behind selecting the above test methodologies is: first, the weak form efficiency states that the return series have to be stationary, and this can be tested using unit root tests. Second, the weak form efficiency hypothesis states that stock prices follow a random walk, so the Variance Ratio test and Runs Test of randomness can be used for this aim.

2.2.1.2.1 Unit Root Test: We have chosen the Augmented Dickey-Fuller test; the Statistic and Hypothesis of the Augmented Dickey-Fuller 1979 test are resumed at the following table:

Table 2. The Augmented Dickey-Fuller –ADF- test

Test Statistic	Test Hypothesis
The ADF test uses the following three models: (1)$\Delta x_t = \alpha_0 + \alpha_1 t + \beta x_{t-1} + \gamma_j \sum_{j=1}^{k} \Delta x_{t-j} + \varepsilon_t$ Includes a constant term α_o and a trend term $\alpha_1 t$. (2) $\Delta x_t = \alpha_0 + \beta x_{t-1} + \gamma_j \sum_{j=1}^{k} \Delta x_{t-j} + \varepsilon_t$. Includes a constant term only. (3) $\Delta x_t = \alpha_0 + \gamma_j \sum_{j=1}^{k} \Delta x_{t-j} + \varepsilon_t$. Doesn't include intercept nor trend terms. Where: *k* is the number of lagged terms in that ε_t is white noise. x_t is the variable being tested for unit roots. β is the regression coefficients. And ε_t is the random error term which is normally distributed with a mean of zero and variance σ^2.□ The t-test statistic for the null hypothesis H0: $\beta = 1$ is $DF_T = \frac{(\beta - 1)}{SE(\beta)}$ Where SE(β) is the OLS standard error of the regression coefficient β, using the null hypothesis that β=0 versus the alternative of β< 0 for any x.	H0:Unit root exists, data is non stationary H1:Unit root does not exist, data is stationary And the test of these two hypothesizes will be as bellow: If: |t Statistic| < |ADF value|, then we accept H0 If: |t Statistic| > |ADF value|, then we reject H0 p-value If: P>0.05 , then we accept H0 If: P<0.05, then we reject H0

Source: (Mills, 2015, pp. 58-71)

2.2.1.2.2 Runs test: Runs test (Bradley 1968) of randomness is a nonparametric statistical test that is used to know the randomness in data, and it is used to test the weak form efficiency and random walk hypothesis. The Statistic and Hypothesis of the Runs test are resumed at the following table:

Table 3. Runs test **(Bradley, 1968)**

Test Statistic	Test Hypothesis
$\mathbf{Z = \frac{R - \bar{R}}{s_R}}$ **Where:** **R is the observed number of runs.** $\bar{R}$ **is the expected number of runs.** $\mathbf{s_R}$ **the standard deviation of the number of runs.** $\mathbf{\bar{R} = \frac{2_{n_1 n_2}}{n_1 + n_2} + 1}$ $\mathbf{s_R^2 = \frac{2_{n_1 n_2}(2_{n_1 n_2} - n_1 - n_2)}{(n_1 + n_2)^2 (n_1 + n_2 - 1)}}$ **Where:** $\mathbf{n_1, n_2}$ **denoting the number of positive and negative values in the series.**	**H0:** The observed series are random. **H1:** The observed series not random. And the test of these two hypothesizes will be as bellow: **Z value** **If: |Z value|< $Z_{1-\alpha/2}$** , accept **H0** **If: |Z value|> $Z_{1-\alpha/2}$** , reject **H0** **p-value** **If: P>0.05**, then we accept **H0** **If: P<0.05**, then we reject **H0**

Source: (Ramachandran & P.Tsokos, 2009, pp. 653-655)

2.2.1.2.3 Variance Ratio test: the Statistic and Hypothesis of the Variance Ratio test are resumed at the following table:

Table 4. Variance Ratio test of Lo and MacKinlay (1988)

Test Statistic	Test Hypothesis
$Z = \frac{(VR-1)}{2\sqrt{\sum_{j=1}^{k-1}[\frac{2(k-j)}{k}]\delta_j}}$ (Lo and MacKinlay, 1988) Where: $VR = \frac{\frac{1}{Nk}\sum_{n=k+1}^{N}(p_t + p_{t-1} + \cdots + p_{n-k} - k\hat{\mu})^2}{\frac{1}{N}\sum_{n=1}^{N}(p_t - \hat{\mu})^2}$ $\delta_j = \frac{\sum_{t=j+1}^{N}(p_t - \hat{\mu})^2 (p_{t-j} - \hat{\mu})^2}{[\sum_{t=1}^{N}(p_t - \hat{\mu})^2]^2}$ $\hat{\mu} = \frac{1}{N}\sum_{n=1}^{N} p_t$ *P0, P1, P2, P3…Pn* are observations obtained at equally spaced intervals.	**H0:** The observed series follow a Random Walk. **H1:** The observed series does not follow a Random Walk. And the test of these two hypothesizes will be as bellow: **Z-Statistic** **If: |Z|< $Z_{1-\alpha/2}$**, then we accept **H0** **If: |Z|> $Z_{1-\alpha/2}$**, then we reject **H0** **p-value** **If: P>0.05**, then we accept **H0** **If: P<0.05**, then we reject **H0**

Source: (Charles & Darné, 2009, pp. 503-527)

2.2.2 Comparison: First we are going to test the normality of the QEI series, then if the two series were normal distributed we will do the independent Samples T-Test, and if not we just do the Mann-Whitney Test.

2.2.2.1 Normality test: We will test whether the data are Normal distributed or not, before and after the crisis, putting two hypothesizes:

H_0: the data are normally distributed

H_1: the data are not normally distributed

So we will Use tests such as: Kolmogorov-Smirnov and Shapiro-Wilk.

2.2.2.2 The independent Samples *t* Test: Commonly used to test the Statistical differences between the means of two groups, by testing the below hypotheses:

$\boldsymbol{H_0}$: $\mu_1 = \mu_2$ ("the two population means are equal")

$\boldsymbol{H_1}$: $\mu_1 \neq \mu_2$ ("the two population means are not equal")

μ_1 and μ_2 are the population means for group 1, and 2 respectively.

To use the Independent Samples *t* Test we assume that: the data are independent of each other, the test (dependent) variable is normally distributed within each of the two populations, and the variances of the test (dependent) variable in the two populations are equal.

For the first assumption our data is totally independent of each other since we are going to use random data of independent observations. The second assumption will be checked when we test the normality of our data. And the third assumption of homogeneity of variance will be tested at the Independent Samples *t* Test by Levene's Test for Equality of Variances.

2.2.2.3 The Mann-Whitney Test: The Mann-Whitney U test is the non-parametric alternative test to the independent sample t-test. Usually, it is used when the assumptions of the t-test are not met. The hypotheses for The Mann-Whitney Test are:

H_0: The two populations' means are equal versus

H_1: The two populations' means are not equal.

3. RESULTS AND DISCUSSION

Our empirical study ends to the following results:

3.1 Weak form Efficiency tests:

3.1.1 Unit Root Test (The Augmented Dickey-Fuller –ADF- test, 1979)

We've chosen the model with no Trend and no Intercept, based on SIC, maxlag=10, and we've tested the unit root at level and at 1st order differencing to see whether the data are differenced stationary or trend stationary:

Table 5. The Augmented Dickey-Fuller test results

Test with order	t statistic	Level of significance	Critical values	Prob.	Observations		Decisions
					Prob.	Critical values	
ADF at level **before crisis**	0.01	1%	-2.61	0.68	P>0.05	|t Stat| < |t Crit|	H0 Accepted
		5%	-1.95			|t Stat| < |t Crit|	H0 Accepted
		10%	-1.61			|t Stat| < |t Crit|	H0 Accepted
ADF at 1st order differencing **before crisis**	-5.35	1%	-2.61	0.00	P<0.05	|t Stat| > |t Critl|	H0 Rejected
		5%	-1.95			|t Stat| > |t Crit|	H0 Rejected
		10%	-1.61			|t Stat| > |t Crit|	H0 Rejected
ADF at level **after crisis**	-0.31	1%	-2.61	0.56	P>0.05	|t Stat| < |t Crit|	H0 Accepted
		5%	-1.94			|t Stat| < |t Crit|	H0 Accepted
		10%	-1.61			|t Stat| < |t Crit|	H0 Accepted
ADF at 1st order differencing **after crisis**	-6.35	1%	-2.61	0.00	P<0.05	|t Stat| > |t Crit|	H0 Rejected
		5%	-1.94			|t Stat| > |t Crit|	H0 Rejected
		10%	-1.61			|t Stat| > |t Crit|	H0 Rejected

Source: Eviews 9 output (Appendix 01)

As we can see at the table 5, both periods before and after the diplomatic crisis accept the H_0 of having a unit root and being none stationary at level, and in opposite at first order differencing the series of the two periods reject H_0 and accept H_1; what means that the data at first order differencing has no unit root and it is stationary.

That guides us to a conclusion that QEI is differenced stationary, and there was no change in the QSE none efficiency before and after the 2017 Gulf diplomatic crisis.

3.1.2 Runs test the Runs test results are shown at the table below.

Table 6. Runs test results

Test with order	$Z_{1-\alpha/2}$	Level of significance	Z-Statistic	Prob.	Observations		Decision
					Prob.	Z-Statistic	
Runs test before crisis	1.96	5%	-3.922	0.000	P<0.05	|Z value|> $Z_{1-\alpha/2}$	Reject H_0
Runs test after crisis	1.96	5%	-5.042	0.000	P<0.05	|Z value|> $Z_{1-\alpha/2}$	Reject H_0

Source: Eviews 9 output (Appendix 02)

As we can see at the table 6, both QEI series -before and after the diplomatic crisis- reject the null hypothesis of randomness, and so the runs test confirm the result of the ADF unit root test that the QSE was not efficient before the diplomatic crisis and remains not efficient after it, and so it concludes that there was no change in the Qatar stock market none efficiency before and after the crisis.

3.1.3 Variance Ratio test

Table 7. Variance ratio test results

Test with order	$Z_{1-\alpha/2}$	Level of significance	Z-Statistic		Prob.	Observations		Decisions
						Prob.	Z-Statistic	
Var Ratio before crisis	1.96	5%	Max |z|	2.502	0.0485	P<0.05	|Z|> $Z_{1-\alpha/2}$	Reject H0
			Period: 2	2.502	0.0123	P<0.05	|Z|> $Z_{1-\alpha/2}$	Reject H0
			Period: 4	2.16	0.030	P<0.0	|Z|> Z_{1-}	Reject

				8	1	5	$\alpha/2$	H0
			Period: 8	1.993	0.0463	P<0.05	$\lvert Z\rvert > Z_{1-\alpha/2}$	Reject H0
			Period: 16	0.148	0.8827	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0
Var Ratio after crisis	1.96	5%	Max |z|	0.992	0.7875	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0
			Period: 2	0.882	0.378	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0
			Period: 4	0.567	0.5708	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0
			Period: 8	0.992	0.3211	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0
			Period: 16	0.768	0.4427	P>0.05	$\lvert Z\rvert < Z_{1-\alpha/2}$	Accept H0

Source: Eviews 9 output (Appendix 04)

The variance ratio test –Table 7**-** shows that there was a change in the Qatar stock market efficiency, as we can see for the period before the crisis most periods (beside period 16) reject the null hypothesis that the data follow a Random Walk and so the QEI wasn't efficient before the crisis as we've seen in the ADF unit root test and the runs test. But at the other hand the variance ratio results for the period after the crisis were deferent from those in the ADF unit root test and the runs test, because we can see that the data accept the H0 what means that the QEI follows a Random Walk after the crisis, and so the Qatar stock exchange was efficient after the crisis.

The variance ratio test shows that there is a change in the Qatar stock exchange efficiency before and after the diplomatic rift that it has changed from being not efficient before the rift to an efficient one after it. And so the diplomatic crisis has affected the Qatar stock exchange efficiency.

3.1.4 Weak form Efficiency tests conclusion: the three efficiency tests agreed that the QSE was not efficient before June 5th, 2017 diplomatic crisis. However there was a difference in results about the period after the crisis as we saw the ADF unit root test and the runs test concluded that there was no change and the QSE remained not efficient after the crisis. But the variance ratio test has shown that the QSE was affected by the diplomatic rift and changed to be efficient after it.

So we can say the June 5th, 2017 Gulf diplomatic crisis had affected the efficiency of the QSE because the Variance ratio test shows more details about the randomness of the data and gives a clear analyzes.

3.2 The comparison between the QEI before and after the crisis:

3.2.1 Descriptive Statistics:

Table 8. Descriptive Statistics

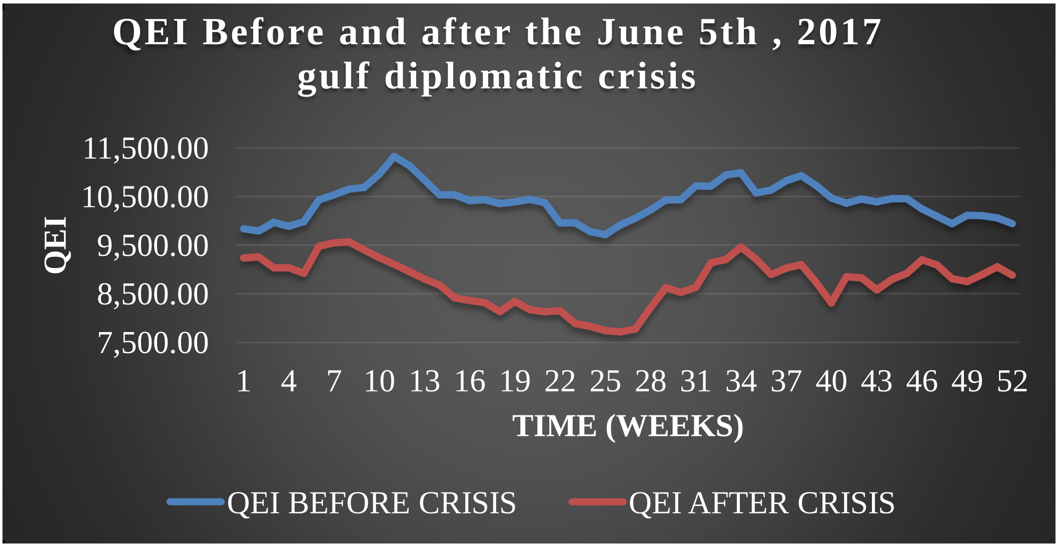
Period	Mean
Before Crisis	10384.99
After Crisis	8746.971

Source: Eviews 9 output (Appendix 03)

As we can see at the Table 8 above there is a big deference between the two periods' Mean which was 10384.99 before the diplomatic rift and fall to 8746.971 after it (a difference of 1638.019, more then 15%). And that is a clear evidence of the crisis impact that will be checked later with the independent Samples *t* Test or The Mann-Whitney Test.

The two periods QEI weekly data is shown at the Graph below:

Fig.1. The two periods QEI weekly data



Source: (Qatar Stock Exchange, 2018)

The two periods QEI weekly data graph gives a clear image about the impact of the crisis, as we can see that the QEI after the crisis for the whole 52 weeks period is below the QEI before the crisis, what means that the

QEI was affected by the crisis and get a lower level. This observation will be tested at the next step when we will see whether this difference is significant or not by using the independent Samples *t* Test or The Mann-Whitney Test, but before that we will test the normality of the two series then do the comparison test.

3.2.2 Normality tests: We've chosen three Normality tests, The p value of each test is shown at the table below:

Table 9. Normality tests

QE Index	Tests of Normality		
	Jarque-Bera p value	Kolmogorov-Smirnov p value	Shapiro-Wilk p value
Before Crisis	0.591622	0.2	0.242
After Crisis	0.258213	0.089	0.054

Source: Eviews 9, and SPSS 23 output (Appendix 03, Appendix 05)

As we can see at the Table 9 all the p values of the three tests for the two periods were greater than the level of significant 0.05, which means that we can accept the null hypothesis of the normality of the two data series before and after the crisis. And as a consequence the Normality assumption is achieved to do the Independent Samples *t*-Test to compare between the two periods means, and what we will see at the next step.

3.2.3 The independent Samples *t* Test: The test results were as below:

Table 10. The Independent Samples *t* Test results

Group Statistics				
PERIOD	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
BEFORE CRISIS	52	10384.99	379.74	52.66
AFTER CRISIS	52	8746.97	493.69	68.46

	Levene's Test for Equality of Variances		**t-test for Equality of Means**					
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**

								Lower	Upper
QEI Equal variances assumed	4.076	0.046	18.964	102	0.000	1638.02	86.3733	1466.697	1809.339
QEI Equal variances not assumed			18.964	95.7	0.000	1638.02	86.3733	1466.561	1809.474

Source: SPSS 23 output (Appendix 08)

According to the results shown at Table 10; the Levene's Test for Equality of Variances Sig value 0.046 is less than 0.05 what means that the two series variances are not equal, however the Independent samples test gives us an alternative choice by the second line which is for the case of equal variances not assumed. And by reading the second line at the table we clearly see that the null hypothesis that the two population means are equal is refused, because the Sig value (2-tailed) is 0.000 less the significant level 0.05, so the two series are significantly deferent with a 1638.02 mean difference, a positive mean difference value meaning that the period before the crisis was better than that after it.

The 95% confidence interval of the difference **[**1466.561, 1809.474] confirms the decision of reusing H0 and accepting H1 since the 0 value is not between the lower and upper values of it.

At the Group Statistics table we can see that the mean of the period before crisis (10384.99) is greater than the mean of the period after crisis (8746.97), and that leads us to a conclusion that the June 5th, 2017 Gulf diplomatic rift has negatively affected the QSE and the QSI was not as good as before the crisis during 52 weeks after the crisis.

E-views can provide us with more Tests for equality of means between the two periods to confirm our conclusion, and we can see that as below:

Table 11. Tests for equality of means Between Series

Method	df	Value	Probability
t-test	102	-18.9644	0.0000
Satterthwaite-Welch t-test	95.7	-18.9644	0.0000
Anova F-test	(1, 102)	359.6484	0.0000
Welch F-test	(1, 95.7)	359.6484	0.0000

Source: Eviews 9 output (Appendix 06)

Table 11 shows that all the p values (0.0000) of the four tests are less than the significant level (0.05) what guides us to confirm that the crisis has affected the QSE, and that affection was negative since the mean of the period before the crisis is less than the one of the period after the crisis.

3.2.4 The Mann-Whitney Test: the test results were as below:

Table 12. The Mann-Whitney Test

Ranks

PERIOD	N	Mean Rank	Sum of Ranks
BEFORE CRISIS	52	78.5	4082.00
AFTER CRISIS	52	26.5	1378.00
Total	104		

Test Statistics

	QEI
Mann-Whitney U	0.000
Wilcoxon W	1378.000
Z	-8.790
Asymp. Sig. (2-tailed)	0.000

Source: SPSS 23 output (Appendix 07)

As shown at Table 12, the Asymp.Sig. (2-tailed) value (0.000) is less than 0.05 the level of significance, we refuse the null hypothesis H_0 that the two populations are equal and we accept H_1 what means that the two populations are not equal, so the crisis has affected the QSE as we've concluded at the Independent Samples *t* Test. And by looking at the Ranks table we confirm that the affection was negative since the mean Rank after crisis (26.5) is less than the one before the crisis (78.5). So the Mann-Whitney test agrees with the Independent Samples *t* Test that the QSE was negatively affected by the 2017 Gulf diplomatic crisis.

4. CONCLUSION

In our paper we've discussed the impact of the June 5th, 2017 gulf political rift on the Qatar stock exchange. That on Monday of June 5th, 2017 Saudi Arabia, United Arab Emirates, Bahrain, Egypt, Yemen (Abd AlHadi Mansour Government), and Libya (Government of National Accord) along with Maldives have decided to cut diplomatic ties with Qatar and suspend land and sea travel to and from Qatar, a crisis that has never been experienced by the Gulf Councils' members since its establishment in 1981.

From the Qatari side one of the immediate consequences was that the Qatar's QE Index for stocks tumbled 8 percent, a big challenge was facing the QSE, so we've studied in our paper the effects of this diplomatic crisis on the Qatar stock exchange in two steps, the first step was concerning the efficiency of the QSE, and the second step was about the crisis effects on the QSI.

After the analyses of 52 weekly observations before the crisis, and 52 other ones after the crisis, using Unit root tests (the Augmented Dickey-Fuller, Runs test, and Variance Ratio test) to test the efficiency weak form of QSI before and after the crisis and see whether it was affected or not, then using the Normality tests (Jarque-Bera, Kolmogorov-Smirnov, Shapiro-Wilk) to see whether the weekly data of the two periods follow a normal distribution or not in order to choose between parametric mean comparison tests (the independent Samples *t* Test) and nonparametric tests (the Mann-Whitney Test). And at the end we came to test whether there was affection on QSE or not by using some mean comparison tests such as The independent Samples *t* Test and the Mann-Whitney Test.

And we came to the following conclusions:

- The June 5th, 2017 Gulf diplomatic crisis had affected the efficiency of the QSE according to the Variance ratio test that shows more details about the randomness of the data and gives a clear analyzes, so the QSE wasn't efficient before the crisis and changed to be efficient after it.
- The two data series before and after the crisis follow a normal distribution.
- The crisis has affected the Qatar stock exchange.
- The QSE was negatively affected by the June 5th, 2017 Gulf diplomatic crisis.

So we came to a same conclusion with most of previous studies that the political crisis and instability affects stock markets, and that there is a negative relationship between stock prices and political instability

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6. Appendices

Appendix 01: The Augmented Dickey-Fuller test results

Augmented Dickey-Fuller Unit Root Test on QEI_BEFORE_CRISIS

Null Hypothesis: QEI_BEFORE_CRISIS has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.886770	0.6468
Test critical values:	1% level	-4.148465	
	5% level	-3.500495	
	10% level	-3.179617	

Augmented Dickey-Fuller Unit Root Test on D(QEI_BEFORE_CRISIS)

Null Hypothesis: D(QEI_BEFORE_CRISIS) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.437896	0.0002
Test critical values:	1% level	-4.152511	
	5% level	-3.502373	
	10% level	-3.180699	

Augmented Dickey-Fuller Unit Root Test on QEI_AFTER_CRISIS

Null Hypothesis: QEI_AFTER_CRISIS has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.742004	0.7178
Test critical values:	1% level	-4.148465	
	5% level	-3.500495	
	10% level	-3.179617	

Augmented Dickey-Fuller Unit Root Test on D(QEI_AFTER_CRISIS)

Null Hypothesis: D(QEI_AFTER_CRISIS) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.286716	0.0000
Test critical values:	1% level	-4.152511	
	5% level	-3.502373	
	10% level	-3.180699	

Appendix 02: Runs test results

Runs Test

	QEI BEFORE CRISIS	QEI AFTER CRISIS
Test Value[a]	10428.29	8836.75
Cases < Test Value	26	26
Cases >= Test Value	26	26
Total Cases	52	52
Number of Runs	13	9
Z	-3.922	-5.042
Asymp. Sig. (2-tailed)	.000	.000

Appendix 03: Descriptive Statistics

Date: 09/28/18 Time: 23:24
Sample: 1 52

	QEI_AFTER_	QEI_BEFORE
Mean	8746.971	10384.99
Median	8836.745	10428.29
Maximum	9563.080	11320.39
Minimum	7714.260	9714.930
Std. Dev.	493.6933	379.7433
Skewness	-0.461830	0.212716
Kurtosis	2.370184	2.449075
Jarque-Bera	2.707937	1.049774
Probability	0.258213	0.591622
Sum	454842.5	540019.4
Sum Sq. Dev.	12430388	7354455.
Observations	52	52

Appendix 04: Variance ratio test results

Variance Ratio Test on QEI_BEFORE_CRISIS

Null Hypothesis: QEI_BEFORE_CRISIS is a martingale
Date: 09/30/18 Time: 06:29
Sample: 1 52
Included observations: 51 (after adjustments)
Heteroskedasticity robust standard error estimates
User-specified lags: 2 4 8 16

Joint Tests	Value	df	Probability
Max |z| (at period 2)*	2.502084	51	0.0485

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.301886	0.120654	2.502084	0.0123
4	1.523221	0.241286	2.168471	0.0301
8	1.782418	0.392638	1.992721	0.0463
16	1.086118	0.583473	0.147595	0.8827

Variance Ratio Test on QEI_AFTER_CRISIS

Null Hypothesis: QEI_AFTER_CRISIS is a martingale
Date: 09/30/18 Time: 06:33
Sample: 1 52
Included observations: 51 (after adjustments)
Heteroskedasticity robust standard error estimates
User-specified lags: 2 4 8 16

Joint Tests	Value	df	Probability
Max |z| (at period 8)*	0.992269	51	0.7875

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.128736	0.146030	0.881570	0.3780
4	1.149724	0.264149	0.566819	0.5708
8	1.415132	0.418366	0.992269	0.3211
16	1.472124	0.615097	0.767560	0.4427

Appendix 08: The Independent Samples *t* Test results

Group Statistics

	PERIOD	N	Mean	Std. Deviation	Std. Error Mean
QEI	BEFORE CRISIS	52	10384.9890	379.74332	52.66092
	AFTER CRISIS	52	8746.9713	493.69332	68.46294

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
QEI	Equal variances assumed	4.076	.046	18.964	102	.000	1638.01769	86.37330	1466.69665	1809.33873
	Equal variances not assumed			18.964	95.701	.000	1638.01769	86.37330	1466.56120	1809.47419

Appendix 05: Normality tests

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	PERIOD	Statistic	df	Sig.	Statistic	df	Sig.
QEI	BEFORE CRISIS	.106	52	.200*	.971	52	.242
	AFTER CRISIS	.114	52	.089	.956	52	.054

Appendix 06: Tests for equality of means Between Series

Test for Equality of Means Between Series
Date: 10/31/18 Time: 08:47
Sample: 1 52
Included observations: 52

Method	df	Value	Probability
t-test	102	-18.96440	0.0000
Satterthwaite-Welch t-test*	95.70084	-18.96440	0.0000
Anova F-test	(1, 102)	359.6484	0.0000
Welch F-test*	(1, 95.7008)	359.6484	0.0000

Appendix 07: The Mann-Whitney Test

Mann-Whitney Test

Ranks

	PERIOD	N	Mean Rank	Sum of Ranks
QEI	BEFORE CRISIS	52	78.50	4082.00
	AFTER CRISIS	52	26.50	1378.00
	Total	104		

Test Statistics[a]

	QEI
Mann-Whitney U	.000
Wilcoxon W	1378.000
Z	-8.790
Asymp. Sig. (2-tailed)	.000