THE IMPACT OF MENA CONFLICTS (THE ARAB SPRING) ON GLOBAL FINANCIAL MARKETS

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ABSTRACT

It is believed that financial markets are integrated and sensitive to news – including political conflicts in some regions of the world. Furthermore, financial markets seem to react differently to information flows from one region to another. The purpose of this research is to discern the effects of the recent Middle East and North Africa (MENA) conflicts – commonly referred to as the Arab Spring – on the volatility of risks and returns of global and regional stock markets as well as Gold and Oil markets. To be more specific, we consider the main uprisings in *Tunisia*, *Egypt*, *Libya* and *Yemen* and their impact on financial markets – as measured by the volatility of their risks and returns. In sum, we cluster 53 stock markets into 6 regions; namely, developed, developing, MENA, Asia, Europe, and Latin America countries, and use T-GARCH to assess the reaction of these regions to each uprising event independently. In addition, we use GARCH-M to assess the reaction of these regions stock markets as well as Gold and Oil markets to the uprisings of MENA as a whole. Our empirical findings suggest that the uprising events of MENA have more impact on the volatility of risks and returns of developed, developing, and Europe regions than MENA itself. In addition, although the results show that the volatility of both risks and returns of both developed and MENA regions are significantly affected by general conflicts in MENA, the volatility of MENA is affected during all intervals and with higher significance level. Furthermore, while MENA uprisings as a whole impact on the volatility of risk of oil (after 5 days) and gold (immediately after entering news) significantly, the returns of these markets are not affected by conflicts.

INTRODUCTION

Political conflicts occur in different regions of the world and the empirical finance literature has paid some though limited attention to the effect of geopolitical events on asset market behavior. It would not be an overstatement that one of the most critical areas in the world is the Middle East and North Africa (MENA). In this region are located the essential and primary sources of energy reserves in the world (developed and developing) and of course the region has an unusually high concentration of the major purchasers of commercial and military equipment from developed countries. The political and economic news of this region are likely to be highly influential on the global economy. Political conflicts in this region will have an impact not only on the financial markets of the MENA countries but also on global financial markets.

MENA countries have been experiencing rare political conflicts collectively referred to as "The Arab Spring" − a revolutionary wave of protests, uprisings and demonstrations that have been taking place in the Arab world since December 2010.

Even though it is clear that the popular unrests are born of a desire for more social, political and economic freedom, the time of uprisings came as a surprise for everyone. Although the main causes of these uprisings are political, their economic roots are unavoidably interlinked. Until now, the revolutions in *Tunisia* and *Egypt* resulted in departure of their leaders while a civil war in *Libya* resulted in Gaddafi's death and changes in government. There have also been demonstrations and uprisings in Syria, Bahrain, *Yemen* and minor protests in Algeria, Iraq, Jordan, Morocco, Oman, Kuwait, Lebanon, Mauritania, Saudi Arabia, and Sudan. It could be argued that there is potential for similar unrest in other important countries in MENA.

These events provide a convenient natural experimental setting for estimating the impact of unexpected and shock news of conflicts on the volatility of international financial markets and the impact of potential unrests (in other countries in this region) on international financial markets. This study contributes to the literature on the reaction of financial markets to political conflicts by providing evidence on market reactions to the news about the unexpected recent conflicts in MENA (see e.g. Ito and Lee 2005, Nikkinen et al. 2008).

We consider commodity markets (oil and gold) in addition to stock markets, which have been the most commonly examined by previous studies (see e.g. Nikkinen et al. 2008, Schwert 1990, Schwert 1989). Gold and oil markets are affected by war and uprisings. This is because gold is considered as a safe investment in the case of conflicts and oil prices are highly sensitive to unrests in oil-supplying countries. We could argue that some exchanges would be safer for investors due to these conflicts.

The main objective of this research is to evaluate the short-term reaction of the major stock markets to the recent MENA conflicts. The study analyses not only the reactions of the MENA markets to the conflicts but assesses the stock market reactions of developed, developing, Asian, European and Latin American regions to these conflicts. Extending the scope of the study across various global regions and focusing on different groups of markets allow us to investigate whether the impacts of such political shocks are limited only to those 'well integrated' markets or whether their impacts are spilling over into various other regions.

Nikkinen et al. (2008) reports, for example, that the September 11 attacks in New York, USA, had only a minor effect on MENA financial markets as compared to its impact on the rest of the world. We, therefore, seek to investigate whether the effect of the recent MENA unrests displays a contagion effect towards other regions, especially developed countries.

We consider four main political conflicts in the MENA region: the Tunisian revolution which ended with the departure of the President of *Tunisia*, *Ben Ali*, on 14 January 2011, the Egyptian unrests that resulted in the departure of the President of *Egypt*, *Mubarak* on 11 February 2011, the intervention of coalition forces with NATO support in the Libyan civil war, specifically, the coalition's attack on 19 March 2011 and the Yemeni uprisings that caused *Ali-Abdullah Saleh* to leave the country on 5 June 2011. We consider these dates as the arrival times of news shocks to markets. The volatilities of returns of 53 stock markets are grouped into 6 main regions (see TABLE 2). The commodity markets for gold and oil are also studied and their returns and volatilities are estimated and compared. A T-GARCH model is estimated to measure the asymmetric reaction of regions stock markets to each of the four main political conflicts in MENA independently. Furthermore, we develop a GARCH-M model to measure the volatility of stock markets of different regions as well as commodity markets to conflicts of MENA as a whole.

The rest of the paper is organized as follows. The second section describes different types of event news which have been considered in literature and reviews the relevant studies related to the impact of political information on stock markets. Moreover, the alternative methodologies which have been used for this purpose are reported. The third section reports on the data and the methods used in this research. The fourth section reports on the empirical analysis and estimation results. The conclusion comes in the last section.

LITRATURE REVIEW

The origin of day-to-day volatility is not fully determined and a large portion of the variation in prices is unexplainable. It appears that identifiable news events do not always drive much of the observed volatility of prices (e.g. Cutler et al. 1998, Roll 1989). The news events could originate from different fields, but empirical evidence points to political and economic events having large impacts on financial markets (Chan et al. 2001).

In the case of economic news the primary focus is on the effect of macroeconomic news releases such as PPI, GDP and unemployment rate (see Rangel 2010, Chuliá et al. 2010, Cutler et al. 1998, Jones et al. 1998, McQueen and Roley 1993, Ederington and Lee 1995) as well as money supply announcement (see Hardouvelis 1988, Pearce and Roley 1985, Cornell 1983) on stock markets prices. While the reaction of stock markets to economic news is empirically relatively weak and mixed, the evidence of reaction from bond markets is more affirmative (see Balduzzi et al. 2001, Harvey and Huang 1993, Hardouvelis 1988, McQueen and Roley 1993, Cornell 1983, Urich and Wachtel 1981, Grossman 1981). Indeed most studies in this area have considered stock, bond and foreign exchange markets separately, but few have examined all markets jointly (see Andersen et al. 2005).

The news about political conflicts (e.g. uprisings, wars, terrorist attacks) has both real and delusional effects on financial markets. On one hand, some intense conflicts such as wars and terrorist attacks on business centers and infrastructures could change the expected future cash flows, which change in expectations will result in a change in current prices of assets directly. On the other hand, conflicts could inject a sudden shock to financial markets which affect prices and returns by increasing the prevailing uncertainty.

The literature studying the impact of different political conflicts (e.g. parliament and presidential elections, uprisings, civil wars) on the asset markets including currency, stock, bond, commodity and future markets is vast. Table 1 represents some of the most prominent studies related to the impact of political conflicts on financial markets.

Most of related empirical approaches have used two general approaches for examining the effect of conflicts on different asset markets. The first approach is an event study (MacKinlay 1997) which has been implemented in a large variety of studies (see e.g. Abadie and Gardeazabal 2001, Guidolin and La Ferrara 2006, Chen and Siems 2004, Guidolin and La Ferrara 2005, Rigobon and Sack 2005, Wolfers and Zitzewitz 2009) to measure the effects of an economic event on the value of firms.

The second general approach implements GARCH family models for examining the effects of political conflicts on the volatility of asset markets. Nikkinen et al. (2006) and (2008), Flannery and Protopapadakis (2002) and Jones et al. (1998) use a simple GARCH (1, 1) model for this purpose. Engle et al. (1987) and French et al. (1995) use the GARCH-M to model financial assets. Also Wei et

al. (1995) use the GARCH-M model to estimate the impact of volatility and price change on developed and emerging markets.

TABLE 1. OVERVIW OF RELATED STUDIES ABOUT POLITICAL INFORMATION ON STOCK MARKETS

Market / News	Study	Data and relations	Main Results
Stock/3 main political issues	(Yue-cheong and Cjw 1996)	1989-1993, daily, weekly and quarterly Hong Kong Stock market Index	Political news increases the stock volatility of shares and that good (bad) political news is correlated with positive (negative) returns for the Hang Kong Index.
Stock/Cease fire announcement	(Abadie and Gardeazabal 2001)	1998 and 1999, daily stock prices	The stocks on the firms which were active in the Basques have a positive reaction to the cease-fire announcement by ETA.
Stock/ Political conflict	(Abadie and Gardeazabal 2001)	1998-2000, 14 Basque stocks and 59 non-Basque stocks	Only the stocks on the firms which were active in the Basques have a positive reaction to the cease-fire announcement.
Stock/ Political conflict	(Chen and Siems 2004)	1915-2002, DJIA, 14 military/ terrorist attacks, daily abnormal return during [0,10]	U.S. capital markets today appear to be more resilient and are quicker to absorb news of terrorist attacks and military invasions/ U.S. market resilience can probability be partially explained by a banking/financial sector that provides adequate liquidity to promote market stability and squelch panic.
Stock, Gold, Treasury Bills, liquidity premium, currency/ Political conflict	(Rigobon and Sack 2005)	Jan-Apr (2003), daily prices and rates	Lower equity prices, higher oil future prices, lower Treasury yields, fall in dollar and a widening of corporate yield spread are the main consequences of the Iraqi war.
Stock, Commodities/ Political conflict	(Guidolin and La Ferrara 2005)	1974-2004, 112 conflicts, Indices of US, UK ,Japan and France , commodities, weakly abnormal returns during [-5,5]	Only a fraction of conflicts had a significant effect on most of commodities prices and on stock markets indices.
Stock / Domestic War	(Guidolin and La Ferrara 2006)	1998-2002, daily abnormal return during [0,3]	After ending the war, the prices of Diamond companies showed negative abnormal returns/ Moderate levels of conflict can be beneficial to private firms, while extremely low or high levels of tension reduce their abnormal returns.

Market / News	Study	Data and relations	Main Results
Stock/ 3 wars US-led alliance and Iraq, Ex-Yugoslavia, and Israel and the Palestinians	(Schneider and Troeger 2006)	1990-2000, daily returns	International crises have mostly negative impact on stock markets; most of these reactions are asymmetrical.
Stock/ September 11 attack	(Nikkinen et al. 2008)	2000-2011, several intervals [-6,6] months, 53 stock markets from 6 regions	Only developed and European countries show similar stock return and volatility reaction over pre- and to some extent post-September 11 attacks/ for the short-time periods of 5 and 10 days after the attack, all regions, but not MENA, exhibit the same downturn.
Oil, stock, Saddam Security/ Political conflict	(Wolfers and Zitzewitz 2009)	Sep 2002-Feb 2003, daily S&P index	Ex-ante a 10 percent increase in the probability of war decreases the S&P500 by 1.5 percent and increases spot oil prices by $1.
Stock/Iraq War	(Al Refai 2010)	1995-2008, weekly data of 11 countries in the MENA region	Evidences on the effect of Iraq war in the MENA regions.

DATA SET AND RESEARCH METHODOLOGY

The data set for this research is obtained from analyzing international stock markets from six different regions. The region wise analysis approach is a proper one to recognize changes in return and volatility of global stock markets (see e.g., Nikkinen et al. 2006 and 2008).

Since we are interested in estimating the short-term reaction of international asset markets to the 4 main unrests in MENA, the data set comprises stock and commodity markets indices worldwide for the sample period December 2009-June 2010. The global stock markets indices are grouped in 6 different regions (TABLE 2).

TABLE 2. SAMPLE REGIONS AND COUNTRIES

Region	Country
Developed	*US, Canada, UK, France, Italy, Germany, Spain, Australia, New Zealand, Japan, Singapore.*
Developing	*Brazil, Mexico, Czech Republic, Russian, Poland, Turkey, Hungry, Chen, Malaysia, Indonesia, Taiwan, South Africa.*
MENA	*Iran, Bahrain, Jordan, Lebanon, Oman, Qatar, Kuwait, Saudi Arabia, Egypt, Morocco, Tunisia.*
Asia	*India, Pakistan, Philippine, South Korea, Thailand.*
Europe	*Belgium, Denmark, Finland, Greece, Netherlands, Norway, Sweden, Swiss, Slovakia.*
Latin America	*Argentina, Chili, Colombia, Peru, Venezuela.*

As mentioned before, the aim of this research is to compare the volatility of return (risk) of gold and oil markets as well as capital markets during the political conflicts in MENA. For capturing the returns, we compute the daily returns of all sampled markets. The daily return (R_t) at day t, is measured by $\ln(P_t / P_{t-1})$, where P_t is the asset price at day t.

One of the assumptions of this research is that the volatility of asset markets ex-ante and ex-post of time t are asymmetric. But in GARCH models, the response of volatility to positive and negative shocks is symmetric (Bollersleve, 1986). To capture this asymmetric reaction, we perform T-GARCH model which is developed independently by Zakoian(1994) and Glosten, Jagannathan and Runkle (1994). This model for the variance is;

$$\sigma_t^2 = v + \alpha\varepsilon_{t-1}^2 + \gamma I_{t-1}\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2, \tag{1}$$

where $I_{t-1} = 1$ for $\varepsilon_{t-1} < 0$ and $I_{t-1} = 0$ otherwise. "Good political news" ($\varepsilon_{t-1} < 0$) has an impact of α on the variance while "Bad political news" has an impact of $\alpha + \gamma$ on the variance. In the case of significant γ, we conclude asymmetric response to shocks. If $\gamma > 0$ a negative shock has a greater impact on the volatility and vice versa. β in both cases specifies the persistence of shocks to the conditional variance.

After computing daily returns and volatility for each country, all of them are grouped into six different regions over several periods as mentioned above. For a better comparison between and within regions, we follow Nikkinen et al. (2008) approach through providing different empirical analyses and hypothesis tests which are categorized and described below.

In the beginning we compute some basic descriptive statistics; namely, measures of central tendency (mean and median), volatility (standard deviation) and shape (standardized skewness and standardized kurtosis) for the return and volatility of six regions over three intervals (5 days, 10 days, and 1 month).
Next, according to the main research questions, the main hypotheses and proper empirical methods for examining them are provided:

I) Testing the null hypothesis (H₁) that cross-sectional average returns (volatility) of the six regions are equal.
For comparing the averages of returns (volatility) between regions, a one-way analysis of variance (ANOVA) is used under the assumption that the returns are normally distributed. Also, as empirical evidence suggests that daily asset returns are not necessarily normally distributed (Chan, Wei, 1995), the non-parametric test of Kruskal-Wallis (K-W) is used to test whether there is any significant difference between the medians of returns (volatility) of the six regions in each interval (TABLE 4 and 5).

II) Testing the null hypothesis (H₂) that, for a given region, the average returns (volatility) before and after an event are equal.
Here we use a t-Test under the assumption that the returns are normally distributed. Furthermore, the non-parametric test of Wilcoxon is used to test whether the medians of returns (volatility) of each given region, before and after an event, are equal (TABLE 6 and 7).

III) Testing the hypothesis (H₃) that the volatility of MENA return (risk) is generally affected by the arrival of MENA political news more than other regions.
IV) Testing the hypothesis (H₄₋₁ and H₄₋₂) that Oil and Gold markets returns (volatility) are generally affected by the arrival of MENA political news.

Here we consider the impact of all the four main MENA conflicts on global stock markets (TABLE 8 and 9) and commodities (TABLE 10 and 11). In other words, instead of considering conflicts case by case, the impact of MENA conflicts as a whole is observed and measured.

For this purpose, we define dummy variable series for different intervals after each main conflict in MENA. Here, the main assumption is that good political news would give a positive impact, whereas bad political news would exert a negative impact on the return (volatility) of markets. Thus, we used the Generalized Autoregressive Conditional Heteroscedasticity in Mean (GARCH-M) model (see, Engle et al., 1987) to capture the impact of news on both returns and volatility of markets.

According to Wei et al. (1995), the specification of a traditional form of GARCH-M model is as follow:

$$R_t = \alpha_0 + \alpha_1 h_t + \alpha_2 u_{t-1} + u_t \quad where \ \sigma_{t-1}|\emptyset_{t-1} \sim (0, h_t) \tag{2}$$

$$h_t = b_0 + b_1 u_{t-1} + b_2 h_{t-1}, \quad b_0 > 0, b_1 b_2 > 0 \ and \ b_1 + b_2 < 1 \tag{3}$$

where, R_t is the return of asset index in period t and $\emptyset_t$ is the set of all news available at day $t-1$. u_t is the error term with a conditionally normally distributed and time varying variance h_t. We modify the above mentioned GARCH-M model as follow;

$$R_t = \alpha_0 + \alpha_1 h_t + \alpha_2 u_{t-1} + \alpha_3 DN \tag{4}$$

$$h_t = b_0 + b_1 u_{t-1} + b_2 h_{t-1} + b_3 DE \tag{5}$$

where, DN is the news dummy with threefold possible value; +1, -1 and 0 , which represents favorable political news, unfavorable political news and no news respectively. DE is the event dummy with two possible values: 1 when there is political news and zero when there is no news. In addition, dummy variables are defined for different time horizons of zero (for the date of exerting news), 5, 10 and 22 days (for the periods of 5, 10 and 22 days after exerting news, respectively).

To determine the type of news dummies (*DN*), say favorable (+1) or unfavorable (-1) political news, the weighted average return of a portfolio consists of all stock markets for the day before and after news arrival are compared. The proportion of market value of each region to total market value of all stock markets is assigned as the weight of each region in the final portfolio. A significant positive (negative) change in the portfolio during the day after rather than the day before news arrival is considered as a proxy of favorable (unfavorable) news.

Based on the results in TABLE 3, we consider the ouster of *Ben Ali* (case of *Tunisia*) and *Hosni Mubarak* (Case of *Egypt*) as well as leaving country by *Ali-Abdullah Saleh* (Case of *Yemen*) as favorable political news and coalition attack on *Libya* as unfavorable political news in MENA.

TABLE 3: COMPARISON OF WEIGHTED AVERAGE RETURN OF STOCK MARKETS THE DAY BEFORE AND AFTER NEWS ARRIVAL

This table shows the results of comparison of all stock markets returns the days, Pre- and Post- conflict date, using the parametric t-test and the non-parametric Wilcoxon test. Both statistics along with their significant level are provided. The null hypothesis for the parametric (non-parametric) test is that the mean (median) of pre-date = the mean (median) of post-date, versus the alternative hypothesis of non-equality. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively. Notice that Positive (negative) t-test means decrease
(increase) in returns mean. However the sign of the z-statistic does not explain increase or decrease in Median.

	Case of Tunisia	Case of Egypt	Case of Libya	Case of Yemen
Return the day before	-0.09%	-0.79%	0.48%	-0.26%
Return the day after	0.14%	0.59%	0.24%	-0.01%
t-statistic	-2.11‡	-0.489	2.31‡	-2.13‡
K-W statistic	-1.04	-0.524	-0.943	-1.07

EMPIRICAL ANALYSIS AND RESULTS

In this section we examine whether MENA conflicts have any effects on the behavior of the global stock markets as well as gold and oil markets. This issue is addressed with five different types of tests mentioned before. For a better presentation, the results are categorized based on the type of market.

Global Stock Markets

For testing the first hypothesis that the cross-sectional means of returns (volatilities) of the six regions are equal, both the parametric F-test (to examine whether there is any significant difference between the means of returns and volatility of the six regions) and the non- parametric Kruskal-Wallis test (to examine whether there is any significant difference between the medians of returns and volatilities of the six regions) are provided. (TABLE 4 and 5)

TABLE 4. THE (NON-) PARAMETRIC RESULTS OF COMPARISON BETWEEN THE MEAN RETURNS OF SIX REGIONS

This table presents the results of the two tests of difference among the means, using the parametric t-test (medians, using the non-parametric Kruskal-Wallis test), of each region and reports the results of F-ratio (K-W statistic). A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

	Case of Tunisia		Case of Egypt		Case of Libya		Case of Yemen	
	Pre-14 Jan	Post-14 Jan	Pre-11 Feb	Post-11 Feb	Pre-19 Mar	Post-19 Mar	Pre – 5 Jun	Post-5Jun
Panel A: 5 days								
F-statistic	1.20	1.42	8.85*	3.62*	3.57*	11.64*	3.16 †	9.52*
K-W	(9.20)	(0.27)	(24.74)*	(11.04) †	(8.45)	(11.40) †	(8.32)	(17.93)*
Panel B: 10days								
F-statistic	2.29 †	1.22	5.49*	6.63*	8.86*	6.63*	5.13*	14.21*
K-W	(7.15)	(8.49)	(18.33)*	(11.54) †	(26.06)*	(11.54) †	(15.02) †	(18.33)*
Panel C: 1 Month								
F-statistic	3.03†	2.71†	3.49*	8.05*	11.98*	3.59*	4.89*	1.62
K-W	(4.40)	(20.41)*	(20.78)*	(16.12)*	(13.75) †	(10.53) ‡	(11.05) †	(12.20) †

As for the case of *Tunisia* and at the significance level of five percent, the difference between the six means of regions' returns in the periods of pre- and post-1 month as well as pre-10 days are statistically significant. Furthermore the median of regions' returns in the interval of post-1 month are statistically significantly different. As for uprisings in *Egypt*, *Libya* and *Yemen*, the differences between the means of the returns during all periods in the post- and pre- of all conflicts (except 1 month after *Yemen* conflict) at the five and ten percent levels of significance are statistically significant. Moreover the results show that there are statistically significant differences among the means and medians during pre- and post- periods of most conflicts.

As mentioned before, it is assumed that T-GARCH model is one alternative for linear structure models in capturing asymmetric and leverage effects. Having looked at TABLE 5, we conclude that there is a significant difference between the means of volatility of all regions during all pre- and post- periods. It is to say that, different regions of the world have different means of volatility pre- and post- of MENA conflicts. In contrast, the medians of volatility are not significantly different. If this is the case, the regions have significantly different means and indifferent medians of volatility which indicates distinctive skewness for regions. However, we cannot draw more conclusions from this table.

TABLE 5. THE (NON-) PARAMETRIC RESULTS OF COMPARISON BETWEEN THE MEAN T-GARCH VOLATILITIES OF SIX REGIONS

This table presents the results of two tests for the difference among T-GARCH volatilities, using the parametric t-test (medians, using the non-parametric Kruskal-Wallis test), of each region and reports the results of F-ratio (K-W statistic). A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

	Case of Tunisia		Case of Egypt		Case of Libya		Case of Yemen	
	Pre-14 Jan	Post-14 Jan	Pre-11 Feb	Post-11 Feb	Pre-19 Mar	Post-19 Mar	Pre-5 Jun	Post-5Jun
Panel A: 5 days								
F-statistic	16.264*	12.776*	14.106*	12.776*	3.742*	12.776*	8.265*	3.497*
K-W	(2.521)	(4.238)	(4.943)	(4.238)	(9.337)[‡]	(4.238)	(5.838)	(9.552)[‡]
Panel B: 10days								
F-statistic	22.131*	13.514*	22.131*	13.514*	6.469*	8.682*	11.172*	3.903*
K-W	(2.621)	(5.225)	(2.621)	(5.225)	(2.512)	(6.811)	(6.484)	(11.442)[†]
Panel C: 1 Month								
F-statistic	24.234*	15.858*	24.234*	15.858*	11.549*	10.989*	9.566*	5.035*
K-W	(4.394)	(3.596)	(4.394)	(3.596)	(0.76)	(5.155)	(4.155)	(10.804)[‡]

For testing the second hypothesis that, for a given region, the average returns (volatility) before and after an event are equal, we use the parametric t-test (t-statistic) and non-parametric Wilcoxon test (z-statistic) for testing the equality of average returns (volatility) of a region pre- and post- an event in MENA.

As seen from panel A of TABLE 6, only the returns of developed and Europe regions show significant decrease over the 5 days post-January 14 at the levels of 1% and 10% respectively. Meanwhile for the 10-day period, developed and developing regions exhibit significant decrease in returns. In addition, for a longer period of 1 month, developing and Asia returns decrease significantly. Interestingly, except for the 1 month period at the level of 10%, MENA region returns are not

affected significantly by *Tunisia* conflict, although this significant impact could be a result of an overlap with *Egypt* conflict. From panel B, we can conclude that the case of *Egypt* is more effective on MENA region, whereas during both post-5 and 10 day periods the return of this region decreases significantly. Likewise, the return of developed region shows a significant decrease over both 10 days and 1 month after February 11. In comparison, developing region exhibits a significant increase over short-term period of 5 days after *Mubarak's* ouster. At the same time, Europe region shows mixed up results. While over short term periods of 5 and 10 days, there is growth in return of Europe, eventually this region shows significant decline in compliance with Developing and MENA. As seen in panel C, the returns of almost all regions show significant increase after the coalition attack on *Libya*. MENA region does not exhibit a significant difference in returns between pre- and post-March 19. The results given from panel D show that Developing, Asia and Europe region show significant decrease in returns over post-10 day period of *Yemen* conflict. In addition, developed region has a significant increase over post-1 month of this conflict. The rest of the regions are not significantly affected by this conflict.

From TABLE 7 - panel A, it is clear that there are no remarkable changes in the mean volatility of regions after *Tunisia* conflict. Meanwhile Developing, MENA and Asia have increased in volatility at the level of 10% over the long term period of 1 month pre- and post-January 14. The results given from panel B indicate that while the volatility of developed region shows significant increase (at lease at the level of 10%) over all intervals, MENA region experiences decrease in volatility. The rest of the regions do not show any significant difference. Panel C indicates that after the coalition attack on *Libya*, there is just Europe (at significance level of 1%) and Developing region (at significance level of 1%) which have a significant decline in volatility. Meanwhile the volatilities of other regions do not show any significant difference. In the case of panel D (*Yemen* conflict) there is just developed region which shows significant increase (at the level of 1%) in volatility after June 5. The volatility of the rest does not demonstrate remarkable changes.

From the results for testing the second hypothesis, we can conclude that the upheavals in *Tunisia* that marked the beginning of the Arab spring have had a significant negative impact on the returns of markets in developing and developed regions, though interestingly not on the MENA region markets. More specifically the volatility of returns of markets in the regions is not affected by the actual ouster from power of the President of *Tunisia*, so it would appear that the markets had correctly anticipated that event, given that the uprising had started.

Egypt has had a bigger effect on global markets across the various regions. The departure of the President of *Egypt* seems to have been received favorably by the markets of the MENA region – we find increases in the return of stock markets of the region associated with this departure. Meanwhile, the developed region and Europe show significant decreases in return in response to the same event, implying that the markets in these regions saw the same event unfavorably. We find increases in the volatility of both MENA and developed region after *Mubarak* departed.

TABLE 6. COMPARISON OF STOCK MARKET RETURNS BETWEEN PRE- AND POST- POLITICAL CONFLICTS IN MENA

The table shows the result of comparison of stock markets returns over several intervals, Pre- and Post- conflict date, for 6 different regions, using the parametric t-test and the non-parametric Wilcoxon test. Both statistics along with their significant level are provided. The null hypothesis for the parametric (non-parametric) test is that the mean (median) of pre-date = the mean (median) of post-date, versus the alternative hypothesis of non-equality. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively. Notice that Positive (negative) t-test means decrease (increase) in returns mean. However the sign of z-statistic does not explain increase or decrease in Median.

	A: Comparison between pre- and Post- 14 January			B: Comparison between pre- and Post- 11 February		
	Panel A: 5 days	*Panel B: 10 days*	*Panel C: 1 month*	*Panel A: 5 days*	*Panel B: 10 days*	*Panel C: 1 month*
Developed	7.07 *	3.189 *	-0.230	-1.788	5.617 *	4.868 *
	(-2.937) *	(-2.667) *	(-0.800)	(-1.512)	(-2.936) *	(-2.845) *
Developing	1.555	2.834 †	3.187*	-3.583 *	-1.544	-1.699
	(-1.412)	(-2.275) †	(-2.353) †	(-2.824) *	(-1.334)	(-1.412)
MENA	0.466	1.528	1.886 ‡	2.362 †	2.75 †	0.603
	(-1.569)	(-1.412)	(-1.883) ‡	(-2.223) †	(-2.490) †	(-1.647) ‡
Asia	-0.493	1.278	5.599 *	-2.307 ‡	-1.835	-1.716
	(-0.524)	(-1.153)	(-2.201) †	(-1.782) ‡	(-1.363)	(-1.363)
Europe	2.201 ‡	0.098	-0.023	-0.488	-2.232 ‡	3.908 *
	(-1.836) ‡	(-0.415)	(-0.415)	(-0.770)	(-1.955) ‡	(-2.310) †
Lat. America	-0.452	-0.628	1.338	-2.330 ‡	-1.599	-0.191
	(-0.135)	(-0.674)	(-1.214)	(-2.023) ‡	(-1.483)	(-0.405)
	C: Comparison between pre- and Post- 19 March			D: Comparison between pre- and Post- 5 June		
	Panel A: 5 days	*Panel B: 10 days*	*Panel C: 1 month*	*Panel A: 5 days*	*Panel B: 10 days*	*Panel C: 1 month*
Developed	-5.619 *	-8.153*	-7.277*	1.62	1.077	-3.280 *
	(-2.934) *	(-2.934) *	(-2.934) *	(-1.511)	(-0.978)	(-2.490) †
Developing	-5.097 *	-6.049 *	-4.007 *	0.927	2.646 †	-1.793
	(-3.059) *	(-2.981) *	(-2.667) *	(-0.941)	(-2.353) †	(-1.412)
MENA	0.116	1.891‡	-1.721	-0.726	-1.414	-0.551
	(-0.392)	(-1.726) ‡	(-1.726) ‡	(-0.706)	(-1.804) ‡	(-0.863)
Asia	-3.917 †	-4.010 †	-4.225 *	2.469 *	6.808 *	0.379
	(-1.992) †	(-1.992) †	(-1.992) †	(-1.782) *	(-2.201) †	(-0.524)
Europe	-3.016 †	-2.850 †	-2.034 ‡	1.733	2.846 †	-1.504
	(-2.310) †	(-2.192) †	(-1.718) ‡	(-1.599)	(-1.955) ‡	(-1.481)
Lat. America	-1.809	-2.940 †	-1.228	-0.215	0.489	0.406
	(-1.214)	(-2.023) †	(-0.944)	(-0.135)	(-0.674)	(-0.674)

TABLE 7.   COMPARISON OF STOCK MARKET T-GARCH VOLATILITY BETWEEN PRE- AND POST- POLITICAL CONFLICTS IN MENA

The table shows the result of comparison of T-GARCH Volatility of stock markets over several intervals, Pre- and Post- conflict date, for six different regions, using the parametric t-test and the non-parametric Wilcoxon test. Both statistics along with their significant level are provided. The null hypothesis for the parametric (non-parametric) test is that the mean (median) of pre-date = the mean (median) of post-date, versus the alternative hypothesis of non-equality. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively. Notice that Positive (negative) t-test means decrease (increase) in volatility mean. However the sign of z-statistic does not explain increase or decrease in Median.

	A: Comparison between pre- and Post- 14 January			B: Comparison between pre- and Post- 11 February		
	Panel A: 5 days	*Panel B: 10 days*	*Panel C: 1 month*	*Panel A: 5 days*	*Panel B: 10 days*	*Panel C: 1 month*
Developed	1.663	0.883	1.001	-1.991‡	-2.767†	-2.822†
	(-1.245)	(-0.622)	(-0.711)	(-1.689)‡	(-2.223)†	(-2.578)*
Developing	0.095	-1.055	-1.929‡	-0.673	-0.121	-1.484
	(-0.471)	(-1.569)	(-1.883)‡	(-1.255)	(-0.628)	(-1.412)
MENA	0.836	-0.191	-2.059‡	2.362†	1.831‡	-1.682
	(-0.628)	(-0.706)	(-2.510)†	(-3.056)*	(-2.040)†	(-1.726)‡
Asia	0.883	-1.474	-2.191‡	-0.089	0.127	-0.309
	(-0.524)	(-1.153)	(-1.782)	(-0.314)	(-0.105)	(-0.105)
Europe	-1.116	-1.385	-1.645	0.144	-0.888	0.103
	(-1.007)	(-1.718)‡	(-2.073)†	(-1.244)	(-1.244)	(-0.889)
Lat. America	-0.657	-1.191	-1.674	-0.132	-0.683	-0.516
	(-0.135)	(-1.753)‡	(-2.023)†	(-0.135)	(-0.944)	(-0.674)

	C: Comparison between pre- and Post- 19 March			D: Comparison between pre- and Post- 5 June		
	Panel A: 5 days	*Panel B: 10 days*	*Panel C: 1 month*	*Panel A: 5 days*	*Panel B: 10 days*	*Panel C: 1 month*
Developed	1.303	1.401	1.441	-3.752*	-1.479	-0.482
	(-2.934)*	(-2.934)*	(-2.667)*	(-2.934)*	(-1.511)	(-0.089)
Developing	1.862‡	1.915*	1.811‡	0.171	0.207	1.968‡
	(-1.647)‡	(-1.961)†	(-1.647)‡	(-0.078)	(-0.471)	(-1.883)‡
MENA	-0.244	1.009	1.515	0.356	0.916	1.413
	(-2.118)†	(-2.040)†	(-2.197)†	(-0.235)	(-0.784)	(-1.569)
Asia	-0.009	0.473	2.381†	-0.404	0.558	0.653
	(-0.943)	(-0.524)	(-1.572)	(-0.314)	(-0.105)	(-0.524)
Europe	5.517*	7.946*	2.933†	-1.813	-1.975‡	-1.650
	(-2.666)*	(-2.666)*	(-2.310)†	(-2.666)*	(-2.547)†	(-1.836)‡
Lat. America	0.403	-0.359	-0.661	-0.980	-0.993	-0.938
	(-0.405)	(-0.405)	(-0.405)	(-0.135)	(-0.405)	(-0.135)

The most intensive conflict in MENA is the coalition attack on *Libya* on March 11. As evident in the results, the returns of all regions, except MENA, increases significantly after the coalition attack commences in *Libya*. The return and volatility of MENA are not, however, influenced by the coalition attack on *Libya*. In contrast, Europe and developing regions show significant increases in the volatility of their stock markets. The *Yemeni* conflict, which reached its peak on June 5 after *Ali-Abdullah Saleh* left the country, overlaps with other uprisings in MENA, including *Syrian* and *Bahraini* protests. Developing countries, Asia and Europe have experienced significant decreases in returns associated with this event. With the exception of the developed region, however, which shows significant increase in volatility, all regions including MENA display little change in volatility.

For testing the third hypothesis that the volatility of MENA returns (risk) is generally affected by the arrival of MENA political news more than other regions, we used a GARCH-M model for return and volatility of regions. TABLE 8 and 9 exhibit the estimated coefficient and respective standard errors of coefficients of this model.

The results given from panel A of TABLE 8 indicate that for the mean return equation of developed region, coefficient on news dummy, α_3 , has a significant negative value on event day. That is, favorable political news (case of *Tunisia*, *Egypt* and *Yemen*) caused developed region to have a lower return and vice versa for unfavorable news (case of *Libya*). Also the dummy news is not significant for other intervals. The empirical results of panel B exhibit that none of coefficients of the dummy news are significantly different from zero. Hence, good or bad news of MENA did not have a significant impact on returns of developing region. As seen from panel C, the event day dummy of MENA has a positive significant coefficient which indicates a positive reaction of returns to favorable news and vice versa. Panel D demonstrates that the Asia region dummy news is significant during intervals of 10 days (at significant level of 1%) and 1 month (at significant level of 10%). Both of them are negative which show that favorable news in MENA decreased return of Asia region and vice versa. From panels E and F of table 8, we conclude that MENA conflicts do not significantly impact on the returns of both Europe and Latin America.

TABLE 9 exhibits the estimated GARCH-M model for the volatility of different regions. From panel A, we conclude that either favorable or unfavorable news about MENA have a significant effect on the volatility of developed stock markets on the event day. This effect cannot be captured for other intervals after upheavals. Looking at panel C, the volatility of MENA region is significantly affected by political conflicts over all intervals. Furthermore, as seen from panel F, the significant impact of MENA conflicts on the volatility of Latin America stock markets is remarkable. This impact exists for all intervals excluding 1 month period after struggles. Besides, the volatility of Developing, Asia and Europe are not affected by MENA conflicts.

TABLE 8. ESTIMATION OF GARCH-M FOR THE RETURN OF DIFFERENT REGIONS

The table presents the results of estimated coefficients of GARCH-M model $R_t = \alpha_0 + \alpha_1 h_t + \alpha_2 u_{t-1} + \alpha_3 DN + \varepsilon_t$ for the mean return of stock markets of different regions with different time period dummy variables. Where R_t= Close-to-close return in percentage; ε_t= the error term; h_t= time-varying conditional variance of ε_t ; DN equals +1 when there is favorable MENA political news and equals -1 when there is unfavorable MENA political news. The standard error of coefficients is provided in prentices. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

Panel A: Developed

Return(R_t)	α_0	α_1	α_2	α_3	Period
	0.0076	-1.0934	0.1913 *	-0.0069	Event day
	(0.0078)	(1.1685)	(0.0621)	(0.0028)	
	-0.0137	2.1239	0.2029 *	-0.0014	5 days
	(0.0152)	(2.2453)	(0.0686)	(0.0022)	
	-0.0141	2.1952	0.1993 *	-0.0017	10 days
	(0.0162)	(2.3963)	(0.0689)	(0.0015)	
	-0.0153	2.3482	0.2005 *	0.0000	22 days
	(0.0159)	(2.334)	(0.0689)	(0.0010)	

Panel B: Developing

Return(R_t)	α_0	α_1	α_2	α_3	Period
	-0.0050 †	0.9035 †	0.0965	-0.0007	Event day
	(0.0022)	(0.3576)	(0.0649)	(0.0112)	
	0.0067	-1.088	0.1407 †	-0.0016	5 days
	(0.0063)	(1.1349)	(0.0580)	(0.0017)	
	-0.0042	0.7954	0.0892	-0.0018	10 days
	(0.0072)	(1.201)	(0.0635)	(0.0012)	
	-0.0039	0.7496	0.1154 ‡	0.0006	22 days
	(0.0050)	(0.8442)	(0.0611)	(0.0007)	

Panel C: MENA

Return(R_t)	α_0	α_1	α_2	α_3	Period
	0.0031 *	-1.1546 *	0.2987 *	0.0048 *	Event day
	(0.0006)	(0.2456)	(0.0468)	(0.0018)	
	0.0033 *	-1.2341 *	0.2867 *	0.0000	5 days
	(0.0008)	(2980)	(0.0500)	(0.0014)	
	0.0031 *	-1.1192 *	0.2721*	-0.0009	10 days
	(0.0008)	(0.3134)	(0.0520)	(0.0009)	
	0.0023 *	-0.7741 †	0.2792 *	-0.0008	22 days
	(0.0008)	(0.3278)	(0.0535)	(0.0007)	

Panel D: Asia

Return(R_t)	α_0	α_1	α_2	α_3	Period
	0.0647	-10.738	0.1711	0.0032	Event day
	(0.0770)	(12.8095)	(0.0628)	(0.0081)	
	0.0023	-0.2103	0.1692 †	-0.0019	5 days
	(0.0034)	(0.5672)	(0.0681)	(0.0024)	
	0.0029	-0.2741	0.1397 *	-0.0039 *	10 days
	(0.0027)	(0.4640)	(0.0725)	(0.0012)	
	0.0005	0.1165	0.1708 †	-0.0021 ‡	22 days
	(0.0029)	(0.5228)	(0.0673)	(0.0011)	

Panel E: Europe

Return(R_t)	α_0	α_1	α_2	α_3	Period
	-0.0010 †	1.4079 †	0.0184	0.0002	Event day
	(0.0041)	(0.6033)	(0.0739)	(0.0045)	
	-0.0093 †	1.3684 †	0.0142	-0.0009	5 days
	(0.0042)	(0.6187)	(0.0747)	(0.0017)	
	-0.0086 †	1.2918 †	0.0087	-0.0016	10 days
	(0.0039)	(0.5792)	(0.0752)	(0.0012)	
	-0.0094 †	1.3818 †	0.0174	-0.0007	22 days
	(0.0042)	(0.6093)	(0.0748)	(0.0008)	

Panel F: Latin America

Return(R_t)	α_0	α_1	α_2	α_3	Period
	-0.0011	0.3258	0.1856 *	0.0039	Event day
	(0.0024)	(0.3869)	(0.0599)	(0.0033)	
	-0.0019	0.4257	0.1854 *	0.0002	5 days
	(0.0023)	(0.3622)	(0.0620)	(0.0016)	
	0.002	-0.1414	0.1765 *	-0.0012	10 days
	(0.0027)	(0.3747)	(0.0632)	(0.0013)	
	0.0035	-0.3626	0.1759 *	-0.0009	22 days
	(0.0023)	(0.3754)	(0.0618)	(0.0011)	

TABLE 9. ESTIMATION OF GARCH-M FOR THE VOLATILITY OF DIFFERENT REGIONS

The table presents the results of estimated coefficients of GARCH-M model $h_t = b_0 + b_1 u_{t-1} + b_2 h_{t-1} + b_3 DE + \varepsilon_t$ for the mean volatility of stock markets of different regions with different time period dummy variables. Where h_t= time-varying conditional variance; ε_t= the error term; DE equals +1 when there is a political news in MENA and equals 0 otherwise. The standard error of coefficients is provided in prentices. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

Panel A: Developed

Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000	0.0026	0.6873*	-0.0000*	**Event day**
	(0.0000)	(0.0179)	(0.0854)	(0.0000)	
	0.0000	0.0211	0.9129*	0.0000	**5 days**
	(0.0000)	(0.0205)	(0.0685)	(0.0000)	
	0.0000	0.0216	0.9058*	0.0000	**10 days**
	(0.0000)	(0.0213)	(0.0742)	(0.0000)	
	0.0000	0.0216	0.9122*	0.0000	**22 days**
	(0.0000)	(0.0203)	(0.0654)	(0.0000)	

Panel B: Developing

Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000	-0.062	0.0118	0.0000	**Event day**
	(0.0000)	(0.0404)	(0.7756)	(0.0000)	
	0.0000	-0.0162 *	1.010 *	0.0000	**5 days**
	(0.0000)	(0.0054)	(0.0004)	(0.0000)	
	0.0000	-0.0612 *	0.0912	0.0000	**10 days**
	(0.0000)	(0.0202)	(0.7514)	(0.0000)	
	0.0000	-0.0617 *	0.564	0.0000	**22 days**
	(0.0000)	(0.0071)	(0.6905)	(0.0000)	

Panel C: MENA

Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000 *	-0.0508 *	1.0207 *	0.0000 *	**Event day**
	(0.0000)	(0.0042)	(0.0004)	(0.0000)	
	0.0000 *	-0.0443 *	0.9995 *	0.0000 *	**5 days**
	(0.0000)	(0.0056)	(0.0107)	(0.0000)	
	0.0000 *	-0.0380 *	0.9854 *	0.0000 *	**10 days**
	(0.0000)	(0.0072)	(0.0105)	(0.0000)	
	0.0000 *	-0.0237 †	0.9464 *	0.0000 *	**22 days**
	(0.0000)	(0.0114)	(0.0146)	(0.0000)	

Panel D: Asia

Variance(ht)	b_0	b_1	b_2	b_3	Period
	0.0000	0.0065	0.4106	0.0000	**Event day**
	(0.0000)	(0.0105)	(1.1815)	(0.0000)	
	0.0000	0.0608	0.8642 *	0.0000	**5 days**
	(0.0000)	(0.0446)	(0.0971)	(0.0000)	
	0.0000	0.1000 ‡	0.8005 *	0.0000	**10 days**
	(0.0000)	(0.0563)	(0.1071)	(0.0000)	
	0.0000	0.0601	0.8129 *	0.0000	**22 days**
	(0.0000)	(0.0493)	(0.1313)	(0.0000)	

Panel E: Europe

Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000	0.0392 ‡	0.9070 *	0.0000	**Event day**
	(0.0000)	(0.2010)	(0.0448)	(0.0000)	
	0.0000	0.0380 ‡	0.9112 *	0.0000	**5 days**
	(0.0000)	(0.0202)	(0.0467)	(0.0000)	
	0.0000	0.0414 ‡	0.9028 *	0.0000	**10 days**
	(0.0000)	(0.0216)	(0.0476)	(0.0000)	
	0.0000	0.0397 ‡	0.9067 *	0.0000	**22 days**
	(0.0000)	(0.0201)	(0.0467)	(0.0000)	

Panel F: Latin America

Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000†	0.1390 †	0.6894 *	0.0000 *	**Event day**
	(0.0000)	(0.0556)	(0.1226)	(0.0000)	
	0.0000‡	0.1339 †	0.7168 *	0.0000 †	**5 days**
	(0.0000)	(0.0556)	(0.1238)	(0.0000)	
	0.0000‡	0.1646 †	0.6786 *	0.0000 *	**10 days**
	(0.0000)	(0.0646)	(0.1321)	(0.0000)	
	0.0000‡	0.1755 *	0.6712 *	0.0000	**22 days**
	(0.0000)	(0.0638)	(0.1298)	(0.0000)	

Commodity Markets (Oil and Gold)

In the cases of Oil and Gold markets, we just consider the effect of the whole MENA political news rather than the case by case conflicts. For testing the hypothesis that Oil market return (volatility) is generally affected by the arrival of MENA political news, we estimated the coefficients of GARCH-M model for the return and volatility of oil during struggles interval in MENA (TABLE 10). We conclude that favorable or unfavorable news do not have a significant impact on returns. However the volatility of oil market is influenced by conflicts over periods of post-5 day of news at the level of five percent.

TABLE 10: ESTIMATION OF GARCH-M FOR OIL

This table presents the results of estimated coefficients of GARCH-M model for the return and volatility of the Oil market over different time periods dummy variables. The standard error of coefficients is provided in parentheses. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

$$h_t = b_0 + b_1 u_{t-1} + b_2 h_{t-1} + b_3 DE + \varepsilon_t \quad \text{and} \quad R_t = \alpha_0 + \alpha_1 h_t + \alpha_2 u_{t-1} + \alpha_3 DN + \varepsilon_t$$

where h_t= time-varying conditional variance; ε_t= the error term; *DE* equals +1 when there is a political news in MENA and equals 0 otherwise; R_t=Close-to-close return in percentage; and *DN* equals +1 when there is favorable MENA political news and equals -1 when there is unfavorable MENA political news.

Panel A: Return(R_t)	α_0	α_1	α_2	α_3	Period
	-0.0012	0.2536	-0.134	-0.0017	**Event day**
	(0.0042)	(0.2687)	(0.0843)	(0.007)	
	-0.0024	0.3331	-0.1294	-0.0004	**5 days**
	(0.0043)	(0.2659)	(0.08655)	(0.0025)	
	-0.0017	0.2897	-0.0007	-0.1373	**10 days**
	(0.004)	(0.254)	(0.0852)	(0.0018)	
	-0.0016	0.287	-0.1426 [‡]	-0.0005	**22 days**
	(0.0038)	(0.2508)	(0.0862)	(0.0015)	
Panel B: Variance(h_t)	b_0	b_1	b_2	b_3	Period
	0.0000	0.3872	0.3662 *	-0.0001	**Event day**
	(0.0000)	(0.0853)	(0.1543)	(0.0002)	
	0.0001*	0.3983 *	0.3280 [†]	0.0000 [†]	**5 days**
	(0.0000)	(0.0906)	(0.1529)	(0.0000)	
	0.0000 *	0.4188 *	0.3274 [†]	0.0000	**10 days**
	(0.0000)	(0.0895)	(0.1533)	(0.0000)	
	0.0000 *	0.4280 *	0.3550 [†]	0.0000	**22 days**
	(0.0000)	(0.0971)	(-0.1507)	(0.0000)	

Also for testing the hypothesis that the Gold market return (volatility) is generally affected by the arrival of MENA political news, as seen from TABLE 11, it is clear that the return of the gold market is not affected by conflict news from MENA as well as oil. In comparison to the oil market, good or bad news of MENA impact on the volatility of the gold market on the day of news release at the level of one percent. With a lower significant level of 10 percent, the gold market volatility is affected during the intervals of 1 month after news.

TABLE 11: ESTIMATION OF GARCH-M FOR GOLD

This table presents the results of estimated coefficients of GARCH-M model for the return and volatility of the Gold market over different time periods dummy variables. The standard error of coefficients is provided in prentices. A star, dragger and double dragger refer to 1%, 5% and 10% significance level, respectively.

$$h_t = b_0 + b_1 u_{t-1} + b_2 h_{t-1} + b_3 DE + \varepsilon_t \quad \text{and} \quad R_t = \alpha_0 + \alpha_1 h_t + \alpha_2 u_{t-1} + \alpha_3 DN + \varepsilon_t$$

where h_t= time-varying conditional variance; ε_t= the error term; *DE* equals +1 when there is a political news in MENA and equals 0 otherwise; R_t=Close-to-close return in percentage; and *DN* equals +1 when there is favorable MENA political news and equals -1 when there is unfavorable MENA political news.

Panel A: Return(R_t)	α_0	α_1	α_2	α_3	Period
	0.0008	0.0199	-0.0499	-0.0061	**Event day**
	(0.0039)	(0.4693)	(0.0673)	(0.0032)	
	-0.0063	0.8517	-0.0563	-0.001	**5 days**
	(0.0072)	(0.8431)	(0.0694)	(0.0018)	
	-0.0047	0.6692	-0.0507	-0.0008	**10 days**
	(0.0069)	(0.8099)	(0.072)	(0.0013)	
	-0.7138	0.007	-0.0014	-0.0505	**22 days**
	(0.404)	(0.0033)	(0.0009)	(0.516)	
Panel B: Variance(ht)	**b_0**	**b_1**	**b_2**	**b_3**	**Period**
	0.0000 *	-0.001	0.9025 *	0.0000 *	**Event day**
	(0.0000)	(0.0196)	(0.0619)	(0.0000)	
	0.0000	0.0048	0.7613 *	0.0000	**5 days**
	(0.0000)	(0.0267)	(0.2534)	(0.0000)	
	0.0000	0.0014	-0.0637	0.0000	**10 days**
	(0.0000)	(0.0475)	(1.0731)	(0.0000)	
	0.0001 *	-0.0390 *	-0.9098 *	0.0000 ‡	**22 days**
	(0.0000)	(0.0121)	(0.0385)	(0.0000)	

CONCLUSIONS

We examined the reaction of 53 stock markets and two commodity markets, oil and gold, to four recent uprisings in the Middle East and North Africa (MENA). We measured and compared the returns and the volatility of returns of the stock markets in these regions both before and after each event. We also investigated the reaction of different regions' markets to these conflicts.

We found a significant difference between pre and post returns and volatility in the six regions for the recent political events in the MENA. The return and volatility of the markets in the MENA region were not significantly affected by uprisings except for the case of the departure of *Mubarak*. We can see that while the volatility of MENA markets decreases, the returns of the markets of this region increase significantly. On the other hand, after the beginning of the revolutionary movements in the MENA, the returns and volatility of the markets in the developed, developing and Europe experienced increased volatility after each conflict. We conclude that in the case of the revolutions of the MENA they have had more of an impact on the volatility of return of other regions rather than the MENA. In other words, we reject the hypothesis that increased volatility of the markets in the MENA region is associated with the upheavals.

For measuring the effect of the whole MENA conflicts on stock markets of regions, we implemented GARCH-M model, and find out that the return and volatility of both developed and MENA regions are significantly affected by conflicts in MENA. Having more deep concern, we can see that, first of all, the significance level of MENA volatility is more than developed region and secondly, MENA return and volatility is significantly affected during all intervals. As a result, the impact of MENA revolutions as a whole on its stock markets is significantly higher than other regions including developed countries. As a result we can say that MENA is more affected from MENA conflicts as a whole.

In the case of commodity markets we figured out that the return of oil and gold markets were not affected by the recent MENA conflicts. Conversely, the volatilities of these markets show a significant effect from these conflicts. Meanwhile, the gold market shows immediate changes in volatility, but the oil market demonstrates changes after 5 days interval.

ENDNOTES

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