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Economic Risk Linkages between Israel and Middle East Countries

Summary: This study analyses the economic risk relationship between seven of the top economies in the Middle East and Israel. Our findings are of great interest and likely to begin a new debate in the Middle East region. The results of a block exogeneity Wald test reveal that economic stability in Israel does Granger-cause economic stability in Lebanon, Oman, Qatar and the UAE. Reverse causality has been validated for Lebanon and Bahrain only. We also find that there is a positive impact on Israel's economic stability over the stability of Bahrain, Kuwait and the UAE with different seasonal patterns. In the reverse direction, in response to a shock to Israel's economic stability, the stability of the UAE, Saudi Arabia, Oman, and Kuwait are also found to be positive and significant with different seasonal frequencies.

Key words: Israel, Middle East, Economic risk, Block exogeneity Wald test, Generalized impulse response function.

JEL: C32, F15, F51.

The Middle East has been a region associated with oil rich economies, authoritarian regimes, political disputes and state-led economies. Low integration in the Middle East region is one of the key characteristics of the region. This is mainly due to the fear of political liberalization. In addition, Middle East economies have displayed poor economic performances and been economically less attractive relative to other developing nations (World Trade Organisation - WTO 2012). However, the eight highest *per capita* income Middle East economies (namely, Bahrain, Kuwait, Israel, Lebanon, Oman, Qatar, Saudi Arabia and the United Arab Emirates - UAE) achieved more than 5.5% economic growth on average annually from 1991 to 2012. The recent democratization process after the Arab Spring, major political change in Arab geopolitics, and the attempts to calm disputes between Arab states and Israel make this region an interesting one to investigate. The ratio of trade to GDP in these eight countries reached 103% on average in 2012 from 85% in 2000 (WTO 2012). Moreover, the countries' total net FDI inflow increased from US$1.33 billion in 1991 to US$76.9 billion in 2008 (United Nations Conference on Trade and Development - UNCTAD 2002, 2009). These factors also attract researchers to investigate more deeply the economies of these nations.

1. Review of Related Literature

It is not only the political relations between Israel and other Middle Eastern countries that have been investigated, (see, Gregory F. Gause and Ian S. Lustick 2012; Eytan

Gilboa 2013; Frédéric Volpi 2013; Imad Salamey 2015), but also the financial integrations among the Arab nations (see, Jorg Bleya and Mohsen Saad 2011; Raphael Espinoza, Ananthakrishnan Prasad, and Oral Williams 2011; Simon Neaime 2012; Ahmed A. A. Khalifa, Shawkat Hammoudeh, and Edoardo Otranto 2014), and the effect of the Asian flu of 1997 and the global financial systemic crisis of 2008 on the Middle Eastern stock markets (see, Neaime 2012; Aktham Maghyereh, Basel Awartani, and Khalil Al Hilu 2015). However, there is no large body of literature on the impact of the economic stability or vulnerability of Israel on the seven highest *per capita* income economies in the Middle East. The exploration of a two-way economic risk linkage between these two parties will most likely open up a new debate in the literature. The economic vulnerability of a country is likely to affect the vulnerability of other neighbouring countries. For example, the Asian flu of 1997 and the global financial systemic crisis of 2008 are two events that have had substantive and negative impacts on the rest of the world over the last two decades.

There have been many theoretical debates investigating the relationship between financial development and economic growth in global economies, in particular Middle East economies. Some of the studies (Nasri Harb and Mouawiya Al-Awad 2005; Hamed El-Said and Jane Harrigan 2006) have investigated the Middle East economies empirically and their results reveal that there are limited linkages between economic growth and financial development in the long-run. The empirical findings of Harb and Al-Awad (2005) reflect short-term causality which runs from economic growth to financial development in the Middle East. On the other hand, El-Said and Harrigan (2006) accentuated that the geo-politically motivated foreign investments in the Middle East economies are likely to reduce inequality and poverty. The failure of financial and economic liberalization in the region has given a chance for Islamic groups to develop a strong relationship with the international community by providing basic goods and services. As such, political instability in Arab countries has deepened and remains unsolved. Moreover, Robert Looney (2006) pointed out that some of the Middle Eastern nations (such as Saudi Arabia, Kuwait, Bahrain, Qatar, the UAE and Oman) have been successful by benefiting from increased globalization. Looney (*ibid*) also argues that, through the benefits of globalization, these countries have already transformed from transnational economies to advanced modern economies. The WTO's (2012) International Trade Statistics report highlighted that economic integration and inter-regional trade in the Middle East is the lowest in the world, although there has been an upward trend in the FDI flows and trade in the Middle East during the last few decades. Rania S. Miniesy, Jeffrey B. Nugent, and Tarik M. Yousef (2003) also estimated the impact of the lack of comprehensive Middle East free trade and stated that there would be double trade integration among the Middle East nations if there was a comprehensive free trade agreement. In addition, more trade integration in the Middle East is likely to increase the welfare level of the Middle East economies.

Neaime (2012) found that the 2008 global financial crisis led to a reduction in GDP growth rates, real estate prices, loan availability and capital flows in the Middle Eastern and North African (MENA) regions. Moreover, stock markets in the MENA countries dramatically tumbled. Meanwhile, Kimberly F. Luchtenberg and Quang Viet Vu (2015) aimed to explore determinants and contagion effects from the 2008 global

financial crisis. Their findings demonstrate how stock markets in the selected developed countries are strongly correlated and how the US and selected developed markets have transmitted and received contagions during the global crisis period. They also argue how trade, production, interest rates and inflation are the economic dynamics which contributed to the international contagions in 2008. These are similar to the findings of Luchtenberg and Viet Vu (2015), Maghyereh, Awartani, and Al Hilu (2015), who also uncovered a strong relationship between stock market volatility in the US and stock market volatility in large MENA countries during the 2008 post global financial crisis. Matthew S. Yiu, Wai-Yip A. Ho, and Daniel F. Choi (2010) examined the financial contagion in selected developed and developing countries. They provided evidence of the transmission of US financial crisis shocks to the Asian markets in 2007. At the same time, they underlined that the US market was not strongly hit by the Asian financial crisis in 2007. Comparatively, Wasim Ahmad, Sanjay Sehgal, and N. R. Bhanumurthy (2013) empirically investigated the contagion effect of the eurozone crisis on BRIICKS countries (Brazil, Russia, India, Indonesia, China, South Korea and South Africa). They concluded that they were dramatically hit by the contagion shock of the eurozone crisis. In addition, Muhsin Kar, Saban Nazlioglu, and Huseyin Agir (2011) investigated the relationship between financial development and economic growth in the MENA countries by using annual data from 1980 to 2007. They failed, however, to capture any causality linkage between financial development and economic growth.

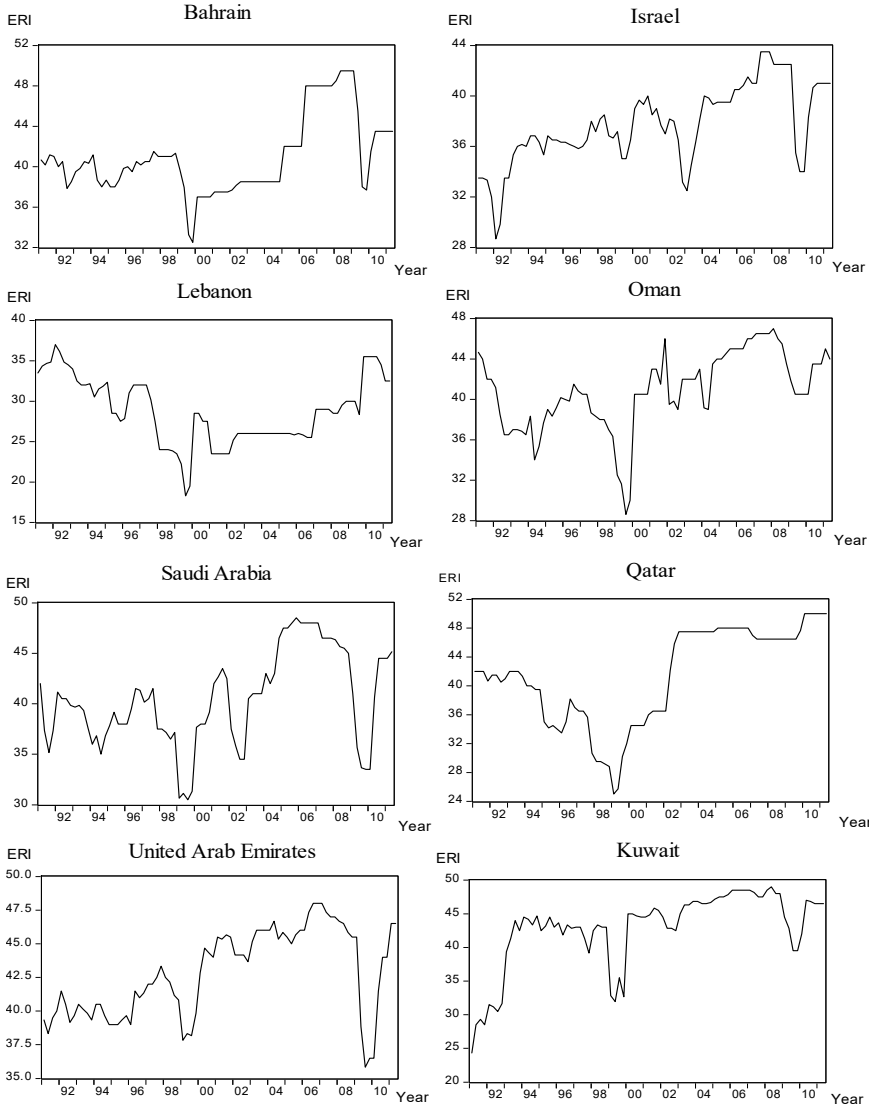
The rest of this paper is organised as follows: Sections 2 and 3 present the data and methodology, respectively. Section 4 reports the empirical findings from the time series analyses. Lastly, the conclusions are presented in Section 5.

2. Data

Time series variables have been used for the empirical tests throughout this study which consists of quarterly data with 82 observations for the period 1991Q1-2011Q2. Data used in this study were collected from the Political Risk Service (PRS) Group (2014)[1]. The economic risk index indicates economic weaknesses and strengths within the Middle East nations. The index takes values between 0 and 50, while 0 corresponds to the highest economic risk and 50 corresponds to the lowest risk. All time-series variables are transformed into natural logs before proceeding to establish a vector autoregressive (VAR) model.

Figure 1 below illustrates the economic risk indexes for the Middle East from 1991 to 2011 on a quarterly basis. From the data, we can observe that risk causes economic fluctuations throughout the entire period. However, the 1997 Asian crisis, 1998 Russian crisis and 2008 global financial crises have caused the risk index to fluctuate and most of the Middle East economies have a downward trend corresponding to the period of crises.

[1] **Political Risk Service Group.** 2014. The International Country Risk Guide. https://www.prsgroup.com/ (accessed September 21, 2014).



Source: PRS Group (2014).

Figure 1 Economic Stability in the Middle East Countries

Descriptive statistics for BAH, KUW, LEB, OMA, ISR, QAT, SAR and the UAE variables are presented in Table 1 below. The economic stability in ISR ranges from 32.50 to 49.50. Moreover, there are variations in economic stability among BAH, KUW, LEB, OMA, QAT, SAR and the UAE ranging from 24.33 to 49.00, 18.26 to 37.00, 28.60 to 47.00, 28.66 to 43.50, 25.00 to 50.00, 30.50 to 48.50 and 35.83 to 48.00, respectively. The results of Skewness, Kurtosis, and Jarque-Bera statistics are presented in Table 1 to deliver information about the distribution of variables. The

distribution of data for QAT, KUW and OMA were approximately systematic, and for LEB, ISR, SAR and the UAE were rather moderately and negatively skewed. The only variable that is moderately and positively skewed is for BAH. Regarding Kurtosis, the distribution of variables, except for the UAE, has large tails (more peaked). In addition, the Jarque-Bera statistics reveal that the data for BAH, KUW, OMA and QAT were normally and identically distributed. The null hypothesis states that the data for UAE, SAR, LEB and IST for normal distribution cannot be rejected with a $\chi^2 = 5.326$ (p-value = 0.069), a $\chi^2 = 1.603$ (p-value = 0.448), a $\chi^2 = 1.367$ (p-value = 0.504) and a $\chi^2 = 0.852$ (p-value = 0.653), respectively.

Table 1 Descriptive Statistics for the Time Series Variables

	UAE	QAT	OMA	SAR	LEB	KUW	ISR	BAH
Mean	42.804	41.307	40.844	40.414	28.788	42.802	37.661	40.900
Median	43.083	42.000	40.500	40.500	28.500	44.500	37.166	40.166
Maximum	48.000	50.000	47.000	48.500	37.000	49.000	43.500	49.500
Minimum	35.833	25.000	28.600	30.500	18.266	24.333	28.666	32.500
Std. dev.	3.2407	6.715	3.882	4.639	4.133	5.648	3.130	3.808
Skewness	-0.183	-0.515	-0.718	-0.019	0.006	-1.482	-0.245	0.856
Kurtosis	1.806	2.168	3.615	2.316	2.367	4.413	2.911	3.250
Jarque-Bera	5.326	5.991	8.354	1.603	1.367	36.875	0.852	10.238
Probability	0.069	0.049	0.015	0.448	0.504	0.000	0.653	0.005
Observations	82	82	82	82	82	82	82	82

Notes: The data bases on 82 observations and collected from PRS Group. UAE, QAT, OMA, SAR, LEB, KUW, ISR, BAH denote the United Arab Emirates, Qatar, Oman, Saudi Arabia, Lebanon, Kuwait, Israel, and Bahrain, respectively.

Source: Authors' calculations.

3. Methodology

In order to investigate the two way economic linkages between Israel and the seven highest *per capita* income Middle East economies, a VAR based block exogeneity Wald test is primarily employed to explore the possibility of a causal relationship between the economic stability of Israel and economic stability of other Middle East economies. Dynamic panel estimation might have been implemented if the other regional economies in different continents were considered for comparison, yet this is beyond the scope of this study.

The general equation of the block exogeneity Wald test for the two time series equations are denoted separately as X_t and Y_t:

$$X_t = \beta_2 + \sum_{i=1}^{n} \alpha_i Y_{t-i} + \sum_{i=1}^{n} \mu_i X_{t-i} + e_t, \quad (1)$$

$$Y_t = \beta_1 + \sum_{i=1}^{n} \Omega_i Y_{t-i} + \sum_{i=1}^{n} \infty_i X_{t-i} + u_t, \quad (2)$$

where n denotes the numbers of lags which were determined by the Akaike information criterion (AIC), β_2, β_1, α_i, Ω_i, μ_i, and ∞_i are the parameters of the estimation, and e_t and u_t stand for random disturbance error term or residuals (Clive W. J. Granger 1988). We investigated whether there is a causal relationship among the variables by using the block exogenity Wald test. The only precondition to perform the block exogenity Wald test is to have stationary variables because, if the time series variables have unit roots

(nonstationary), the Wald (χ^2) test statistic will have no meaning and VAR stability will not be met (Dervis Kirikkaleli 2016). By employing the Svend Hylleberg et al. (1990) seasonal unit root tests (hereafter known as the HEGY test) the seasonal unit roots were detected and the appropriate filteration ($1 + L^2$) invoked to remove the seasonal unit roots at zero frequency (Philip H. Franses 1991; Vedat Yorucu 2016) which was integrated at the order of I(1,0,0). The lag length specification is another important issue for macroeconomic and financial modelling. We selected lag 3 as an optimum lag length for our models based on the results of the VAR lag order selection criteria. This decision was based on the most appropriate optimal lag lengths where there was no autocorrelation and no heteroscedasticity in the estimated VAR models. However, the sign of the estimated coefficients and their level of significance may change over time, which cannot be explored by the block exogeneity Wald test. The generalized impulse response function (GIRF) employed by Gary Koop, M. Hashem Pesaran, and Simon M. Potter (1996), and Pesaran and Yongcheol Shin (1998), has been adopted to obtain this information.

4. Empirical Findings

The seasonal unit root test proposed by Hylleberg et al. (1990) was carried out to check the order of integrations for the time series variables at different frequencies before proceeding with the VAR based block exogeneity Wald test (Tomás B. del Barrio Castro, Denise R. Osborn, and Robert A. M. Taylor 2016). Table 2 presents the results of the HEGY test which reveals that the time series variables are integrated in the order I(1,0,1) which is nonstationary at zero and annual frequencies, except KUW which is integrated in the order I(1,0,0).

Table 2 HEGY Test for the Time Series Variables

		Result	Filteration			Result	Filteration
	Y_1	0.2648			Y_1	1.3046	
ISR	Y_2	7.1423	$L(1,0,1)$	UEA	Y_2	7.019	$L(1,0,1)$
	$Y_{3\text{-}4}$	-1.8903			$Y_{3\text{-}4}$	-1.769	
	Y_1	0.7004			Y_1	1.1452	
QAT	Y_2	8.4904	$L(1,0,1)$	BAH	Y_2	-9.0726	$L(1,0,1)$
	$Y_{3\text{-}4}$	-0.8283			$Y_{3\text{-}4}$	-1.1911	
	Y_1	0.9929			Y_1	0.8858	
KUW	Y_2	5.6762	$L(1,0,0)$	LEB	Y_2	-8.888	$L(1,0,1)$
	$Y_{3\text{-}4}$	-2.526			$Y_{3\text{-}4}$	-0.548	
	Y_1	1.4616			Y_1	1.7255	
OMA	Y_2	-6.9432	$L(1,0,1)$	SAR	Y_2	-7.1966	$L(1,0,1)$
	$Y_{3\text{-}4}$	-1.2781			$Y_{3\text{-}4}$	-0.9883	

Notes: Decisions are taken based on 5% level. $Y_{3\text{-}4}$ is calculated based on *F*-test.

Source: Authors' calculations.

In order to perform the block exogeneity Wald test and GIRF, all series must have the same order of integration. Therefore, the seasonal unit roots were removed for BAH, LEB, OMA, ISR, QAT, SAR and the UAE by invoking the seasonal differencing filter $(1 + L^2)$ which are equal to two complex roots $(1 - iL)(1 + iL)$. This filtration removed the unit roots at seasonal and annual frequencies and they all turned to an integrated order of I(0,0,0).

Table 3 Block Exogeneity Wald Test

			χ^2	*p*-value	Decision	
					5% level	10% level
BAH	→	ISR	15.676	0.001	√	√
ISR	→	BAH	2.456	0.483	X	X
LEB	→	ISR	14.098	0.002	√	√
ISR	→	LEB	9.879	0.019	√	√
KUW	→	ISR	2.644	0.449	X	X
ISR	→	KUW	4.398	0.221	X	X
OMA	→	ISR	2.790	0.425	X	X
ISR	→	OMA	8.109	0.044	√	√
QAT	→	ISR	3.276	0.351	X	X
ISR	→	QAT	8.869	0.031	√	√
SAR	→	ISR	5.169	0.159	X	X
ISR	→	SAR	3.852	0.277	X	X
UAE	→	ISR	6.927	0.073	X	√
ISR	→	UAE	11.068	0.011	√	√

Notes: → indicates the direction of causality while χ^2 denote the degree of freedom and Chi-sq, respectively. Since the aim of this paper is to investigate the relationship between economic stability in Israel and economic stability in the seven high *per capita* income Middle East countries, the possible causal impacts of control variables (1997 Asian crisis and 2008 global financial crisis) on the time series variables are not presented in Table 3.

Source: Authors' calculations.

Considering the economic risks, the block exogeneity Wald test is used to investigate the possibility of a causal relationship between Israel and the seven highest *per capita* income Middle East economies. The results regarding the short-term causal relationships are displayed in Table 3.

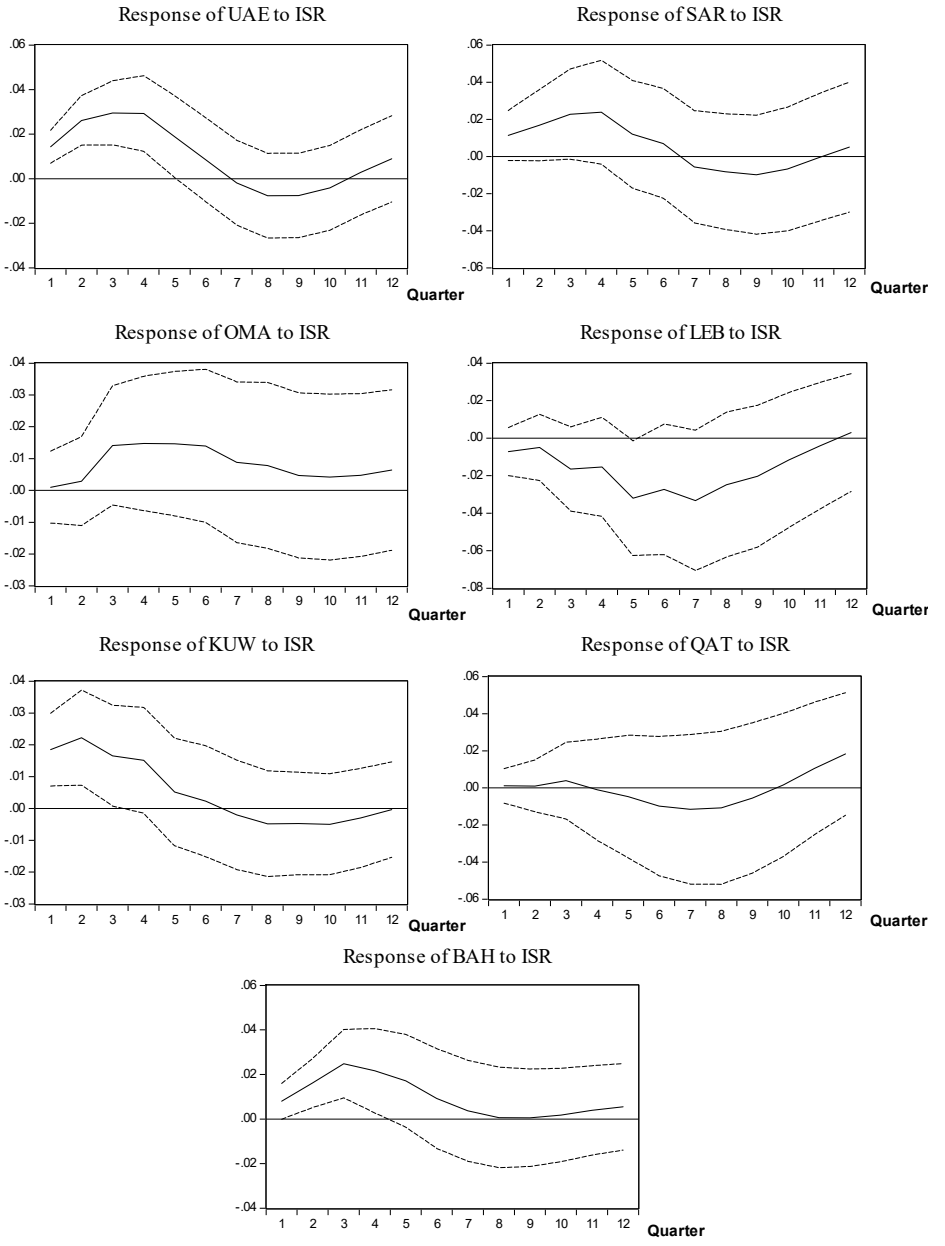
Table 3 demonstrates that there is a bi-directional causality running between ISR and LEB at a 5% level, which implies that the variations in economic stability in Israel significantly lead to changes in economic stability in Lebanon and *vice versa*. These findings are of particular interest and deserve special attention because, within the seven highest *per capita* income Middle East economies, Lebanon is the one which has geographical proximity to Israel. We also investigated whether economic stability in Israel Granger-causes economic stability in the UAE and *vice versa*. The results, however, reveal that at only 10% level, feedback causality exists among the aforesaid countries. This is evidence that economic stability in Israel is an important precondition for the economic stability of the UAE and *vice versa*. Aside from these findings, Table 3 also shows that the variations in the economic stability of Israel significantly lead to changes in the economic stability of Qatar and Oman, respectively while an uni-directional causality has been detected running from Bahrain to Israel.

The GIRF test is also employed in the multivariate VAR model to gather information about the sign of the coefficient and the duration of their impact. Figure 2 and 3 illustrate the response of the economic stability of Israel to one standard deviation (s.d.) in shocks in the economic stability of the seven highest *per capita* income Middle East economies and *vice versa*. These responses are displayed in Figure 2. The responses are of great interest and are likely to call for new study in the related literature. This could be due to the responses of the economic stability of the UAE, Bahrain and Kuwait to the economic stability of Israel, which is significant and positive within 3 quarters of an entire period. This implies that reducing the economic risk of Israel is associated with less economic risk in UAE, Bahrain and Kuwait. This is because these three Middle Eastern countries are the ones who have liberalized their finance markets and achieved greater prosperous economic growth than the others. Nevertheless, robust evidence obtained from the estimations reveals that the stability of Israel's economy has an inverse effect on the economic stability of Lebanon. This may be because of prolonged political disputes between Israel and Lebanon or due to the ongoing civil war in Lebanon. This current situation was addressed by the Lebanese prime minster, Fouad Siniora, who stated that "Lebanon will be the last Arab nation to make peace agreement with Israel" (Gilboa 2013).

These findings suggest that the Middle East Arab nations should normalize their diplomatic and trade relations with Israel. The results of this study clearly highlight that there are bilateral benefits if trade relations with Israel are normalized. The gains from trade will also bring peace to the region. The results also validate the win-win situation among Middle East nations and Israel if economies are integrated and trade is liberalized. Strong resistance by the Arab nations against Israel will only trigger the haterism and hinder economic prosperity. If the current situation stays as it is, the real losers will be international companies and the people who are suffering from long lasting unemployment in the region.

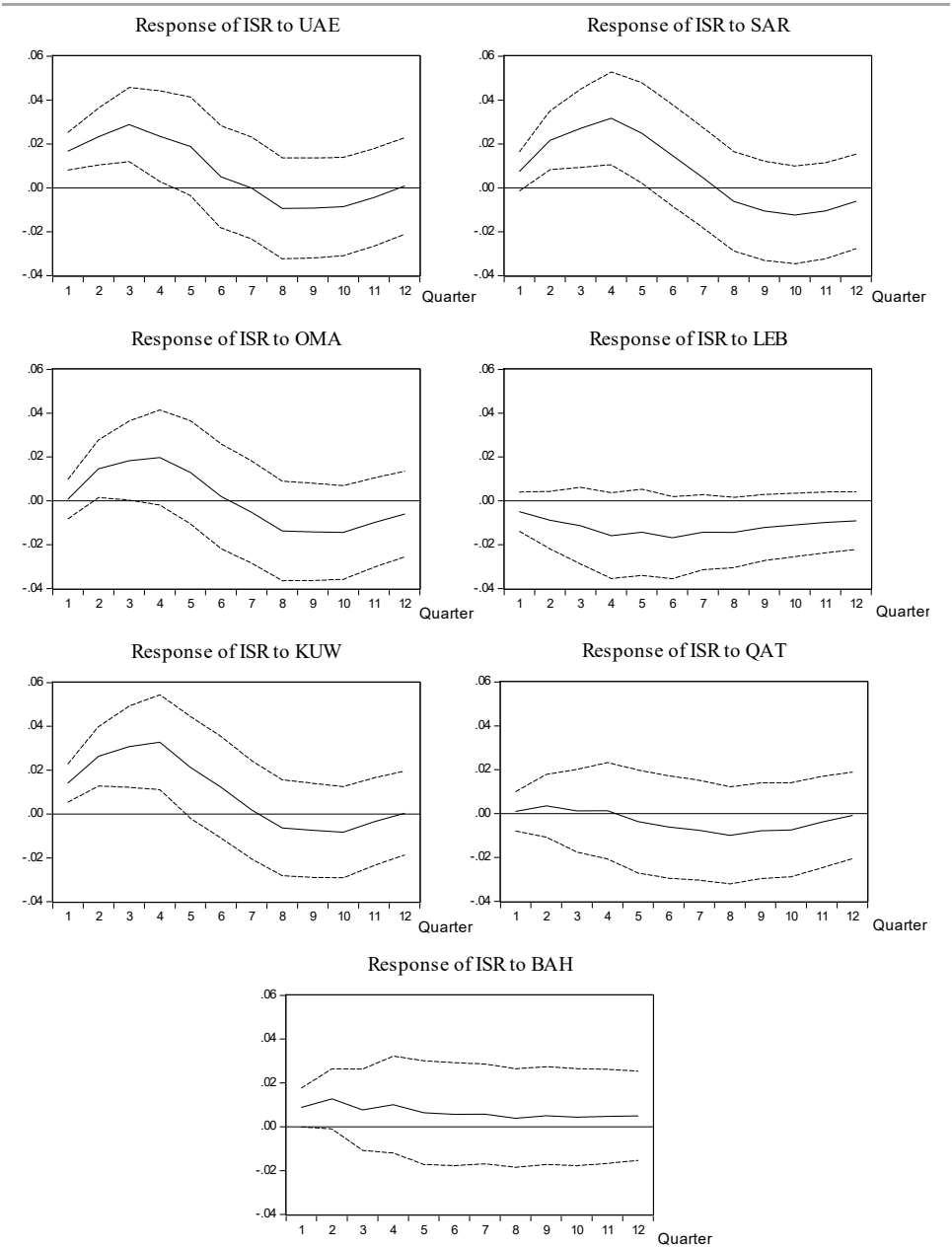
The reverse responses also reveal other surprising results, which are illustrated by the results of Figure 3, which highlight that the economic stability of the UAE and Kuwait has a positive and significant effect on the economic stability of Israel during the first 4 quarters of the entire period. Meanwhile, the response of the economic risk of Israel to the economic risk of Saudi Arabia (at the 2nd, 3rd and 4th quarters) and Oman (at the 2nd quarter) is found to be significant and positive. In the reverse responses, there are no significant or negative responses detected. Therefore, none of these countries have a negative impact on the economic stability of Israel. These findings clearly show that the politicians in the seven highest *per capita* income economies in the Middle East and Israel are not determined to solve the existing problems, which may soon help to stimulate their economic growth, bring peace and restore democracy in the region.

A number of diagnostic tests have been applied for the models with the control variables, such as serial autocorrelation for Lagrange multipliers (LM), VAR residual heteroscedasticity and a test for the stability of the VAR models. The results are tabulated in Tables 4 and 5 in the Appendix. The results demonstrate that there is no heteroscedasticity and serial correlation problem in the VAR models. In addition, the inverse roots of AR characteristic polynomials were performed to detect the stability of



Source: Authors' calculations.

Figure 2 Response of the Highest Seven per capita Income Middle East Economies to Israel



Source: Authors' calculations.

Figure 3 Response of Israel to the Highest Seven per capita Income Middle East Economies

the VAR model, and the results of this test are available in Figure 4 (see the Appendix). The *t*-statistics are also found to be satisfactory for all models. Finally, out-of-sample tests were conducted to establish the stability of the models. The findings of the first 78 observations model were found to be similar to those with 82 observations. There is neither any change in the significance of causalities in the block exogeneity results nor any change in the signs of the relationships in the GIRF functions. The findings with 78 observations models are not presented.

Academic scholars and practitioners can implement the findings of this study to eliminate the prejudiced perception against Israel. The Arab nations are indirectly benefiting from doing trade with Israel, except Lebanon, and *vice versa*. Based on the results of this study, we can therefore confidently argue that the Middle East Arab nations should normalize their diplomatic and trade relations with Israel. The benefits of bilateral trade with Israel are important and will also bring peace to the region. The results also validate a win-win trade policy among the Middle East nations if they do trade with Israel only, but not with Lebanon.

5. Conclusion

The ultimate aim of this study is to investigate two-way economic stability linkages between Israel and the seven highest *per capita* income Middle East economies by implementing a VAR based block exogeneity Wald test and GIRF while controlling for the 1997 Asian crisis and 2008 global financial crisis factors. The result of the block exogeneity Wald test reveals that the changes in the economic stability of Israel lead to significant changes in the economic stability of Lebanon, Oman, Qatar, and the UAE, while only Lebanon and Bahrain Granger-causes the economic stability of Israel. Meanwhile, the results of the GIRF indicate that there is a positive impact from Israel's economic stability on the economic stability of Bahrain, Kuwait, and the UAE in the short-term. In the reverse direction, in response to a shock to Israel's economic stability by the stability of UAE, Saudi Arabia, Oman, and Kuwait are also found to be positive and significant with different seasonal frequencies. This is a surprising result and likely to trigger a new debate in the region. In line with these findings, Bahrain, Kuwait, and the UAE need further economic relations with Israel in order to reduce economic vulnerability in their market while Israel's economy needs further economic links with the economies of the UAE, Saudi Arabia, Oman, and Kuwait. Increasing economic interconnectivity between Israel and the other top economies in the Middle East is also accompanied by the possibility of improving political and social relations between them.

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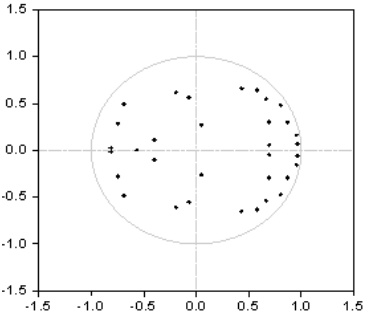
Appendix



Source: Authors' calculations.

Figure 4 Inverse Roots of AR Characteristic Polynomial

Table 4 VAR Residual Heteroskedasticity Tests

Null hypothesis: no heteroskedasticity No cross terms (only levels and squares)	
Multivariate VAR model	
Chi-sq	Prob
1798.476	0.116

Source: Authors' calculations.

Table 5 VAR Residual Autocorrelation LM Tests

Null hypothesis: no serial correlation at lag order *h*		
Multivariate VAR model		
Lags	LM-stat	Prob
3	73.729	0.189

Source: Authors' calculations.