Market Index Return and Volatility Spillovers Evidence from Arabian Stock Markets

Khaled Lafi AL-Naif[1], Sari Suliman Malahim[2], Musa Ahmad Atieh[3]

ABSTRACT

This study aims to examine the index return variation caused by shocks transmissions among six Arabian stock markets namely (Amman stock exchange, Casablanca stock exchange, Dubai financial market, Egypt Capital Market, Saudi Stock Market, and Palestine Securities Exchanges) throughout the 2nd of January 2017 and the 2nd of January 2020. The results showed weak returns and volatility spillovers within the Arabian stock markets; in particular, the overall spillover index of return indicates that only 3.38% of the variations are caused by the cross-market shocks, whereas, 96.62% of the variations are caused by the market's shocks**.**In addition, the overall value of the volatility spillover index implies that only 2.4% of the variations are caused by the cross-market shocks, whereas, 97.6% of the variations are caused by market own shocks.The study recommended conducting further studies on all Arabian markets, especially in light of the current conditions of the Corona crisis**.**

Keywords: Arabian stock markets, Market index, Return and Volatility Spillover.

[1] Associate Professor , Department of Economics and Finance, Al-Balqa' Applied University, Jordan, ✉ kalneif@bau.edu.jo.
[2] Lecturer, Department of Economics and Finance, Al-Balqa' Applied University, Jordan,
[3] Professor of Economics, Departemt of Economics and Financem Al-Balqa' Applied University, Jordan,

Received on 27/5/2020 and accepted for publication on 24/8/2020.

1. Introduction

Over the past thirty years, with the increased financial liberalization, developments in the international equity markets and the consequences of globalization, the barriers of investment were removed, and cross-border trades are not only enhancing investors return but also becoming the cause of more correlation, connection, and integration of different financial markets more than ever before which may cause catastrophic loses. As the stock market crash of October 1987 produced a pervasive domino effect across the global financial markets.

Markowitz (1952) analytically approved that the diversification advantages depend on the correlation coefficient between portfolio components risk and return, therefore, investors began to invest internationally wherever they can gain more profits.

Therefore, the significance of analyzing the nature and strength of relationships and correlations among different markets, especially markets with trading environments similarity, gained considerable interest from investors, financial institutions and governments from all over the world and stimulated academic researches to examine the stock markets integration, because two integrated markets will not secure the portfolio diversification benefits (Jebran and Igbal, 2016) and the spillover effect across markets may cause volatility shock in another market (Karginet al., 2018).

Early studies were predominantly concentrated on the relationship across the developed countries' markets, while little attention has been paid among the Arabian stock markets (ARSM).

In this vein, this study aims to examine the return and volatility spillover (RVS) among six of ARSM. Distinctively, this study aims to answer the following questions:

- Is there a return spillover across ARSM indices?
- Is there a volatility spillover across ARSM indices?

By adopting Diebold and Yilmaz (2009) spillover methodology, this study contributes and differs from the existing literature in three ways. Firstly, this study was applied to the daily closing prices in the most recent period, covering the period from the 2nd of January 2017 to the 2nd of January 2020. Secondly, it uses the precise measurement of volatility. Finally, to our knowledge, it is the first study to examine the RVS among ARSM.

The results of the study are expected to contribute to the Arabian scant literature on the stock market relationships since the practical implications of this study might be beneficial for both institutional and individual investors, and policymakers in forecasting the behavior of these markets and making portfolio decisions.

The remainder of this paper is organized as follows: Section 2; a brief overview of ARSM, Section 3; the relevant literature and previous studies, and study methodology is described in Section 4, Section 5; presents the empirical results and discussion, and section 6; conclusions and recommendations.

2. Arabian stock markets: An Overview

Arab states consist of 22 countries. The gross domestic product is \$2.782 trillion (2018), and the per capita is \$6,647 (World bank data).

The market capitalization (MC) of the ARSM is 3161 billion at the end of 2019 (AMF annual report, 2019). The number of listed corporations is 1542 (AMF’s database). Table 1 presents sample characteristics.

Table (1): Sample characteristics:

Country	**Jordan**	**Morocco**	**UAE**	**Egypt**	**Saudi Arabia**	**Palestine**
Market	Amman stock exchange	Casablanca stock exchange	Dubai financial market	Egypt Capital Market	Saudi Stock Market	Palestine Securities Exchange
Est.date	1999	1929	2000	1903	1985	1995
INDEX	AMGNRLX	MASI	DFMGI	EGX30	TASI	PLE
listed com. (2019)	191	75	67	248	204	48
Market capitalization (MC) (Billion U.S. $)						
2018	23.1	60.5	93.5	41.8	496.3	3.7
2019	21.02	64.2	102	42.4	2406.9	4.2
Web site	ase.com.jo	casablanca-bourse.com	dfm.ae	egx.com.eg	tadawul.com.sa	pex.ps

Source: Official AMF and market website.

It is noted from the table that the Egypt Capital Market is the oldest, as it was established in 1903 and most recently Dubai financial market in 2000. It also notes the variation in the number of listed companies from 48 in Palestine Securities Exchanges to 248 in Egypt Capital Market. As for the markets capitalization value (at the end of 2019), it ranged from 4.2 Billion US $ in Palestine Securities Exchanges to 2406.9 US $ for Saudi Stock Market.

3. Literature review and previous studies:

3. 1. Literature review

The study of inter and intra stock markets associations within the view of portfolio theory, which argues that international portfolio diversification reduces risk and increases return if the markets are weakly or negatively correlated (Markowitz, 1952). On the other hand, integrated markets will be susceptible to the exact opposite, as crises will be passed among them (Jebran& Iqbal, 2016 and Baele, 2005).

The transmission of variability from market to market has been usually known as "Volatility Spillover", It happens when the price change in one market causes a lagged impact on volatility price on its own and on other markets (Hassan, et al, 2019). While, the transmission of returns, has been widely termed as a return or mean spillover (Natarajan et al., 2014).

The literature of volatility spillover can be divided into three fields: unidirectional, bidirectional, and non-persistence volatility spillover among stock markets (Hung, 2018).

However, according to (Natarajan et al., 2014) volatility spillovers are divided into; own volatility spillovers; a unidirectional causal relationship between past and current shocks of volatility in the same market, and cross volatility spillovers; a unidirectional causal relation between past volatility in market A and the current volatility in market B.

3.2. Previous studies

Early studies focused on the relationship among developed countries markets, for example, (Hamao et al., 1990) reported the volatility transmissions of price from New York to Tokyo and London, and from London to Tokyo.

The finance literature provides numerous studies related to the connectedness across national stock markets, and the most recent empirical studies have been brought out.

Hassan, et al. (2019) examined the possibility of volatility transmission between the KSE100 index (Pakistan) and S&P500 index (USA), the study used the GARCH models. The results reported the absence of spillover effect between them.

Hung. (2019) studied the daily returns and volatility spillover impacts between China and 4 countries in Southeast Asia (Malaysia, Thailand, Vietnam, and Singapore). The study used vector autoregression. He found a significant effect of the volatility of the Chinese on the other sample markets.

Another study is that of (Purbasari, 2019) who examined the effects of volatility spillover of USA and Japanese to the ASEAN-5 equity markets. The study employed the bivariate GARCH (1,1) model. The results reported a volatility spillover from the U.S. and Japan to the ASEAN-5 markets. The results also showed a unidirectional internal volatility spillover occurs among ASEAN-5.

Alrabadi, D,. (2018) examined the dynamic adjustment of stock prices toward the fundamental values in Amman Stock Exchange using daily data over the period (2004-2013). The results confirmed the asymmetric relative mean reversion process in both the short as well as the long runs.

Alrabadi, Dima and Alrabadi, Hanna. (2018) investigate whether individual stock volatility co-moves with the overall market volatility. Their sample consisted of the daily observations of 105 companies listed in Amman Stock Exchange (ASE) over the period 2006-2015. The results revealed strong evidence of commonality in volatility in ASE.

Bhowmik et al,. (2018) studied the extent of interdependence across six of the Asian emerging markets (Bangladesh, China, India, Malaysia, the Philippines, and South Korea). The results revealed that RVS behaved quite differently over time (during pre-crisis, crisis, and post-crisis periods). Significantly, Asian emerging stock market interaction was lesser before the international financial crisis period.

In their study, (Kargin et.al, 2018) examined the volatility spillover effects of French, German and American stock market indices on the Turkish stock market index BIST 100. The study used the VAR (TVAR) model and E-GARCH (1,1) method. Their findings revealed that S&P was the most influential index to affect BIST 100 both in high and low-risk regimes.

Oliveira &Maranhao. (2017) examined the volatility spillover in the Brazilian stock market. The study used GARCH multivariate conditional correlations and Granger causality. The results showed the existence of spillovers from exchange rate shocks and financial markets to the Ibovespa index, and these correlations had temporal dynamics, with spillovers always in the direction of the shocks to the Ibovespa index.

Kim and Ryu, (2015) studied the volatility transmission, and return spillover between the U.S and Korean stock markets. The results found that there was a significant volatility transmission between them, and they also found return spillover impacts from the US market to the Korean market.

In the Arabian context, Kirkulak and Ezzat, (2017) investigated the volatility spillover of stock returns among Egypt, Israel, Saudi Arabia, and Turkey stock markets. The study covered the period of 2007 to 2013. The result showed a strong shock transmission from Egypt to Israel, Saudi Arabia and Turkey.

Finally, Ibrahim, (2009) investigated the long-term relationship between three major North African stock markets: Morocco, Tunisia, and Egypt, the results indicated a multivariate and a bivariate nonlinear long-term relationship between stock prices of these markets, which implies that portfolios in these markets were inefficient, as the movement in the prices of these markets were linked to a predictable direction but yet nonlinearly.

4. Study methodology

4.1. Data

The data set used in this empirical study includes the trading closing stock market index return for the period from the 2nd of Jan. 2017 to the 2nd of Jan. 2020 of five trading days a week. The study covers six ARSM's indices; with a total of 765 usable observations for each market index. All the secondary data were obtained from the official website of AMF database and respective stock markets.

4.2 Study Variables:

Market Index Return (MIR):

In line with the previous studies (see, e.g., Modi et al,. 2010; Natarajan et al., 2014; Singh & Kaur, 2015; Uludag&Ezzat, 2017 and Hung, 2019), this study computes the daily MIR using the following formula;

$$R_{i,t} = Ln\ (P_{i,t} / P_{i,t-1}) \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: $R_{i,t}$ is market i index return for day t, P_t and P_{t-1}: market i index closing prices of at time t and (t-1), respectively.

i: AMGR, MASIR, DFMR, EGX R, TASIR and PEX R: Amman Stock Exchange, Casablanca Stock Exchange, Dubai Financial Market's, Egypt Capital Market, Saudi Stock Exchange, and Palestine Exchange index return.

Return Volatility (RV):

Following (Yarovaya, et al,. 2016) this study used the volatility estimator of (Rogers and Satchell, 1991), which was found to be more efficient than traditional volatility estimators (Shu and Zhang, 2006) by using the following formula:

$$\delta^2_{RS} = h_t (h_t - C_t) + L_t (L_t - C_t) \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: h_t : The high daily price, L_t : The low daily price, C_t: The closing daily price.

AMGV, MASIV, DFMV, EGXV, TASIV and PEXV: Amman Stock Exchange, Casablanca Stock Exchange, Dubai Financial Market's, Egypt Capital Market, Saudi Stock Exchange, and Palestine Exchange index return volatility.

4.3 Hypotheses

Based on the literature and previous studies, the study hypotheses are as follow:

H01: There is no return spillover among the ARSM index return.

H02: There is no volatility spillover among the ARSM index return.

4.4. Statistical method:

To examine the proposed RVS, several steps were taken in this study. The daily data of the series were first subjected to descriptive statistics to ascertain the central tendency, dispersion and normality distribution of the series.

Next, stationary tests of the study variables are assessed by ordinarily testing methods such as Dickey and Fuller ADF (1979) and Perron (1988), to guarantee that the results of the analysis are not spurious. These tests have been conducted to confirm that the series is stationary at level.

Then, following several previous studies (see, e.g., Bhowmik et al., 2018;and Kargin etal., 2018) this study adopted the spillover methodology proposed by (Diebold and Yilmaz, 2009) which based on the notion that the initial spillover index is directly following the usual idea of variance decomposition VD combined by an N-variables VAR. The total spillover index is defined as the total contribution of shocks on market index increasing from all other market indices contribution and it is calculated as (Singh and Kaur, 2015):

$$S = \frac{\sum_{h=0}^{H-1} \sum_{i,j=1}^{N} a_{h,ij}^2}{\sum_{h=0}^{H-1} trace\ (A_h A'h)} * 100 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where: S: Spillover index, N: variables, i, markets, H; step-ahead forecasts, a forecast error variation, trace (AhA'h) is the total forecast error variation. In our study, this study used second-order 6 index VARs with 10-step-ahead forecasts.

5. Results and discussion

5.1. Descriptive statistics:

The descriptive statistics for the daily index returns of the six ARSMs are reported in Table 2.

Table (2): Descriptive Statistics Results

Variable	Mean	Med.	Std. Dev.	kew.	Kurt.	J.B
Return (R)						
AMGR	-0.02	-0.04	0.40	0.05	6.85	471.6*
MASIR	0.01	0.01	0.56	0.34	6.46	396.4*
DFMR	-0.03	-0.03	0.80	0.16	5.93	277.4*
EGXR	0.02	0.05	1.04	-0.61	5.35	223.8*
TASIR	-0.03	-0.05	0.86	-0.14	7.31	594.7*
PEXR	0.00	-0.03	0.37	-0.47	8.14	870.1*
Volatility (V)						
AMGV	-0.006	-0.007	0.03	-0.00	5.62	218.9*
MASIV	-0.005	-0.007	0.06	0.05	4.18	44.6*
DFMV	-0.0002	-0.0003	0.07	-0.07	4.96	123.6*
EGXV	0.008	0.007	0.10	0.42	4.86	133.2*
TASIV	-0.0106	-0.006	0.08	-0.64	7.07	579.1*
PEXV	0.091	0.10	0.17	-0.74	6.77	521.5*

Note: Significance at the 0.01 level.

The means of returns and volatilities are around zero. In details, they ranged from -0.03 for DFMR and 0.02 for EGXR, and while three markets (AMGR, DFMR and TASIR) had a negative return, two markets (MASIR and EGXR) were positive and the return was equal to zero in (PEXR).

These results are consistent with Hung, (2019) results who reported that the mean of return in Hungary 0.02, Poland 0.02, Czech -0.0, Romania 0.01 and Croatia -0.02 at the post-crisis periods. However, these results are lower than those of (Modi et.al., 2010), which reported the return in RTS Russia at 0.11%, BVSP Brazil 0.10%, Mexico 0.10%, and close to FTSE 100 UK and DJIA USA at 0.02%, Hang Seng at 0.03%, NASDAQ USA at 0.04% and BSE India at 0.05%.

During the same period the means of volatility are lower than means of return, ranging from -0.0002 for DFMR and 0.09 for PEXV and the (AMGV, MASIV, DFMV and TASIV) are on the lower parts of the graph.

The values of kurtosis, skewness and JB are also shown above (Table 2). All indices are highly leptokurtic with concerns of normal distribution.

Figure 1 and Figure 2 plot movements and time-varying variability index returns and volatilities for all series. The charts indicate that the return volatility series is stationary and fluctuate below and above the horizontal zero axes.

5.2. Empirical Results

5.2.1. Unit Root Test

Each stock market index is checked for stationarity using ADF and PP tests. Table (3) present the Stationarity test results.

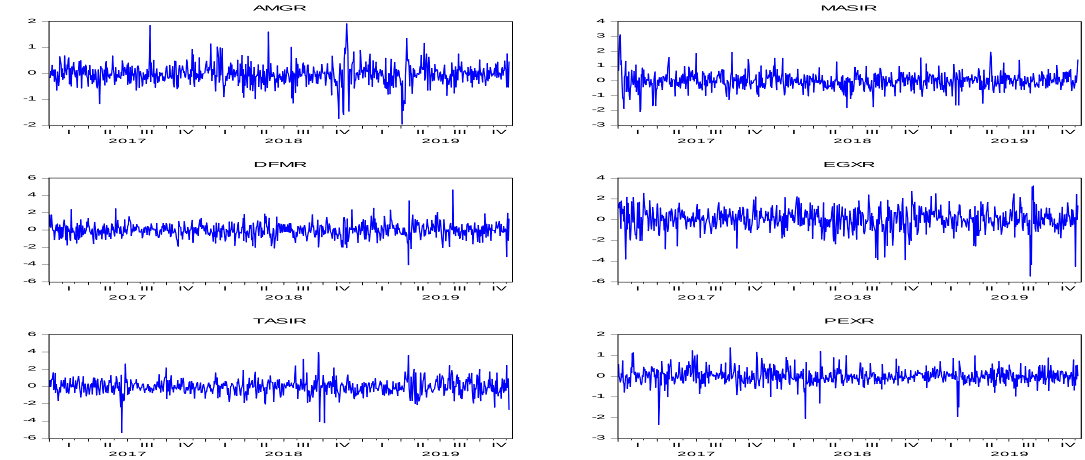

Figure1. The daily indices return clustering

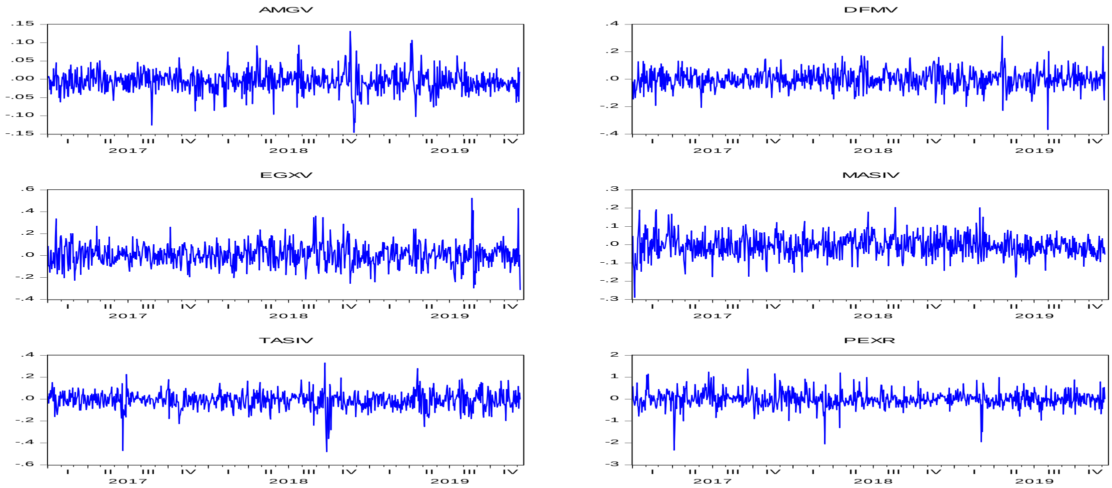

Figure 2 The daily indices return volatility clustering

Table (3): Stationarity test results

H0: X_i has a unit root	ADF t. sta.	PP t.sta.	H0: X_i has a unit root	ADF t. sta.	PP t.sta.
AMGR	-16.49*	-22.79*	AMGV	-17.13*	-24.54*
MASIR	-12*	-22.9*	MASIV	-7.08*	-25.29*
DFMR	-25.15*	-25.27*	DFMV	-26.10*	-26.17*
EGXR	-23.15*	-22.92*	EGXV	-17.03*	-22.87*
TASIR	-10.42*	-22.71*	TASIV	-11.36*	-24.99*
PEXR	-17.3*	-26.22*	PEXV	-27.31*	-27.32*
Test critical values:	0.01, 0.05 &0.10 level: -3.97,-3.416 &-3.13				

*MacKinnon (1996) one-sided p-values.

*Denote statistical significance at the 0.01 level.

Table 3 represents that all of the calculated values are more negative than the critical values, and all p-values of ADF and PP are less than 0.05 for all series, which implies that we reject all null hypotheses, and concludes that all series are stationary at level (i.e. I(0)).

5.2.2. Return and volatility Spillover analysis results

To calculate RVS index and based on (Diebold and Yilmaz, 2009) technique, table 4 and table 5 reports the variance decomposition for 10 days ahead forecasting horizon (h) based on VAR of order 2, which is identified using Cholesky factorization results for return and volatility. The (x,y)th value is the estimated contribution to the variance of the 10-day-ahead real stock return forecast error of country x coming from innovations to real stock returns of country y (Diebold and Yilmaz, 2009).

To illustrate the calculation process, let us further describe the content of these tables, which are known as spillover tables by (Diebold and Yilmaz, 2009). The xyth entry in the table is the estimated contribution to the forecast error variance of market x (returns in Table 4, volatility in Table 5) coming from innovations to market y. The column "Contribution from others" shows which market is the most sensitive to external shocks; spillover from all foreign markets to a domestic market. The Sum columns demonstrate the total spillovers from all markets y from a specific region to market x (Yarovaya et al., 2016). Moreover, the rows "Contribution to other" (horizontal entries) demonstrates the reverse direction of spillovers and captures the total spillovers from (domestic) market x to all markets y.

The analysis of both contributions provides an accurate picture of cross-market specific information transmission.

The overall spillover index is calculated by dividing the total value of contribution from other markets on the number of markets presented in the study (Sing and Kour, 2015). Tables 4 and 5 report the spillover Indexes for returns and volatility in the lower right corners.

Table (4): Return spillover across stock markets:

TO →	From ↓						C.f.o*
	AMGR	MASIR	DFMR	EGXR	TASIR	PEXR	
AMGR	98.47	0.15	0.17	0.37	0.12	0.72	1.53
MASIR	0.89	98.87	0.02	0.05	0.08	0.10	1.13
DFMR	0.87	0.72	97.56	0.66	0.16	0.02	2.44
EGXR	0.78	0.56	2.13	96.05	0.01	0.47	3.95
TASIR	0.20	1.07	6.21	0.44	91.89	0.19	8.11
PEXR	0.64	0.69	0.35	0.50	0.95	96.88	3.12
Cont. To own	98.47	98.87	97.56	96.05	91.89	96.88	20.29
Cont. To other	3.38	3.19	8.88	2.03	1.31	1.51	3.38%
Cont. including own	101.8	102.1	106.4	98.1	93.2	98.4	
Return Spillover index value = 20.29%/3 =							

* C.f.o: Contribution From other

The first row of Table 4 exhibits the contribution of shocks towards AMGR arising from the AMGR itself (98.47%) and other stock markets.

In details, MASIR, DFMR, EGXR, TASIR and PEXR are responsible for only (0.15, 0.17, 0.37, 0.12 and 0.72) of AMGR forecast error variance, respectively. So, the greatest magnitude of AMGR spillovers is being from PEXR, while the sum of the contribution from others to AMGR is (1.53%).

Similarly, AMGR is responsible for only 3.38% of the error variance in forecasting 10-day-ahead ARSMIR. In details the contribution from AMGR to MASIR, DFMR, EGXR, TASIR and PEXR are (0.89, 0.87, 0.78, 0.20 and 0.64), respectively.

Based on that, AMGR is more sensitive to its internal previous lag than to external markets. Finally, the contribution from AMGR is less than the contribution to others.

As for MASIR, while the spillover transmitted by MASIR to all other markets is (3.38%), the spillover from other countries is (1.13%).

In detail, MASIR is responsible for only 3.19% of the error variance in forecasting 10-day-ahead ASNIR. Moreover, the contribution from MASIR to ASSR, DFMR, EGXR, TASIR and PEXR are (0.15, 0.72, 0.56, 1.07, and 0.69) respectively. The greatest magnitude of spillovers being from MASIR to TASIR (1.07%).

For DFMR, it is responsible for the highest contribution of 8.88% of the error variance in forecasting 10-day-ahead ARSMIR. It contributes to 6.21%, 2.13% and 0.35 of the error variance in forecasting TASIR, EGXR and PEXR respectively.

For EGXR, TASIR and PEXR their responsibilities of the error variance in forecasting 10-day-ahead of other markets are less than 1%.

In summary, the highest return spillover to all markets among Arabian markets is detected from DFMR (8.88%) followed by AMGR (3.38), MASIR (3.19%), EGXR (2.03), PEXR (1.5%), while, the lowest return spillover index is TASIR (1.31%).

The sum of total contribution is 20.29, then the overall spillover index of return equals 3.38%, which states that about 3.38% of the variations is caused by the cross-market shocks; 3.38% of forecast error variance came from spillovers, whereas, 96.62% of the variations are caused by the market's shocks.

While being consistent with (Hassan, et al, 2019) in Pakistan and S&P500, these results are low compared to (Diebold and Yilmaz, 2009) who reported the total return spillover of 19 global equity markets (35.5%) and (Singh and Kaur, 2015) who reported a 10% total return spillover in the US, China and India.

On the other hand, volatility spillovers across stock market results are represented in table 5.

Table (5): Volatility spillover across stock markets

TO →	From ↓						C.F.O*
	AMGV	MASIV	DFMV	EGXV	TASIV	PEXV	
AMGV	97.51	0.66	0.50	0.73	0.21	0.37	2.49
MASIV	0.63	98.82	0.36	0.02	0.01	0.16	1.18
DFMV	1.21	0.11	98.38	0.23	0.03	0.04	1.62
EGXV	0.44	0.99	1.47	96.81	0.29	0.00	3.19
TASIV	0.22	0.70	2.00	0.40	96.06	0.60	3.94
PEXV	0.16	0.56	0.25	0.68	0.35	98.00	2.00
Cont. To own	97.51	98.82	98.38	96.81	96.06	98.00	14.42
C.F.O	2.66	3.02	4.59	2.07	0.90	1.19	2.4%
Cont. including own	100.2	101.2	103	98.9	97	99.2	
Volatility Spillover index value = 14.42%/3 =							

* C.F.O: Contribution from other

As Table 5 shows, AMGV is sensitive to its internal previous lag (97.5%) as to AMGR, and the impact upon by the foreign information transmission (sensitive to external) is weak.

AMGV is responsible for only 2.66% of the error variance in forecasting 10-day-ahead ARSMIR. In details the contribution from AMGV to MASIV, DFMV, EGXV, TASIV and PEXV are (0.63, 1.21, 0.44, 0.22 and 0.16 respectively. On the other hand, MASIV, DFMV, EGXV, TASIV and PEXV are responsible for only 0.66, 0.50, 0.73,0.21 and 0.37 of AMGV forecast error variance, so the greatest magnitude of AMGV spillovers is from EGXV. Finally, total AMGV contribution to other 2.66% is greater than total spillovers from the Arabian markets 2.49%.

Table 5 also indicates that total volatility spillovers from the MASIV, DFMV, EGXV, TASIV and PEXV to other markets are: 3.02, 4.59, 2.07, 0.90 and 1.19, respectively. The magnitude of volatility spillovers from DFMV is higher than that from other markets.

While DFMV has the highest value of the contribution to others 4.59%, TASIV has the lowest value 0.90. Similarly, total volatility spillover to others from AMGV, MASIV, DFMV, EGXV, TASIV and PEXV from other markets is 2.49%, 1.18, 1.62, 3.19, 3.94 and 2, respectively.

Table 5 also reports that the overall value of the volatility spillover index is 2.4% which implies that 2.4 % of the variations are caused by the cross-market shocks (a result of spillovers from other markets), whereas, 97.6 % of the variations is caused by market own shocks.

6. Conclusion and recommendations:

This study aims to examine market index returns and volatility spillovers in six of the ARSM indices by adopting Diebold and Yilmaz, (2009) spillover methodology. The study results reveal that the means of returns and volatility are around zero and all series are stationary at a level.

The overall spillover index of return equals 3.38%, meaning that 3.38 % of the fluctuations have been induced by cross-market shocks; that 3.38 % of forecast error variance came from spillovers, whereas, 96.62 % of the fluctuations have been induced by the market own shocks. The overall volatility spillover index value is 2.4% meaning that 2.4 % of the fluctuations have been a result of spillovers from other markets, whereas, 97.6 % of the fluctuations are induced by the own market shocks.

Concluding that the shock contribution in a market to the variation in other market forecasted error variance is markedly low and these market returns and volatilities are being driven mainly by their own past shocks.

These results of low interrelation between markets are worthy for both individual and institutional investors in making an efficient portfolio that might raise their returns and decrease their risk.

The study recommended conducting further studies on all Arabian markets, especially in light of the current conditions of the Corona crisis.

REFERENCES

Alrabadi, D. (2018). Dynamic Mean Reversion of Stock Prices: Evidence from Amman Stock Exchange. ***Jordan Journal of Economic Sciences***, *5* (1): 57-65.

Alrabadi, Dima and Alrabadi, Hanna. (2018).Commonality in Volatility: Does it Exist in Amman Stock Exchange? *Jordan Journal of Economic Sciences*, *5* (2): 197-211.

Baele, L. (2005). Volatility Spillover Effects in European Equity Markets, ***The Journal of Financial and Quantitative Analysis***, *40* (2): 373-401.

Bhowmik, R., Abbas, G., & Wang, S. (2018). Return and Volatility Spillovers Effects: Study of Asian Emerging Stock Markets, ***Journal of Systems Science and Information***, *6* (2): 97–119.

Dicky, D.A., & Fuller W.A. (1979). Distribution of the Estimators for Autoregressive time Series With a Unit Root**, *Journal of American Statistical Association***, 74: 427- 431.

Diebold, F., & Yilmaz, K. (2009). Measuring Financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets. ***The Economic Journal***, *119* (534), 158– 171

Hamao, Y., Masulis, R and Victor Ng (1990). Correlations in Price Changes and Volatility across International Stock Markets**, Review of Financial Studies**, 3 (2): 281-307.

Hassan, M., Ahmad, M., Abubakr, Naseem, M., & Rehman, R. (2019). Examining the Spillover Effect between the KSE100 and the S&P500 Indexes, ***Universidad and Empresa***, *2* (36): 175-195

Hung, Ngo Thai (2018). Dynamics of volatility spillover between stock and foreign exchange market: empirical evidence from Central and Eastern European Countries., Theconference's proceedings of *European Council for Modeling and Simulation ECMS.*

Hung., Ngo Thai (2019). Return and volatility spillover across equity markets between China and Southeast Asian countries, *Journal of Economics, Finance and* ***Administrative Science***, 24 (47): 66-81

Ibrahim, Onour (2009). Financial Integration of North Africa Stock Markets, Arab Planning Institute.

Jebran, K., & Iqbal, A. (2016). Dynamics of Volatility Spillover between Stock Market and Foreign Exchange Market: Evidence from Asian Countries, ***Financial Innovation***, *2* (1): 1-20.

Johansen, & Juseilus, S. (1990). Maximum Likelihood Estimation and Inference On Cointegration – With Application to The Demand For Money**, *Oxford Bulletin of Economics and Statistics***, 52, 169-210.

Karğın, S, Kayalıdere, K. Güleç, T, &Erer ,D. (2018). Spillover of Stock return Volatility to Turkish Equity Markets from Germany, France and America, ***Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi***, 20 (2): 171-187.

Kim, J and Ryu, D. (2015). Return and Volatility Spillovers and Cojump Behavior Between the U.S. and Korean Stock Markets, ***Emerging Markets Finance & Trade***, 51: S3–S17.

Kirkulak, Uludag, B., & Ezzat, H. (2017). Volatility Spillover Effect in MENA Stock Markets:Evidence from Pre-and Post- Egyptian Revolution, ***Journal of Yasar* University**, 12 (45): 32-47.

Markowitz, Hari (1952). Portfolio selection, ***The journal of finance***,7 (1): 77-91.

Modi, A, Patel and Patel, N . (2010). The Study on Co-Movement of Selected Stock Markets, ***International Research Journal of Finance and Economic***, 47, 164-179.

Natarajan, V, Singh, A, & Priya, N. (2014). Examining Mean-Volatility Spillovers across National Stock Markets, **Journal of Economics. *Finance and Administrative Science***, 19: 55-62.

Oliveira, W., &Maranhao, A. (2017). Spillovers of Foreign Exchange Volatility and International Financial Markets in the Brazilian Stock Market,. ***Brazilian Review of Finance***, *15* (4): 569-603

Perron, P. (1988). Trends and Random Walks In

Macroeconomic Time Series, ***Journal of Economic Dynamics and Control***, *12* (1 & 2): 297 332.

Purbasari, Intan (2019). Volatility Spillover Effects from the US and Japan to the ASEAN-5 Markets and Among the ASEAN-5 Markets, ***Journal Management danBisnis***, XI, 2: 293-331.

Rogers, L. G., & Satchell, S. E. (1991). Estimating Variance from High, Low and Closing Prices, ***The Annals of Applied Probability***, 1 (4): 504–512.

Shu, J., & Zhang, J. E. (2006). Testing Range Estimators of Historical Volatility, ***Journal of Futures Markets***, 26 (3): 297–313.

Sims C A. (1980). Macroeconomics and Reality, ***The Econometric Society***, 48 (1): 1–48.

Singh, A. & Kaur, P. (2015). Stock Market Linkage: Evidence from the US, China and India During the Subprime Crisis, ***Timisoara Journal of Economics and Business***, *8* (1): 137–162.

Yarovaya, L., Brzeszczyński, J & Lau,. K. (2016). Intra- and Inter-Regional Return and Volatility Spillovers across emerging and developed markets: Evidence from Stock Indices and Stock Index Futures. *International Review of Financial Analysis*. 43, 96–114.

انتقال الأثر لعوائد وتقلبات مؤشر السوق: (دراسة على أسواق الأسهم العربية)

خالد لافي النايف[1]، ساري سليمان الملاحيم[2] ، موسى أحمد عطيه[3]

ملخص

تهدف هذه الدراسة إلى اختبار تباين عائد المؤشر الناجم عن انتقال الصدمات بين ستة منأ سواق الأسهم العربية، وهي (بورصة عمان، وبورصة الدار البيضاء، وسوق دبي المالي، والبورصة المصرية ،وسوق الأسهم السعودية، وبورصة فلسطين) للفترة الزمنية من الثاني من كانون ثاني 2017 إلى الثاني من كانون الثاني 2020.

أظهرت النتائج ضعف انتقال الأثر للعوائد والتقلبات بين أسواق الأسهم العربية، إذْ تشير قيمة المؤشر العام لانتقال الأثر للعوائد إلى أن 3.38٪ فقط من الاختلافات ناتج عن انتقال الصدمات بين الأسواق، وأن 96.62٪ منها ناتج عن الصدمات في السوق نفسه. كما أظهرت النتائج أنَّ القيمة الإجمالية لمؤشر انتقال الأثر للتقلبات تشير إلى أنَّ 2.4٪ من الاختلافات ناتج عن الصدمات بين الأسواق، وأن 97.6٪ منها ناتج عن الصدمات الخاصة بالسوق نفسه،

وأوصت الدراسة بإجراء المزيد من الدراسات على جميع الأسواق العربية ولاسيما في ظل الظروف الحالية لازمة كورونا.

الكلمات الدالة: أسواق الأسهم العربية، مؤشر السوق، انتقال الأثر بين العوائد والتقلبات.

[1] أستاذ مشارك، قسم الاقتصاد والتمويل، جامعة البلقاء التطبيقية، الاردن، kalneif@bau.edu.jo

[2] محاضر، قسم الاقتصاد والتمويل، جامعة البلقاء التطبيقية، الاردن.

[3] أستاذ دكتور، قسم الاقتصاد والتمويل، جامعة البلقاء التطبيقية، الاردن.

تاريخ استلام البحث 2020/5/27 وتاريخ قبوله 2020/8/24.