

Effect of the financial integration on the international diversification gains: The case of GCC markets: Evidence from a conditional ICAPM



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ARTICLE INFO

Article history:

Received 23 January 2019

Received in revised form

29 June 2019

Accepted 1 July 2019

Keywords:

International financial integration

International financial diversification

GCC markets

Conditional ICAPM

ABSTRACT

Our study is focused on investigating whether international financial integration affects international diversification gains into GCC markets by employing a conditional version of the ICAPM. Our findings suggest that GCC markets are not perfectly integrated with the global market portfolio. Our results suggest that diversification gains are important for some GCC markets (KSA, UAE, and Qatar), less important for some others (Oman and Bahrain) and to a loss when we invest in Kuwait. That is, investing in GCC markets can lead to high and attractive benefits especially in UAE and KSA. However, financial crises reduce these gains.

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1. Introduction

After the World War II, many reforms and development in the financial markets had been considered one of the most important reasons for the financial globalization. Since the study of Markowitz (1952), financial literature has identified, the importance of the financial diversification. Later, Grubel (1968), Levy and Sarnat (1970) and others started to prove the advantages of the international diversification.

When dealing with international diversification gains, authors such as Grubel (1968), Levy and Sarnat (1970), Solnik (1995), Stulz (1981), Adler and Dumas (1983) and others focused on the gains when investing in developed markets. Emerging markets weren't yet promising in terms international diversification gains issued from international diversification strategies into these markets. They weren't yes as opened as our days.

In fact, financial liberalization and the international trade were boosted by the beginning of the eighties and capital flows movements are becoming more flexible. New opportunities appeared and many countries such as Korea, Taiwan, Malaysia, Thailand, Indonesia, Argentina, Brazil, Mexico and many others appeared on the global economic scene. They are offering so many

opportunities for a large set of investments. Their stock markets had been moved ahead. They abolished the barriers to international portfolio investments. They offer better returns and, also, a better risk sharing for those who are looking for lowering their risks. Adler and Dumas (1983), Roll (1992), Bekaert and Harvey (1995), Harvey (1995), Fama and French (1998) was between the first researchers to study their welfare. They found that diversifying into emerging markets is the optimal choice for diversification since it reduces risks and rise benefits.

GCC consists of six countries (KSA, UAE, Qatar, Oman, Kuwait and Oman). An agreement was born in 1981. Its main objective is to enhance economies of the member countries. Another side of this economic agreement was to achieve economic integration. The GCC economies are no more relying on oil, gas and petrochemical industries. They are encouraging many other fields in economy. They are diversifying their national economic activities and new industries emerged. The GCC stock markets are affected by these changes and are becoming more opened for international portfolio investments.

Financial theory stipulates that investing in these markets supposed to be less correlated with other markets will be more profitable for international diversification. However, recent subprime crisis proved that GCC markets are more integrated with other markets than ever. The effect of the financial integration on the potential international diversification gains is ambiguous. In this study, we investigate whether international diversification benefits exist in GCC markets that are supposed to be more integrated with the global market.

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<https://doi.org/10.21833/ijaas.2019.09.006>

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Section 2 discusses the literature. Section 3 describes the model. Section 4 provides the data and describes the methodology. Section 5 contains main empirical results and interpretations for international (time-varying) financial integration and international (time-varying) diversification gains. Section 6 reports main concluding remarks.

2. Literature review

Early studies, and even the more recent ones, found evidence of increasing integration (King et al., 1994; De Santis and Gerard, 1997; Amadi and Bergin, 2008; Francis et al., 2008). This crucial interest for the international financial integration degree is explained by the divergence of the point of views. In fact, other authors found that financial markets are imperfectly integrated (Carrieri, 2001; Aggarwal and Kyaw, 2005; Lagoarde-Segot and Lucey, 2006).

Financial theory stipulates that integration and diversification gains are expected to be negatively correlated. Despite this theoretical evidence, Recent studies De Santis and Gerard (1997), Arouri (2004), and Wasli and Mamoghli (2018) found empirical evidence that high degrees of financial integration can lead to international diversification gains and this can be displayed even for developed markets. Emerging markets are more vulnerable for financial turmoil's. This pushes investors to invest locally while investing abroad in a highly risky stock markets.

GCC stock markets are improving their performances (market capitalizations, stocks trades, etc.). They are changing and updating their laws to attract more investments especially in portfolios.

In this context, Bley and Chen (2006) support the evidence of increasing market integration while the return behavior is clearly not homogenous.

Hammoudeh and Choi (2006) found that GCC markets rise with US markets while the impact of the T-bills rate is important but mixed. For these authors, global factors account for only a small percentage of these stock markets total variations. Hammoudeh and Choi (2006) found that oil price factors accounts for 30% of Oman's and 19% Saudi's total variation.

Boubakri and Guillaumin (2011) found that the financial integration during 2007-2009 was the result of the contagion effect caused by the subprime crisis. Their work was based essentially on the model of Adler and Dumas (1983). Boubakri and Guillaumin (2011) have said that integration between Central and Eastern European Countries (CEECs) are not perfectly integrated. However, this integration is increasing over time.

Bley and Saad (2012) had the aim to study the pricing of idiosyncratic volatility of the GCC countries. They conclude that there is significant but negative relationship between expected returns and lagged realized idiosyncratic volatility for individual stocks in Saudi Arabia and Qatar and none in Abu Dhabi and Kuwait.

Khalifa et al. (2014) found, using the Multi-Chain Markov Switching (MCMS) model, the evidence of different transmission patterns between GCC and global markets with stronger connections with the global equity than with the oil markets.

Saiti et al. (2014) used the Dynamic Conditional Correlation (DCC) to test whether Islamic indices provide better diversification potential for any given US investor that conventional ones. Their findings tend to suggest: "both the conventional and Islamic MSCI indices of Japan, GCC ex-Saudi, Indonesia, Malaysia and Taiwan provide better diversification benefits compared to Korea, Hong Kong, China and Turkey. It tends to suggest that the Islamic countries provide better diversification benefits compared to the Far East countries with strong policy implications for the domestic and international investors in their portfolio diversification for hedging against unforeseen risks".

El Alaoui et al. (2015) found that the two markets (DFM-UAE and (GCC and Saudi)) are converging in the long run to the same level of risk and volatility with the global sukuk index. They also found that closer markets tend to suggest a contagion effect showing higher correlation and higher interdependence with a certain delay.

Neaime (2016) studied the contagion effects during the financial crises in the MENA stock markets. He said that GCC markets still offer financial diversification potentials. According to Neaime (2016), the vulnerability of those markets to regional and global financial crises will have important bearings on the respective economies growth rate and their ability to diversify international and regional portfolios. Using Granger causality tests and impulse response functions, Neaime (2016) found that they "reveal that while the GCC equity markets still offer international investors portfolio diversification potentials. In fact, those markets are relatively less vulnerable to global and regional financial crises. Moreover, even though the remaining MENA stock markets of Egypt, Morocco, and Tunisia have matured and are now financially integrated with the world stock markets, they tend to exhibit more vulnerability to regional and international financial crises. Their vulnerability to international financial crises is due, on the one hand, to weak regional integration, and to greater economic and financial integration with the more advanced economies on the other".

Alotaibi and Mishra (2017), in their paper, develops international financial integration index for GCC stock markets by employing an international asset pricing model of time-varying market integration and DCC-GARCH methodology. There are wide ranges in the degree of integration for GCC stock markets and none of them appear to be under complete segmentation. We find that trade openness, financial market development, turnover and oil revenue have significant positive impact on integration index of GCC stock markets. Global financial crisis has a significant negative impact on

integration index. Our results have policy implications for GCC markets.

3. The model

Based on the pioneer works of Solnik (1995) with his famous ICAPM and the extensions given by Stulz (1981) and Adler and Dumas (1983). De Santis and Gerard (1997) developed and tested a conditional version of the ICAPM. However, this model is a particular case of the Adler and Dumas (1983) model.

In our study, we will use the same model as presented by De Santis and Gerard (1997). In fact, it's known that it represents the most used model in the financial literature when dealing with such problems. Furthermore, we will apply two main modifications related to the model. The first one is concerns the informational vector. The second one is related to the targeted sample that will be investigated in this paper, i.e., the GCC stock markets. The model as initially presented by De Santis and Gerard (1997) is presented as follows:

$$E(R_{it}/\Omega_{t-1}) - R_{ft} = \beta_{iw,t-1}[E(R_{wt}/\Omega_{t-1}) - R_{ft}] \quad (1)$$

with

$$\beta_{iw,t-1} = \frac{Cov(R_{it},R_{wt}/\Omega_{t-1})}{Var(R_{wt}/\Omega_{t-1})}, \quad (2)$$

where $\beta_{iw,t-1}$ represents the sensitivity the portfolio "I" to the world portfolio "W" conditionally to an informational vector referred to as " Ω_{t-1} " which is really non-observable. The Eq. 1 can be written otherwise:

$$E(R_{it}/\Omega_{t-1}) - R_{ft} = \delta_{t-1}Cov(R_{it}, R_{wt}/\Omega_{t-1}) \quad (3)$$

with

$$\delta_{t-1} = \frac{E(R_{wt}/\Omega_{t-1})}{Var(R_{wt}/\Omega_{t-1})} \quad (4)$$

where δ_{t-1} is referred to as the market covariance risk price. Thus, the financial markets are integrated if this value is the same for all assets and/or securities.

De Santis and Gerard (1997) in their paper, have supported the idea that the traditional ICAPM is valid so that the world market portfolio is efficient. Their analysis is based on the evolution in the time of market benefits under international benefits.

In fact, they have established a relationship extracted from the original ICAPM which reflects the difference between a couple of expected returns of two different portfolios is considered as an ex-ante benefit given the international financial diversification. This benefit is given by the following equation:

$$E(R_{it} - R_{it}/\Omega_{t-1}) = \delta_{t-1}(1 - \rho_{iw,t-1})Var(R_{it}/\Omega_{t-1}) \quad (5)$$

with

$$\rho_{iw,t-1} = \frac{Cov(R_{it},R_{wt}/\Omega_{t-1})}{\sqrt{Var(R_{it}/\Omega_{t-1})Var(R_{wt}/\Omega_{t-1})}} \quad (6)$$

However, the Eq. 3, according to De Santis and Gerard (1997) is valid for all the financial assets. Hence, an empirical specification can be established. In fact, for "N" risky assets in any given economy, the system below has to be satisfied at any time t:

$$\begin{aligned} E(R_1/\Omega_{t-1}) - R_{ft} &= \delta_{t-1}Cov(\tilde{R}_{1t}, \tilde{R}_{wt}/\Omega_{t-1}) \\ &\vdots \\ &\vdots \\ E(R_{N-1t}/\Omega_{t-1}) - R_{ft} &= \delta_{t-1}Cov(\tilde{R}_{N-1t}, \tilde{R}_{wt}/\Omega_{t-1}) \\ E(R_{wt}/\Omega_{t-1}) - R_{ft} &= \delta_{t-1}Var(\tilde{R}_{wt}/\Omega_{t-1}) \end{aligned} \quad (7)$$

The above system can be written as follows:

$$\tilde{R}_t - R_{ft}\tau = \delta_{t-1}h_{Nt} + \tilde{\varepsilon}_t \frac{\tilde{\varepsilon}_t}{\Omega_{t-1}} \approx N(0, H_t); \quad (8)$$

with \tilde{R}_t is a vector of size (N-1) containing the "N-1" first risky assets and the market portfolio, τ is a vector of dimension "Nx1" and in which all the elements are equal to 1, H_t is the conditional variance-covariances matrix of size "NxN" of excess of returns and h_t is the Nth column of H_t containing the conditional variance of each asset with the world market portfolio.

Finally, De Santis and Gerard (1997) used a multivariate GARCH process. It's a relevant process to study conditional variances, covariances, etc.

In our case, we will use a bivariate GARCH (1, 1). It allows the excess of returns to be linear function of the conditional variance.

The specification of Engle and Kroner (1995) referred to as BEKK, is largely used in such empirical studies. For this reason, we will use the same specification given by the equation below:

$$H_t = C' C + A'^{\varepsilon_{t-1}} \varepsilon'_{t-1} A + B'^{H_{t-1}} B; \quad (9)$$

where C is a symmetrical matrix (NxN), A and B are two matrices (NxN) of constant parameters.

In this study, with reference to the study of De Santis and Gerard (1997), we will allow the price risk of covariance to vary over time.

4. Data and methodology

In this paper, we will test a conditional ICAPM using a bivariate GARCH specification. The main variables that will be used in this paper are the stock market indices and the risk-free rate. The indices will be taken in Napierian logarithm that enables us to go on an analysis based on the market returns. Each index represents a financial market (it's the better proxy for any given market at any time t).

The same thing will be done with the risk-free rate which represents the risk-free investment. For this reason, we will use the one-month treasury bills rate.

Our sample is composed of seven markets: the six main GCC financial markets (KSA, UAE, Qatar, Oman, Bahrain and Kuwait) and the world market. Data is provided by Morgan Stanley Capital International. The risk-free rate is provided by the Federal Reserve Economic Data.

In addition, the conditional ICAPM is modelled conditionally to an informational vector that can be represented by the following macroeconomic variables (they are lagged by one period):

- INF_{t-1}: The inflation measured by the growth of the index of the American consumption prices.
- BOND_{t-1}: A default premium measured by the difference in the yields of the Moody's Bonds Baa and Aaa.
- DEFPT-1: A default premium (US term premium) measured by the spread in the difference between a long interest rate (a ten-year American treasury bills) and a short rate (a three-month American certificate of treasury).
- GIPRO_{t-1}: Growth of the American industrial production
- EURDEP_{t-1}: Month to month changes in the one-month Eurodollar deposits rate. Given the high proportion of US market capitalization in the world index, the change in the US interest rate may be

important in predicting change in returns worldwide.

Given these informational variables, the conditional price of risk of covariance is, thus given by the following relationship:

$$\delta_{t-1} = \delta_0 + \delta_1 INF_{t-1} + \delta_2 BOND_{t-1} + \delta_3 DEFPT_{t-1} + \delta_4 GIPRO_{t-1} + \delta_5 EURDEP_{t-1}. \tag{10}$$

Finally, for many reasons of the lack of data related to the GCC markets, the period of this study starts from June 2005 till December 2017.

5. Empirical results and interpretations

5.1. Statistical overview

The descriptive statistics of the initially computed excess of returns for the full period and for all GCC markets and the world market are reported in the [Table 1](#).

Table 1: Summary statistics for the monthly excess of returns

	BAHRAIN	KSA	KUWAIT	OMAN	QATAR	UAE	WORLD
Mean	-0.019980	-0.098861	-0.246172	-0.435026	-0.072219	-0.364391	0.403565
Median	-0.060000	1.458000	0.277000	0.150000	0.627000	-0.231000	1.095807
Maximum	1.593000	17.68300	19.31700	10.95600	20.77700	31.19200	9.570464
Minimum	-1.472000	-27.58700	-20.73400	-33.68500	-28.98900	-38.82500	-19.35016
Std. Dev.	0.405194	8.133986	6.296297	5.712709	8.125715	10.02464	4.318627
Skewness	0.329732	-0.753737	-0.390212	-1.492885	-0.566987	-0.433218	-1.124136
Kurtosis	5.317901	4.273855	4.189477	9.652424	4.981981	5.004861	5.910396
Jarque-Bera	36.53922	24.50721	12.73381	334.5251	32.80566	30.01237	85.09562
Probability	0.000000	0.000005	0.001717	0.000000	0.000000	0.000000	0.000000
Sum	-3.017000	-14.92800	-37.17200	-65.68900	-10.90500	-55.02300	60.93832
Sum Sq. Dev.	24.62736	9924.260	5946.503	4895.257	9904.087	15074.00	2797.581
Observations	151	151	151	151	151	151	151

The results show a clear evidence from normality as it can be seen by high values of skewness and kurtosis.

These results report that there is a high min-max spread of the excess of returns for all the markets except that of the Bahraini market. This interpretation is confirmed by the standard-deviation values which indicate that there is high volatility into these five markets. The market of Bahrain is less volatile. It's not a risky market compared to other GCC markets. The Emirati market seems to be the most volatile market in the region since it is the most open market and its large market capitalization (the second after the Saudi market; GDP (2017) = 686.8 bil. US\$).

By the other side, kurtosis and skewness reflect the nature of the distribution of the series. In fact,

kurtosis values are greater than 3 than the dataset has heavier tails than a normal distribution. The distribution is so called leptokurtic and extremum values cannot be well captured.

Skewness coefficients are negative for all the markets except of Bahrain. This can be interpreted that the data are skewed left.

Finally, the probabilities of Jarque-Bera statistic are null. That is, all of the above lead us to say that the distribution is not normally distributed.

5.2. Correlation analysis

[Table 2](#) reports the summary of the cross correlations between the markets in our sample.

Table 2: Static Correlation coefficients

	BAHRAIN	KSA	KUWAIT	OMAN	QATAR	UAE	WORLD
Bahrain	1.000000						
KSA	-0.031942	1.000000					
Kuwait	-0.008579	0.330295	1.000000				
Oman	-0.134909	0.468942	0.509566	1.000000			
Qatar	-0.093210	0.441556	0.416201	0.527377	1.000000		
UAE	-0.151093	0.544378	0.485787	0.571253	0.705155	1.000000	
World	-0.130505	0.409313	0.486952	0.469403	0.448440	0.478673	1.000000

Since that these correlation coefficients are static, it means that they are not time varying ones. The

results show that the Bahraini market is negatively correlated with all other markets including the

world market. It confirms our previous findings. When we consider the five other GCC markets, we find that they are highly correlated between themselves and with the world market portfolio. The Emirati market displays the high bivariate correlation compared to other stock markets. This can be explained its high market capitalization (rank 2 after the Saudi market) with its two main stock markets in Dubai and Abu Dhabi. The Emirati local laws make capital flows movements easier and more flexible, the country is more attractive for the FDI's, Portfolio Investments more profitable for foreigners. Another main result is that the high correlation is displayed between Qatar and UAE: this can be explained by their high level of transparency in addition of their same characteristics regarding their degree of market openness and economic structure.

These results need to be analyzed in a time-varying context for a better understanding of the market correlations. This aims to detect periods of high correlations and periods of low correlations. In fact, it helps us to advance interpretations related to moving degree of the financial integration. Further conclusions can be scheduled for the international diversification gains. Fig. 1 reports the time-varying

correlations of each GCC market with the world market portfolio.

Fig. 1 reflects the dynamic cross-correlations between every GCC stock market and the world markets portfolio. It's evident that Bahrain is not correlated with the world market portfolio over time. It is highly volatile correlation moving from positive to negative values from one month to another. These variations do not exceed (drop below) 8% (-8%). This result means there is no correlation between these two markets. Bahrain is a segmented market.

Qatar is surprisingly negatively and very weakly correlated with the world market portfolio (a minimum of -9%). Also, Qatar can be considered as a segmented market. For the other markets, time varying correlations vary largely from may till December 2017. It reaches high values from 2011 to 2013. A sudden collapse in correlations can be seen since early 2008 till 2009. Globally, the time varying correlations lead us to conclude that the dynamic correlation for these markets can be delimited in the interval [30%; 40%] which means that, also, these markets are segmented from the world market portfolio. Diversification into GCC markets can be beneficial.

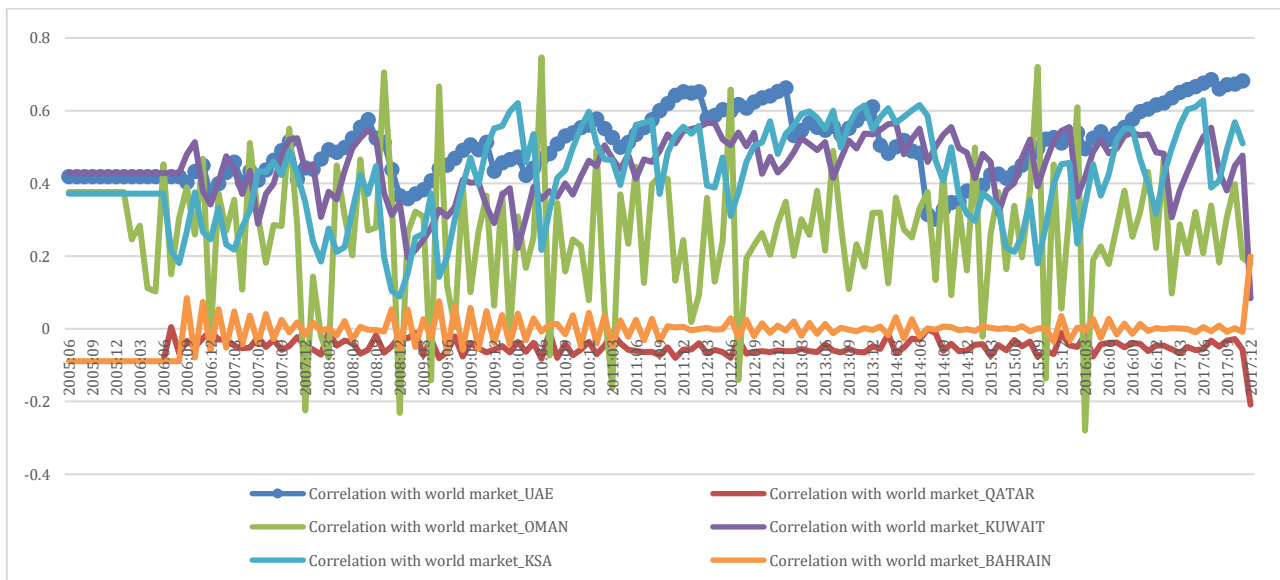


Fig. 1: Time varying conditional correlations

5.3. Analysis of the informational variables

When we deal with the informational variables, the graphic analysis seems to be important for a study since they model we will test is conditionally modelled on a set of economic and financial information unobservable but can be presented by this vector of information. The informational variables were shown in Fig. 2.

Fig. 2 shows that the subprime crisis had a consistent effect on these variables. In fact, only the default premium rises since 2007. This can be explained by the large spread effect between the ten-year American treasury bills and the three-month American certificates. The other variables dropped

considerably in response to this crisis. The reform Act of 2010 makes these variables change slowly and slightly leading to a clear trend till the end of our study period. By the other hand, Table 3 shows the summary statistics of this informational vector.

Bond and DEFP are the variables with largest min and max values however, the difference is too insignificant for the other variables. Even for the volatility, these two variables show high volatility. EURDEP, GIPRO and INF have very low standard deviations. These results are confirmed by the graphic representations given earlier in this sub section.

Kurtosis values exceed three for all the informational variables except DEFP, so the dataset

has heavier tails than a normal distribution. Skewness coefficient are negative for all the variables. It means that the data is skewed left.

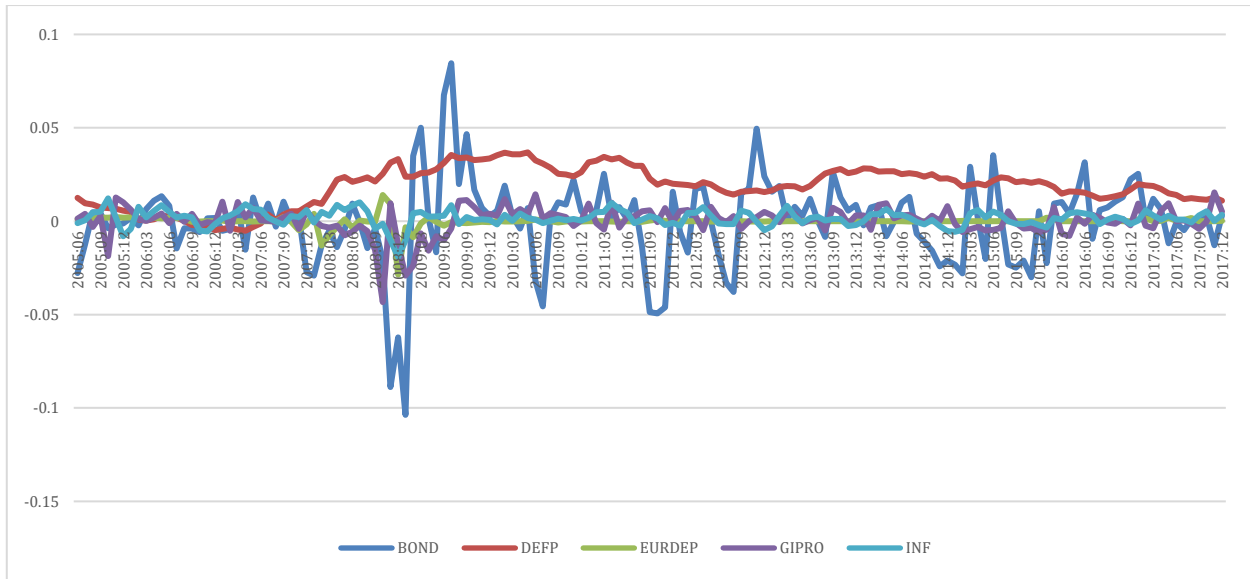


Fig. 2: The informational variables

Table 3: Summary statistics for the informational variables

	BOND	DEFP	EURDEP	GIPRO	INF
Mean	-3.463576	18461.13	-0.000111	0.000405	0.001608
Median	17.00000	19667.00	0.000000	0.001168	0.001780
Maximum	846.0000	36845.00	0.014024	0.015398	0.012220
Minimum	-1037.000	-5155.000	-0.028568	-0.043330	-0.019153
Std. Dev.	231.2786	10610.16	0.003216	0.007418	0.004135
Skewness	-0.652597	-0.436438	-4.542859	-2.009969	-0.953197
Kurtosis	7.488963	2.513425	46.45264	11.89092	6.836077
Jarque-Bera	137.5001	6.283280	12398.88	599.0198	115.4510
Probability	0.000000	0.043212	0.000000	0.000000	0.000000
Sum	-523.0000	2787630.	-0.016767	0.061134	0.242793
Sum Sq. Dev.	8023470.	1.69E+10	0.001552	0.008255	0.002565
Observations	151	151	151	151	151

The Jarque-Bera probability is null. In addition to the all the other previous interpretations that this distribution is not normal. Table 4 given hereafter

summarizes the correlations between the informational variables.

Table 4: Correlations of the informational variables

	BOND	DEFP	EURDEP	GIPRO	INF
BOND	1.000000				
DEFP	0.045255	1.000000			
EURDEP	0.028582	-0.109311	1.000000		
GIPRO	0.072289	-0.032897	0.083969	1.000000	
INF	0.435314	-0.102569	0.178015	0.042658	1.000000

Only INF and BOND are highly correlated. This finding is strongly confirmed by the Fig. 2. It can be explained by the interest rate effects. In fact, when the inflation increases, the cost of funds rises causing an increase in returns on the bonds issued by governments regardless their ratings.

These informational variables can be considered as a proxy for the informational vector that must be used in such studies and that cannot be really observed since it is a delicate task to choose them.

Finally, it is important to say that this vector does not contain redundant information due to these weak correlations between these variables.

5.4. Analysis of the estimations of the conditional betas

The conditional betas given by the estimation of the Eq. 1 are reported in the Table 5.

Table 5: The conditional betas

Market	Bahrain	KSA	UAE	Qatar	Oman	Kuwait
Beta	-0.000420 (-0.793665)	0.527601 (15.642298)***	1.022611 (33.420187)***	-0.055687 (-1.388772)***	0.369526 (16.892590)***	0.604199 (140.907426)***

***, **, * denotes statistical significance at 1%, 5% and 10% respectively

The results reported in the Table 5 confirm the hypothesis saying that the GCC markets are segmented from the world market. However, the Emirati market appears to be perfectly integrated with the world market, which normally expected to have a beta equal to one. Given these results, the market segmentation is still present into these

markets for the considered period. The estimated beta for Bahrain is not statically significant.

By the other side, the betas given above are calculated at a mean basis. That is, the Eq. 1 allows as to draw the time varying betas since May 2005 till December 2017 were shown in Fig. 3.

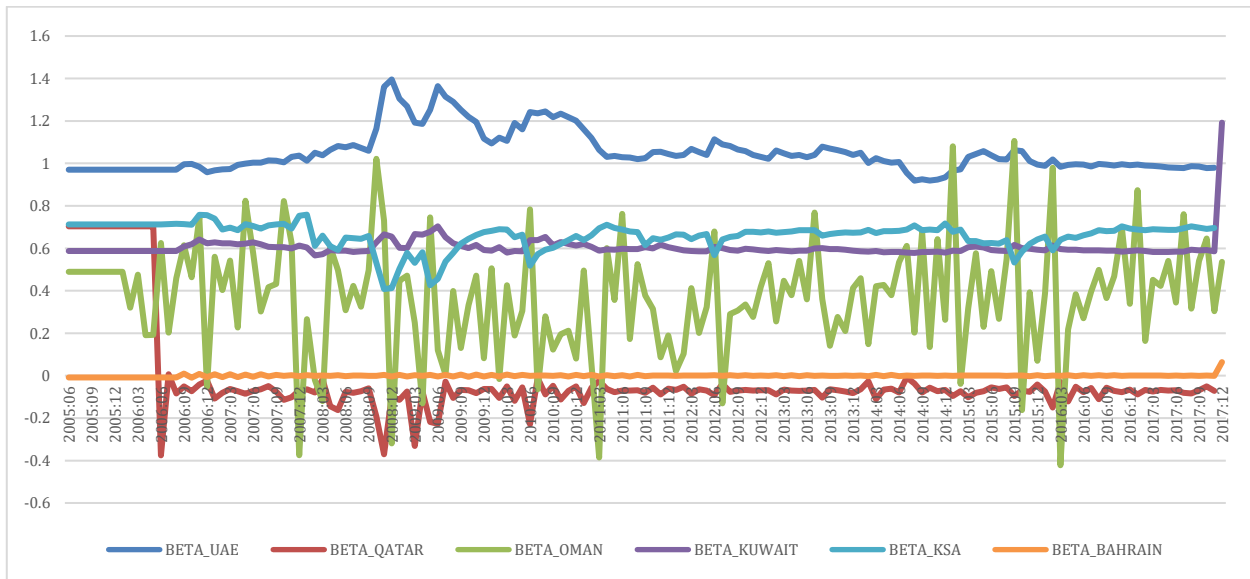


Fig. 3: Time varying conditional betas

Fig. 3 confirms the results issued by the time varying correlations. In fact, Bahrain and Qatar are segmented from the world market portfolio. The time varying betas are close to zero for Bahrain. Qatar exhibits negative time varying betas close to -0.05 in mean after the subprime crisis. However, these betas are lower yet and yet when considering the crisis period. These results lead us to confirm that these two markets are not integrated with the world market portfolio in this period. Bay the other hand, the betas for KSA, UAE, Oman and Kuwait are

high and close to one essentially after the subprime crisis referred to as post crisis period. UAE is the market the most integrated with world market portfolio. International diversification, theoretically, seems to be beneficial only in Bahrain and Qatar.

5.5. Analysis of the price of risk of covariance

The estimation of the Eq. 8 gives these results as reported in the Table 6.

Table 6: The prices of risk of covariance

Market	Bahrain	KSA	UAE	Qatar	Oman	Kuwait
Price of covariance risk	0.036181 (8.991674)***	0.793968 (203.852622)***	0.621635 (86.361127)***	0.275822 (29.494024)***	0.172183 (48.724492)***	-0.435472 (-56.679047)***

***, **, * denotes statistical significance at 1%, 5% and 10% respectively

These results come from tests of each market with the world market; i.e., bivariate tests. The results show positive price of risk of covariance for all the GCC markets except Kuwait which has a negative value which can be explained by the negative excess of returns. The free risk portfolio is doing better than the Kuwaiti market.

Also, the results show that the prices of risk of covariance do not converge nine to each other to say they are integrated with each other, nor to world market price of risk of covariance to say they are integrated with the global market. This can be interpreted as a segmentation still present in these markets. A particular interpretation is driven by the values registered in the UAE and KSA. In fact, the Saudi market seems to be the most integrated market with the world market portfolio.

The bivariate GARCH (1.1) tests applied on a conditional ICAPM allows, also, the price of risk of covariance to vary over time. The results are summarized in Fig. 4.

Fig. 4 shows that the price of risk of covariance do not vary largely during our sample period. Moreover, all the markets reacted similarly during this period. However, the main idea reflected by Fig. 4 can be considered with the markets common reaction to the subprime crisis of 2008. Even, the Bahraini market was concerned by this collapse since the crisis was spread out in all the international markets by contagion effect for a large set of markets (essentially developed and emerging) and by interdependence effect for other emerging and frontier markets.

The graphic representations show that the markets of KSA and UAE are the most integrated with the global market. The markets of Bahrain and Kuwait are the most segmented ones.

These results lead us to forecast large international diversification benefits into these two last markets. That is why, in the last section, we will measure the international diversification gains.

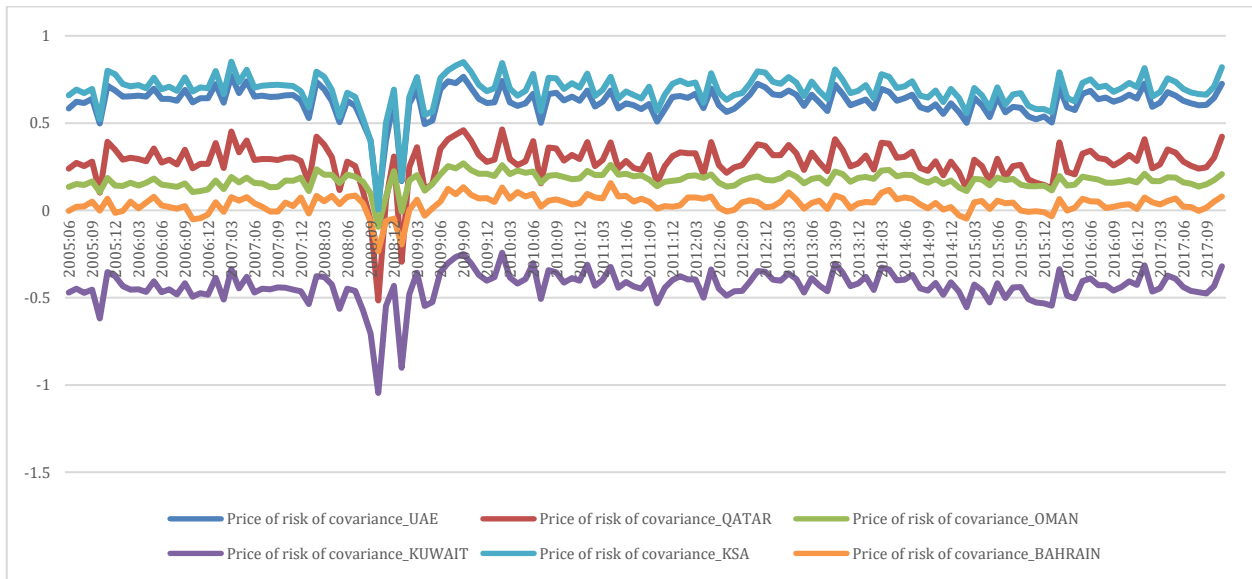


Fig. 4: Time varying price of risk of covariance

5.6. International diversification gains

The international diversification gains are driven by the estimation of the Eq. 5. The results are summarized in the Table 7.

The results show positive gains throughout our sample except of the Kuwaiti market where gain is

equal to -9%. That is, there is no advantages for international diversification into this market. The Emirati market displays the most important gain compared to the other markets (26.67%) followed by the Saudi market (23.44%).

Table 7: International diversification gains

Market	Bahrain	KSA	UAE	Qatar	Oman	Kuwait
Gain (%)	0.005057 (8.758339)***	23.440742 (18.372748)***	26.677151 (21.083436)***	16.954716 (7.005706)***	3.465900 (17.522987)***	-9.940902 (-10.238918)***

***, **, * denotes statistical significance at 1%, 5% and 10% respectively

However, diversification within the Qatari market gives a benefit for about 16.95% which is, in fact, an attractive gain. The diversifying in Oman seems to be less beneficial than investing in the three above markets with its 3.46% gains. Meanwhile, the Bahraini market doesn't make profits.

These results reflect the mean values of the international diversification gains. However, the conditional ICAPM with the empirical specifications edited previously has the originality of highlighting the gains over time. These time varying gains are drawn by the Fig. 5.

Fig. 5 shows graphic representations of the international diversification gains over time. At first glance, Fig. 5 reflects a deep time varying gains since June 2005 till December 2017. In fact, we can decompose, by simply observing, Fig. 5 into three main periods: pre-crisis (06-2005; 12-2017, crisis (01-2008; 12-2010) and post-crisis period (01-2011; 12-2017).

During the two first periods, international diversification gains are volatile and reached their caps and their floors during the subprime crisis. The Saudi market had a gain very closely to zero in October 2008 and reached a gain cap of 240% two

months later (December 2008). The same result was displayed by the UAE market at the same dates with the same min value and max gain of 105% approximately by December 2008. For Qatar, it reached a minimum of loss of -90% in January 2009 and a maximum of 175% twelve months later. Oman had known the same effects at the same nearly dates with a minimum of -3% and a maximum of 19%.

Concerning the markets of Kuwait and Bahrain the effect of the subprime crisis wasn't the same as for the other markets. It was totally the inverse effect since the international diversification gains dropped dramatically especially in the Kuwaiti market. This can be explained by the high sensitivity and vulnerability of this market to the financial shocks even it's considered as a market without any potential for the international diversification strategies. The Bahraini market reacts similarly to the Kuwaiti market but with a negligible range. The post crisis period can be described as the period of constant gains in mean for all markets.

Finally, it's obviously evident that the international diversification gains increase when the price of risk of covariance. This result is in accordance with De Santis and Gerard (1997).

However, there is a continuous enigma that increasing financial integration does not lead imperatively to weak international diversification gains. That is the effect of the international financial

integration on the international diversification gains is still ambiguous even with emerging and/or frontier markets almost presenting a high potential for economic growth.

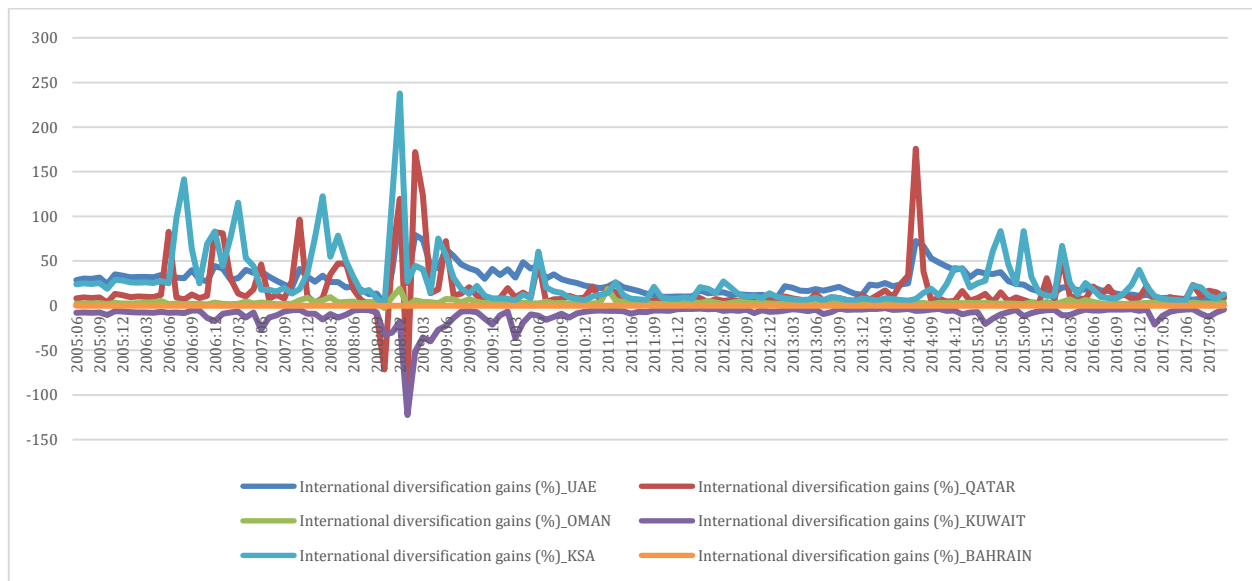


Fig. 5: Time varying international diversification gains

6. Conclusion

This study suggests that GCC stock markets are segmented from the world market portfolio. Bahrain and Qatar are the most segmented whereas UAE, KSA, Oman and Kuwait are less segmented from the global portfolio. In fact, these results are driven by static and dynamic estimations of the correlations, betas and price of risk of covariances. The conditional version of the ICAPM originally developed by De Santis and Gerard (1997) and applied in this paper for a sample of the six GCC markets from May 2005 till December 2017 allows correlations, betas, price of risk of covariances and international diversification gains to vary over time. Our finding that increasing integration does not eliminate the potential for the international diversification gains. Reciprocally, GCC markets considered as emerging and frontier markets do not mean necessarily weak integration and favourable for diversification. In fact, GCC markets rely on trade openness and banking sectors with largely qualified financial services to boost their economies and to cut with oil dependence. Our findings are also in accordance with De Santis and Gerard (1997), De Santis et al. (2003), Arouri (2004), Wasli and Mamoghli (2018), that stipulates international diversification gains still exist in a context of an increasing integration. In addition, our findings that GCC markets offer real opportunities for international diversification are in accordance with the findings of Neaime (2016) and Alotaibi and Mishra (2017).

Our study is very important and valuable for academics and professionals who are interested in the study of the effects of the financial globalization on the GCC stock markets. This study offers answers

concerning the integration degree of these markets and its effects on international diversification benefits. This paper is the first attempt to measure these gains issued from international diversification strategies.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

References

- Adler M and Dumas B (1983). International portfolio choice and corporation finance: A synthesis. *The Journal of Finance*, 38(3): 925-984. <https://doi.org/10.1111/j.1540-6261.1983.tb02511.x>
- Aggarwal R and Kyaw NA (2005). Equity market integration in the NAFTA region: Evidence from unit root and cointegration tests. *International Review of Financial Analysis*, 14(4): 393-406. <https://doi.org/10.1016/j.irfa.2004.10.008>
- Alotaibi AR and Mishra AV (2017). Time varying international financial integration for GCC stock markets. *The Quarterly Review of Economics and Finance*, 63: 66-78. <https://doi.org/10.1016/j.qref.2016.03.001>
- Amadi AA and Bergin PR (2008). Understanding international portfolio diversification and turnover rates. *Journal of International Financial Markets, Institutions and Money*, 18(2): 191-206. <https://doi.org/10.1016/j.intfin.2006.09.003>
- Arouri HME (2004). The impact of increasing stock market integration on expected gains from international portfolio diversification: Evidence from a multivariate approach with time varying risk. *Economics Bulletin*, 6(3): 1-13.
- Bekaert G and Harvey CR (1995). Time-varying world market integration. *The Journal of Finance*, 50(2): 403-444. <https://doi.org/10.1111/j.1540-6261.1995.tb04790.x>

- Bley J and Chen KH (2006). Gulf cooperation council (GCC) stock markets: The dawn of a new era. *Global Finance Journal*, 17(1): 75-91.
<https://doi.org/10.1016/j.gfj.2006.06.009>
- Bley J and Saad M (2012). Idiosyncratic risk and expected returns in frontier markets: Evidence from GCC. *Journal of International Financial Markets, Institutions and Money*, 22(3): 538-554.
<https://doi.org/10.1016/j.intfin.2012.01.004>
- Boubakri S and Guillaumin C (2011). Financial integration and currency risk premium in CEECs: Evidence from the ICAPM. *Emerging Markets Review*, 12(4): 460-484.
<https://doi.org/10.1016/j.ememar.2011.08.001>
- Carrieri F (2001). The effects of liberalisation on market and currency risk in the European Union. *European Financial Management*, 7(2): 259-290.
<https://doi.org/10.1111/1468-036X.00155>
- De Santis G and Gerard B (1997). International asset pricing and portfolio diversification with time-varying risk. *The Journal of Finance*, 52(5): 1881-1912.
<https://doi.org/10.1111/j.1540-6261.1997.tb02745.x>
- De Santis G, Gerard B, and Hillion P (2003). The relevance of currency risk in the EMU. *Journal of Economics and Business*, 55(5-6): 427-462.
[https://doi.org/10.1016/S0148-6195\(03\)00049-3](https://doi.org/10.1016/S0148-6195(03)00049-3)
- El Alaoui AO, Dewandaru G, Rosly SA, and Masih M (2015). Linkages and co-movement between international stock market returns: Case of Dow Jones Islamic Dubai financial market index. *Journal of International Financial Markets, Institutions and Money*, 36: 53-70.
<https://doi.org/10.1016/j.intfin.2014.12.004>
- Engle RF and Kroner KF (1995). Multivariate simultaneous generalized ARCH. *Econometric Theory*, 11: 122-150.
<https://doi.org/10.1017/S0266466600009063>
- Fama EF and French KR (1998). Value versus growth: The international evidence. *The Journal of Finance*, 53(6): 1975-1999.
<https://doi.org/10.1111/0022-1082.00080>
- Francis BB, Hasan I, and Sun X (2008). Financial market integration and the value of global diversification: Evidence for US acquirers in cross-border mergers and acquisitions. *Journal of Banking and Finance*, 32(8): 1522-1540.
<https://doi.org/10.1016/j.jbankfin.2007.10.013>
- Grubel HG (1968). Internationally diversified portfolios: Welfare gains and capital flows. *The American Economic Review*, 58(5): 1299-1314.
- Hammoudeh S and Choi K (2006). Behavior of GCC stock markets and impacts of US oil and financial markets. *Research in International Business and Finance*, 20(1): 22-44.
<https://doi.org/10.1016/j.ribaf.2005.05.008>
- Harvey CR (1995). Predictable risk and returns in emerging markets. *The Review of Financial Studies*, 8(3): 773-816.
<https://doi.org/10.1093/rfs/8.3.773>
- Khalifa AA, Hammoudeh S, and Otranto E (2014). Patterns of volatility transmissions within regime switching across GCC and global markets. *International Review of Economics and Finance*, 29: 512-524.
<https://doi.org/10.1016/j.iref.2013.08.002>
- King M, Sentana E, and Wadhvani S (1994). Volatility and links between national. *Econometrica*, 62(4): 901-933.
<https://doi.org/10.2307/2951737>
- Lagoarde-Segot T and Lucey BM (2006). Capital market integration in the Middle East and North Africa and its implications for international portfolio allocation.
<https://doi.org/10.2139/ssrn.739748>
- Levy H and Sarnat M (1970). International diversification of investment portfolios. *The American Economic Review*, 60(4): 668-675.
- Markowitz H (1952). Portfolio selection. *The Journal of Finance*, 7(1): 77-91.
<https://doi.org/10.1111/j.1540-6261.1952.tb01525.x>
- Neaime S (2016). Financial crises and contagion vulnerability of MENA stock markets. *Emerging Markets Review*, 27: 14-35.
<https://doi.org/10.1016/j.ememar.2016.03.002>
- Roll R (1992). Industrial structure and the competitiveness behavior of international stock market indices. *The Journal of Finance*, 47(1): 3-41.
<https://doi.org/10.1111/j.1540-6261.1992.tb03977.x>
- Saiti B, Bacha OI, and Masih M (2014). The diversification benefits from Islamic investment during the financial turmoil: The case for the US-based equity investors. *Borsa Istanbul Review*, 14(4): 196-211.
<https://doi.org/10.1016/j.bir.2014.08.002>
- Solnik BH (1995). Why not diversify internationally rather than domestically? *Financial Analysts Journal*, 51(1): 89-94.
<https://doi.org/10.2469/faj.v51.n1.1864>
- Stulz R (1981). A model of international asset pricing. *Journal of Financial Economics*, 9(4): 383-406.
[https://doi.org/10.1016/0304-405X\(81\)90005-2](https://doi.org/10.1016/0304-405X(81)90005-2)
- Wasli A and Mamoghli C (2018). International financial integration and international diversification gains when considering financial crises: Evidence from a conditional CI-CAPM. *European Journal of Business and Social Sciences*. Available online at:
<https://bit.ly/32AwCpF>