Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.8, No.2, 2017

Examining Integration Between Dubai and Kuwait Stock Markets

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Abstract
The objective of this study is to examine the GCC stock markets integration mainly through its stock markets concentrating on specific markets namely, Dubai and Kuwait. There are several methods have been used to examine the existence of integration. However, the Johansen approach to integration is considered a more reliable method than other conventional integration approaches, Johansen approach is more robust and performs well for large sample size, the results show that the null hypothesis of no integration cannot be accepted. This suggests the existence of a long-run relationship between Dubai and Kuwait.stock markets.
Keywords: stock markets integration, Johansen cointegration , Granger causality

1. Introduction

In most developing countries, financial markets have grown rapidly during the last two decades due to several reasons such as the information technology revolution, deregulation and globalization .Integration among countries has grown during this period all over the world. This is mainly due the direct relationship with the economy, given the important role of the financial markets in real economic activities. In the gulf cooperation council (GCC) countries, the stock markets have changed drastically during this period; privation programs and new issues of shares have come to surface.

The development in computer-based trading and the inter-listing of shares on their stock markets is the concern of authorities in these countries in the last years there was cooperation between stock markets in the region has come in the form cross listing. In March 1995 , the Bahrain stock markets established full linkage with Omani stock markets and also has considering listing other GCC companies.

The purpose of this paper is to test the existence of financial integration concentrating on tow GCC stock market , namely, Dubai, Kuwait

2. GCC STOCK MARKETS: AN OVERVIEW

During the 1980's and 1990's financial services developed an increasingly important role in the GCC countries. This has come as result of these countries being engaged in commercial oil production, which accumulated large amount of oil income. This development gave an impetus to the development of financial institutions in these countries. Cooperative efforts have so far been made to develop interaction and integration between their respective economies, but coordination efforts ought to be further strengthened by developing the local capital markets and encouraging the inter-listing domestic companies.

Most GCC countries have similar financial systems, which mainly consist of the central bank, commercial banks, insurance companies, stock broking firms, stock exchanges, stc. However, Kuwait, Bahrain and Omar are the only countries in the region with formal stock markets. Plans for organized stock markets in other GCC countries have been in the marking for several years. But due to the lack of general public awareness and sophistication with regard to stock issuance and trading and the small potential markets resulted in little interest in developing formal markets. Also, most of the GCC stock markets are relatively small and virtually closed to foreign investors, leading to block of foreign portfolio investment inflows. However, this is rapidly changing. For example, in recent years resident expatriates are allowed to invest in funds especially founded to deal in domestic stock markets.

The stock markets of the GCC countries are still small; by 2010 the number of listed companies reached 700 with total market capitalization equivalent to 737.28. By year 2013 total market capitalization for the GCC stock markets amounted to around 938.7 US billion

The Dubai Financial Market was established on 26th March 2000, and in its short history the DFM has achieved landmark successes and developments, largely attributed to the support and co-operation generously shown by its valued market participants, partners and employees By 2010 number of listed companies decreased from 65 to 58 at the end of 2014, with total market capitalization of USD 87.83 billion.

The Kuwait stock market is the older in the region; officially it was opened in 1977. The number of companies listed on the exchange decreased from 54 before the Iraqi invasion to 48 at the end of 1994 then increased to 210 by the end of 2013, with total market capitalization of US $105.1 billion but has decreased to 100.33 billion by the end of 2014. Despite its small size, the Kuwaiti stock exchanged is one of the most dynamic in the world; turnover sometimes exceeds that of the London stock exchange.

Table 1 : Market Capitalization 2010-2014

Market	2010	2011	2012	2013	2014
Kuwait stock exchange	113.88	86.29	100.0	105.1	100.33
Dubai stock markets	54.72	49.03	49.52	70.68	87.83

Source: Arab Monetary Fund, Respective stock exchanges ,Zawya & Global Research

TABLE2: NUMBER OF LISTED COMPANIES 2010-2014

	2010	2011	2012	2013	2014
Kuwait stock exchange	214	216	219	210	216
Dubai securities market	43	42	42	42	58

Source: Arab Monetary Fund

3.Literature Review

The literature review develops a theoretical background for the study through a review of relevant theories. The literature review places the study in context by reviewing prior stock market integration studies in both global and regional contexts. Although there has been extensive research on equity market integration, there is no st agreement on this phenomenon. Research results differ according to the methodology used, the model, the data, the sample; and the time period. Some studies have concluded that world equity markets are integrated, that the US market is the most influential stock market in the world, and that the Japanese market is the second most influential. On the other hand, some studies have reported no lead or lag relationships among international markets at all.

Grubel (1968) was the first to explore the risk-return relationships of internationally diversified portfolios by employing the models of portfolio balance developed by Tobin (1958) and Markowitz (1959). He studied the effect of international diversification of asset holding on international economic relations by using data on the share price indices of 11 industrialized countries from 1959 to 1966. Results indicated that diversification among 11 countries has allowed investors a superior return-risk trade-off compared to a portfolio consisting of Moody's Industrial Average of common Stock.

Hillard (1979) examined daily equity markets data from Frankfurt, New York, Tokyo, Zurich, Amsterdam, Paris, London, Milan, and Toronto for linkages during the period of the oil crisis from July 1973 to April 1974, Hillard used cross-spectral analysis and found high correlations among markets on the same continent, but low correlations among markets on different continents.

Stulz (1981) defined the integration of financial markets as "if assets with perfectly correlated returns have the same price, regardless of the location in which the trade". A fully integrated financial market is defined as a situation where investors earn the same risk adjusted expected return on similar financial instruments in different public markets, Philippe and Schwartz (1986) which means the lack of arbitrage profit achievement. In other words, if the risk of an identical financial instrument is traded on the same price in different markets, then it will be an indication of integration between these markets. However, a financial market is considered to be more integrated, if there are stronger domestic returns depend on shocks of world market, which means that the internal market is interacting with the world market. This definition underlines not only the openness of financial markets but also measures directly the extent to which shocks are transferred across financial markets. The transfer of a shock requires both the removal of barriers and the capital flows across markets in order to take advantage of market opportunities, Fratzscher (2002). It is believed that, in case of a more fully integrated financial market, the country's economy and the subject market will not be separated from any external influence.

Choudhry et al (2007) and Masih and Masih (2002) mentioned that financial markets development improves the degree of integration among these markets. Moreover, financial integration among markets has gained considerable attention of both the finance specialists and policy markets.

To summarize, we will refer to Narayan et al (2004) and Von Furstenberg and Jeon (1989) conclusions. The previous studies say that, if two securities have identical cash flows, they should have the same price. In other words, all assets with similar identifications and same risk characteristics should generate the same return in the different markets ignoring the location or any other factors.

Portfolio diversification and management are considered as important implications of the existence of a long run relationship between financial markets. Kearny and Lucey (2004) mentioned that when there is no integration, investors may try to reduce the risk through diversifying their portfolio among financial markets. Therefore, there is a contrary relationship between the benefits generated out of diversifying the portfolio and the level of financial markets integration.

There are two common methods to measure or examine the financial markets integration : the first method is the ICAPM or the international capital asset pricing model, and the second method is through using the approaches of cointegration.

The ICAPM assumes that the financial markets are integrated. ICAPM comes opposite to the CAPM

which assumes that financial markets are segmented. Moreover, the ICAPM assumes that financial markets are integrated when two securities with same risk characteristics in tow different markets have the same price levels. Several studies were conducted using the ICAPM as a measurement of integration such as Solink (1974), Stutz (1981), Alder and Dumas (1983), Philippe and Schwartz (1986), Buckberg (1995), Buckerberg in his study used the data of twenty emerging financial markets for the period between 1977 and 1991 on a monthly basis. The results of the previous study indicated that eighteen countries out of the twenty are integrated mainly due to the cash flow coming from the industrial countries during 1980's.

The most popular methods used to test the extent of integration between financial markets are the cointegration approaches.

Azman and other researchers in 2002 mentioned that, one of the stock prices habits is that over a long period the stock prices tend to move together and follow a common upward trend. In other words, common trends are expected to be achieved out of these indices if financial markets are integrated. This means that, the co-movements between securities prices represent an indication for the existence of integration. Moreover this co-movement or common trend implies that one market will help in predicting the returns of the other, due to the existence of a valid error correction representation.

Kasain in 1992 was one of the earliest researchers to measure the existence of financial integration using cointegration approach. In his research, Kasa finds that five (list them) industrial countries are correlated perfectly. These countries are USA, Canada, Germany, England and Japan.

The cointegration approach of Johansen-Juselius was used by Ali Darrat et al. (2000). The previous study was explored to examine the integration between Morocco, Jordan and Egypt and to what extent they are linked among themselves and with the international financial markets. The research concluded that most Middle East and North Africa (MENA) countries are segmented internationally and integrated regionally. The financial markets integration in the MENA region was examined also by Neaime (2002) using the Engle-Granger efficient maximum likelihood test to examine the existence of the long-term relationship among the MENA markets themselves and between the MENA markets and the world markets represented by the US, UK and French markets. The study indicated a solid integration between MENA countries and developed markets and a weak integration among MENA markets. A research conducted by Marashdeh (2005) to examine the extent of financial integration in the MENA region, using the ARDL approach. Marashdeh adopted the ARDL approach to examine the long-run equilibrium relationship among stock price indices in the MENA region stock markets. Long run equilibrium relationships were found in MENA region markets. The empirical findings of this study indicated that the stock markets in the MENA region are found to be integrated with each other.

Febrian and Choudhry et Al. (2007), Narayan et al. (2004), Herwany (2007) and Yang e al. (2003) use different cointegration approaches to measure financial market integration among several markets in Asia. Different results were reported regarding the integration of these financial markets.

There are not many of research studies conducted to examine the extent of integration among Gulf Corporation Council (GCC) financial markets. Abrham et al (2001) applied the examination on Kuwait, Saudi Arabia and Bahrain and reached a low correlation between these three financial markets. A long-term equilibrium relationship between three GCC markets founded by Hassan (2003) namely, Bahrain, Kuwait and Oman.

Johansen-Juselius (1990) method used by Al-khazali et al.(2006) to examine the intra regional integration of the GCC stock markets, namely, Kuwait, Bahrain, Saudi Arabia, and Oman. The research finds a common stochastic trend over the long run among these countries. Other research conducted by Alkulaib et al.(2009) argues that the GCC region hase more interaction and linkage than the MENA region due to the

4. Methodology:

This paper uses the Johansen approach to examine the existence of cointegration between Dubai and Kuwait stock markets.

4.1 Causality Test and Cointegration Variable

The relationship causality between different time series is based as following steps:

4.1.1. **Unit Root Tests**

The vector error correction model results to lead us to examine the stationary of the series. A stochastic process is stationary if its first and second moments are constant.

Analytically, y_i is stationary if:

$$E(y_t) = \mu \quad \forall t$$

$$E\left[(y_t - \mu)(y_{t-h} - \mu)'\right] = \Gamma_y(h) = \Gamma_y(-h)' \tag{1}$$

With $\Gamma_y(h)$ is a finite covariance matrix.
Dickey-Fuller (DF) tests is that the non-stationary statistical series. In other words, this test detects the presence or absence of a unit root.
Base models of the construction of this test are:

$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \varepsilon_t$$
$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \beta + \varepsilon_t$$
$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \beta + \partial t + \varepsilon_t$$

By using the statistical Student's

$$t = \frac{\hat{\emptyset}_1 - 1}{\hat{\sigma}_{\hat{\emptyset}_1}}$$

unit root test using:

$$\begin{cases} H_0 : |\emptyset_1| = 1 \\ H_1 : |\emptyset_1| < 1 \end{cases}$$

To get a broader view, Dickey-Fuller took an autoregressive process of higher order known as the Augmented Dickey-Fuller (ADF). This test is represented as a following:

$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \sum_i \theta_i \Delta y_{t-i} + \varepsilon_t$$
$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \sum_i \theta_i \Delta y_{t-i} + \beta + \varepsilon_t$$
$$\Delta y_t = (\emptyset_1 - 1) y_{t-1} + \sum \theta_i \Delta y_{t-i} + \beta + \partial t + \varepsilon_t$$

4.1.2. Cointegration
The main objective of this paper is to assess not only the pairwise nature of causality among the variables, but, also the short run and long run dynamic impact as well, we tested for cointegration using two well known approaches: the one developed by Engle and Granger (1987) and the other one by Johansen (1988).
4.1.2.1. Engel - Granger Method
The Engle–Granger test is a procedure that involves an OLS estimation of a pre-specified cointegrating regression between the variables. This was followed by a unit root test performed on the regression residuals previously identified. We applied the Engle-Granger two-step procedure:
Step 1: Static regression between integrated variables.
Step 2: Test to verify the residual stationary.
This procedure has some weaknesses, as the test is sensitive to which variable is used as a conditioning left-hand-side variable, which is problematic in the case of more than two variables.
4.1.2.2. Johansen method
Johansen developed the maximum likelihood estimator for cointegration analysis. Johansen's cointegration test is used as a starting point in the vector autoregression (VAR) model. The vector autoregression model of order p (VAR (p)) is constructed as a following equation:

$$\Delta y_t = \prod y_{t-1} + \sum_{i=1} \Gamma_i \Delta y_{t-i} + C + \varepsilon_t$$

The number of cointegrating relationship of the system is based on determining the rank of the matrix ∏. Three cases are distinguished:
- If rank ∏=0, then the matrix ∏ is null and the VAR model to writing as a VAR in difference.
- If rank ∏ = n, then the matrix ∏ is full rank and yt is stationary.
- If 0 < rank ∏ = r <n, then there are r cointegrating relationship between the process which consists Yt.

The Lokelihood ratio is the ratio that gives the LR statistic defined as follows:

$$LR = -T \sum_{i=r+1}^{K} \log(1 - \lambda_i) \qquad for\ r = 0.1 \ldots\ldots K - 1$$

With T: The number of observations
λ : The eigenvalue of the matrix ∏
K: number of variables
r: rank of matrix ∏

The number of cointegrating relationship is determined by through a sequential procedure. The decision rule is as a following:
- If rank ∏=0 (r = 0), we test the hypothesis H_0: r = 0 against H_1: r>0, if LR is greater than the critical value, we reject H_0 and we move to the next step.
- We test the hypothesis H_0: r = 1 against H_1: r> 1 if H_0 is rejected, we proceed to the next test.
- If after rejecting the various hypotheses H_0, the last step, we test H_0 r = K-1 against H_1: r = K.

4.2. An Error Correction Model

For interpret the vector error correction model found in the different regression equations. Indeed, an error correction model (ECM) can detect the dynamics of short-term and long term of a variable around its stationary equilibrium value. Thus, for an adjustment error correction requires that the sign of the coefficient of the residual is negative and statistically significant. In this regard, the higher the absolute value of the coefficient is higher, faster we reach the long-run
equilibrium.
The model error correction reads:

$$\Delta p_t = \alpha_1 z_{t-1} + lagged(\Delta p_t, \Delta y_t) + \varepsilon_{1t}$$

$$\Delta y_t = \alpha_2 z_{t-1} + lagged(\Delta p_t, \Delta y_t) + \varepsilon_{2t}$$

With $z_{t-1}$the error correction term to resulting from estimating the cointegrating relationship, ε is the error term stationary

$$|\alpha_1| + |\alpha_2| \neq 0.$$

4.3. Causality Test

The causality test based on the model vector error correction has the advantage of providing a causal relationship even if no estimated coefficient of lagged variables used is significant. Thus, an error correction model after processing can be rewritten as following equations:

$$\Delta p_t = \alpha + \sum_{i=1}^{k} \lambda_i \Delta p_{t-i} + \sum_{i=1}^{k} \delta_i \Delta y_{t-i} + \theta z_{t-1} + \varepsilon_t$$

$$\Delta y_t = \beta + \sum_{i=1}^{k} \phi_i \Delta y_{t-i} + \sum_{i=1}^{k} \varphi_i \Delta p_{t-i} + \psi z_{t-1} + \mu_t$$

From these both equations, p_t does not cause y_t the sense of Granger if $\varphi_i=\psi=0$, yt does not cause p_t if $\delta_i=\theta=0$. cointegration cannot be rejected.

5. Data and Descriptive Statistics

This study uses the monthly stock price indices for a period ranging from January 2004 to January 2010. These indices are for two GCC markets, namely, Kuwait and Dubai markets , there are 120 observations for each.

TABLE 3: Index selected

S.N°	Index selected for the study	Market
1	DFM	Dubai
2	KSE	Kuwait

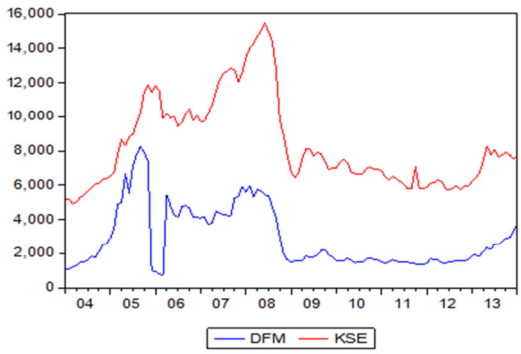

FIGURE 1: Monthly performance of Dubai & Kuwait
Stock Markets from January 2004 to January 2014

Table 4: Group Descriptive Statistics for the Sample Markets

	DFM	KSE
Mean	2906.762	8371.297
Median	1914.300	7549.500
Maximum	8236.880	15456.00
Minimum	698.0000	4947.600
Std. Dev.	1805.262	2641.129
Skewness	1.060977	0.980829
Kurtosis	3.151729	2.979264
Jarque-Bera	22.81713	19.40301
Probability	0.000011	0.000061
Sum	351718.2	1012927.
Sum Sq. Dev.	3.91E+08	8.37E+08
Observations	121	121

5. RESULTS AND DUSCUSSION:

5.1. Unit Root Tests

Table 5(test of serie DFM) and Table 6 (test of serie KSE) represents the results of unit root tests. The results show that all the series are non stationary at level. Taking the variables in their first difference, results show that all are I(1) at 1 percent level of significance.

Table 5

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.289919	0.0000
Test critical values:	1% level	-3.487550	
	5% level	-2.886509	
	10% level	-2.580163	

Table 6

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.177368	0.0000
Test critical values:	1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

5.2. Johansen Cointegration Tests

Table 7 presents the test results for the number of cointegrating vectors. The results show that the trace statistic suggests the presence of one cointegrating equation among the two stock markets

Table 7

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.127887	21.55231	20.26184	0.0330
At most 1	0.047780	5.679254	9.164546	0.2170

5.3. Granger Causality Test

Causality tests between Dubai stock market and Kuwait stock shows the existence of a unidirectional causality emanates from Dubai stock market to Kuwait stock market. Table 5 presents the results of pairwise Granger causality among two markets

Table 8

Null Hypothesis:	Obs	F-Statistic	Prob.
DFM does not Granger Cause KSE	119	5.77032	0.0041
KSE does not Granger Cause DFM		0.23048	0.7945

6. Conclusion

The result of this study provides a existence of integration between Dubai and Kuwait stock markets , The application of Johansen cointegration and Granger causality tests made it clear that the direction of the causality is from Dubai to Kuwait stock market over 01/01/2004 to 01/01/ 2014.

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