European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol 4, No.7, 2012

An Empirical Investigation on the Financial Integration between Arab Countries and the European Union Using Johansen Approach

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Abstract

The objective of this research is to examine the extent of integration between the European Union countries and the Arab countries financial markets. 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 and is applicable irrespective of the order of integration of the time series. Unlike most of the conventional integration procedures, which are valid for large sample size, Johansen approach is more robust and performs well for large sample sizes. The results of the test show that when Arab market index is a dependent variable, the null hypothesis of no integration cannot be accepted. This suggests the existence of a long-run relationship between European Union markets and Arab markets. While, when European Union is the dependent variable, the null hypothesis of no cointegration can be accepted. According to the results, both markets are moving together in the same direction when Arab markets are the dependent variable while not in case of the European Union is the dependent variable.

Keywords: Financial Markets Integration, Johansen Approach, Law of One Price (LOOP), Capital Asset Pricing Model (CAPM), Market Capitalization, Arab Countries, European Union (EU).

1. Introduction

Integration among countries has grown during this period all over the world. Financial integration refers to a condition where there are no barriers such as transaction costs, legal restrictions, taxes and tariffs stands against the mobility and trade in foreign assets or the equity flows of portfolios.

The Arab countries and European Union have shared relations since the development of the European Union into a more political power rather than an economical one. The economy of Europe depends on the Arab countries for oil and it is considered as an important market for its goods and services. For Arab countries, Europe is not only a major partner of trading and a major buyer of oil, but also a key source of the investment and technology required by Arab region economies.

This research project covers indices for the period ranging from May, 2005 until January, 2011. These indices are for two regional financial markets namely, Arab financial markets and European Union Financial markets. The data are based on MSCI monthly indices of both groups of countries starting from May, 2005. The research results could be useful for at least the following three main groups of users, namely; Investors in Arab countries financial markets and European Union financial markets; Financial markets integration researchers, Investment policy makers at both, the Arab countries and European Union.

2. Financial Markets Overview

2.1 Arab Countries Financial Markets

The majority of Arab countries, since the late 1980's, became aware of the financial market and private sector importance in developing their economies and achieving the integration. It is worth mentioning that these countries have shown an appreciated commitment and interest, the thing that directly affected the development of their economic structure which led to increasing the number of Arab active financial markets, Atyeh (2012). Starting from only four countries (Lebanon, Kuwait, Jordan and Egypt) during the 1970's until reaching fifteen Arab stock markets

in 2010 as shown in table 1. As per ESCWA (2003), regulations and laws of financial markets are based on the same concerns and issues including the institutional structure, management membership, requirements of listing, financial disclosure, pricing procedures and trading.

2.2 European Union Financial Market

Certainly and since the last two decades, the financial integration of Europe has been an important issue in both the regional and global sense, as well as both the empirical and theoretical sense. Constructing a unified market for financial services is the major target of the European Union. Since the financial system is important for the allocation of economic resources, a single market for financial services has the potential to significantly improve the efficiency of investment and increase economic growth by removing frictions and barriers over cross border exchange.

The Euro introduction and the actions taken under the Financial Service Action Plan (FASP) have pushed the integration of the European Union financial markets. However, there are different degrees of integration across different financial market segments, even though they are all progressing towards integration. Table 2 provides a list of the European Union stock markets which reached 46 by the end of year 2010.

Table 3 provides a genral comparison between both the Arab countries and European European Union markets interms the the total population of both markets which is around half a billion for European Union and around 360 million for the Arab countries. Table 3 sheds the light as well on the GDP of each market in addition to other general economic and social facotors which directly effects the integration process as per Vazakidis et. al. (2010) .

3. Literature Review

There are many research were conducted regarding the financial markets integration issue. Many indicators were developed to examine the existence of integration but the “Low of one price” or what is known by LOOP is the common factor of all these indicators and measures.

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 they 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, Rezai (2007) indicated that a financial market is considered to be more integrated, if there are stronger domestic returns depend on shocks of 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 makers.

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. As per the research conducted in 2004 by Kearny and Lucey, 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 integration level of financial markets.

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. The previous principle of 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 two different markets have the same price levels. Several studies was conducted using the ICAPM as a measurement of integration such as Solink research (1974), Stutz (1981), Adler and Dumas (1983), Philippe and Schwartz study (1986) and Buckberg (1995). Buckberg in his study used the data of twenty emerging financial makets 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 *et al*. (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.

Kasa (1992) was one of the earliest researchers to measure the existence of financial integration using cointegration approach. In his research, Kasa finds that five industrial countries are correlated perfectly. The cointegration approach of Johansen-Juselius was used by 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 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 cointegration approach. 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. Long run equilibrium relationships were found in MENA region financial 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 Herwany (2007), Narayan *et al*. (2004), Febrian, et. al. (2007) and Yang *et 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.

4. Materials and Methodology

The Johansen approach to cointegration is considered a more reliable method than other conventional cointegration approaches and is applicable irrespective of the order of integration of the time series. Moreover, Johnson approach is more robust and performs well for large sample sizes.

To analyze the relationship among the two markets, individual model for each market is employed based on the following general model (Linear Regression Model):

$$y = \alpha + \beta_i X_i + u$$

where,

y – *Stock market as dependent variable*
X_i – *Stock market as independent variable*
α *is the Intercept*
u *is constant*

In the previous model, Arab countries financial market is the dependent variable while European Union financial market is an independent variable. In the second model, European Union becomes dependent variable and Arab

countries become an independent variable.

In the above model, the null hypothesis of no cointegration for each of the dependent variables is: ($H_0: \gamma_1 = \gamma_2 = 0$) and it is tested against the alternative hypothesis ($H_A: \gamma_1 \neq \gamma_2 \neq 0$). These hypotheses are examined using the standard F-statistics of Pesaran and Pesaran (1997). Asymptotic critical values are provided by Pesaran and Pesaran (1997) and Pesaran et al (2001). If the computed F-statistics is greater than the F distribution critical value, then we reject the null hypothesis of no cointegration and conclude that there exists steady state equilibrium between the variables. If the computed F-statistics is less than the F distribution critical value, then the null hypothesis of no cointegration cannot be rejected.

This study uses the monthly stock price indices for a period ranging from May 2005 to January 2010. These indices are for two markets, namely, Arab countries and European Union. Based on the dates of data available, we ended up with 69 observations for each market.

The Descriptive statistics for the indices presented in table 4 suggest that European Union market has a highest mean value than Arab countries. The standard deviation figures show that market prices in European Union have more volatility than the Arab countries one. Moreover, results indicate that both European Union and Arab markets indices are skewed to the left, which indicates that there is a greater probability of higher returns. In addition, both markets European Union and Arab countries show a low coefficient of kurtosis.

6. Results and Conclusion

The results of the test reported in Table 5 show that when Arab market index is a dependent variable, the calculated F-statistics (1.51) is higher than the F distribution critical value at 5% significance level (1.35). Thus, the null hypothesis of no cointegration cannot be accepted. This suggests the existence of a long-run relationship between European Union markets and Arab markets.

While, when European Union is the dependent variable, the calculated F-statistics (0.58) is lower than the F distribution critical value at 5% significance level (1.35). Thus the null hypothesis of no cointegration can be accepted.

The paper has discussed the financial markets in general and went through two regional financial markets namely, Arab financial markets and European Union financial markets.

The study analyzed the historical trend and performance of the European Union and Arab market and investigated the long-run relationship and linkages of these two regional financial markets.

The test results show that the two markets seem to be integrated between themselves in one case and not in the other. According to the results, both markets are moving together in the same direction when Arab markets are the dependent variable while not in case of the European Union is the dependent variable.

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Table 1: Arab Countries Financial Markets

Country	Arab Countries Stock Markets	Date of Est.
Bahrain	Bahrain Stock Exchange	1989
Kuwait	Kuwait Stock Exchange	1962
Oman	Muscat Securities Market	1989
Qatar	Doha Securities Market	1996
Saudi Arabia	Saudi Stock Market	1984
UAE	(1) Abu Dhabi Securities Market	2000
	(2) Dubai Financial Market	1998
Jordan	Amman Stock Exchange	1976
Lebanon	Beirut Stock Exchange	1945
Palestine	Palestine Securities Exchange	1995
Morocco	Casablanca Stock Exchange	1929

Tunisia	Tunis Stock Exchange	1969
Egypt	(1) Alexandria Stock Exchange	1888
	(2) Cairo Stock Exchange	1903

Source: Arab Stock Markets Websites & Arab Monetary Fund (2010)

Table 2: European Union Financial Markets

Country	European Union Stock Markets	Date of Est.
Europe	Euronext	2000
Austria	Vienna Stock Exchange	1771
Belgium	Euronext Brussels	1801
Bulgaria	Bulgarian Stock Exchange	1914
Cyprus	Cyprus Stock Exchange	1996
Czech Republic	Prague Stock Exchange	1861
Denmark	Copenhagen Stock Exchange	1620
	GXG Markets	1998
Estonia	Tallinn Stock Exchange	1920
Finland	Helsinki Stock Exchange	1912
France	Euronext Paris	1724
	MATIF	1986
Germany	Berliner Börse	1685
	Börsen Hamburg und Hannover	
	Börse München	1830
	Deutsche Börse Group	
	Eurex	1998
	Frankfurt Stock Exchange	
Greece	Athens Stock Exchange	1876
Hungary	Budapest Stock Exchange	1864
	Iceland Stock Exchange	1985
Ireland	Irish Stock Exchange	1793
	Irish Enterprise Exchange	2005
Italy	Borsa Italiana	1808
Latvia	Riga Stock Exchange	1816
Lithuania	Vilnius Stock Exchange	1993
Luxembourg	Luxembourg Stock Exchange	1927
Malta	Malta Stock Exchange	1992
Netherlands	Euronext Amsterdam	1602
Poland	Warsaw Stock Exchange	1817
Portugal	Euronext Lisbon	1769
	OPEX	2003

Romania	Bucharest Stock Exchange	1882
	RASDAQ	1996
	Sibiu Stock Exchange (futures)	1997
Slovakia	Bratislava Stock Exchange	1991
Slovenia	Ljubljana Stock Exchange	1989
Spain	Bolsa de Valores de Barcelona	
	Bolsa de Valores de Bilbao	
	Madrid Stock Exchange	1831
	Mercado Oficial Español de Futuros y Opciones	1989
	Bolsa de Valores de Valencia	
Sweden	Nordic Growth Market	2003
	Stockholm Stock Exchange	1863
United Kingdom	London Stock Exchange	1801

Source: European Union Website

Table 3: General Comparison between Arab Countries and European Union

	Arab League	European Union
Population	360,029,936	501,259,840
Area	13,953,041 km² (5,382,910 sq mi)	4,324,782 km² (1,669,807 sq mi)
Population Density	24.33/km² (63 /sq mi)	115.9/km² (300.2/sq mi)
Headquarters	Cairo	Brussels
Largest City	Cairo - 6,758,581 (17,856,000 Metro)	London - 7,429,200 (12,300,000 Metro)
Organization Type	Regional Organization and Political Union	Economic and Political Union
Official languages	Arabic language	European Languages
Main Religions	91% Islam (5.8% Christianity), 4% Others,	Not Known, Majority Christianity.
GDP	USD 1.898 trillion (USD 7,672 per capita)	USD 14.793 trillion (USD 29,729 per capita)

Source: Arab League and, European Union Websites

Table 4: Group Descriptive Statistics

	European Union	Arab Countries
Mean	588.5	336.6
Maximum	650.6	368.3
Minimum	258.0	294.4
Std. Dev.	39.4	23.6
Skewness	-0.1	-0.6
Kurtosis	-1.3	-0.4
Observations	69	69

Table 5: Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
Arab Markets Index does not Granger Cause EU Index	69	1.51809	0.1999
EU Index does not Granger Cause Arab Markets Index		0.58601	0.7106