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Working Paper

2014-214

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Khaled Guesmi
Frédéric Teulon

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IPAG Business School
184, Boulevard Saint-Germain
75006 Paris
France

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The determinants of regional stock market integration in Middle East: A Conditional ICAPM Approach

Khaled Guesmi^{*}; Frédéric Teulon^{**}

Abstract

Over recent years, several emerging market regions have actively taken part in globalisation movements and world market integration. However, the financial integration processes appear to vary over time, and differ considerably from one region to another. This paper investigates intra-regional integration in the Middle East region during the period 1996-2008 using an international conditional Capital Asset Pricing Model (ICAPM) version that allows for dynamic changes in the degree of regional market integration, global risk premium, currency risk premium and local market risk premium.

Our findings show that inflation, exchange rate volatility, variations in interest rate spread and global market dividend yields are key intra-regional integration variables in the Middle East context. Moreover, despite the complex economic and political situation that characterises the Middle East, our results indicate that stock markets in this area are well integrated in the regional market.

JEL Classification: F36; C32; G15

Keywords: Multivariate GARCH, Intra-regional integration, CAPM (Capital Asset Pricing Model)

Post Print : *International Economics*, vol. 137, pp. 22-31, 2014.

^{*} Department of Finance, IPAG Business School, Paris – IPAG Lab, EconomiX, University of Paris West Nanterre La Défense. Email: khaled.guesmi@ipag.fr.

^{**} Department of Finance, IPAG Business School, Paris – IPAG Lab, Email: f.teulon@ipag.fr.

1. Introduction

For around forty years, the Middle East countries have formed a region of instability in the global economy. With attention focused for many years on, first, the political clash between Israel and its neighbouring countries and, second, the role of the oil-producing countries, there has been a tendency to forget that there is an economic and financial dynamic in non oil-exporting countries: i.e. Turkey (17th world economy in terms of GDP, before Switzerland and Sweden), Egypt (second GDP in the region, 27th world power), Israel (52nd) and Jordan (103rd). These countries are geographically close to one another, but do not have mutual trade agreements and do not form a free trade zone. The question of the financial integration of these countries is rarely touched on or, in the best of scenarios; they are watered down in a so-called emerging countries group where the focus is usually on the BRIC countries (Brazil, Russia, India and China). These countries are not included in the OPEC group and their importance is considered as negligible in today's global financial system. And yet the stock markets in Istanbul, Cairo, Tel Aviv and Amman are no longer simply relegated to the sidelines of the global economy, but have increasingly caught the interest of investors and portfolio managers specialised in emerging countries.

Grouping by major geographical clusters should lead to financial integration as well as to the validity of the law of one price under the impetus of trade and investment between countries in the same region. We would expect adjustments in the foreign exchange markets for this law to be applied. However, as far as international portfolio diversification to financial assets in emerging countries is concerned, the hypothesis of unique price of risk across markets is usually violated insofar as exchange rate regimes are likely to be subject to more or less stringent regulations imposed by local authorities. Several studies have examined the dynamics of regional integration in emerging markets,

but they focused mainly on the analysis of trade flows in goods and services (e.g., Markusen, 1995; Freudenberg et al., 1998) and on direct intra-regional investment flows (e.g., Manzocchi and Ottaviano, 2000; Petri, 2006). Moreover, empirical methodologies are generally insufficient because they ignore interactions between different factors in both local and international integration.

That said, the study of regional financial integration must take place within the framework of asset pricing models that can identify common risk factors affecting expected stock returns, risk premiums associated with these factors, as well as the dynamics of financial integration. In this paper, we use a conditional version of the ICAPM ((International conditional Capital Asset Pricing Model) for partially integrated markets to examine the regional integration of emerging markets. The latter are in fact characterized by the many barriers and restrictions they impose on international investments (Bekaert and Harvey, 1995). We particularly question whether ICAPM, conditioned by local and regional variables, is able to explain the dynamics of asset returns traded in major emerging markets of the Southeast European region. This issue is of paramount importance for at least three reasons. First, modeling the risk exposure of an emerging stock market only by its covariance with the regional market portfolio in the context of an ICAPM might not be free of bias because the market under consideration is not fully integrated into the regional market. Second, a true assessment of the risk-return trade-off for emerging assets generally requires the consideration of the currency risk exposure owing to the violations of the PPP (Purchasing Power Parity) condition. Finally, market integration is gradual and may be inverted, and more importantly its determinants are not known in advance.

Although past studies (Darrat et al., 2000 and Yu and Hassan; 2008), have permitted a better understanding of Middle East equity market integration as well as its determinants,

they mainly rely on the concept of market correlation that is not directly related to the true patterns of evolving market integration. As noted by Carrieri et al. (2006), correlations are informative for portfolio allocation and management, but they do not constitute an accurate measure of diversification benefits or overall integration. In particular, Pukthuanthong and Roll (2009) show the inappropriateness of correlation as a proper measure of integration and they argue that two highly integrated markets may have a low correlation. Indeed, if returns on the two markets are affected by the same common factors but do not have the same sensitivities to all of them, the two markets are highly integrated but only weakly correlated. Adler and Dumas (1983) also point out that the correlation between markets depends very much on their level of international trade. As a result, market co-movement reflects only sector linkages instead of market integration. Therefore, tests for market integration need to be built on asset pricing model frameworks which impose the similarity of systematic risks (Bekaert and Harvey, 1995; Bhattacharya and Daouk, 2002).

This study contributes to the extant literature by exploring the determinants of regional market integration for Middle East emerging markets (Turkey, Israel, Jordan and Egypt). Given the exploratory nature of the empirical investigation, we attempt to encompass as much explanatory variables as possible. We consider a complete list of potential determinants from the past empirical literature on market integration. A partially segmented (ICAPM) in the spirit of Bekaert and Harvey (1995) is used to model the dynamics of expected returns. The model allows not only for the time-varying market integration but also for time-varying covariance risks. It considers the real exchange rate as a common source of systematic risk, in addition to the local and regional systematic risks. We adopt the multivariate DCC-GARCH (Dynamic Conditional Correlation -

Generalized Autoregressive Conditional Heteroskedasticity) process as described in Engle (2002) to accommodate the conditional variances and covariances of stock returns.

Using monthly data from our four Middle East countries over the period 1996-2008, we find that the number and nature of driving factors for regional integration are very sensitive to the exchange rate risk measures. In the meanwhile, inflation, exchange rate fluctuations, rate spread variations and world market dividend yield play a common and significant role in explaining the dynamics of regional market integration.

The remainder of the article is organized as follows. Section 2 presents the empirical model. Section 3 describes the data. Section 4 discusses the obtained results. Section 5 concludes the article.

2. Dynamic of stock market integration

Under the assumption of purchasing power parity (PPP) and perfect integration, the international version of the CAPM of Sharpe (1964) and Lintner (1965) predicts that excess expected return on a security is priced with respect to the world market risk factor, usually represented by the stochastic fluctuations of a world market portfolio. When the regional integration is examined, the world market portfolio can be replaced by a regional market portfolio. Formally, expected returns are priced according to the degree of regional market integration as follows

$$E(R_{i,t}|\psi_{t-1}) = \Omega_{t-1}^i \left[\lambda_{t-1}^r \text{Cov}(R_{i,t}, R_{r,t}|\psi_{t-1}) + \sum_{k=1}^l \lambda_{t-1}^k \text{Cov}(R_{i,t}, R_{k,t}|\psi_{t-1}) \right] + (1 - \Omega_{t-1}^i) \lambda_{i,t-1}^d \text{Var}(R_{i,t}|\psi_{t-1}) \quad (1)$$

where $R_{i,t}$, $R_{r,t}$ and $R_{k,t}$ represent respectively expected excess returns on the local market portfolio, the regional market portfolio and the exchange rate of currency k against the reference currency. λ_{t-1}^r , $\lambda_{i,t-1}^d$ and λ_{t-1}^k are the expected prices of a unit of risk, related to the regional market, the local market and the exchange rate, respectively. Ω_{t-1}^i refers to a

conditional measure of financial integration degree of market i with the regional market. k denotes the currencies of four countries

Let A_{t-1} , $B_{i,t-1}$ and $F_{i,t-1}$ denote respectively the vector of regional information variables, the vector of local information variables and the vector of integration variables, available at time $(t-1)$. The expected prices of risk and the dynamics of market integration can then be modelled as

$$\begin{cases} \lambda_{t-1}^r = \text{Exp}(\delta'_m A_{t-1}) \\ \lambda_{i,t-1}^d = \text{Exp}(\gamma'_i B_{i,t-1}) \\ \lambda_{t-1}^k = (\delta'_k A_{t-1}) \\ \Omega_{t-1}^i = \text{Exp}(-|v_0 + v_1 X_{i,t-1}|) \end{cases} \quad (2)$$

A market is fully integrated into the regional market when $\Omega_{t-1}^i = 1$ and, in this case, the expected return on market i depends upon its covariances with regional stock market and exchange rate returns. Thus, the model in Eq. (1) becomes the two-factor regional CAPM allowing for deviations from PPP. If $\Omega_{t-1}^i = 0$, market i is completely segmented from the regional market. The expected return is therefore determined uniquely with respect to the local market risk and the model in Eq. (1) is reduced to the domestic CAPM. When Ω_{t-1}^i is comprised between 0 and 1, market i is in a situation of partial integration with the regional market and asset pricing relationship is based on a combination of regional, local and exchange rate risk factors.

Under the hypothesis of rational expectations, the econometric specification of our model in Eq. (1) is characterized by the system of equations below

$$\begin{cases}
\tilde{r}_{i,t}^c = \Omega_{i-1}^i \left(\lambda_{i-1}^r h_{ir,t} + \sum_{k=1}^l \lambda_{i-1}^k h_{ik,t} \right) + (1 - \Omega_{i-1}^i) \lambda_{i,t-1}^d h_{ii,t} + \varepsilon_{i,t} \text{ with } k=1,2,3,4 \\
\varepsilon_t = (\varepsilon_{r,t}, \varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}, \varepsilon_{4,t}, \varepsilon_{G,t}, \varepsilon_{P,t}, \varepsilon_{R,t}, \varepsilon_{C,t}) \mid \psi_{t-1} \sim N(0, H_t) \\
H_t = D_t R_t D_t' \\
\Omega_{i-1}^i = \text{Exp}(-|\alpha_0 + \alpha_1 * F_{i,t-1}|) \\
\text{with } i = \text{TR (Turkey), IS (Israel), JO (Jordan), and EG (Egypt)}
\end{cases} \quad (3)$$

where $\tilde{r}_t$ refers to the (9×1) vector of excess returns on the regional market, the four emerging markets and the four bilateral exchange rates, respectively. All the return series are assumed to be normally distributed. As before, $F_{i,t-1}$ is the vector of information variables available at time $t-1$ that are likely to drive the integration degree of the market i .

$h_t^{i,reg}$, $h_t^{i,k}$ and $h_{ii,t}$ are, respectively, the conditional covariance between market i 's return and regional market return, the conditional covariance between market i 's return and exchange rate k 's return, and the conditional variance of market i , all being issued from the (9×9) variance-covariance matrix H_t . We model H_t by using a multivariate DCC-GARCH model as described in Engle (2002). R_t is the (9×9) symmetric matrix of dynamic conditional correlations. D_t is a diagonal matrix of conditional standard deviations for each of the return series, obtained from estimating a univariate GARCH process.

Overall, the system of equations (3) is composed of nine individual equations. The first equation describes the dynamics of regional market return which depends solely on regional market risk. The following four equations capture the time-variations of four exchange rates measuring the exchange value of each local currency against one unit of the reference currency. The last four equations describe the return dynamics of four

individual markets considered, which depends on both regional market risk, exchange rate risk and local market risk.

At the empirical level, we consider two exchange rate specifications. First, we consider the U.S. as the reference country and use bilateral real exchange rates to measure the exchange value of local currencies against the U.S. dollar. This specification, being the baseline, permits us to compare our results with those of existing studies. Second, the real effective exchange rate indice is employed. These different exchange rate specifications enable us to check the robustness of the findings and to justify our choice of reference currency.

In line with previous work (Bhattacharya and Daouk, 2002; Guesmi et al., 2013) we estimate the system (3) as follows. In the first stage, we use the quasi-maximum likelihood estimation method to estimate the system of five equations corresponding to regional market excess returns and four exchange rate excess returns. This step gives us the risk premiums excess return associated with regional market and exchange rate risks as well as the conditional variances of the regional market and exchange rates.

In the second stage, we estimate the complete system with nine equations to identify the financial integration determinants by introducing the candidate factors of market integration one by one. We also impose the estimation results from the first stage to guarantee, for all individual markets, the same prices of risk related to regional market and exchange rates. It is worth noting that risk premiums associated with common risk factors (regional market risk and exchange rate risks) are weighted by the degree of market integration Ω_{t-1}^i , while local market risk premium is proportional to the degree of segmentation $1 - \Omega_{t-1}^i$.

Once the relevant market integration factors have been identified from the above procedure, we use them to re-estimate the complete system with nine equations and to explore the dynamics of regional integration. From an empirical point of view, this step can be considered as a form of back-testing to ensure the correct specification of the asset pricing model.

3. Data

We use monthly data over the period from January 1996 through December 2008. The recent period covering the global financial crisis is excluded in order to avoid its harmful impacts on the estimation of the model parameters. The dataset includes returns series, real exchange rates, and various variables that are likely to affect the degree of financial market integration and equity risk premiums.

3.1 Stock returns and exchange rates

We use monthly stock returns in excess of the 1-month Eurodollar deposit rate which is considered as the risk-free rate in our study. Stock market returns are calculated from stock market indices with dividends reinvested by taking the difference in the natural logarithm of two successive index prices. Market index data are obtained from Thomson Datastream International. Real exchange rates represent the value of local currencies against the U.S. dollar and come from the IMF's International Financial Statistics and the U.S. Federal Reserve databases. Logarithmic changes of real exchange rates are used in our empirical estimation.

3.2 Global, regional and local instrumental variables

As global and regional instrumental variables are used to explain changes in the prices of regional markets and foreign exchange risks, we consider: the world market dividend yield in excess of the 1-month Eurodollar deposit rate (WDIV), the dividend yield of the

region in excess of the 30-day Eurodollar interest rate (RDIV), the regional market index return (RRENT), and the region term spread (RPRM).

As local instrumental variables, we consider the dividend yield of a market portfolio (DDIV), the return on the stock market index in excess of the 30-day Eurodollar interest rate (RSRI), and the variation in the inflation rate (DINF). Data are extracted from MSCI and Datastream International databases.

3.3 Potential factors of financial integration

We consider a set of potential factors of market integration that have been considered by various studies in the related literature and summarize their measurements in Table 1. These factors are expected to provide information about the evolving degree of market integration through time.

Table 1. Potential factors of market integration

Variables	Measurement	Previous works
Trade openness	Total trade with the world to GDP ratio	Bekaert and Harvey (1997, 2000), Rajan and Zingales (2001), Bhattacharya and Daouk (2002), Carrieri et al. (2007) and Guesmi and Nguyen (2011)
Stock market development	Market capitalization to GDP ratio	Levine and Zervos (1996), Bekaert et Harvey (1995), Bekaert et al. (2002), Carrieri et al. (2007)
Industrial production	Industrial production in logarithm	King et Levine (1993a, 1993b), Savides (1995), Honig (2008)
Inflation rate	Arithmetic changes in consumer price index	Boyd et al. (2001)
US term spread	Natural logarithm of US 10-year Treasury bond in excess of US risk-free 30-day rate	Harvey(1995), Hardouvelis and al. (2006)
Dividend yield differential	Differential of dividend yields on country's i market index and world market index or Dividend to price ratio	Ferson and Harvey (1994), Bekaert and Harvey (1995, 2000), Chari and Henry (2004), Hardouvelis et al. (2006)
Exchange rate volatility	GARCH-based conditional volatility. Exchange rate represents the value of domestic currency per unit of US dollar	De Santis and Gerard (1998), Bollerslev et al. (1992), Ng (2004)
Economic growth rate	Logarithmic changes in Gross Domestic Product	King et Levine (1993a) , Savides (1995), Honig (2008)
Current account deficit	Natural logarithm of the difference between total export and total import	Guesmi (2012)
Market returns	Difference in natural logarithm of two successive prices	Bekaert and Harvey (1997, 2000), Guesmi and Nguyen (2011)

Interest rate	Natural logarithm of short-term interest rate, T-bills rate or interbank rate	Desroches and Francis (2007), Carrieri et al. (2006)
Difference in industrial production	Difference in industrial production between country i and G7 countries	Gurley et Shaw (1967), King et Levine (1993a, 1993b)

4. Empirical results

In this section we present the impact of the various factors on financial integration, the tests of robustness and the degree of regional integration for each country.

4.1. Prices of regional market and real exchange rate risks

Table 2 show that the prices of exchange rate risk for four markets are mainly determined by regional dividend yield ($RDIV$), regional stock returns ($RRENT$) and the regional term spread. They are positively associated with regional stock returns, but negatively associated with regional dividend yield. The interest rate spread ($RPRM$) is significant for all countries region members.

Table 2. Prices of regional market and real exchange rate risks

	<i>WDIV</i>	<i>RRENT</i>	<i>RPRM</i>	<i>RDIV</i>
<i>Panel A: Price of exchange rate risk</i>				
<i>Egypt</i>	0.216* (0.157)	0.004*** (0.002)	-0.013** (0.001)	-0.025*** (0.010)
<i>Israël</i>	0.161 (0.124)	0.011*** (0.001)	-0.003** (0.001)	-0.009** (0.008)
<i>Jordan</i>	0.046 (0.123)	0.014*** (0.001)	-0.002 (0.001)	-0.030*** (0.007)
<i>Turkey</i>	0.223** (0.105)	0.023*** (0.002)	-0.005*** (0.002)	0.06*** (0.005)
<i>Panel B: Price of regional market risk</i>				
<i>Middle East</i>	0.144*** (0.008)	0.003*** (0.0002)	0.007*** (0.0001)	-0.012*** (0.0004)

Notes: The standard deviations of coefficient estimates with corrections for heteroscedasticity are reported between brackets. The asterisks indicates significant coefficients at a threshold of 10% (*), 5% (**) or 1% (***).

4.2 Financial integration factors

We now turn to identify the determinants of regional financial integration by estimating the full system (3) for each integration factor at a time. Following Bhattacharya and Daouk (2002), we impose the same coefficients in the equation specifying the degree of market integration for all markets. This assumption permits us to account for the impact of each candidate factor on the integration of each individual market into the regional market. Recall that the set of considered factors includes the local, regional and global variables that may influence the degree of regional financial integration.

When the bilateral exchange rates against the US dollar are used, the results in Table 3 show that the degree of integration in the Middle East is primarily determined by inflation, exchange rate volatility, rate spread variations and world market dividend yield.

Table 3. Potential factors of financial integration

	Bilateral exchange rates against the US dollar		Real effective exchange rate index	
	V_0	V_1	V_0	V_1
Degree of trade openness	-0.254 (0.753)	-0.39 (-0.425)	-0.660 (1.648)	0.272 (3.712)
Degree of stock market development	-0.130 (-0.450)	0.3488 (0.284)	7.745 (6.353)	0.049 (2.332)
National industrial production	0.227 (0.717)	-0.0212 (-0.459)	0.285 (0.762)	0.214 (0.384)
World industrial production	2.704 (1.778)	1.508 (-1.521)	-0.243*** (0.067)	-0.005*** (0.002)
Differences in industrial production growth rates	-4.34 (-3.82)	0.981 (0.920)	-0.383 (0.525)	0.155 (0.749)
Inflation rate	-6.824** (-1.69)	-3.50** (1.817)	0.063 (0.353)	0.010*** (0.000)
Exchange rate volatility	-6.75*** (0.34)	-5.68*** (0.101)	-3.955*** (0.183)	4.597*** (2.17)
Economic growth rate	-0.242 (-0.335)	17.947*** (0.792)	0.130 (0.020)	-0.163 (0.345)
Dividend yield on the local market index	0.216 (0.698)	-0.937 (-0.646)	0.807 (0.953)	-1.732*** (0.619)
Dividend yield on the regional market index	1.312*** (0.6217)	0.087*** (0.001)	0.213 (0.343)	-0.023 (0.364)
Dividend yield on the world market index	-2.504** (-2.047)	-0.607* (-1.99)	0.569 (0.730)	-4.050*** (0.987)
Differences in dividend yield	-0.089 (-0.857)	0.659 (0.721)	1.060 (1.230)	0.0030 (0.000)

Short-term interest rate	-0.139 (-0.417)	1.822 (1.728)	0.307 (0.253)	-0.597*** (0.092)
Long-term interest rate	1.800 (6.255)	1.900 (1.700)	0.1583 (0.471)	-0.254 (0.162)
Interest rate spread (long-term minus short-term)	0.99*** (0.474)	0.900*** (0.0001)	-0.383 (0.524)	0.1657 (0.647)
Current account deficit	-0.834 (-0.758)	-0.095 (0.075)	-0.0426 (0.501)	-0.214 (0.243)
Local market returns	0.216 (0.309)	-0.397 (1.449)	0.0783 (0.184)	0.137 (0.755)
Regional market returns	-0.194 (-0.103)	-2.495 (-2.443)	0.285 (0.762)	-1.214 (1.384)
World market returns	-0.0344 (-0.0855)	0.0547 (0.634)	-0.243*** (0.0673)	-0.005 (0.004)
World interest rate	1.659 (-1.79)	0.282 (1.646)	-0.211 (0.315)	0.215 (0.341)

Notes: The numbers in parenthesis are the associated standard deviations. *, **, and *** indicate significance at the 10%, 5% and 1% levels respectively.

Similar to most prior empirical work, we use, in the previous estimations, the US dollar as the reference currency (Bekaert and Harvey, 1997; Griffin, 2002; Karolyi and Stulz, 1999; Dumas et al., 2003; Barr and Priestley, 2004; Carrieri et al., 2007). We now test the sensitivity of our results when bilateral exchange rates are replaced by a real effective exchange rate index.¹ The latter is simply the geometric average of bilateral real exchange rates of the countries under consideration. Accordingly, our empirical model incorporates two common risk premiums for all markets: the regional market risk premium and the exchange risk premium. The results in the second column of Table 3 show that exchange rate fluctuations affect the degree of intra-regional integration. The other factors are not statistically significant and do not impact the level of intra-regional financial integration.

Overall, the key factors that drive regional financial integration change significantly when the real effective exchange index is considered. These findings help explain the result divergence among previous studies with regard to the number and nature of integration factors.

¹ Adler and Qi (2003) also adopt this approach in their study.

4.4 Intra-regional integration

The degree of integration is estimated from equation (2) with the conditional variance of regional stock market returns, their covariance with the global market and the real exchange rate indices, as well as the cost of associated risks. The degree of integration is thus modelled as follows:

$$IM_{t-1}^i = \text{Exp}(-|\alpha_0 + \alpha_1 INF_{i,t-1} + \alpha_2 VTC_{i,t-1} + \alpha_3 VST_{i,t-1} + \alpha_4 RDVW_{i,t-1}|) \quad (8)$$

INF, VTC, VST and RDVW are respectively inflation, exchange rate fluctuations, rate spread variations and world market dividend yield. Figure 1 shows that the Middle East stock markets are highly integrated in the local market. Egypt is the most integrated market: its level of integration was around 85% during the sub-period 1996-1999 before falling to slightly lower values of around 80%. With rates respectively around 80% and 75% (Figure 1), Egypt integration was the highest at the end of the period. Israel presents a level of integration of 58.1%. Jordan has a level of integration (69.2%) slightly higher than Israel. Analysis of figure 1 shows an upward trend in the financial integration of the Israeli, Jordanian and Turkish markets.

Figure 1: Estimates of integration levels

In fact, the high level of intra-regional financial integration may be explained by an increase in financial flows. A certain number of studies like that of Krugman (1991) aim to reintroduce the role of geographic distance and proximity to determine trade flows and localisation of firms. In effect, Egypt and Jordan, for example, are attracted by the proximity of the most developed countries in the region like Turkey and Israel (notably, in terms of GDP) and, on the other hand, less developed countries become attractive investments for the more developed countries in the region. From this perspective, the heterogeneity of the degree of development in the Middle East area promotes intra-regional integration.

5. Conclusion

This paper has investigated the evolution of the process of integration in four Middle East equity markets (Turkey, Israel, Jordan and Egypt) between 1996 and 2008. In the spirit of the current literature following Bekaert and Harvey (1995), we used a model that combines the local and global versions of the CAPM theoretical framework to analyse the preponderant factors of intra-regional financial integration. We tested the power of local factors and exchange rates to explain expected returns and empirically inferred segmentation when the weight of the local and exchange factors are important.

ICAPM suggests that the availability of market substitutes that allow investors to duplicate the returns on unavailable foreign assets affects the degree and time variation of regional market integration. Hence, we focus on homemade diversification that could

effectively integrate the regional market even though explicit barriers to portfolio flows are in place. We applied the multivariate DCC-GARCH specification to estimate the CAPM and the non-linear least squares method to determine the financial integration variable components with the aim of finding new ways to identify potential intra-regional financial integration factors.

Our results suggest that while local and exchange risks are still important factors in explaining time variation of regional market returns, none of the four considered countries appears to be strongly integrated. The estimated integration indices suggest there are wide ranges in the degree of integration. Whereas Egypt is on average the most integrated over the whole sample, Jordan is the most segmented. Overall, our results indicate that the degree of Middle East integration is essentially determined by inflation, exchange rate volatility and rate spread variation factors. However, global factors like the global interest rate, world market returns and world market dividend yield do not affect the degree of stock market integration. Concerning regional factors, excess dividend yields are also non significant for virtually all the markets studied.

Furthermore, despite the complex economic and political situation that characterises the Middle East region, the results indicate that stock markets in this area are well integrated in the regional market. Egypt has the highest market integration in the region (92.7%) followed by Jordan (73.2%). Political ups and downs observed during our period 1996-2008 – like the period of instability that prevailed in Turkey before the AKP (party for justice and development led by the Prime Minister Recep Tayyip Erdogan) won the elections – appear to have little impact on financial integration. Similarly, the second Lebanon War (2006) did not isolate the Israeli financial market from other Middle Eastern countries. Our study therefore concludes on a relative disconnection between the political and financial variables in this region.

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