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FINANCIAL INTEGRATION AND INTERNATIONAL RISK DIVERSIFICATION

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ABSTRACT

The effect of international financial integration on performance strategies diversification is ambiguous for countries émergents1. It is explained by two reasons: hand, financial integration of national markets makes international diversification portfolios more efficiently, and helping the transition from one market to another and increasing efficiency of financial markets. On the other hand, financial integration increased correlations between national financial markets, reducing income strategies international diversification. We will show that this ambiguity is due to the use different properties with different testing procedures provided in the literature econometric. This is of particular interest to the present unit root test in the presence arch.

Keywords: International financial integration, International diversification of portfolios, The benefits of international diversification strategies, Root test unit in the presence arch arch model, Garch, Egarch.

JEL Classification: F14, Q43.

1. INTRODUCTION

The markets are perfectly integrated called if and only if the systematic risks are paid in the same way in all countries. In other words, if markets are fully integrated, assets with the same risk should have the same price even if they are traded on different markets. Markets perfectly integrated, common investors at risk and the risks specific to their countries or sectors activity, but they are only paid to common sources of risk as the specific risk is completely diversifiable. If markets are strictly segmented, the investors should have specific risks. For example, in two different countries, the same investment project can have different profits for the origin of risk and / or their prices may be different. The financial markets lie between these two extremes. A market partially integrated, the market appreciates the two sources of risk: specific common risk. For example, in the literature of financial markets models valuation of financial assets are one of the two polar assumptions as follows: segmentation strict financial or perfect financial integration. Gerard K.

Gerard *et al.* (2003) and Arouri (2006) studied the integration Financial few Asian emerging markets in the global market. The results of these studies reject the hypothesis of segmentation show that financial risk household is not appreciated in these markets. The overall effect of international financial integration on performance strategies diversification is ambiguous.

It is explained by two arguments: On the one hand, financial integration of national markets makes diversification International portfolios more efficiently, and helping the transition to a market another and increasing the efficiency of financial markets. On the other hand, financial integration has increased the correlations between markets domestic capital, thereby reducing the benefits of diversification strategies internationals. Deregulation and liberalization of financial markets has prompted a strong integration of economies around the world. Therefore, the indices of national markets have become increasingly correlated. This will reduce the benefits of international diversification. The objective of this paper is therefore to measure the integration of financial markets developed - emerging and conclude whether international diversification gains between them. We expect to market integration admit solve a gain international diversification or not, that is to say, if markets are integrated, then the potential gains will be small. If markets are segmented while international diversification plays an important role: What is the impact of increasing the level of integration of emerging financial markets in the developed markets of the potential gains from international diversification? Our objective is to find the conditional correlations between the domestic and the world market, and discover the link between the degree of integration of financial markets and the expected benefits of international diversification strategies portfolios. We are interested in assessing the properties with different procedures tests provided on the econometric literature. This is of particular interest to the present unit root test in the presence ARCH.

2. THE INTEGRATION OF FINANCIAL MARKETS and INTERNATIONAL DIVERSIFICATION

Globalization has prompted increasing links between different places Thus; the financial sector was characterized by the opening of institutions financial management and financial markets to new products and financial instruments. These changes are the effects of movements of deregulation, disintermediation, deregulation of markets innovations financial and technological.

Financial integration should increase the efficiency of markets through increased liquidity, lower transaction costs and greater comparability of financial products, allowing de facto a more efficient allocation of capital. However, in recent years financial markets have approved the reforms. The main motivation is to move towards a more open market. These reforms have led to changes in the financial environment. Financial integration has facilitated the approximation of overall market behavior. It is interpreted by an increase in correlations between them and greater asset volatility. Such developments must be taken into account when developing strategies for portfolio management internationally. Forbes and Chinn (2003) showed that the co-movements

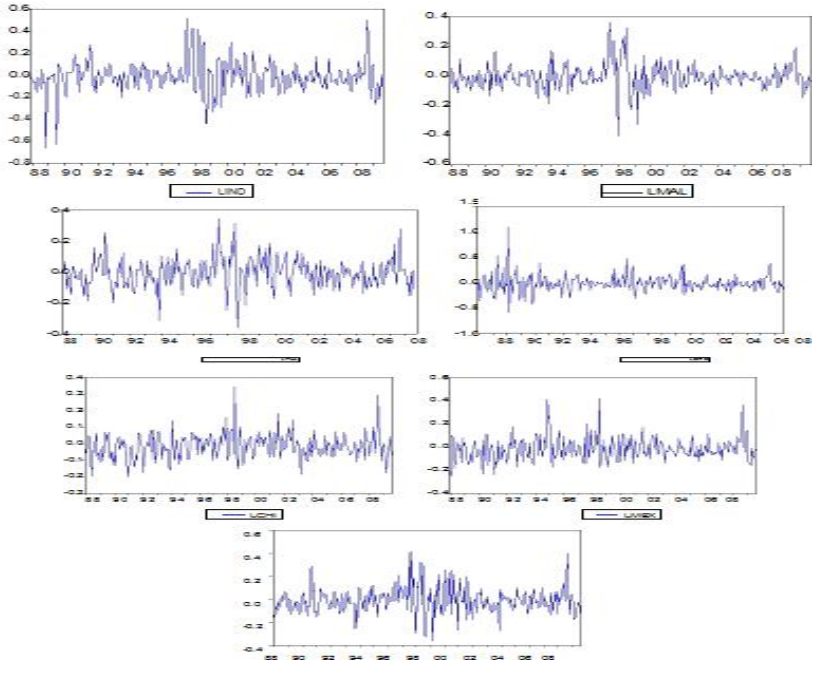
between markets increased during the financial year 1990. This period is the most marked by a strong trend towards globalization of capital markets? They noted that the correlations between the financial markets of the seven most industrialized countries in the world have experienced a sharp increase very significantly compared to previous periods. The type of integration in the global economy is a key factor in understanding the development of the financial structure of a country. It should be emphasized that the analysis of the relationship between type of integration in the global economy and structure of the domestic financial system is attached to a number of parameters: the weight of the public sector in the economy, diversification and the depth of the domestic financial system and the degree of openness of the country to trade flows and foreign investment.

2.1. Empirical Validation

This study focuses on the stock market indices of seven emerging countries: Indonesia, Malaysia, Philippines, Brazil, Chile, Mexico and Thailand. This is to compare the behavior of returns in emerging markets. Observations are used during monthly period end décembre1987 to September 2009. Stock prices are from Morgan Stanley Capital International (MSCI) and are calculated with dividend reinvestment. The performances are all expressed in U.S. dollars and calculated in excess of the Eurodollar rates at 30 days from DataStream. Statistical properties of the series of indices yields Logarithmic function returns indices. Using this rate for financial series can connect models as discrete as those continue.

$$R_t = \log\left(\frac{S_t}{S_{t-1}}\right) \qquad (1)$$

Fig-1. Performance curves of logarithmic indices



Examination of these figures shows the instability series of index returns stock. The point is that the majority of curves have a nearly constant average but the amplitude of the variation is not constant. This shows that the series set obviously does not follow the normal distribution. To do this, we proceed to the analysis of values of descriptive statistics. (Eviews 6.0).

Table-1. Analysis of values of descriptive statistics

	I brésil	I chili	IIndonésie	IMalaisie	IMexique	IPhilippine	IThaïlande
Moyenne	-0,0165	-0,0145	-0,0092	-0,0064	-0,016	-0,0049	-0,0056
Maximum	1,095	0,3438	0,5199	0,3595	0,4193	0,345	0,415
Minimum	-0,591	-0,200	-0,6648	-0,405	-0,254	-0,360	-0,359
Ecart-type	0,159	0,072	0,142	0,086	0,096	0,093	0,115
Skewness	1,400	0,649	-0,163	0,2515	1,013	0,153	0,536
Kurtosis	12,509	5,866	7,255	6,911	6,136	4,774	5,104
Jarque-Bera	1068,82	107,695	198,12	169,17	151,63	35,28	60,68

We note that the data are highly variable. This is reflected by the fact that flattening coefficients of the two series are high. Distribution is called leptokurtic. In addition, if we examine the skewness, we see that they are different from zero, which the value is corresponding to the normal law. According to the descriptive statistics and the curves of the geometric return, we are dealing with time series that does not follow the normal distribution. The question that arises is: what these series may be made by a process of ARCH. To give an answer to this question is through the estimation of ARMA type process. The study of the stationarity of the variables is a very important step to move to about our work. The following table shows the results of the test Dukey Fuller augmented ADF.

Table-2. Results of the test Dukey Fuller Increased ADF

Les indices boursiers	La valeur d'ADF calculée	Probabilité 5%
Brésil	-7,766	-1,940
Chili	-5,876	-1,940
Indonésie	-5,917	-1,940
Malaisie	-6,271	-1,940
Mexique	-6,650	-1,940
Philippine	-6,510	-1,940
Thaïlande	-7,592	-1,940

For all series the unit root hypothesis is rejected, since the value exceeds critical values of statistics. Data are stationary. We are going to determine the lag order of the autoregressive process. These series are heteroscedastic, this is emphasized by the instability of the value of the variance of the series of returns of exchange rates and stock indices.

The determination of the lag order process type AR (p), MA (q) and ARMA (pq) according correlograme of them. The theory is when the order p +1 of the partial autocorrelation function vanishes and the same reasoning for MA (q). Determination of the order of delays AR (p), MA (q) and ARMA (p, q) each series. According to the estimation result, we choose a model that better explains the volatility of financial markets. The criteria used for selecting the model are R^2, Akaike criterion and Shwarz. Our choice is based on comparing the values of these criteria, the model that has the lowest value of Akaike and Schwartz and a value close to 1 for R^2 is the model to follow.

By examining the autocorrelation function and FACP, we suggest that the series performance of the stock market index of Brazil may be specified by an ARMA (1, 3).

This model reflects the lowest SC. Similarly, the ARCH-LM test detects the presence of ARCH effects. This probability is <0.05 so we can move to the modelling of ARCH-GARCH models. It is an ARMA (1,3)-GARCH (1,1)The principle of ARCH effect test is to test if the residuals are squared $\hat{\varepsilon}_t^2$ autocorrelated. Indeed, a test of autocorrelation of the series is to demonstrate if $\hat{\varepsilon}_t^2$ is time-dependent. Thus, the conditional variance of the series depends on time.

Then there is a ARCH effect. Series of stock index returns chili is specified by an AR model (1). But at ARCH-LM test, we concluded that $P = 0,264 \succ 0,05$, that is to say not ARCH effect.

The absence of ARCH effects can be defined by the existence of an independence of the conditional variance in time. The absence of this effect in this series of performance means that it is not possible to predict the future risk (variance) from past risk. This is verified by the random walk hypothesis. Through the following series of return on stock index Indonesia We specified a model ARCH (1), because the model AR (1) is more appropriate and there is the presence of ARCH effect: $P = 0,01 \prec 0,05$.

The ARCH model (1) is presented as follows:

$$\varepsilon_t = z_t \sqrt{h_t} \text{ et } h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2$$

$$h_t = \underset{(0,000)}{0,012} + \underset{(0,000)}{0,44}\,\varepsilon_{t-1}^2 \qquad (2)$$

The series returns in the stock market in Malaysia is characterized by the absence ARCH effect: $P = 0,414 \succ 0,05$. If there is no ARCH effect because the coefficients are insignificant, that is to say that this auxiliary regression will have a very low R^2 (R^2 = 0.002).

$$\hat{\varepsilon}_t^2 = \alpha_0 + \alpha_1 \hat{\varepsilon}_{t-1}^2 + \eta_t$$

$$\hat{\varepsilon}_t^2 = \underset{(0,000)}{1,051} - \underset{(0,414)}{0,050}\,\hat{\varepsilon}_{t-1}^2 + \eta_t$$

A reassessment of the model does not take into account the effect ARCH, just take the ARMA (1,1):

$$Y_t = \underset{(0,0032)}{-0,0062} + \underset{(0,066)}{0,0606} Y_{t-1} + \varepsilon_t + 0,427\varepsilon_{t-1} \quad (3)$$

Variables are significant at 10%.

The series returns in the stock market in Mexico are indicated by the presence of a AR (1) with the presence of ARCH effect: $P = 0,02 \prec 0,05$

$$h_t = \underset{(0,000)}{0,007} + \underset{(0,07)}{0,120}\, \varepsilon_t^{\,2}{}_{-1} \quad (4)$$

Series of performance Philippine stock index is presented by a model AR (1) and a TGARCH (1.1).

By examining the autocorrelation function and FACP, we suggest that the series of performance of the Thailand stock index can be specified by an AR (2). The estimation results of the model are:

$$y_t = \underset{(0,616)}{-0,0043} + \underset{(0,464)}{0,0452}\, y_{t-1} + \underset{(0,017)}{0,147}\, y_{t-2} + \mu_t \quad (5)$$

We notice that the coefficient of the first delay is not significant. This leads us to re-estimate the AR (1):

$$y_t = \underset{(0,501)}{-0,0051} + \underset{(0,337)}{0,059}\, y_{t-1} + \eta_t \quad (6)$$

The first delay is not significant.

Table-3. Result of estimation

	R^2	*AIC*	*SC*
AR(2)	0,022	-1,500	-1,473
MA(2)	0,029	-1,503	-1,476
ARMA(1,1)	0,015	-1,482	-1,441

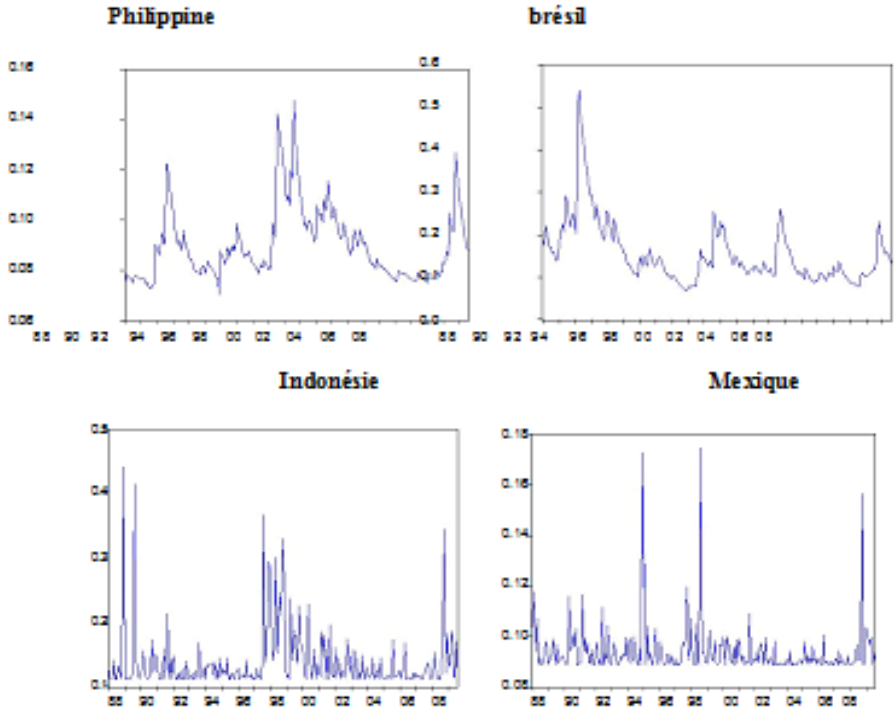
For reasons of parsimony we adopt the estimation of the model MA (2), which reflects the AIC and SC lower in comparison with other models. Similarly, the value of R 2 is high.
The ARCH model (1) is presented by the following model:

$$h_t = \underset{(0,00)}{0,01} + \underset{(0,016)}{0,2\ 1}\varepsilon_t^{\,2}{}_{-1} \quad (7)$$

2.2. Estimation of ARCH Models

After estimating models through the econometric software Eviews, we found a specific model for each index. Indeed, the volatility index is described by different models.

Fig-2. The curves of the conditional variance



It should be noted that the volatility of each stock index follows a curve. Concerning the case of indices for Indonesia, Mexico and Thailand, they have a volatility characterized by stagnant periods and other high variations. While the Philippine low volatility at the beginning of the period. We note the presence of picnic followed by a high volume of volatility.

Brazil is marked by greater volatility in less stable markets. Do not forget that some interpreted the study period major events in financial integration, which could influence the results.

Schwert (2003) studied the impact of stock market volatility on aggregate economic factors such as consumption, investment and capital variables economic cycles. Similarly, the upward trend in volatility and the multiplication of peaks of volatility resulting from cyclical phenomena, related to the characteristics of the period current (market downturn marked questioning the criteria for assessing the value of asset, high corporate debt) or more structural factors, it is related functioning of financial markets, management techniques implemented by investors. The results show that volatility increases after a contract is open outside. She became acute in 2007, but thereafter, we see a downward trend. If integration with global markets puts the balancing process more efficient indices for emerging markets, it can be expected to decrease. Kaminsky and Schmukler (2001) have demonstrated that financial markets become more volatile following

financial liberalization but that volatility tends to stabilize long term.In fact, the following table presents the conditional correlations of returns in excess return.

Table-4. Conditional correlations of returns in excess return

	LBRE	LCHI	LIND	LMAL	LMEX	LPHL	LTHA
LBRE	1,000	0,427	0,231	0,233	0,384	0,258	0,270
LCHI		1,000	0,354	0,405	0,465	0,419	0,440
LIND			1,000	0,514	0,340	0,524	0,510
LMAL				1,000	0,349	0,561	0,575
LMEX					1,000	0,359	0,424
LPHL						1,000	0,619
LTHA							1,000

The strongest correlation was 61.9% between the Philippine and Thailand. Indonesia has a correlation of 23.1% with 35.4% correlation with the Chilean market. fact, the gains from international diversification are a function of the interdependence between national markets. When they have high correlations between them gains will be small or non-existent. However, when correlations between national markets are small gains will be important.

3. CONCLUSION

This study allowed us to conclude that the financial turmoil had adverse effects on economic growth in emerging countries and countries in developments. Thus, financial difficulties exhibited the following characteristics:

• A poor financial regulation, which led to exposure excessive global financial instability. This regulation has contributed to financial imbalances.

• The financial turmoil was very expensive viewpoints budget. The struggling economies have distinguished the global economy as an opportunity overcomes the delays that accompanied the national crises and region. This work has demonstrated that financial markets become more volatile following financial integration but that volatility tends to stabilize long term. In fact, we noticed that the volatility increases rapidly. She became acute in 2007, but then, we distinguished a downward trend. It can be expected decrease if integration with global markets makes the balancing movement more effective indices for emerging markets. It should be noted that global imbalances are related not only to financial regulation and monetary policy, but also to profound and lasting changes in the global real economy. The most notable changes are marked in the productivity and international competitiveness (China, India), relative prices (oil and natural resources) as well as the sources of global savings and demand effective. In particular, it is interesting to present empirically and theoretically the link between financial integration and international diversification of portfolios for the study risk. A deregulated economy may be informed of the risks and volatility the unexpected change of capital flows such as risk during the crisis.

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