Time varying financial integration in emerging stock markets, de jure capital account openness and risk premiums

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***Abstract*:** De jure and de facto capital account openness may differ significantly in emerging countries and may vary under the pressure of extreme events such as crises. Besides, as shown by Errunza and Losq (1985), international investors may gain access to risk exposure to the most closed emerging markets through investments in cross listed stocks, country funds or industry funds. The aim of the paper is therefore to assess the evolution of the de facto degree of financial integration of emerging stock markets and of the dynamics of the three components of the risk premium for each emerging market under study. To this end, we estimate the variant of the International Asset Pricing Model (IAPM) developed by Errunza and Losq (1985) and Carrieri et al. (2007) for 12 emerging stock markets over the period 02.1988-12.2012. We find that the currency risk accounts for a significant part of the total risk premium. The results are overall consistent with the main changes in the de jure measure of capital openness. But the de facto degree of financial integration appears to be much more variable and to be impacted by crises.

Keywords International financial integration, capital controls, de jure capital account openness, emerging markets, ICAPM, currency risk premium.
JEL classification C32, F31, G12

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1. Introduction

Several articles provide an evidence of partial segmentation of both developed and emerging stock markets. According to Karolyi and Stulz (2002), in the context of partial segmentation or imperfect financial integration, equity flows that take place either in or out of a country are limited because of explicit constraints on or because of barriers to international investment. An extensive literature based on the empirical asset pricing approach investigates the impact of barriers to international investment.[1] Work in this area can be classified in two categories; the first one examines the impact of those barriers on expected returns, on the risk premium and on the degree of financial integration. The second one tests the impact of removing barriers to international investment on the development and integration of local markets (see table 1 in the Appendix for a detailed survey).[2]

Carrieri et al. (2007) analyse the determinants of market integration using the theoretical model of international asset pricing (IAPM) developed by Errunza and Losq (1985). They derive from their model a measure of financial integration that is less variable and more easy to interpret than the Bekaert and Harvey (1995) integration measure. Using monthly data from January 1977 to December 2000 for eight emerging markets (Argentina, Brazil, Chile, India, Korea, Mexico, Taiwan and Thailand), they show that none of countries studied appears to be completely segmented and that financial development as well as market liberalization have a positive impact on countries financial integration.[3]

However, in their article, Carrieri et al. (2007) take into account only two sources of risk related to local and global financial markets. Given the importance of purchasing power parity (PPP) deviations, especially in the case of emerging markets, the currency risk can also play an important part in the total risk premium of emerging stock markets. Few empirical studies have therefore taken into account the currency risk, such as Jorion (1991), Dumas and Solnik (1995), Bailey and Chung (1995), DeSantis and Gerard (1998) and Hardouvelis et al. (2006) and evidence its importance in the assessment of the total risk premium. In the context of PPP

[1] See Stulz (1981) for a general model of barriers to international investment.
[2] Karolyi and Stulz (2002) provide an excellent survey of the literature on testing international asset pricing models.
[3] Carrieri et al. (2007) consider that their indices of market integration can be viewed as complementary to the Bekaert and Harvey (1995) integration measures using the regime-switching model. However, the results of Bekaert and Harvey regarding some emerging countries are difficult to interpret. Indeed, some countries became less integrated over time.

deviations, the total risk premium on emerging stock markets must then be broken up into three components: a first one related to global market risk, a second one to the compensation for risk due to local market characteristics, and a third one to unanticipated fluctuations in exchange rates.

In this article, we follow this approach which combines the influence of the global stock market, the foreign exchange market and the local market in assets evaluation in order to take into account purchasing power parity (PPP) deviations and volatility of local inflation in emerging countries.[4] Besides, allowing for a currency risk premium component in the total risk premium of emerging stock markets, our study includes two other contributions. First, we analyze jointly the liberalization of equity markets and the changes in the degree of financial integration. Precisely, we assess the impact of removing barriers to international investment on the degree of financial integration and on the market risk premium. Accordingly we rely on the information related to de jure liberalization of equity markets dates (Phylaktis and Rayazzolo, 2002; Bekaert et al., 2003) and the Chinn-Ito Index of Capital Account Openness. Second, according to the general perception, countries should become increasingly integrated through the progress of financial liberalization. But, if financial integration is a gradual process, it is also a complex one, that may be halted or subject to short term reversals during extreme events such as local or global crises. We therefore examine the fluctuations of the de facto degree of financial integration during crises and in particular, since the global crisis appeared in 2007-08.

The paper is organized as follows. Section 2 describes the empirical model. Section 3 details the data used in this paper together with some preliminary analysis. In Section 4 we report and interpret the results of the estimations. Section 5 concludes.

2. The empirical model

Our empirical asset pricing model relies on the framework developed by Errunza and Losq (1985). It satisfies the properties of the theoretical model estimated by Errunza et al. (1999) and Carrieri et al. (2007) and uses similar econometric procedures. However, given the

[4] See for example, Black,1974; Stulz, 1981b; Errunza and Losq 1985, 1989; Eun and Janakiramanan,1986; Rogoff, 1996; Cooper and Kaplanis, 2000; De Jong and De Roon, 2005; Chaieb and Errunza, 2007. All of these studies provide an excellent survey the main properties of the theoretical asset pricing model.

importance of the risk related to purchasing power parity (PPP) deviations, especially in the case of emerging market, this model is extended in order to take into account the currency risk. Carrieri et al. (2006a) show, indeed, that in emerging markets the currency risk is priced separately from other specific risks and exerts an impact that tends to intensify during crisis episodes. Hence, in emerging markets, the expected return of each stock market index must include three risk premiums: a global market premium, a currency premium, and a local premium.

The conditional mean excess return on the country's market index can then be specified as:

$$E_{t-1}(R_{I,t}) = \lambda^{m}_{t-1}\,\mathrm{cov}_{t-1}(R_{I,t}, R_{m,t}) + \lambda^{s}_{t-1}\,\mathrm{cov}_{t-1}(R_{I,t}, R_{s,t}) + \lambda^{I}_{t-1}\,\mathrm{var}_{t-1}(R_{I,t} / \underline{R}_{e,t}) \qquad (1)$$

Where $R_{I,t}$ is the expected excess return on the local stock market index of country I, given information up to time *t-1*, $R_{m,t}$ is the excess return on the world stock market index, $R_{s,t}$ is the currency return, $\underline{R}_{e,t}$ is the vector of returns on "eligible" stocks, which can be bought by global as well as by local investors , λ^{m}_{t-1}, λ^{s}_{t-1} and λ^{I}_{t-1} are the time-varying prices of global risk, currency risk and local risk, cov_{t-1} is the conditional covariance operator, and var_{t-1} is the conditional variance operator.

This model is close to the one retained by Carrieri et al. (2007). But in their model, the pricing equation for the emerging market index of country I only includes the global and local market risks. Our specification is more general, as we include the currency risk component $\lambda^{s}_{t-1}\,\mathrm{cov}_{t-1}(R_{I,t}, R_{s,t})$. Indeed, as recalled by Adler and Dumas (1983) and Dumas and Solnik (1995), this risk is priced even under the hypothesis of perfect integration, due to PPP deviations.

In equation (1), when the degree of financial integration of country I is perfect, the local risk premium vanishes: $\mathrm{var}(R_I / \underline{R}_e) = 0$. In other terms, when financial integration is perfect the local return index is perfectly correlated with some combination of eligible returns. On the opposite, in the extreme case of total segmentation of stock market I from the world market, the local stock return is uncorrelated with the world stock return and the global risk premium component vanishes, whereas the local risk premium is strictly positive, with $\mathrm{var}(R_I / \underline{R}_e) = \mathrm{var}(R_I) > 0$. In practice, most emerging stock markets will be characterized by an intermediate degree of financial integration between these two polar cases. Even the most

stringent capital controls in country I does not preclude some correlation between its local stocks and internationally eligible assets. Industry effects, as well as the cross listing of local stocks and the existence of country funds amongst eligible assets allow international investors to invest in portfolios of eligible assets that are correlated with country's I return index R_I.

Denoting R_{DIV} the return of the portfolio of eligible securities that is most correlated with the return of the local portfolio (R_I), the return on this "diversification portfolio" is defined as:

$$R_{DIV,t} = A' \underline{R_{e,t}}$$

where A' , the vector of weights of eligible securities, is chosen as to maximize the correlation between $R_{I,t}$ and $R_{DIV,t}$. $\underline{R}_{e,t}$ the vector of returns on "eligible" stocks - which can be bought by global as well as by local investors - may include securities such as stocks of country I cross listed on foreign markets, country funds allowing to invest indirectly in country I, industry indices, *etc*.

The higher the correlation between R_{DIV} and R_I , the more investing in the diversification portfolio enables international investors to gain exposure to the local stock market of country I. When the correlation between R_{DIV} and R_I is equal to one, there is no segmentation: the financial integration of the emerging market I is perfect. On the opposite, when the correlation is zero, segmentation is total. In most cases integration is imperfect, but not nil, and therefore the variations in the local stock return R_I are neither independent from R_{DIV}, nor entirely explained by R_{DIV}. Errunza and Losq (1985) show that:

$$\text{var}(R_I / \underline{R}_e) = \text{var}(R_I)(1 - \rho^2_{I,DIV}) \tag{2}$$

where $\rho^2_{I,DIV}$ is the squared correlation between R_I and R_{DIV}.

The following integration index may then be computed (Carrieri et al. 2007):

$$II = 1 - \frac{\text{var}(R_I / \underline{R}_e)}{\text{var}(R_I)} = \rho^2_{I,DIV} \tag{3}$$

The maximum value of this index is one when integration of market *I* is perfect, its minimum value is zero when there is total segmentation of market *I*. In order to calculate this index measure and $\text{var}(R_I / \underline{R}_e)$, we need for each country *I* the series R_{DIV} of the returns of the portfolio of eligible assets, which is most correlated with the local return R_I. Following

Carrieri et al. (2007), we construct the return of the diversification portfolio ($R_{DIV,t}$) from the regression of the returns of the local portfolio ($R_{I,t}$) on the returns of the following set ($\underline{R}_{e,t}$) of eligible securities: the Morgan Stanley Capital International (MSCI) world index, 34 MSCI global industry indices, a country fund (CF) for country *I* and American Depositary Receipts (ADRs) for stocks of country *I* cross listed in the US. As Errunza et al. (1999), for countries with multiple CFs, we select the one with the longest history. The set of ADRs varies for each of the countries in our dataset (see list in Table A2 in appendix).[5] The fitted values of R_I in its regression on the aforementioned set of eligible assets yields the return R_{DIV} of the portfolio of eligible assets most correlated with R_I.

For each country *I*, the estimated model (1) can be written as follows:

$$R_{I,t} = \lambda^{m}_{t-1} h_{I,m,t} + \lambda^{s}_{t-1} h_{I,s,t} + \lambda^{i}_{t-1} h_{I,t}\left(1 - \frac{h^{2}_{I,DIV,t}}{h_{I,t} h_{DIV,t}}\right) + \varepsilon_{I,t} \tag{4}$$

Where is $h_{i,j,t}$ is the conditional covariance between asset i and j, and $h_{i,t}$ is the conditional variance for asset i. $Var(R_{I,t} / \underline{R}_{e,t})$ is here calculated as $\left[Var_t(R_{I,t})(1-\rho^2_{I,DIV,t})\right]$, which is equal to $(h_{I,t})(1-(h^2_{I,DIV,t} / h_{I,t} h_{DIV,t}))$.

Following Carrieri et al. (2007), equations (5a) and (5b) below are used to retrieve the price of global market risk, λ^{m}_{t-1}:

$$R_{m,t} = \lambda^{m}_{t-1} h_{m,t} + \varepsilon_{m,t} \tag{5a}$$

$$R_{DIV,t} = \lambda^{m}_{t-1} h_{DIV,m,t} + \varepsilon_{DIV,t} \tag{5b}$$

Moreover, as our model includes the currency risk related to the exchange market, we can write the following equation to retrieve the price of currency risk, λ^{s}_{t-1},[6]

$$R_{s,t} = \lambda^{m}_{t-1} h_{m,s,t} + \lambda^{s}_{t-1} h_{s,t} + \varepsilon_{s,t} \tag{5c}$$

where $\varepsilon_t = (\varepsilon_{I,t}, \varepsilon_{m,t}, \varepsilon_{s,t}, \varepsilon_{DIV,t} / X_{t-1}) \sim$N $(0, H_t)$ and $h_{I,t}$, $h_{m,t}, h_{s,t}, h_{DIV,t}$ are the conditional variances on the diagonal of the 4×4 matrix of variance-covariance H_t. H_t is modelled as a multivariate GARCH process, assuming a conditional Gaussian distribution. The use of a

[5] Regressions are based on the full sample available monthly data on market returns. For the period prior to inception of the CFs and ADRs their returns are set to zero.

[6] For more details see Hardouvelis et al. (2006).

GARCH approach is usually considered as an appropriate solution for modelling the conditional variances and covariances for stock market series.[7] However, the number of parameters to be estimated in matrix H_t is high and increases rapidly with the number of variables. Several constrained specifications have therefore been proposed to estimate the variance-covariance matrix H_t, the two most popular being probably the *CCC* (Constant Conditional Correlation) model proposed by Bollerslev (1990) and the *BEKK* (Baba-Engle-Kraft-Kroner) approach defined in Engle and Kroner (1995). However, these approaches assume somewhat unrealistic constraints on the parameters. The *DCC* (Dynamic Conditional Correlation) approach, proposed by Engle (2002) and Tse and Tsui (2002), allows to model in a more realistic way both the variances and conditional correlations of several series. Besides, Cappiello *et al.* (2006) have incorporated a mechanism of asymmetry in the *DCC* model by allowing the conditional correlations to react differently according the sign of shocks. This model takes into account the possible asymmetry of the impact of shocks, while it allows for fluctuations in the conditional correlations and covariances.[8] We therefore opt for a DCC asymmetric GARCH to model the conditional variance-covariance matrix H_t.

The previous system formed by equations (4) and (5a) to (5c), incorporates the prices of risks related to the world market (λ^m_{t-1}), to the exchange rate (λ^s_{t-1}) and to the local market (λ^I_{t-1}). As the evidence (Bekaert and Harvey, 1995) suggests that the price of risk is time varying, the dynamics of these prices remains to be specified. Following the literature (Bekaert and Harvey, 1995; Hardouvelis et al. 2006, amongst others), we model the evolution of the prices of global market risk, local risk and foreign exchange risk through equations (6) to (8),

$$\lambda^m_{t-1} = Exp\left(\delta'_m X_{t-1}\right) \tag{6}$$

$$\lambda^I_{t-1} = Exp\left(\gamma'_I Z^I_{t-1}\right) \tag{7}$$

$$\lambda^s_{t-1} = (\delta'_I Y^I_{t-1}) \tag{8}$$

where X_{t-1} denotes all the information on global variables available at time *t-1* and δ'_m represents the weights associated with these variables in equation 6, Z^I_{t-1} is the vector of local information variables observable on the market *I)* and γ'_I represents the weights associated

[7] The GARCH model allows components of the variance-covariance matrix to vary over time depending on products of shocks ε_t observed in the past values of H_t. It is thus suited to study the risks of a portfolio and to capture the dynamic relationships between various financial assets.

[8] Engle (2002) provides a detailed presentation of this approach.

with these variables. The price of currency risk can theoretically take positive values or negative ones, therefore it is not constrained to be positive: it is supposed to vary as a linear function of Y_{t-1}^{I}, with $\delta_I^{'}$ the weights associated with these instrumental variables.

The parameters are estimated by quasi-maximum likelihood (QML) in order to avoid the problems due to the non normality in excess returns. Given the specificities of our model (a large number of parameters, nonlinear properties…), we follow the literature and estimate the system of equations in two steps. We first estimate the equation (5a) for world returns. This step allows us to obtain the estimated values for the price of world market risk (λ_{t-1}^{m}), that we will use afterwards for each country I. In the second step we estimate for each country I equation (4) and equations (5a) to (5c), with the price of world market risk (λ_{t-1}^{m}) constrained to its previously estimated value. This second step allows us to retrieve the price of the local risk (λ_{t-1}^{I}), the price of the currency premium (λ_{t-1}^{s}), the total risk premium and its three components for each country I. This strategy of estimation is also employed by Bekaert and Harvey (1995) and Hardouvelis et al. (2006); this sequential procedure presents the great advantage of imposing the same world price of risk for each country.

3. Data and preliminary analysis

Our study focuses on 12 emerging countries[9] belonging to the Asian region and Latin America: China (CHN), Hong-Kong (HKG), India (IND), Indonesia (IDN), Korea (KOR), Malaysia (MYS), Singapore (SGP), Thailand (THA), Argentina (ARG), Brazil (BRA), Chile (CHL) and Mexico (MEX). The choice of these twelve countries is motivated by their importance as emerging economies and by the fact that they have undergone some financial liberalization and, therefore, have relatively developed equity markets. As this study focuses on equity markets we report in table 1 the official dates of the opening of the Equity market for each country. These dates are based on Bekaert and al. (2003) and Phylaktis and Ravazzolo (2002). For China, such information is not available and numerous restrictions on the transactions of foreign and domestic investors persist, despite some gradual changes. In particular, one important change was the launch of the Qualified Foreign Institutional Investor (QFII) programme in December 2002. A further step towards the equity markets liberalization of China has been accomplished through the recent (2011.12) launch of a pilot programme (RBQFII) providing foreign investors with a way to use offshore funds in RMB to buy

[9] The Economist still classifies Hong Kong and Singapore as Emerging Economies, whereas the IMF considers that they are Advanced Economies.

Chinese securities. According to the 2008 IMF classification and the de Facto classification of Reinhart and Rogoff (2004) the twelve countries under study have also undergone a variety of exchange rate regimes, ranging (column 2 and 3, table 1) from a currency board (Hong-Kong) to nearly floating exchange rates (Brazil).

Table 1. Exchange rate regimes and liberalization of equity markets

Country	IMF classification 2008.04	De facto ER regime 2008/2010[a]	Equity Market Opening
CHN	Crawling Peg (USD)	Peg to USD	NA
HKG	Currency Board	Currency Board	73.01
IND	Managed Floating	Crawling band ($)	92.11
IDN	Managed Floating	Crawling band ($)	89.09
KOR	Floating	Managed Floating	92.01
MYS	Managed Floating	Band around USD	88.12
SGP	Managed Floating	Moving band ($)	78.06
THA	Managed Floating	Moving band ($)	87.09
ARG	Peg to USD	Crawling band (USD)	89.11
BRA	Floating	Managed floating	91.05
CHL	Floating	Band around USD	92.01
MEX	Floating	Managed floating	89.05

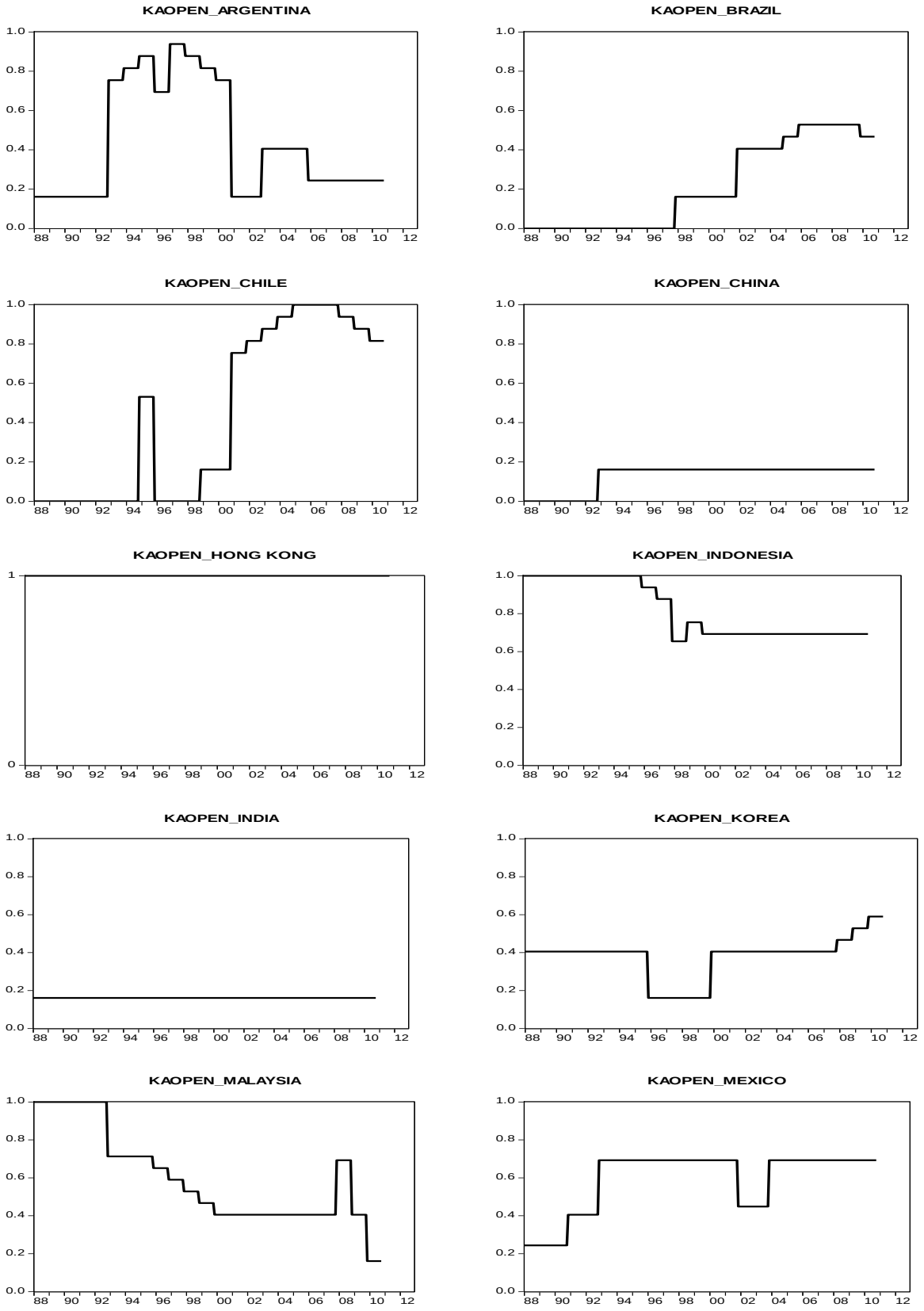
Note: De facto Exchange Rate regimes classification based on Reinhart et al. (2004), updated by Reinhart and Rogoff (2011). The classification is constant over 2008-2010, except for Argentina, which switched from a crawling band around USD to a de facto crawling peg to USD in 2009.

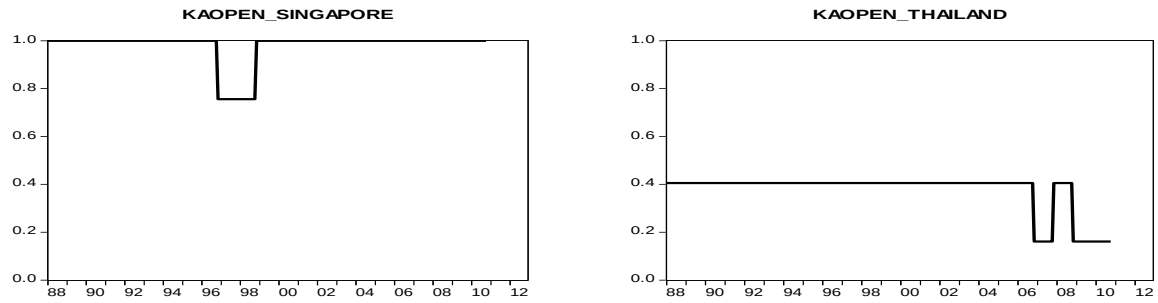
China (CHN), Hong-Kong (HKG), India (IND), Indonesia (IDN), Korea (KOR), Malaysia (MYS), Singapore (SGP), Thailand (THA), Argentina (ARG), Brazil (BRA), Chile (CHL) and Mexico (MEX).

These 12 countries are also characterized by various and fluctuating degrees of capital account openness synthesized by the Chinn and Ito (2008) index of capital account openness[10] over the period 1988-2010, as shown in the figure 1.

[10] The Chinn and Ito index of capital account openness relies on information on controls on cross-border financial transactions from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. It is available for 181 countries from 1970 to 2010.

Figure 1. The Chinn and Ito (2008) index of capital account openness





Note: The value of this index has been normalized between 0% (no openness) and 100% (no restrictions).

According to figure 1, Hong Kong and Singapore stand out with a complete openness of their capital accounts. On the opposite China appears as the country with the most restricted cross-border financial transactions, despite a slight opening up in 1993 that allowed China to catch up with India. Since that year China and India's indices of capital account openness are stuck at the relatively low level of 16%. It contrasts with the strong trend of liberalization of the capital flows of Brazil, Chile and Mexico. However, Malaysia and to a lesser extent Indonesia have experienced the reverse trend: from relatively open capital accounts to increased restrictions. This decrease in openness is fuelled by the Asian crisis of 1997-1998 which has been followed by an increase in restrictions on cross-borders capital flows not only in Malaysia and Indonesia, but also in Korea and even in Singapore. The same kind of phenomenon can be observed for Argentina: during its crisis of 2001-2002 its degree of capital account openness dropped from 75% to 16%. This closing up during episodes of speculative attacks is to be expected. In this respect the last global crisis is somewhat different: it did not begin with speculative attacks on emerging economies currencies, but with the Subprime crisis in the US. Consequently its effects on the financial openness of emerging markets are more ambiguous. In the first stage of the crisis the emerging markets seemed partly preserved from the turmoil affecting developed economies, but the extension of the crisis in 2008 did not spare them. At that stage some emerging countries probably welcomed capital inflows, which may explain for instance why the degree of openness transitorily increases in Malaysia from 41 to 69% in 2008. In 2010 the policy of quantitative easing led by a number of leading economies (notably the US and the UK) triggered undesired inflows and real appreciation in many emerging economies. Brazil and Thailand responded to this "international currency war"[11] by increased restrictions on cross borders capital flows and, accordingly, their indices of capital account openness drops at the end of the period.

[11] A term coined by Brazil's finance minister, Guido Mantega in September 2010.

We consider three groups of data: (i) monthly returns of the stock market index in each emerging country and the world MSCI return, (ii) real exchange rates expressed vis-à-vis the dollar, (iii) macroeconomic and financial variables used to explain the price of risk and to construct the diversification portfolio (see section 2). The data are monthly and cover the period from February 1988 to December 2012, except for China (December 1993 to November 2008) and India (February 1998 to July 2008).

For the national index return, we use the *Emerging Markets Global* indices (EMG) extracted from *Morgan Stanley Capital International* (MSCI), except China and India for whom they are computed from the total return on the S&P/IFCG Composite index.[12] For the world market portfolio, we use the MSCI world index. Stock market returns are defined as $R_{i,t} = \ln\left(P_{i,t} / P_{i,t-1}\right)$ where $P_{i,t}$ is the stock market index at time *t*. The excess return of each index is calculated using the one-month Eurodollar rate as a proxy of the risk free rate. The series of real exchange rates are expressed relative to the dollar U.S. and are extracted from the *International Financial Statistics* (IFS) of the International Monetary Fund and Financial Statistics of the *Federal Reserve Board*.[13] Unit root tests show that all series of excess stock returns and variation in real exchange rates are stationary.[14]

Information variables are used in order to estimate the prices of the different risk factors. Following Bekaert and Harvey (1995) and Hardouvelis et al. (2006) among other, in order to estimate the price of the global market risk and the price of risk associated with unexpected fluctuations of real exchange rates, we have retained the following factors: the first lag of the global market dividend yield in excess of the 1–month Eurodollar deposit rate, the first lag of the change in the term spread, the first lag of the default spread and the first lag of return on a U.S treasury certificate to 1 month. All these information variables are taken from Datastream. Regarding the price of risk of local market for each emerging market, the

[12] As explained by Bekaert et al. (1998), two main sources of emerging market benchmarks exist: The International Finance Corporation Global (IFC) and Morgan Stanley Capital International (MSCI). If we retain the Global indices of each source (IFCG) and (EMG), we find little difference in their behavior. The correlation between the two indices is greater than 0.91 for all countries under study except for China and India (0.41-0.45). The MSCI source presents the longest history (For IFC, data are not available after 2008), therefore, we choose to focus on the MSCI, only for China and India, we retain IFCG indices which provides a better study of the impact of capital market liberalization on the returns.

[13] We use the change in the currencies' real exchange rate as a measure of PPP deviations. Intuitively, it is more appealing to approximate this risk through the real exchange risk, since changes in the real exchange rate come from the combined effects of changes in the inflation differential and changes in the nominal currency value. In addition, using changes in the real exchange rate helps overcome possible complications due to fixed exchange rate regimes or discrete changes in nominal exchange rates due to devaluations or currency peg management.

[14] Results are available upon request from the authors.

following set of information variables has been selected, (for the motivation of this selection see for example, Bekaert and Harvey, 1995; Gerard et al., 2003; Hardouvelis et al., 2006): the first lag of excess equity returns, the local dividend yields and the first lag of the variation of real exchange rate.

To construct the diversification portfolio (see section 2) we need to define a set of eligible stocks, which may be bought both by global and local investors. We use the MSCI world index, 34 MSCI global industry portfolios, CFs of country I and ADRs of country I listed on the New York Stock Exchange as the eligible set for each country I. The composition of the industry portfolios is identical to the one selected by Carrieri et al. (2007). The number of ADRs varies for each country. In the case of Argentina, Brazil, Chile and Mexico, which have a large number of ADRs, as Carrieri et al. (2007) we select up to five ADRs per country based on their listing date in order to preserve degrees of freedom in our regression. A complete list of the set eligible securities is reported in Table A2 in appendix.

Some descriptive statistics are presented in Table A3 in Appendix. The row 2 of this table includes the average and standard deviation of stock returns for the emerging markets and the global market. The mean of stock returns is in most cases higher than the mean of foreign exchange returns. The standard deviation of stock returns is also higher. In particular all emerging countries of our sample are characterized by a higher volatility of their stock returns than the world market's one. The most volatile market is the Brazilian one which also presents the highest mean. Panel B of Table A3 also reports for each emerging country I the correlation coefficients between: (*i*) the return on the local stock index (R_I) and the world return (R_m), (*ii*) the return on the local stock index (R_I) and the return on the diversification portfolio (R_{DIV}), (*iii*) the return on the diversification portfolio (R_{DIV}) and the world return (R_m). As expected the world return is correlated with the diversification portfolio. Of more interest is the fact that the correlation between the diversification portfolio and the local portfolio is always much higher than the correlation between the world portfolio and the local portfolio. For instance, the correlation between the world market and the return on the Indian Stock market is only 0.261, the second lowest after the one of China. But the correlation between the Indian Stock return and the corresponding diversification portfolio is around 0.603, close to the levels of Argentina and Indonesia. Therefore the degree of financial integration of the Indian Stock market is much more higher and similar to the ones of Argentina and Indonesia than it appears at first sight.

However, these average correlations may hide significant time variations in the degree of financial integration as well as in the relative importance of the local component in the total risk premium of each of the 12 emerging stock markets under study. Therefore we turn in the next section to the estimations of the time varying risk premia and the time varying index of financial integration.

4. Empirical Results

We present here all the results from the estimation of the IAPM and of the integration index. Firstly, we analyze the significance and the importance of each source of risk. In particular, we detail the results of the estimations of the currency risk premium which represents one of the contributions of this paper. Secondly, we discuss the dynamic of the financial integration degree and propose a joint analysis of the financial integration dynamics and the evolution of the risk premia and its three components.

4.1. The relative sizes of the risk premiums and the dynamics of the total and currency risk premiums

Before turning to the dynamics of the risk premium and its three components for each emerging country under study it is interesting to characterize their average relative importance for each country. Table 2 reports the means of the three components of the total risk premia for each emerging stock market: the local market premium, the global market premium, and the currency risk premium due to the unexpected fluctuations of real exchange rates of each country vis-à-vis the U.S. dollar. These results are derived from the estimation of equations (4) to (8).

Table 2. The risk premiums and their relative sizes

	Estimation of IAPM			Weight of each risk premium (%)		
Countries	**WRP**	**CRP**	**LRP**	**WRP**	**CRP**	**LRP**
ARG	0.332**	**0.056****	0.617**	29.5	**5.8**	64.7
	(28.595)	(8.668)	(47.912)			
BRA	0.385**	**0.222****	0.393**	34.4	**16.5**	49.1
	(27.029)	(19.645)	(23.452)			
CHL	0.320**	**0.238****	0.442**	29.9	**20.8**	49.3
	(34.837)	(28.429)	(33.684)			
CHN	0.151**	0.108	0.741**	11.9	7.9	80.277
	(4.460)	(1.179)	(11.993)			
HKG	0.418**	0.005	0.576**	39.8	3.3	56.9
	(24.379)	(0.160)	(24.671)			
IND	0.248**	0.048	0.703**	15.9	9.5	74.6
	(6.848)	(0.723)	(10.176)			
IDN	0.332**	**0.168***	0.499**	26.3	**25.94**	47.8
	(4.919)	(2.147)	(31.403)			
KOR	0.667**	-0.464	0.797*	36.8	16.7	46.5
	(2.723)	(-0.820)	(2.481)			
MYS	0.382**	**0.304****	0.312**	33.7	**28.5**	37.8
	(27.018)	(17.517)	(26.747)			
MEX	0.287**	**0.381****	0.332**	32.6	**24.97**	42.5
	(5.839)	(3.837)	(6.013)			
SGP	0.423**	**0.138****	0.438**	42.0	**13.5**	44.5
	(49.636)	(17.578)	(49.670)			
THA	0.217**	**0.142****	0.640**	22.7	**14.5**	62.8
	(37.479)	(36.843)	(91.363)			

Notes: The levels of significance are 1% (**) and 5% (*). *WRP*, *CRP* and *LRP* are, respectively, the average world market risk premium, the average currency risk premium, the average local-market risk premium. The t-statistics are given in parentheses.

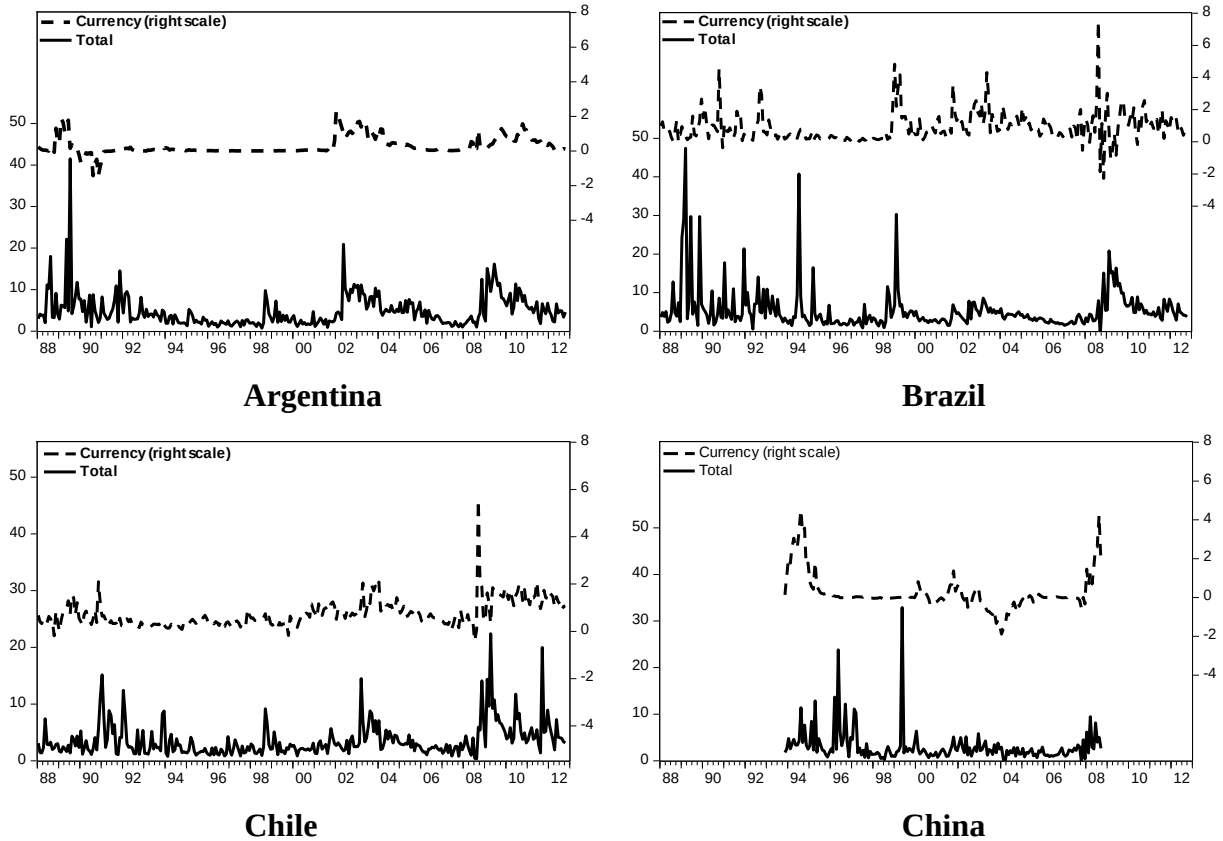
China (CHN), Hong-Kong (HKG), India (IND), Indonesia (IDN), Korea (KOR), Malaysia (MYS), Singapore (SGP), Thailand (THA), Argentina (ARG), Brazil (BRA), Chile (CHL) and Mexico (MEX).

Overall, we find that the average risk premiums linked to world and local equity markets are significant for all countries of our sample. The currency risk premium is significant for 8 markets among the 12 studied. In particular this risk premium is significant for the four countries of Latin America (Argentina, Brazil, Chile and Mexico) and four Asian countries (Indonesia, Malaysia, Singapore and Thailand). This result indicates the importance of this risk due to the volatility in the exchange markets of these emerging countries and the connection between the foreign exchange market and the stock market**s**. Indeed, as suggested by Phylaktis and Ravazzolo (2004), the exchange rate affects the stock market through its impact on economic activity and the current and future cash flows of companies while the stock market impacts the exchange rate through its effect on wealth and the demand for assets. Not surprisingly, for countries participating in an exchange rate system with a hard peg like China and Hong-Kong, the currency risk premium is not significant.

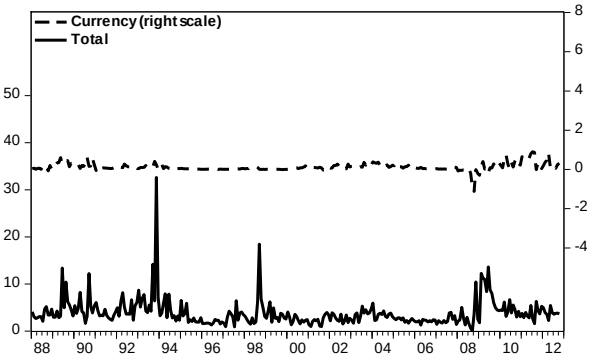
Table 2 also reports the weight of each risk premium in the total risk premium. We can distinguish two groups of countries: (i) the first one in which the local-market risk premium is substantial and forms a big part of the total risk premium (more than 50%): Argentina, China, Hong Kong, India and Thailand. In those countries, the value of the total risk premium is dominated by the value of the local market risk premium, reflecting a situation of markets partially segmented. As could be expected, the local risk premium is the highest (80%) in China where it represents around 8 times the global risk premium ; (ii) the second group of countries is characterized by a total risk premium mainly dominated by the international risk (i.e. world equity and currency market). Unlike the first group, those countries are also characterized by a significant and high currency risk premium, (Malaysia, Indonesia, Mexico, Chile, Brazil), implying that the total premium from international investment is mostly a reward for exposure to currency risk.

Figure 2 shows the dynamics of the total and the currency risk premiums over our sample period.

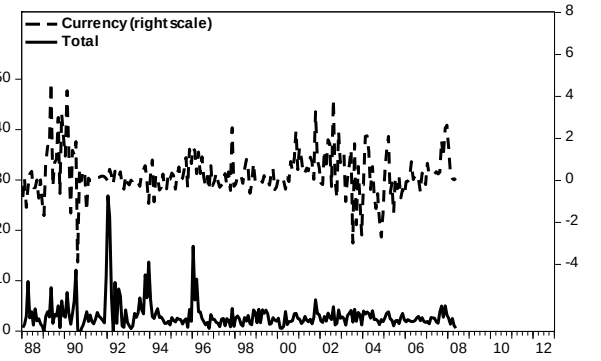
Figure 2. Dynamics of the currency risk premium and the total risk premium



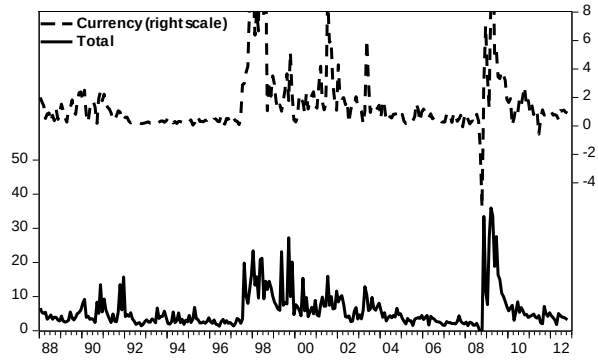
Note: the vertical axes correspond to the currency risk premium (right scale) and Total risk premium (left scale) in (%).



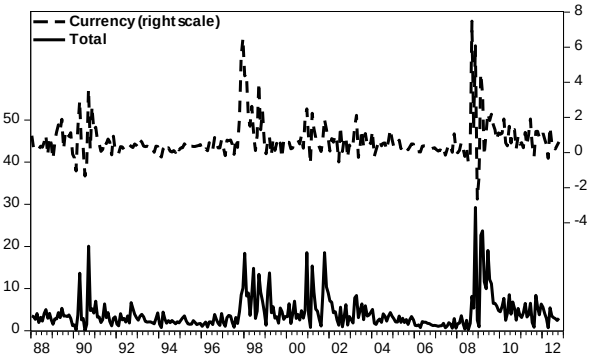
Hong-Kong



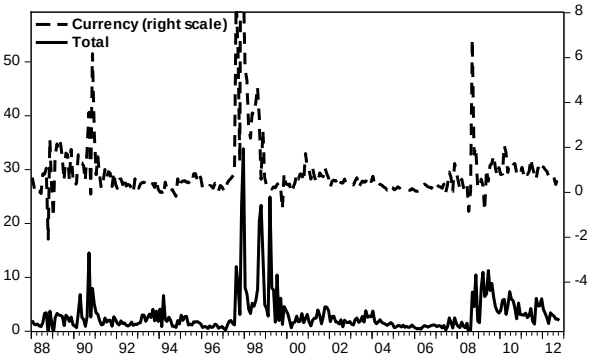
India



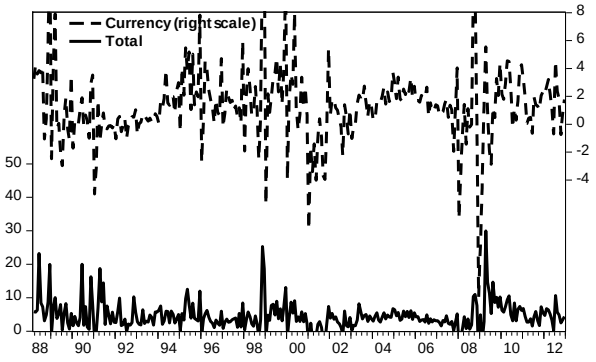
Indonesia



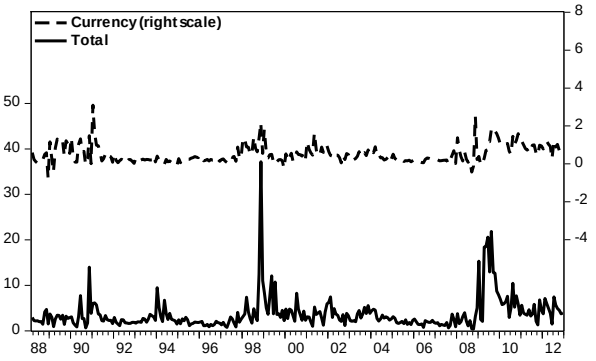
Korea



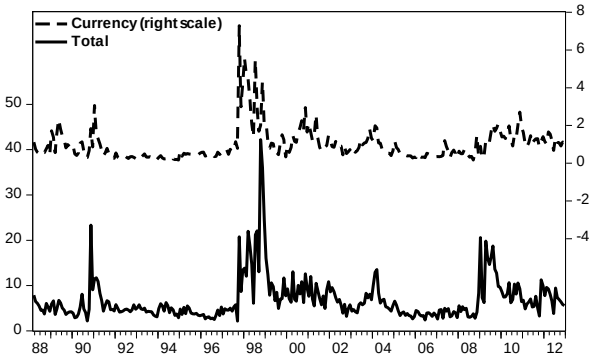
Malaysia



Mexico



Singapore



Thailand

Note: the vertical axes correspond to the currency risk premium (right scale) and Total risk premium (left scale) in (%).

It can be seen from the figure 2 that the currency risk premium and the total risk premium have been affected by the different financial crises that occurred in South America in 1994 and in 2002 and in Asia in 1997 as well as by the current global crisis. The two series are highly time varying and are marked by two peaks. The first one corresponds to domestic crisis, such as the Mexico's one in 1994 and the Argentina's one in 2002 or to regional crisis as the Asian crisis of 1997-98. The second one corresponds to the global crisis in financial markets that appeared in 2007-2008 and hit all countries. However, some countries, particularly Asian countries, seem to have been more affected by the regional crisis than by the last global crisis. This may be explained by the existence of common factors for these countries such as: (i) poorly managed financial liberalization of capital flows, (ii) the fragility of banking systems and (iii) speculative attacks against fixed or semi-fixed exchange rate regimes. There are also specific elements to these countries that contributed to these financial and economic crises such as a foreign debt with a high proportion of short-term maturities (Eichengreen, 2004). According to figure 2 the currency risk premium is globally positive and grows significantly in the 1990s when financial markets became more liberalized and during the period of 2007-09.

4.2. Time-Varying Integration

The degree of integration (*II*) is estimated using equation (3). If *II* tends to 1, the local market risk premium can be considered as negligible: the total risk premium is mainly formed by the international risk premium (*i.e.* world and currency risks) and the local market converges to the global market. If *II* is near 0, the reverse case occurs: the market is partially integrated and the total risk premium is mainly composed by the risk premium related to the local market.

Table 3, reports the means and the standard deviations of the integration indexes over the whole period and over sub-periods.

Table 3. Integration indexes

Countries	Mean - whole period	Std. Dev - whole period	Mean 1988-2000	Mean 2001-2012
Argentina	0.452	0.197	0.425	0.481
Brazil	0.610	0.261	0.403	0.832
Chile	0.623	0.165	0.528	0.724
China*	0.260	0.094	0.221	0.295
Hong Kong	0.702	0.143	0.651	0.758
India	0.414	0.261	0.244	0.703
Indonesia	0.456	0.144	0.365	0.553
Korea	0.586	0.034	0.569	0.604
Malaysia	0.562	0.040	0.545	0.579
Mexico	0.764	0.137	0.691	0.841
Singapore	0.756	0.078	0.705	0.811
Thailand	0.521	0.120	0.447	0.599

Notes: China (CHN), Hong-Kong (HKG), India (IND), Indonesia (IDN), Korea (KOR), Malaysia (MYS), Singapore (SGP), Thailand (THA), Argentina (ARG), Brazil (BRA), Chile (CHL) and Mexico (MEX).

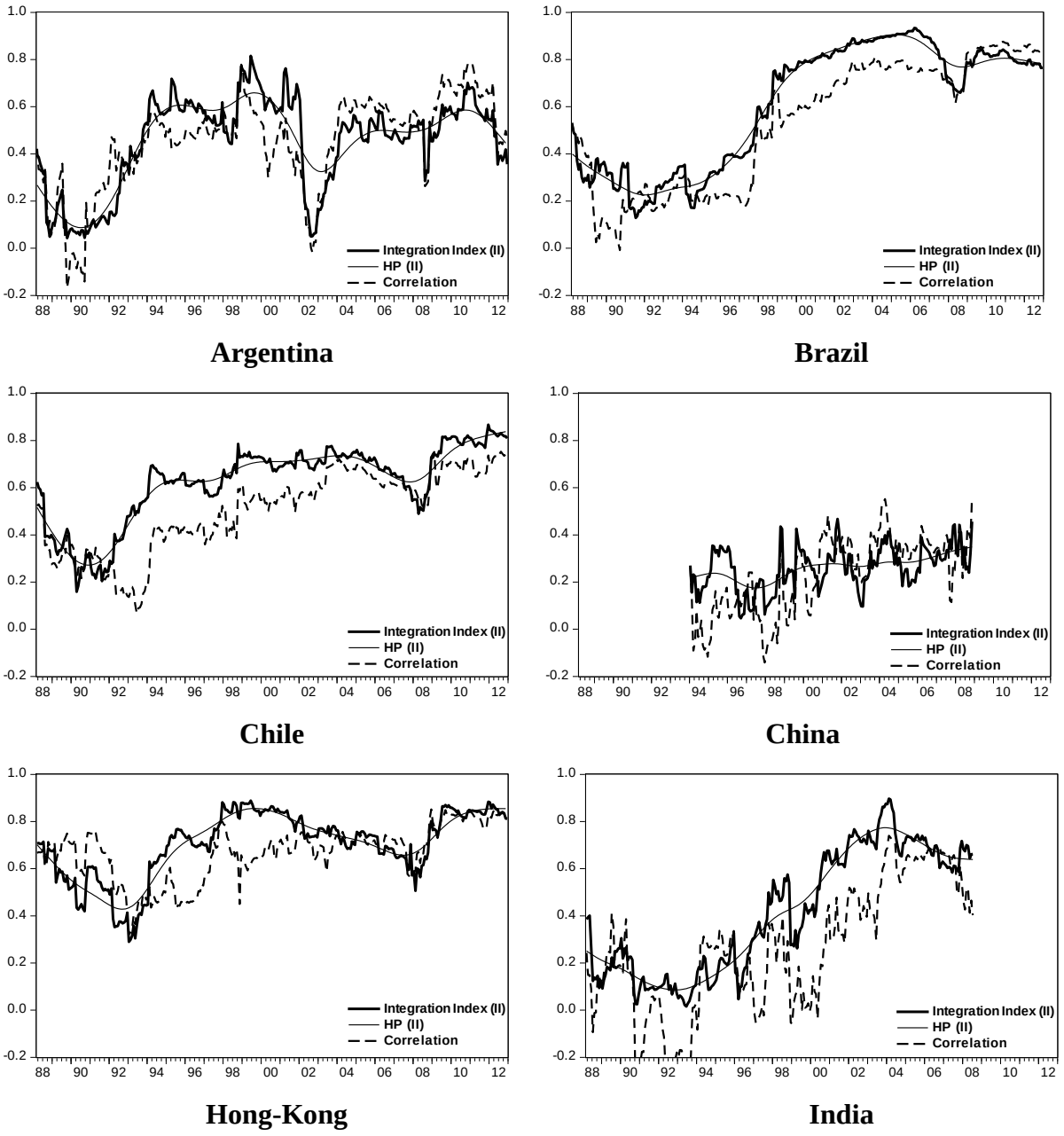
Globally, the results are significant and consistent with the financial and economic reality of each emerging market. A detailed analysis of Table 3 allows us to distinguish three groups of countries ; (i) the first one includes countries characterized by a high degree of integration, greater than 0.7 in average (Hong Kong, Mexico, Singapore), which even exceeds 0.8 during the period of 2001-2012; (ii) the second group is characterized by countries in which markets are partially integrated (mean between 0.5 and 0.6): Brazil, Chile, Korea, Malaysia and Thailand, (iii) the third group includes the other emerging countries in which the financial integration is lower than 0.5 such as China, India Indonesia and Argentina. Our results are consistent with previous studies of Karolyi (2004) and Carrieri et al. (2007). For example, Carrieri et al. found that Mexico has the highest degree of integration (0.61) whereas Argentina is weakly integrated with the global market (0.37). Our results also confirm that the degree of integration has increased over time for all markets, confirming the progress of financial liberalization and the gradual globalization of stock markets.

Figure 3 displays the time varying integration index (II) of each country, as well as the dynamics of the correlation between each domestic equity return and the global market usually used as an indicator of integration. The integration index II, as it reflects the contribution of assets such as CFs and ADRs to financial integration, offers a more accurate measure of financial integration, than the simple correlation with the world market, as

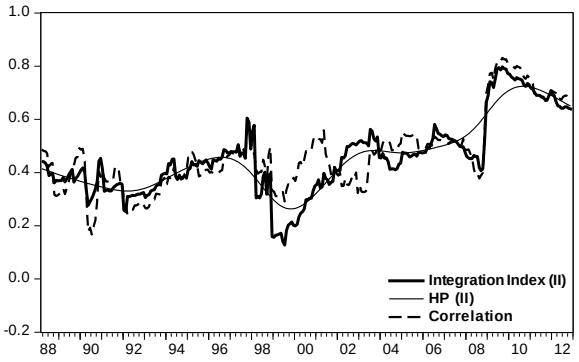
evidenced by Dumas et al. (2003).[15] Not surprisingly, the correlations are in most cases different compared to the integration index.

Figure 2 also reveals important differences in the dynamics of integration of our sample countries.

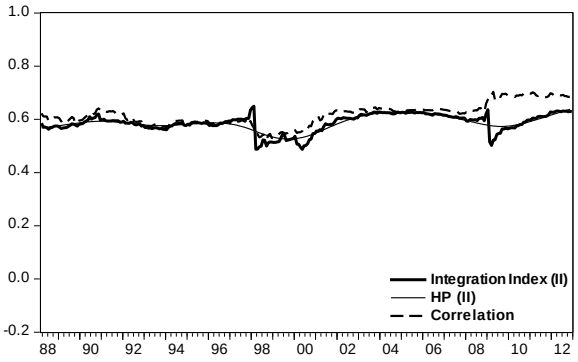
Figure 3. Integration Index and Conditional correlations of market index returns with world market returns



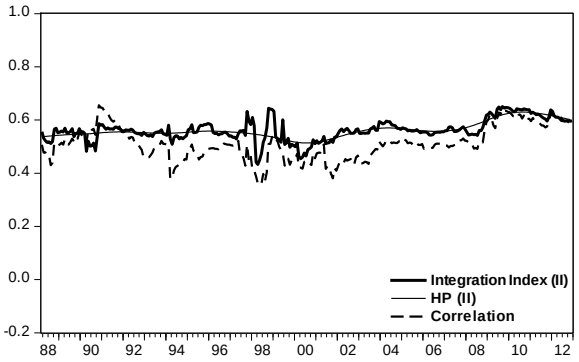
[15] According Dumas et al. (2003), it is inappropriate to conclude to the integration of financial markets only from the simple calculations of correlations with the world stock returns.



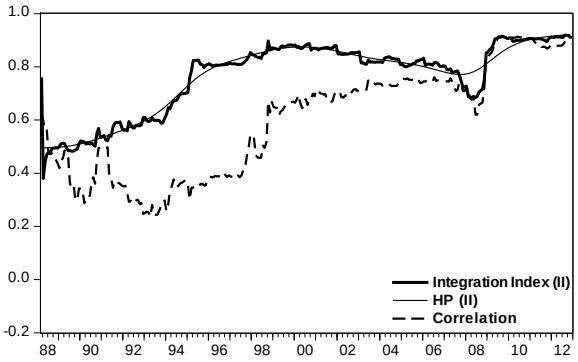
Indonesia



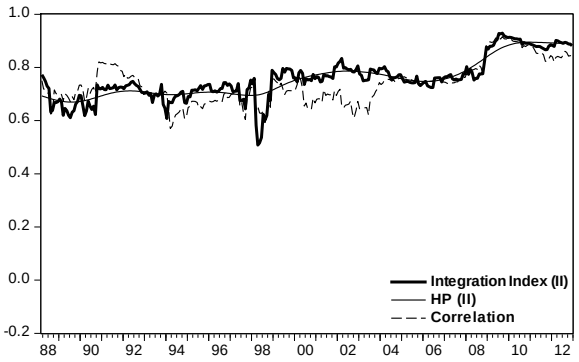
Korea



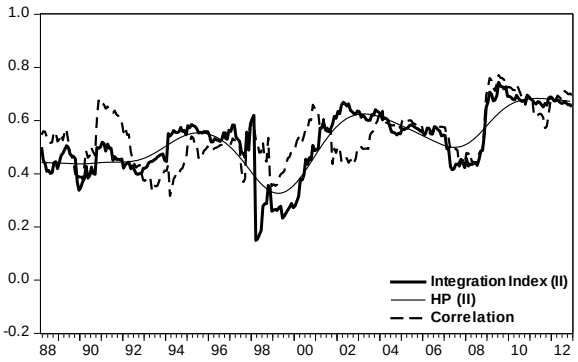
Malaysia



Mexico



Singapore



Thailand

Note: the Hodrick Prescott Filtered series (HP(II)) applied Integration Index (II).

Regarding the Latin American markets, we note a similar rising trend of the financial integration in Brazil, Chile and Mexico, which contrasts with the case of Argentina. In the case of Brazil, Chile and Mexico we note two phases of evolution. The first one covers the beginning of the period (from 1988 to 1993-94), where the markets are essentially segmented (II is on average 0.27 for Brazil, 0.34 for Chile, 0.53 for Mexico). The second phase begins after 1994 and is marked by a significant increase in the integration index, mainly explained

by the introduction of ADRs listings on the NYSE.[16] During this second phase the three countries are characterized by a high integration index II on average: 0.78 for Brazil after 1996, 0.69 for Chile after 1994 and 0.83 for Mexico after 1994. At the end of the period Mexico has the most integrated market amongst the four Latin countries and also amongst all the 12 countries under study. Despite the outbreak of the Mexican Peso crisis in the end of 1994, the Mexican market has benefited from the assistance of international institutions and the high contribution of U.S investor participation in Mexican stocks.[17] The Brazilian stock market has also suffered from the consequences of the Mexican Peso crisis as evidenced by the decrease of its integration degree in the end of 1994. Moreover, these three Latin countries have been significantly affected by the global crisis in 2007. Their degrees of financial integration have, indeed, declined during the crisis, especially after the bankruptcy of Lehman Brothers' in September 2008. However, from 2010 onwards the financial integration of the three countries has increased, reaching levels above 0.8.

The relatively low integration of the Argentinean market at the beginning of our sample period confirms the findings of Carrieri et al. (2007). However, the introduction of the Argentina Fund on the New York Stock Exchange (NYSE) in October 1991 and the ADR listings in 1993-94 seem to have had an important positive impact on the financial integration. We remark a large jump in the integration index which reached 0.72 in April 1995. The integration remains high until the end of 2001 (0.65 in average). The dramatic fall in the integration index of the Argentinean market in January 2002 is not a surprise (0.19 in April 2002, and 0.10 in July against 0.67 in December 2001). This decline reflects the severity of the economic crisis that hit Argentina at that time. To fight the bank runs and the capital flight, the Argentinean government took measures that resulted in a sharp drop in the capital account openness (see the index kaopen for Argentina in figure 1) in 2001 and 2002. Besides, the default on the public debt in December 2001 and the end of the currency board and of the peg on the USD in January 2002 contributed to the disruption of financial markets. It is only in 2010 that Argentina's financial integration index catches up with its pre-crisis level. Until the end of the studied period, the recovery of Argentina's integration index seems fragile and its stock market remains largely segmented. The global crisis that began in 2007 with the

[16] We note that for the Brazilian market, the firsts exchange–traded ADR are Breskem S.A. and Fibria Cellulose, which have started trading in 1995, for Chile it began in 1992 with the listing of Compania Cervecerias Unidas, and for Mexico in 1992 with the listing of Empresas S.A.

[17] The United States with international organizations, lend 50 billion U.S. dollars in Mexico, one week after the onset of the crisis, of which 18 billion through the International Monetary Fund.

subprime and worsened in September 2008 had a particularly large adverse effect on the degree of financial integration of Argentina.

The dynamics of integration index is also heterogeneous amongst Asian countries, but here again there is an upward trend during the sample period for some of the countries. India's financial integration is characterized by the most pronounced upward trend, which allows it to improve dramatically from a level fluctuating from 0.05 to 0.4 at the beginning of the period to levels around 0.7 at the end of the period. The introduction of ADRs listings on NYSE in 1999-2000 probably helped to improve the financial integration of the Indian Stock market. This result for the de facto index of financial integration contrasts with the very low and stable de jure index of capital openness of India displayed in figure 1. It illustrates the usefulness of estimating de facto indexes of financial integration. Despite lasting capital controls the Stock market of India appears to be largely integrated at the end of the period. Hong Kong sees a large rise in its financial integration index after 1993. The period between 1995 and 2006 is marked by a high level of integration (0.77 in average). However, during the global crisis the integration index of Hong Kong has decreased (0.51 in April 2008), before rising again from 2010. For China the upward trend financial integration is less marked, and its stock market remains largely segmented with an integration index constantly below 0.5.

The Indonesian and Thai markets appear as partially segmented over the period of analysis. Their integration index varies between 0.2 and 0.6 until 2009. For the last three year of our sample period their integration has however increased and reached 0.7 on average. The Asian crisis that began in July 1997 appears to have negatively affected the financial integration indexes of Korea, Singapore, Malaysia, Thailand and Indonesia. But amongst these 5 countries Indonesia and Thailand appears to be the more impacted. In December 1998, their integration index is marked by a strong decline from 0.39 to 0.16 for Indonesia and from 0.54 to 0.28 for Thailand. The stock markets of Singapore and Hong-Kong appear as largely integrated with integration indexes fluctuating around 0.7 and above, from the mid-1990s onwards for Hong-Kong and over the whole period for Singapore. This true to a lesser extent for Korea and Malaysia, with indexes fluctuating around 0,6 for Korea and 0.55 for Malaysia.

The financial integration indexes of all the Asian countries under study have been in a first stage adversely hit by the global crisis that began in 2007. But for some countries the worsening of the crisis has led in a second to stage to an improvement of their indexes of financial integration. This appears to be the case for Indonesia and Thailand and, to a lesser extent, for Singapore and Malaysia. This apparent paradox may be related to two factors.

First, as the crisis spread to these emerging markets their co-movements increased with those of internationally investable stocks. Second, in the context of a global crisis some efforts were probably made by these countries to attract foreign investors.

Overall our findings are consistent with our expectations that the reduction of capitals controls, the graduate liberalization of capital markets and the growth of eligible securities (ADRs and CFs) should have led to increasing degrees of financial integration. Our results are also consistent with the findings of Carrieri et al. (2007) and Karolyi (2004), but are somewhat different from those Bekaert and Harvey (1995). These last authors have used a similar theoretical approach based on the IAPM. But, using a Markov switching model, they find a very volatile level of integration, that varies abruptly between the two polar cases of perfect integration and strict segmentation. These authors also find that some countries become less integrated over time. Their findings have launched several debates, as they are inconsistent with the general perception that countries become more integrated, with the exception of periods of severe crisis.

5. Conclusion

Financial liberalization should have improved the financial integration of emerging stock markets. However de facto integration may differ from de jure measures of capital account openness. Besides local and global crises may produce some short term (or medium terms) reversals in financial integration. Lastly, the currency risk is often neglected in the models of emerging stock markets risk premiums, whereas it may play an important role, due to deviations from the purchasing power parity (PPP), volatile inflation and devaluations following speculative attacks.

To study the dynamics of financial integration and of the risk premiums for twelve Emerging Stock markets from Asia and Latin America, we have opted for the model of Errunza and Losq (1985). It allows us to derive a measure of financial integration that is less variable and more easy to interpret than the one by Bekaert and Harvey (1995), based on Markov switching. We introduce a currency risk factor in the model to take account of PPP deviations.

Our results show that the currency risk premium is an important component of the total risk premium on many of these emerging stock markets. The degree of financial integration is

characterized by an upward trend in a number of emerging countries. This upward trend may be related to the cross listing of emerging countries stocks (through ADRs in the US) and the increasing availability of country funds. Crises tend to disrupt the progress in financial integration. This appears to be especially true for Argentina, which recovery from its 1999-2002 crisis has been difficult. It is also true for the Asian crisis and for the last global crisis. Though in this last case, the drop in financial integration in the first stage of the crisis (Subprime crisis) has been followed for some countries by an increase in the degree of financial integration after the worsening of the crisis in 2008. This last evolution may be related to a kind of contagion effect (in the broad sense) and to the welcoming of foreign investors in times of scarce liquidity.

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TABLE A.1
Literature Review

Authors	Asset Pricing and barriers to international investment	Finding and Results
Black (1974)	Barriers take the form of proportional tax.	Obstacles to investment reduce the return for short and long positions.
Stulz (1981b)	Barriers can be represented as taxes on the absolute value of an investor's holding of risky foreign assets.	Hold as long as barriers to international investment make it costly for a domestic investor to hold the same foreign security simultaneously long and short.
Errunza and Losq (1985) Eun and Janakiramanan (1986)	Outright ownership restrictions	-Risk premium determined by the severity of the constraint and the "pure" foreign market risk. -For foreign securities that cannot be held freely by foreign investors, there are two ruling prices, a higher one for domestic investors, and a lower for foreign investors.
Stulz and Wasserfallen (1995) Domowitz et al. (1997)	Price discrimination and ownership restrictions	Demand curves for domestic securities from foreign investors are downward sloping.
Bekaert and Harvey (1995)	Methodology combines the two polar specifications of full integration and complete segmentation. Market expected return depends both on its volatility and on its world beta.	-Degree of integration changes over time and market is partially segmented. -Some countries became less integrated over time.
Bekaert and Harvey (2000) Henry (2000)	Removing barriers to international investment	-Opening a country's market to foreign investors has a relatively small impact on the risk premium of that market. -The small decrease in risk premium may be explained by the home-bias.
Errunza, Hogan and Hung (1999)	Benefits of international diversifications	-The investors can obtain most of the benefits from in international diversification by investing in assets that trade only abroad. -It is inappropriate to use correlations of market wide index returns as a measure of the potential benefits of international diversification
Karolyi (2004)	-Capital market liberalization and importance of ADRs for international capital markets. -Influence of ADRs on the integration, development of markets and on the gains from international diversification.	-Growth and expansion of the ADRs markets in the ermeging markets is significantly positively associated with growing market integration over time. -Growth of the ADRs does not facilitates development of local markets.
Carrieri et al. (2007)	-Determinants of market integration. -Impact of substitute assets (industry portfolios, ADRs and CFs) on the development and integration of local markets.	- While local risk is still a relevant component in the formation of the risk premium, none of the countries appear to be completely segmented. -The effect of financial development and market liberalization to have a positive impact on market integration.

TABLE A.2
List of Eligible Securities

The eligible set securities consists of 34 MSCI global industry portfolios, twelve Country Funds (CFs), 40 American Depositary Receipts (ADRs) and the MSCI world index. This set of eligible securities used to compute the Diversification portfolio (DIV) for each country.

Panel A: Global Industry Indices		
Aerospace and defense	Electronic Equipment Manufacturers	Media
Automobiles	Energy Equipment and services	Metals and Mining
Banks	Food Products	Oil Gas and consumable fuels
Beverages	Gas utilities	paper and Forestry Products
Chemicals	Health care equipment and support	Real Estate
Communications Equipment	Hotels Restaurants and Leisure	Textiles Apparel and Luxury goods
Computers and Peripherals	Household durables	Tobacco
Constructions Materials	Household Products	Trabsportation (Marine)
Financial services	Iformation Technology services	Trading Companies and distrubtion
Telecommunication services	Insurance	Transportation (Airlines)
Electric utilities	Machinery	Transportation (Road and rail)
Electronic Equi. Instruments and Components		

Panel B: Country Funds (CFs)	Start date		Start date
	Argentina Fund	10/91	Korea Fund 8/84
	Brazil Fund	3/88	Malaysia Fund 5/87
	Chile Fund	9/89	Mexico Fund 6/81
	China Fund	7/92	Singapore Fund 7/90
	India Fund	2/94	Thailand Fund 2/88
	Indonesia Fund	3/90	

Panel C: ADRs	Start date		Start date
	Argentina		India
	BBVA Banco Frances	12/93	Infosys. 4/99
	CRESUD Sacifya	10/97	ICICI BK. 4/00
	Telecom Argn.B	1/95	TATA communications 9/00
	TSPA. Gas Del Sur	12/94	DR. Reddy's Labs. 5/01
	YPF.	7/93	HDFC Bank 8/01
	Brazil		Indonesia
	Net services de Communicacao	11/96	PT Indosat. 11/94
	Braskem SA	2/95	Telekomunikasi Indo. 12/95
	Companhia Brasl. Distb.	7/96	
	Fibria Celulose	1/95	Korea
	Tefonica Brasil	12/98	Korea Elec. Pwr. 11/94
			SK Telecom 7/96
	Chile		Posco 11/94
	VINA Concha	11/94	Financial GP. 11/01
	SQM SPN.	10/93	
	Enersis S.A.	11/93	Mexico
	Empresa S.A.	8/94	Empresas S.A. 6/92
	Compania Cervecerias Unidas	10/92	Grupo Casa Saba 1/94
			Grupo Televisa 1/94
	China		Grupo Somec 7/93
	Huaneng Pwr.	11/94	GRF. Inbursa 10/96
	Sinopec Shai. Petrochem.	8/93	
	Guangshen RY.	6/96	
	Chin. ETN. AIRL.	3/97	

TABLE A.3.
Summary statistics

Table 2 reports descriptive monthly statistics for emerging markets and world market dollar returns for the sample period from February 1988 to December 2012 except for China where the data start in December 1993 to November 2008, and India from February 1988 to July 2008. Mean and standard deviation are in percentage. The test for the Kurtosis coefficient has been normalized to zero, B-J is the Bera-Jarque test for normality, Q(12) refers to Ljung-Box statistics for serial correlation based on 12 lags and $Q^2(12)$ are Ljung-Box statistics for squared returns. The levels of significance are 1% (**), 5% (*) .

	World	***Argentina***	***Brazil***	***Chile***	***China***	***Hong Kong***
Panel A : Descriptive statistics						
Mean	0.501	0.870	1.618	1.325	0.485	0.964
Std. Dev.	4.653	11.302	12.151	7.363	8.878	7.690
Skewness	-0.479**	0.103	0.104	-0.045	0.291	0.246
Kurtosis	1.526**	0.554	0.818**	0.911**	1.423**	1.903**
B-J	40.482**	4.354	8.887*	10.459**	17.723**	48.172**
Q(12)	8.103	13.651	2.546	10.711	45.622**	22.999*
$Q^2(12)$	7.955*	15.437**	2.736	12.832**	21.572**	18.656**
Panel B : Correlation coefficients						
$\rho_{I, m}$	-	0.449	0.531	0.504	0.233	0.667
$\rho_{I, DIV}$	-	0.649	0.759	0.780	0.501	0.833
$\rho_{DIV, m}$	-	0.631	0.652	0.591	0.538	0.753

	India	***Indonesia***	***Korea***	***Malaysia***	***Mexico***	***Singapore***	***Thaïlande***
Panel A : Descriptive statistics							
Mean	1.231	0.470	0.635	0.665	1.721	0.836	0.460
Std. Dev.	8.714	11.044	10.128	7.794	9.119	7.198	9.966
Skewness	0.181	-0.392**	0.294*	-0.442**	-0.423**	0.061	-0.264
Kurtosis	0.025	1.575**	1.722**	3.103**	1.371**	2.458**	1.365**
B-J	1.353	38.564**	41.220**	129.727**	32.349**	75.511**	26.692**
Q(12)	24.553*	28.927**	24.116*	49.527**	13.625	16.395	28.335**
$Q^2(12)$	26.014**	25.339**	21.036**	34.527**	13.071**	16.286**	22.518**
Panel B : Correlation coefficients							
$\rho_{I, m}$	0.261	0.471	0.618	0.510	0.598	0.737	0.537
$\rho_{I, DIV}$	0.603	0.667	0.765	0.749	0.869	0.868	0.716
$\rho_{DIV, m}$	0.420	0.633	0.776	0.652	0.651	0.821	0.629