

INTERNATIONAL FINANCIAL INTEGRATION AND EQUITY RISK PREMIUM IN EMERGING COUNTRIES

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Introduction

Since the early 1990s, emerging and developing countries have had access to foreign capital. These countries make efforts to attract foreign investors by removing the restrictions on cross-border capital flows and deregulating their financial markets. Many financial economists find that the degree of international financial integration has increased over the last two decades. Many researchers are interested in studying the effect of capital market liberalization on economic growth (Quinn, 1997; Rodrick, 1998; Edwards, 2001; Goncharuk, 2006; Prasad et al., 2007; Quinn and Toyoda, 2008; Kose et al., 2008; Misati and Nyamongo, 2011; Vithessonti and Tongurai, 2012). Another strand of research examines the effect of market integration on the cost of capital (Tandon, 1997; Smith and Sofianos, 1997; Miller, 1999; Errunza and Miller, 2000; Henry, 2000; Bekaert and Harvey, 2000; Lins et al., 2005; Lewis, 2006). However, these studies have divided opinions concerning the effect of international financial integration on the cost of capital. In this paper, we examine the effect of international financial integration on the equity risk premium. Equity risk premium is a key input into estimating the cost of capital. If the Capital Asset Pricing Model is applied to emerging and developing economies, a country risk must be added. This country risk is associated with potential loss of funds invested in an emerging market. To model the cost of equity, researchers consider an additional risk related to emerging and developing economies (Godfrey and Espinosa, 1996; Erb et al., 1996; Damodaran, 1998; Estrada, 2000; Apoteker et al., 2006).

International Financial Integration and the cost of capital

Financial integration may lead to a cost of capital decrease. Two possible explanations are proposed by Boyle (2009). Firstly, the author explains that the cost of capital is proportional to domestic market volatility for segmented markets, but depends only on world market return covariances for integrated markets. Given that these covariances are generally much lower than local variances, which reduces security expected returns, thus it reduces the cost of capital. Secondly, Boyle (2009) argue that firms can enlarge their shareholder basis and improve liquidity, which both reduce expected returns and the cost of capital, when listed on foreign stock market.

Furthermore, Henry (2000) examine local stock market reaction to control relaxation on foreign sharing and find a high revaluation which implies a decrease in the cost of capital. In a similar analysis, Bekaert and Harvey (2000) use equity returns as a proxy of the cost of capital and estimate that it drops post stock market liberalization.

In addition, Miller (1999) studies the effect of double listing and reports a positive equity price revaluation of firms adopting this type of listing. Further, Errunza and

Miller (2000) calculate the cost of capital for non American firms and estimate that it decreases following a listing in the USA.

Moreover, Lins et al. (2005) find that investment sensibility to cash-flows decreases for emerging markets firms whose stocks are listed on the American Market suggesting that such firms have their cost of capital decreased because of easier financial constraints.

Despite the results listed above argue that international financial integration affects positively the cost of capital, many other studies show that this effect is conditional. Indeed, Bekaert and Harvey (2000) note that such benefits depend on new opportunities that offer diversification benefits to foreign investors. Because of developed markets correlations increase (Goetzmann et al., 2005), the potential cost of capital improvements is likely to be small when these markets are integrated.

To corroborate this result, Lins et al. (2005) examine American listings of foreign firms. The authors do not note any change in investment cash-flows sensibility concerning firms from developed countries. Lins et al. (2005) conclude that the cost of capital decrease is closed to developed countries.

Measuring international financial integration

Financial integration is a gradual process where dates are the most characteristic events. Many researchers in finance and economics tried to measure the intensity of financial integration in order to explain market indicators change during the different stages of financial liberalization. For this reason, Bekaert et al. (2003) find that using binary variables 0/1 may be inappropriate because it is unable to evaluate market integration intensity.

Empirical models have been developed so that financial integration degree changes over time. This leads us from a statistic paradigm segmentation/integration to a dynamic integration process partial segmentation/partial integration. Bekaert (1995), Edison and Warnock (2002) propose a continuous measure of capital markets' openness that reflects the part of foreign investment in these markets. This measure is based on the ratio of market capitalization of firms composing the *IFC Investable Index* over market capitalization of firms composing the *IFC Global Index* for each country.

Moreover, Lane and Milesi-Ferretti (2003) study international financial integration using International Investment Position (IIP). The authors propose two measures using volume and equity. More recently, in order to measure international financial integration, Vo and Daly (2007) use eight different percentage of GDP ratios based on stock of assets and liabilities, foreign direct investments and Portfolio investment equity. In this study, we adopt the measure used by Arfaoui and Abaoub (2010) which is the ratio of (FDI net inflows+ FDI net outflows) per GDP.

Model Formulation

In addition to international financial integration, we consider a set of country characteristics that may influence the equity risk premium as independent variables in the model. These variables include two of the determinants of equity risk premium that are detailed by Damodaran (2011) which are inflation and economic risk.

Inflation

Modigliani and Cohn (1979) examine the decrease of equity prices in the 70s and conclude that it is a consequence of inflation increase.

Brandt and Wang (2003) argue that equity risk premium increase (decrease) when inflation is higher (lower) than anticipated. therefore, it is not the level of inflation which determines the equity risk premium but uncertainty about it (Damodaran, 2011).

Economic Risk

Lettau et al. (2008) link changes in the equity risk premium in the USA to the changes in economic growth volatility. The authors attribute low equity risk premium of the 90s to the low volatility of consumption, employment and economic growth.

The model

$$\text{ERP}_{i,t} = \alpha_i + \beta_1 \text{IFI}_{i,t} + \beta_2 \text{inflation}_{i,t} + \beta_3 \text{Econ. Risk}_{i,t} + \beta_4 \text{Crisis}_{i,t} + \text{IFI}_{i,t} * \text{Crisis}_{i,t} + \varepsilon_{i,t}$$

for panel data $i = 1, \dots, 60$ and $t = 2000, \dots, 2010$

We use equity risk premium data available on the website of Professor Damodaran (<http://pages.stern.nyu.edu/~adamodar/>). Dependent variables are described in Table 1.

Data descriptive statistics and methodology

To estimate equity risk premium we use panel data of sixty emerging and developing countries over the period 2000-2010. The distinction between emerging and developing countries is in accordance with the World Bank classification. Our sample is diversified. Infact, it includes emerging and developing countries from six regions of the world: Asia, Central and Eastern Europe, Commonwealth of Independent States, Latin America, Middle East and North Africa and Sub-Saharan Africa. Figure 1 indicates the sample composition.

Figure 2 shows the broad trend of equity risk premium. But a detail about this figure intrigued us. We note that equity risk premium reach two peaks in 2002 and 2008. These years were marked by two financial crises. Therefore, we think that it would be interesting to include the dummy variable “crisis” into the model as an independent variable. We also consider the term of “IFI*Crisis” to decipher the effect of the interaction between international financial integration and economic and financial crisis on equity risk premium. In other words, we are interested in the effect of international financial integration on equity risk premium in crisis situation.

The broad trend of equity risk premium per region, represented in Figure 3, shows that all regions were affected by the financial crises in 2002 and 2008. This evidence makes out the fact that developed and emerging financial markets are connected.

Table 1. Description of variables and expected effects

Variable	Description	Expected effect	Explanation	Source
International Financial Integration	(FDI net inflows + FDI net outflows) / GDP (Arfaoui and Abaoub, 2010)	negative	When international financial integration increases, the cost of capital decreases (see the literature review above).	World Bank database
Inflation	Inflation rate	positive	When inflation is higher, equity risk premium increases (Modigliani and Cohn (1979), Brand and Wang (2003) and Damodaran (2011)).	World Bank Database
Economic risk	GDP Volatility : standard deviation of quarterly GDP	positive	There is a positive relationship between economic risk and equity risk premium (Lettau et al. (2008) and Damodaran (2011)).	International Financial Statistics 2010 CD ROM
Crisis	Dummy variable : it takes the value of 1 if there is financial or economic crisis and the value of 0 if not.	positive	In crisis situation, investors require higher equity risk premium.	The data is from Reinhart and Rogoff's website (http://www.reinhartandrogoff.com/data)

Figure 4 exhibits the broad trend of international financial integration. We point out an increase in international financial integration from 2000 to 2007 then a sudden drop over the period 2007-2008. We conclude that this drop is due to the subprime mortgage crisis. We also examine the changes of international financial integration per region shown in Figure 5. We notice that Central and Eastern Europe countries were the most affected by the crisis. In fact, international financial integration in this region dropped sharply in 2007.

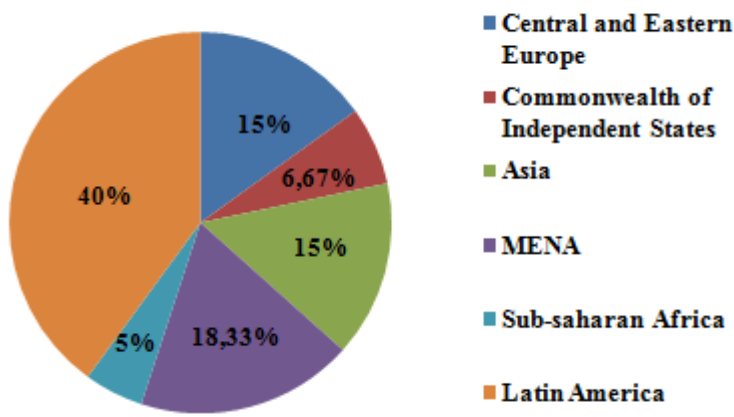


Figure 1. Sample composition

Table 2 exposes the summary statistics of the data. While examining min and max values, we noticed that there is an important variation of the variable inflation across countries and over time. The minimum value of inflation rate is -2,42% (Qatar, 2010) and the maximum value is 96,09% (Ecuador, 2000) and the mean value is 6,93%. There is also a considerable variation in the equity risk premium. The highest value is about 0,23 (Moldova, 2008), the minimum is 0,0451 (Bermuda, 2002) and the mean value is about 0,0915.

Table 3 shows the correlation matrix of the variables employed in this analysis. It appears that there is a negative relationship between international financial integration and inflation (Vo and Daly, 2007).

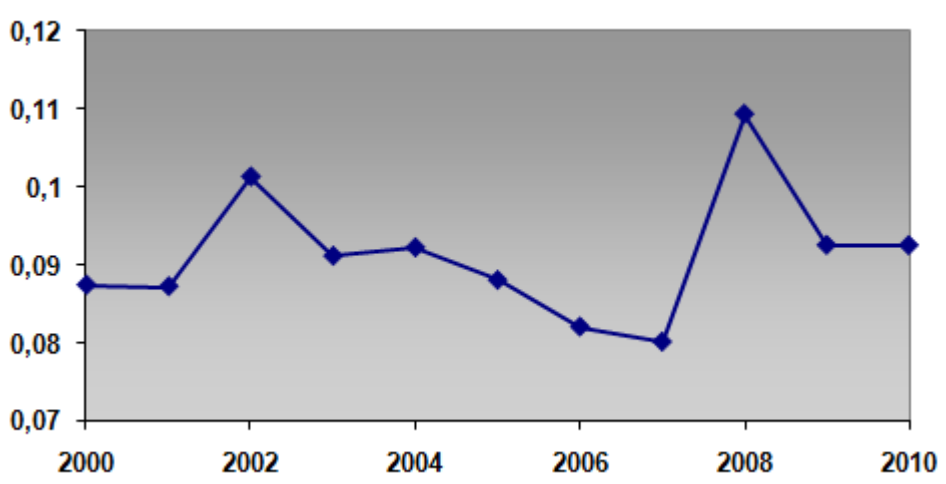


Figure 2. Broad trend of equity risk premium

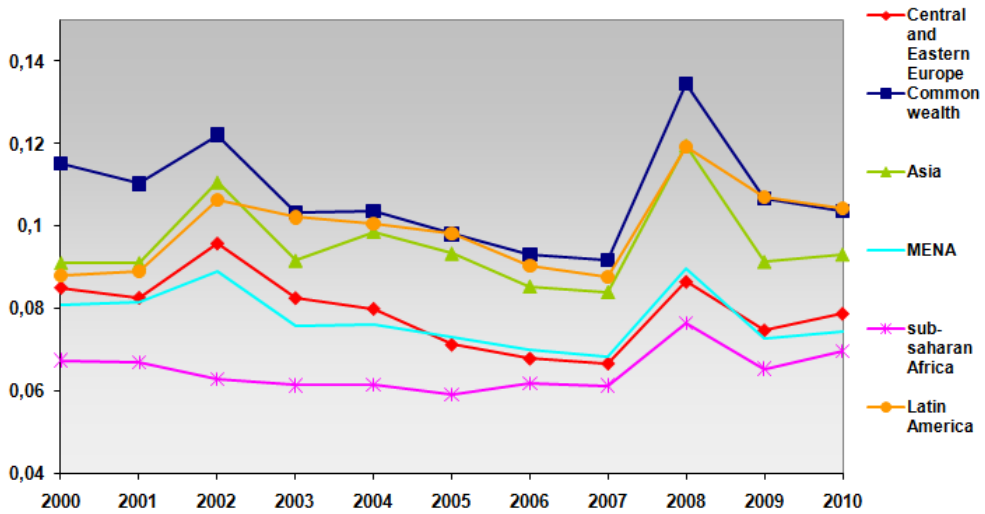


Figure 3. Broad trend of equity risk premium per region

Moreover, there is a negative relationship between international financial integration and economic risk. We also note that there is a positive relationship between crisis and international financial integration. The variable crisis is also positively correlated with inflation and economic risk. In addition, there is a negative relationship between international financial integration and equity risk premium. Equity risk premium and economic risk are positively correlated. The correlation coefficient between crisis and equity risk premium is about 0,43 which indicates a significant correlation, the same applies to inflation with a correlation coefficient of 0,46.

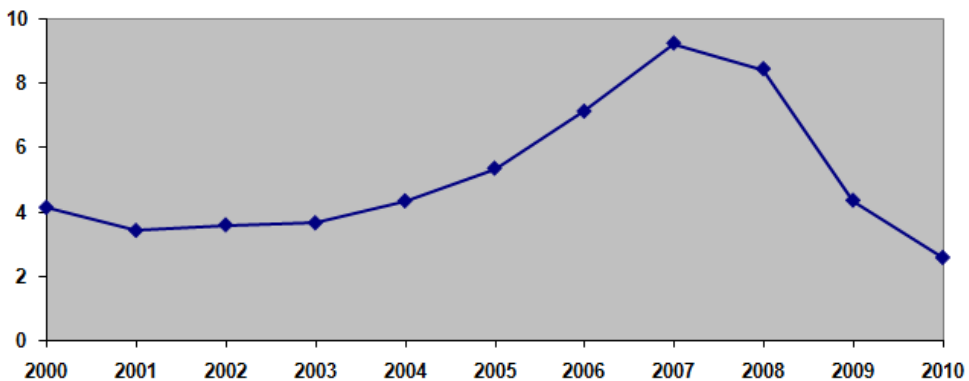


Figure 4. Broad trend of international financial integration

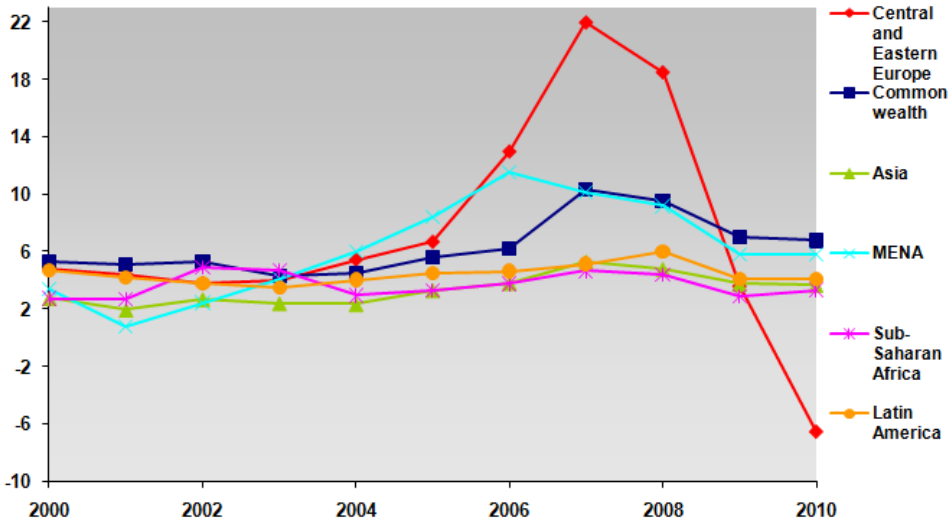


Figure 5. Broad trend of international financial integration per region

Results

Panel estimation results are shown in Table 4. We use STATA 10 to estimate equity risk premium . First, we test for individual effects and we use the hausman test to detect the nature of individual effects. The results show that there are fixed effects.

Then, we use the Breusch-Pagan test which shows heteroskedasticity. Finally, using the Wald test indicates that there is no autocorrelation of errors. To estimate the model, we use the generalized least squares method.

We estimate the model for the whole sample and per region. The estimated coefficient for international financial integration is negative and significant at 5% for the total sample. The same result is obtained for the four regions.

Table 2. Data descriptive statistics

	Mean	Median	Maximum	Minimum	S.D.
ERP	0.0915621	0.08	0.23	0.0451	0.0333634
IFI	5.124294	3.782529	101.7779	-68.20309	8.060515
Inflation	6.937322	5.296155	96.09412	-2.425257	7.615585
Econ. Risk	1.693922	1.150287	13.62988	0	1.688831

We conclude that when the degree of international financial integration increases, the equity risk premium decreases.

Concerning inflation, we note that all coefficients are positive and significant for the total sample and all regions. We deduce that when inflation is higher the equity risk premium increases.

Table 3. Correlation matrix

	ERP	IFI	Inflation	Econ. Risk	Crisis
ERP	1.0000				
IFI	-0.1542	1.0000			
Inflation	0.4605	-0.0289	1.0000		
Econ. Risk	0.2631	-0.0390	0.1602	1.0000	
Crisis	0.4376	0.1300	0.2241	0.0918	1.0000

Table 4. Panel estimation of equity risk premium

	Total Sample	Asia	Central and Eastern Europe	Latin America	MENA
IFI	-0.0008**	-0.0030***	-0.00009	-0.0002	-0.0002
Inflation	0.0016***	0.0035***	0.0009**	0.0018***	0.0013***
Econ. Risk	0.0017*	0.0012	0.0077***	0.0028	-0.0002
Crisis	0.0087**	-0.0021	-0.0007	0.0326***	0.0103
IFI*Crisis	0.0005	0.0017*	0.00003	-0.0037	-0.0050

***, **, and * : Significant at 1%, 5% and 10% respectively.

The estimated coefficients for economic risk are positive and significant at 10% for the total sample and at 1% for Central and Eastern Europe. We conclude that when economic growth volatility is higher, equity risk premium increases.

Finally, we examine the effect of international financial integration on the equity risk premium in crisis situation. We consider both financial and economic crisis. The estimated coefficient for crisis is positive and significant at 5%. We also note that the estimated coefficient for crisis in Latin America is positive and significant at 1%. This region represents 40% of our total sample. The results for Latin America are relevant owing to the financial and economic crises that hit this region over the last decade. There is a positive relationship between interaction term “IFI*Crisis” and equity risk premium. It means that, in situation of crisis, equity risk premium increases when international financial integration is higher.

Conclusions

This paper investigates the effect of international financial integration on equity risk premium. Equity risk premium is also affected by inflation and economic risk. The empirical results from this paper indicate that there is a negative relationship between international financial integration and equity risk premium. Moreover, the empirical evidence show that there is a positive relationship between inflation and equity risk premium. The same results are found by Modigliani and Cohn (1979) and Brand and Wang (2003). In addition, we find a positive relationship between economic risk and equity risk premium. Our result corroborates those of Lettau et al. (2008).

Finally, the results show a positive relationship between crisis and equity risk premium. In addition, there is a positive relationship between the interaction term “crisis*IFI” and equity risk premium; it indicates that equity risk premium reacts nega-

tively to international financial integration in crisis situation.

This paper has policy implication for emerging and developing economies. Our results indicate equity risk premium react positively to international financial integration. It means that international financial integration have positive effects on the economy. The positive reaction of equity risk premium to international financial integration is conditional because it is not confirmed in crisis situation. The results of this paper indicate that international financial integration is advantageous for emerging and developing economies if the governments of these countries provide adapted legal, policy and institutional framework.

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Abstract

This paper analyzes the effect of international financial integration on the equity risk premium using a panel dataset of sixty emerging and developing countries over the period 2000-2010. We also use equity risk premium determinants as independent variables in the model. The results show that there is a negative relationship between international financial integration and equity risk premium. We add the interaction term between international financial integration and crisis as an independent variable in the model. We find out that our results are not confirmed in crisis situation.

Keywords: international financial integration, equity risk premium, crisis, emerging countries, panel data, generalized least squares