

Stock Market Integration and Expected Equity Returns

By applying the time-varying market integration rankings

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Abstract

With this research paper I am setting out to explore the relationship between stock market integration and the equity returns by applying the time-varying market integration rankings from 1996-2011. In a sample of 16 years monthly total returns of the MSCI country indexes and/or S&P/IFC indexes, I have recorded 192 observations for each market group, namely developed, emerging, frontier and world markets. As a result, there is no evidence to attest the existence of a significant relationship for all markets in terms of the HF and the KOF rankings. Based on the EFW rankings, I find that stock market integration has a significant effect on the equity returns in the world market. However, this result is not so robust because I haven't found a significant relationship for other markets based on the EFW ranking. In sum, it is fair to conclude that stock market integration has no significant effect on the equity returns. This result is inconsistent with the prediction of international CAPM that equity market integration may decrease the integrated country's cost of capital as well as previous significant findings.

Keywords: stock market integration; equity returns; time-varying market integration rankings

Table of Contents

1. Introduction	p. 3
2. Literature	p. 5
3. Data and Methodology	
3.1 Data	p. 8
3.2 Methodology	p. 16
4. Empirical Results	
4.1 The HF Ranking	
4.1.1 Developed Markets	p. 21
4.1.2 Emerging Markets	p. 22
4.1.3 Frontier Markets	p. 23
4.1.4 World Market	p. 24
4.2 The KOF Ranking	
4.2.1 Developed Markets	p. 25
4.2.2 Emerging Markets	p. 26
4.2.3 Frontier Markets	p. 27
4.2.4 World Market	p. 27
4.3 The EFW Ranking	
4.3.1 Developed Markets	p. 29
4.3.2 Emerging Markets	p. 29
4.3.3 Frontier Markets	p. 30
4.3.4 World Markets	p. 30
5. Conclusion	p. 32
6. References	p. 34
7. Appendix	p. 37

1. Introduction

In the past two decades, one of the most important policy decisions is the international equity market liberalization, which offers an opportunity for foreign investors to purchase shares in the domestic equity market as well as domestic investors have a right to transact in foreign equity securities. Developed markets have liberalized since 1970s, whereas emerging markets have liberalized during the second half of 1980s. With the development of stock market liberalization, more and more emerging countries become more integrated or less segmented from the world market. For example, since 1980s, many emerging countries, such as Brazil, India, Russia and China (BRICs), tend to change their political and economic environment to allow more foreign investors to invest/trade in their domestic countries. Nevertheless, it is vital to notice that the concept of liberalization is different from integration. Explicitly, liberalization is treated as a regulation/law while market integration is defined as an action of liberalization. It is not always true that liberalization will lead to market integration. This may be due to either the market has been integrated with the world market before the release of liberalization or the liberalization has small or no effect on integration as foreign investors may not believe this regulation will last in the long term (Bekaert, Harvey and Lundblad, 2003). In this paper, I will neglect such difference and hence the term liberalization and integration can be used interchangeably.

Most of the facts suggest that equity market integration across the world has progressed over time. Growing international equity market integration, in general, is expected to have some important implications. A crucial finding, as documented by Henry (2000a, b) as well as Bekaert and Harvey (2000), is that the cost of equity capital decreases when the level of integration increases with respect to emerging markets. A number of studies has treated liberalization as a one-shot event, which postulates that markets are totally segmented before the official liberalization date and completely integrated after that date. However, according to Campbell (1987), Harvey (1989, 1991), and Bekaert and Harvey (1995), the level of integration with the world market is actually not the same over time but exhibit a time-varying movement. Additionally, De Jong and De Roon (2005) argue that the time-varying market integration should be taken into account when estimating the effect of integration on the cost of capital. Therefore, the world market, in fact, can be distinguished into three markets, namely segmented markets, integrated markets and partially segmented markets.

Theoretically, standard international asset pricing models (IAPMs) predicts that equity market integration may decrease the integrated country's cost of equity capital (Henry, 2000a,

b). Specifically, if a country's stock market is completely segmented from the rest of the world, the IAPMs imply that expected equity returns of that country are proportional to the domestic return variance as all risks have to be borne by the domestic investors. On the other hand, if a country's stock market is entirely integrated with the world market, a country's expected equity return is based on the covariance of those returns with the world market portfolio. Thus, the expected equity returns of a partially segmented country will lie somewhere between the fully segmented and integrated equity returns. A big part of the theoretical explanation on a relationship between the degree of market integration and the expected equity returns is based on the risk sharing across countries in which less country-specific risk can be diversified away when the degree of integration increases.

Empirically, some studies indeed find a significant relationship exists between stock market integration and the expected equity returns with a special attention to emerging markets. Although emerging markets is perceived to be individually risky, the increasing correlation with the world market improves risk sharing and hence decreases the cost of capital. In contrast, developed markets are tending to be relatively more correlated with the world market. So, the expected equity returns in developed markets are expected to be even lower than in emerging markets. Errunza (1983), Claessens et al. (1993) and Harvey (1995a) declare that returns and risks in emerging equity market have been found to be relatively higher than developed markets. Salomons and Grootveld (2003) also state that the equity risk premium of emerging markets is significantly larger than developed markets. Therefore, it seems profitable for global investors to add investments in emerging markets to their portfolios.

The above mentioned relationship between the stock market integration and the expected equity returns is the main focus of this research paper. However, I find that most of the literatures examine this relationship in either developed markets or emerging markets, or both. I aim to extend the analysis to include frontier markets as well as the world market (put all three markets as one group together). The classification of the world market is based on the Morgan Stanley Capital International (MSCI) Market Classification Framework. Furthermore, previous works use a variety of methods to measure international equity market integration and then to test whether a relationship exists between stock market integration and the expected equity returns. Give an example, the measure of stock market segmentation is analysed by taking the ratio of noninvestable market value (the assets that can only be held by domestic agents) to total market value by De Jong and De Roon (2005). In this paper,

however, I will uncover the impact of stock market integration on the expected equity returns conditional on the time-varying market integration ranking in regard to developed, emerging, frontier and world markets respectively. Explicitly, three rankings are available to measure the stock market integration, namely the index of economic freedom reported by the Heritage Foundation (HF), the KOF index of Globalization constructed by the ETH Zurich (KOF) and the Economic Freedom of the World (EFW) reported by the Fraser Institute (de Groot, Pang and Swinkels, 2010). Therefore, the research hypothesis of this paper is “*There is a significant relationship between stock market integration and the equity returns in terms of three market integration rankings*”.

The purpose of this research paper is to examine whether the data is in line with the theoretical implication of lower expected equity returns for higher integration level based on three different market integration rankings. I will start by reviewing previous works which is relevant to my study. Next, I will elaborate on the data and methodology, after which I will present the empirical tests respectively in terms of three integration measurements that have been stated above, as well as the empirical results and underlying theoretical explanations. The paper will end up with a conclusion, summarizing the main findings, and suggesting topics for further research inspired by the findings and limitations of this paper and data.

2. Literature

Relative to the previous works, the contribution of this research paper is to examine whether the impact of equity market integration on the expected equity returns still exists given three different market integration rankings, and to extend the analysis of this relationship into more segmented markets.

In general, there are three possible ways available to measure the integration of international equity market, namely the International Capital Asset Pricing Model (CAPM), correlations and cointegration, and time-varying estimates. First and foremost, equity market integration is tested by an international CAPM. On the one hand, if asset pricing studies suppose that all equity markets are completely integrated with the world market, the asset risk is purely related to the covariance of local returns with the world market portfolio. This assumption consists of studies of an international CAPM by Grauer et al (1976) and Harvey (1991a), an international CAPM with exchange rate risk by Dumas and Solnik (1995) and Dumas (1994), a world consumption-based model by Wheatley (1988), world arbitrage pricing theory by Solnik (1983) and Senbet et al. (1986), and the world multi-beta models by Ferson and

Harvey (1993, 1994). Mathematically, an international CAPM can be represented in a form of $E(R) = R_{f,DC} + \beta_{WM} * WMRP + \gamma_{DC} * FCRP$, where $E(R)$ is the expected return of domestic country, $R_{f,DC}$ is a domestic risk-free rate, β_{WM} is asset's world market beta, $WMRP$ is the world market risk premium, γ_{DC} measures a sensitivity of the asset's domestic currency return to a change in the local currency, and $FCRP$ is the foreign currency risk premium. On the other hand, an asset pricing study assumes that the market is entirely segmented from the world market. In this case, asset risk of this market is proportional to the domestic market return variance. This approach is similar with the CAPM of Sharpe (1964), Lintner (1965) and Black (1970) which only use one country's data. Mathematically, CAPM can be represented in a form of $E(R_i) = R_f + \beta_i (E(R_m) - R_f)$, where $E(R_i)$ is the expected return on a capital asset, R_f is the risk free rate, β_i measures a sensitivity of the expected excess asset returns to the expected excess market returns and $E(R_m)$ is the expected return of the market. However, a more realistic approach is the so-called mild segmentation model, which derives from an international CAPM in which the local market is neither perfectly integrated nor segmented with the world market. Thus, the equity premium lies somewhere between the perfectly integrated and completely segmented equity premium. This model is proposed by Errunza and Losq (1985) and Errunza, Losq and Padmanbhan (1992). The disadvantage of this model is that the degree of segmentation is assumed to be static over time. In order to avoid such weakness, Baekert and Harvey (1995) developed a time-varying market integration model, which has been extended by De Santis and Imrohorglu (1997), and Phylaktis and Ravazzolo (2002). These papers demonstrate that the level of integration in general increases over time.

Secondly, some papers have examined the equity market integration in terms of a perspective of growing correlations in cross-sectional asset returns over time. They argue that if the correlation matrix of asset returns across markets is unstable over time, at some extent, this might indicate that there exist increasing market integration. In other words, the market correlation can be treated as the interdependence between markets. However, it is less accurate to make a conclusion of market integration by only take correlation into account. In an asset pricing framework, the fully integrated markets can be without correlation in asset returns across markets. Empirically, Panton, Lessign and Joy (1976) and Watson (1980) found that correlation matrix is stable, but the majority show that there is instability of correlation matrix of asset returns over time, such as Fischer and Palasvirta (1990), Madura and Soenen (1992), Wahab and Lashgari (1993), and Longin and Solnik (1995). By the same

token, cointegration is used as another measurement to assess the degree of equity market integration, which is examined by Kasa (1992), Chan et al. (1992) and Bernard and Durlauf (1996).

Finally, according to Harvey (1989, 1991), Bekaert and Harvey (1995) and Stulz (1999a), the degree of equity market integration is in fact not the same over time but exhibit a time-varying movement. Hence, the early papers that haven't taken time-varying market integration into account may lead to confusing results. A range of papers has been selected to concentrate on this issue. Specifically, Hardouvelis et al. (1999) use an explicit equilibrium asset pricing model associated with a time-varying measure of integration and finds that European equity market integration has increased considerably over time. Rangvid (2001) as well as Aggarwal, Lucey, and Muckley (2004) employ dynamic cointegration methodologies and uncover that among European markets, there is a significant increase in integration. On the contrary, Sentana (2002) and Fratzscher (2002) discover a slow level of market integration. All in all, previous papers reveal that international equity market is indeed a partially segmented market and the degree of integration is not static but time-varying. In addition, the bulk of papers also show that there is an increasing trend of market integration.

Subsequently, one of the most important implications with an increase of equity market integration is a reduction of expected equity returns (cost of capital). As De Jong and De Roon (2005) attest, there is a significant relationship between market integration and the expected equity returns. However, they also declare that the market integration has an additional effect on the beta of a country in relation to the world market portfolio. Explicitly, the beta will probably increase when the level of market integration increase. This increase in beta may leads to an increase in the expected equity returns based on the CAPM. Thus, the direct impact of market integration on the cost of capital is opposite to the effect by the beta: the direct effect of an increase in market integration causes lower expected returns, which is accompanied with an increase in beta, this alludes to higher expected returns. During the empirical test, they find that there is about 9 basis points increase in beta annually owing to the increase in market integration, but the overall effect of the increase in market integration on expected returns is 11 basis points and it is statistically and economically significant. Moreover, this relationship has been quantified and modelled since at least the years of the 20th century. Martin and Rey (2000) test an impact of financial integration on economic and corporate conditions and they find that financial integration results in a decline in the cost of capital. This finding is supported by Hardevoulis et al. (1999, 2006) in the context of

European Monetary Union (EMU) and Stulz (1995, 1999a, b) in the context of international equity markets. In addition, Errunza and Miller (2000) also find that financial market liberalization have a significant negative effect on the cost of capital in an international context, which is reduced by 42 basis points. What is more, a number of papers examine such relationship with a special attention to emerging markets. Bekaert and Harvey (2000) use a cross-sectional time-series model to examine the effect of emerging equity market liberalization on the cost of capital and uncover that the cost of capital always decreases with an effect varying between 5 and 75 basis points after capital market liberalization. Henry (2000a) shows that the cost of equity in emerging markets falls by 26 basis points after stock market liberalization. Next, as mentioned it before, De Jong and De Roon (2005) also find that the cost of capital (as measured by dividend yields) is reduced by 11 basis points when market integration increase in regard to emerging markets. At last, stock market integration may result in other implications. Martin and Rey (1999) declare that liberalization brings about on average an increase in the price of financial assets. Based on Lombardo and Pagano (2000), liberalization increases the number of risky projects accepted by a demand effect. After that, Henry (2000b, 2003) demonstrates that stock market liberalization causes private investment booms as well as economic growth. Therefore, it is fair to conclude that there is a significant negative relationship between stock market liberalization and the expected equity returns in terms of previous literatures.

3. Data and Methodology

3.1 Data

To test for the existence of above mentioned hypothesis, first of all, I classify the world market into three individual markets (developed markets, emerging markets and frontier markets) in terms of the Morgan Stanley Capital International (MSCI) Market Classification Framework (see Appendix A-C). This market classification framework is the latest version which is released by MSCI on June 2011, and it is measured by three criteria: economic development, size and liquidity as well as market accessibility¹. Secondly, based on the financial market integration ranking, portfolios are created and consist of the most or the least integrated countries in a group of developed, emerging, and frontier respectively. If I take all countries into one group, the most integrated country will be developed countries and the least integrated countries will be frontier countries. So, it is sensible to separate the countries

¹ MSCI Market Classification Framework is available at <http://www.msci.com>

into three different groups. Additionally, to realize a comprehensive view of rankings, it is valuable to have all markets as one group together (the world market) as well.

What's more, there are three resources available of measuring the stock market integration, namely the HF ranking², the KOF ranking³ and the EFW ranking⁴. Remarkably, in this paper, I will assume that these three financial market integration rankings are a reasonable proxy for the stock market integration across the world. The higher the scores, the higher the integration level with the world market. The HF ranking is ranged from 1995-2010; the KOF ranking is ranged from 1994-2009. However, the EFW ranking is only available for the year 1990, 1995 and 2000-2009. To make it comparable with other two rankings, I postulate that the EFW ranking over the period 1990-1994 is the same with the year 1990. Likewise, the ranking from 1995 to 1999 will be the same with the year 1995. Particularly, according to the figure 1-2, it is obvious to see that developed markets have an extremely higher score than both emerging and frontier markets over the examined period. In other words, developed markets are highly integrated with the world market. Nevertheless, it is surprising to see that developed markets have a declining trend from 2000 to 2009 in terms of the EFW ranking, which is in contrast with a growing trend for both the HF and the KOF ranking over the same period. In addition, based on the HF ranking (figure 1), emerging markets is slightly more integrated with the world market compare with frontier markets from 1995 to 2004. Afterwards, frontier markets turn out to be more integrated than emerging markets. According to the KOF ranking (figure 2.1), both emerging and frontier markets are increasing over time, but there is no substantial difference between these two markets. Finally, based on the EFW ranking (figure 2.2), it is apparent to see that emerging markets have higher integration scores than frontier markets over the period 1994-2009.

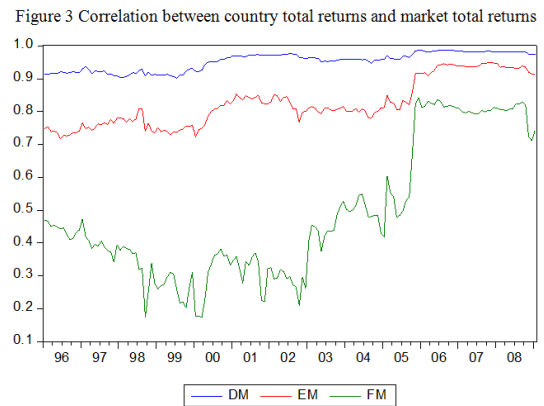
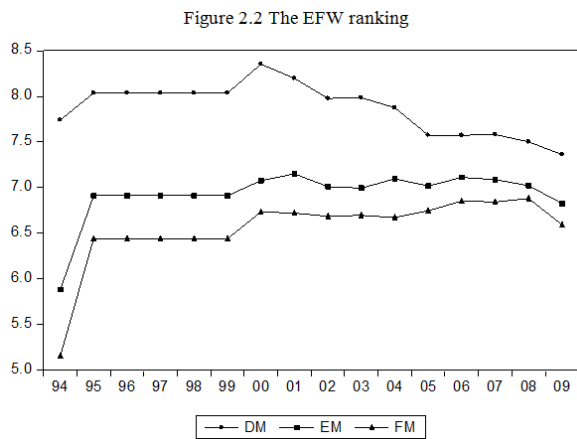
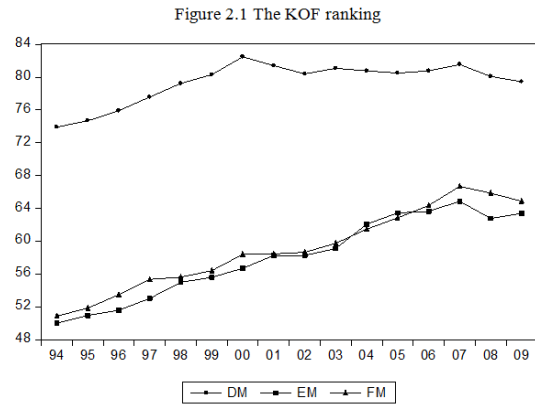
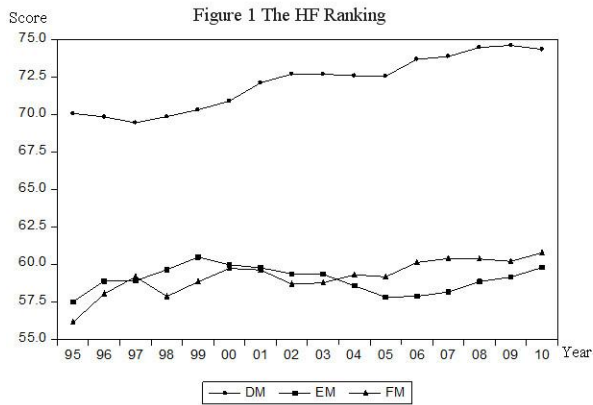
Additionally, as I mentioned in the literature section, correlation matrix between asset returns is one of the measurements of the market integration. In this paper, I am rolling 36 months correlations between country total returns and market total returns to examine whether the integration level are increasing over time. Figure 3 shows the correlation between world market returns with developed, emerging and frontier countries total returns respectively. Specifically, developed markets have an extremely higher correlation than emerging and

² Data are available at <http://www.heritage.org>.

³ Data are available at <http://globalization.kof.ethz.ch>. I use the Economic Globalization dimension scores, because the Political and Social Globalization dimensions are less relevant for the financial market integration

⁴ Data from the Fraser Institute available at <http://www.freetheworld.com>. I use the area Freedom to Trade Intentionally, because this area most directly represents for the financial market integration.

frontier markets. Compare with emerging markets, frontier markets have the lowest correlation level. There is no clear rising trend between developed countries total returns and world market returns. For emerging markets, correlation of emerging countries total returns with the world market returns has increased progressively over time. Before the year 2002, the level of correlation in frontier markets exhibits a declining trend. Afterwards, it turns out to be increase over time.



Subsequently, I use a data set of 16 years monthly total returns (1996-2011) of the MSCI country indexes for developed and emerging equity markets and rely on Standard & Poor's International Financial Corporation (S&P/IFC) indexes for frontier equity markets. Because the MSCI country indexes are not completely available for frontier countries, thus the S&P country broad market indexes are used as another sources to obtain the total returns. Next to the total return index, the data also includes MSCI world total return index and the US risk free rate. Explicitly, MSCI world total return index is treated as a proxy for the world market index, which is available from the DataStream. Whereas the US risk free rate is collected from Kenneth French's data library. It is worth noting that all returns are denominated in US dollars.

Over the 16 years (1996-2011) sample period, I have recorded 192 observations for each market group. According to the MSCI market classification framework, there are 24 countries selected in the sample of developed markets, 21 countries selected in the sample of emerging markets, and 31 countries selected in a sample of frontier markets. Because the MSCI and/or S&P/IFC total returns index of Trinidad and Tobago as well as Zimbabwe are not available to obtain from the DataStream, hence I will exclude these two countries from the group of frontier markets. In other words, only 29 countries are available for the group of frontier markets. Therefore, I have overall 74 countries to construct portfolios based on the financial market integration rankings. Table 1-3 respectively show the descriptive statistics for developed, emerging and frontier markets over the period 1996-2011. Specifically, table 1 demonstrates that average total returns are 0.72% with a standard deviation of 6.94% in developed markets. Correspondingly, emerging markets have an average of 1.32% total returns with a standard deviation of 10.32% (table 2), and frontier markets are averaged at 0.71% with a volatility of 9.72% (table 3). Graphically, figure 4 demonstrates that emerging markets are more volatile than both developed and frontier markets, hence it has higher average total returns compare with other two markets. Frontier markets are indeed more risky than developed markets, but there is no substantial difference of average returns between them. Figure 5 depicts that investing in emerging and frontier markets yield much more total returns than developed markets from 2003-2011. The total returns of investing in emerging markets are slightly higher than frontier markets over the examined period. During the period of the US credit crunch (around the year 2009), the reduction of total returns in emerging and frontier markets are particularly larger than developed markets. Put another way, the global investors who invest in emerging and/or frontier markets suffer more losses than in developed markets. Nonetheless, it is also important to highlight that investing in developed markets are lucrative before the year 2003.

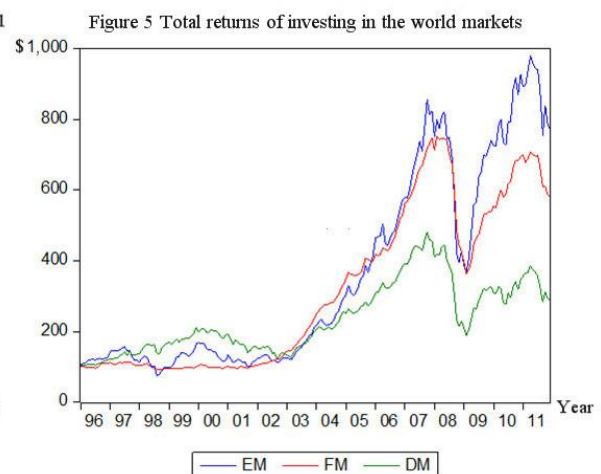
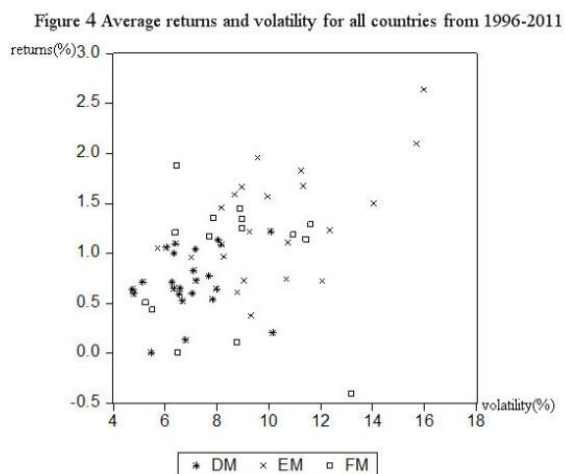


Table 1 Descriptive statistics of developed markets over the period 1996-2011

Countries	MSCI country index start year	Mean (%)	St. Dev (%)	Beta with MSCI world	Average HF score	Average KOF score	Average EFW score
					1995-2010	1994-2009	1994-2009
Australia	1995	1.00	6.34	1.124	78.13	73.24	7.07
Austria	1995	0.54	7.82	1.213	68.64	84.16	7.91
Belgium	1995	0.52	6.66	1.082	67.81	92.88	8.38
Canada	1995	1.10	6.39	1.163	74.01	78.24	7.55
Denmark	1995	1.06	6.05	1.010	72.54	88.22	7.82
Finland	1995	1.22	10.06	1.545	70.12	84.66	7.63
France	1995	0.71	6.26	1.195	60.91	70.35	7.56
Germany	1995	0.73	7.19	1.342	68.94	73.15	8.11
Greece	1995	0.20	10.15	1.306	60.39	72.12	6.78
Hong Kong	1995	0.77	7.69	1.122	89.39	-	9.60
Ireland	1995	0.13	6.78	1.091	78.03	94.00	8.51
Israel	1995	0.83	7.09	0.913	64.91	75.79	7.65
Italy	1995	0.60	7.04	1.181	62.14	76.01	7.46
Japan	1995	0.01	5.47	0.773	70.59	43.81	6.37
New Zealand	1995	0.59	6.55	0.937	80.92	92.78	8.01
Norway	1995	1.09	8.17	1.372	67.57	81.25	7.12
Portugal	1995	0.65	6.56	0.966	64.39	78.49	7.53
Singapore	1995	0.64	7.98	1.202	87.39	80.49	9.40
Spain	1995	1.04	7.16	1.232	66.46	94.56	7.57
Sweden	1995	1.14	8.04	1.432	67.56	78.03	7.98
Switzerland	1995	0.72	5.13	0.846	78.69	88.05	7.50
The Netherlands	1995	0.65	6.33	1.191	73.35	83.93	8.41
United Kingdom	1995	0.60	4.79	0.915	77.90	78.16	7.97
United States	1995	0.64	4.74	0.963	78.29	63.65	7.66
Average		0.72	6.94	1.130	72.04	79.39	7.81

Table 2 Descriptive Statistics of Emerging Markets over the period 1996-2011

Countries	MSCI country index start year	Mean (%)	St. Dev (%)	Beta with MSCI world	Average HF Score	Average KOF score	Average EFW score
					1995-2010	1994-2009	1994-2009
Brazil	1995	1.83	11.25	1.693	57.68	53.11	6.23
Chile	1995	0.96	7.00	0.929	76.05	74.65	8.08
China	1995	0.74	10.67	1.186	52.90	47.43	7.11
Colombia	1995	1.96	9.58	0.846	63.40	50.59	5.92
Czech Republic	1995	1.59	8.67	0.993	68.02	78.43	8.01
Egypt	1995	1.57	9.95	0.851	54.56	44.98	5.95
Hungary	1995	1.68	11.32	1.628	62.36	80.87	7.77
India	1995	1.22	9.26	1.068	50.94	34.82	5.98
Indonesia	1995	1.50	14.04	1.476	55.83	56.42	7.10
Malaysia	1995	0.73	9.03	0.839	64.60	73.80	7.57
Mexico	1995	1.46	8.16	1.315	63.01	58.21	7.24
Morocco	1995	1.05	5.71	0.271	59.37	43.73	5.74
Peru	1995	1.66	8.96	0.927	64.39	59.80	7.04
Poland	1995	1.11	10.72	1.529	59.51	60.72	6.66
Russia	1995	2.64	15.97	1.855	51.21	47.94	6.38
South Africa	1995	0.97	8.25	1.212	63.69	65.30	6.82
South Korea	1995	1.23	12.35	1.529	69.41	55.66	7.06
Taiwan	1995	0.61	8.77	1.115	71.17	-	7.86
Thailand	1995	0.72	12.06	1.395	65.96	59.70	7.43
The Philippines	1995	0.38	9.30	0.967	58.92	56.16	7.14
Turkey	1995	2.10	15.68	1.804	58.08	58.68	6.71
Average		1.32	10.32	1.211	61.48	58.05	6.94

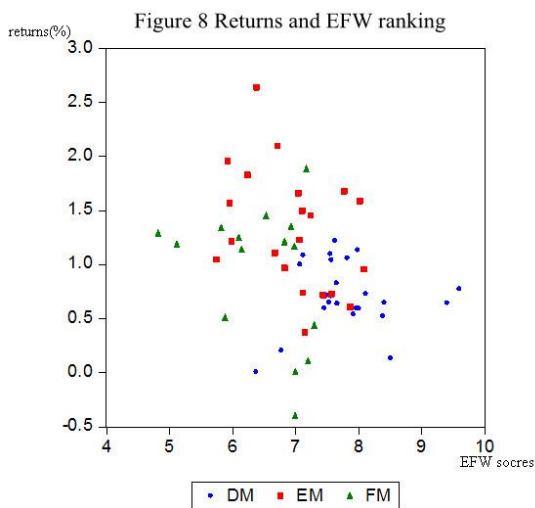
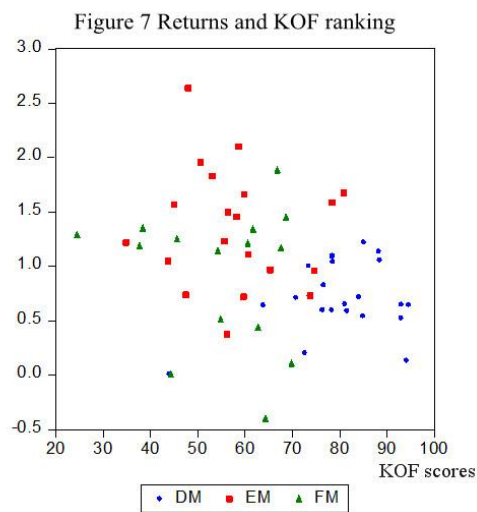
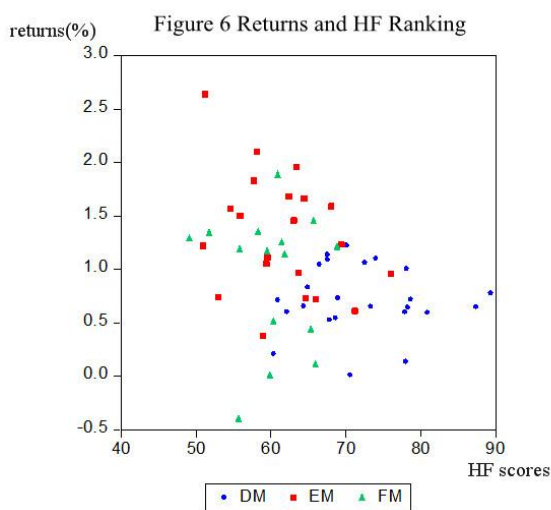
Table 3 Descriptive Statistics of Frontier Markets over the period 1996-2011

Countries	MSCI/S&P country index start year	Mean (%)	St. Dev (%)	Beta with MSCI world	Average HF Score 1995-2010	Average KOF score 1994-2009	Average EFW score 1994-2009
Argentina	1995	1.14	11.42	1.165	61.80	54.26	6.14
Bahrain	2000	0.42	5.19	0.454	74.71	84.85	7.62
Bangladesh	1995	1.29	11.61	0.169*	49.07	24.47	4.82
Bosnia and Herzegovina	2010	-0.67	7.64	0.702*	45.02	53.32	-
Botswana	1995	1.88	6.44	0.341	60.87	66.83	7.17
Bulgaria	1995	-0.40	13.17	0.719	55.64	64.30	6.99
Croatia	1998	0.74	9.01	1.076	52.57	61.63	6.36
Estonia	1998	1.09	10.49	0.866	73.86	85.53	8.34
Ghana	1995	0.01	6.47	-0.027*	59.83	44.33	6.99
Jamaica	1995	1.45	8.87	0.143*	65.66	68.64	6.53
Jordan	1995	0.44	5.51	0.319	65.33	62.77	7.29
Kazakhstan	2005	2.08	17.64	1.281	53.96	63.93	-
Kenya	1995	1.35	7.86	0.573	58.26	38.37	6.92
Kuwait	2004	0.88	7.78	0.677	66.61	64.91	7.04
Lebanon	2000	1.02	9.52	0.513	59.05	-	-
Lithuania	1995	0.11	8.76	0.833	65.90	69.84	7.19
Mauritius	1995	1.21	6.38	0.509	68.81	60.57	6.82
Nigeria	1995	1.34	8.95	0.470	51.72	61.67	5.82
Oman	2000	1.27	6.04	0.482	65.95	67.63	7.61
Pakistan	1995	1.19	10.94	0.442	55.78	37.69	5.11
Qatar	2005	0.55	9.50	0.993	63.68	-	-
Romania	1998	0.69	12.45	1.270	53.53	53.22	6.38
Serbia	2008	-1.57	18.64	2.078	50.90	51.61	-
Slovenia	1995	1.17	7.70	0.371	59.45	67.59	6.98
Sri Lanka	1995	1.25	8.95	0.493	61.41	45.62	6.09
Trinidad and Tobago	-	-	-	-	70.47	71.55	6.61
Tunisia	1995	0.51	5.24	0.117*	60.32	54.81	5.88
Ukraine	1998	1.21	13.86	1.059	47.83	52.40	6.73
United Arab Emirates	2005	-1.27	11.08	1.148	69.01	80.99	8.41
Vietnam	2006	0.31	14.74	0.939	45.57	52.19	-
Zimbabwe	-	-	-	-	37.79	45.52	4.04
Average		0.71	9.72	0.795	59.04	59.00	6.64

Note: * means that the beta with MSCI world is not statistically significant at 5% significance level.

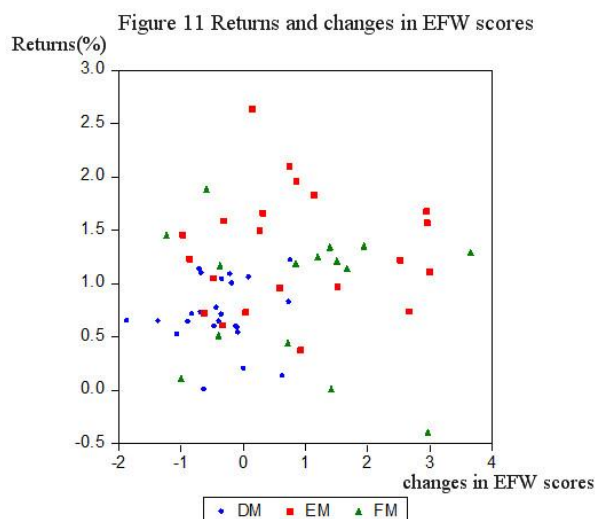
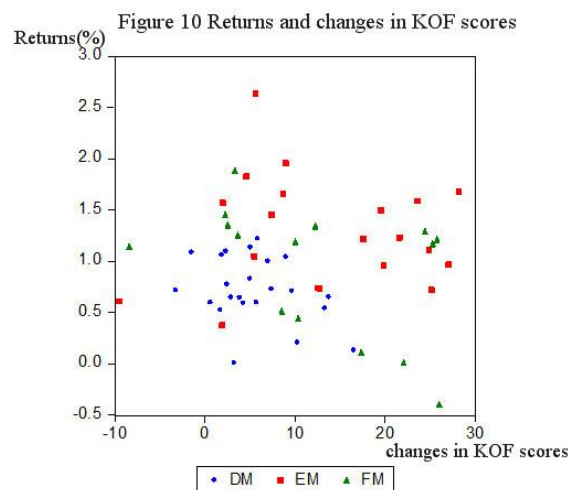
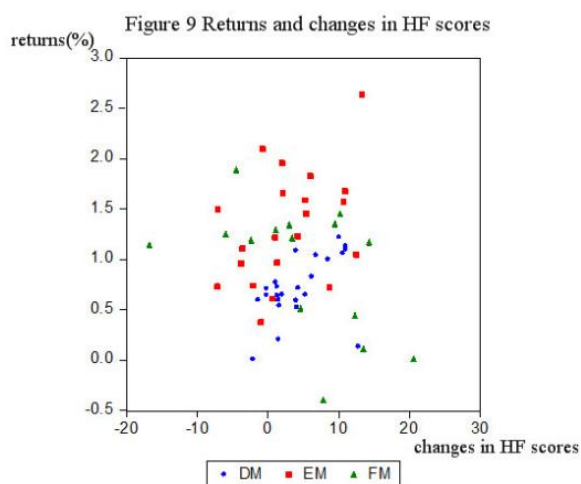
Furthermore, the majority countries within developed and/or emerging markets are considerably highly correlated with the world market (β is approximately around 1). The betas of emerging markets have an average of 1.211, which is slightly higher than the average of developed markets ($\beta=1.130$). This may be due to the prevalence of economic globalization in which more and more emerging countries become correlated with the world market. Nevertheless, it is interesting to note that Morocco which belongs to the group of emerging markets is exceedingly less correlated with the world market ($\beta=0.271$). So, not all emerging countries have a high correlation with the world market after the market liberalization. In addition, the betas of both developed and emerging markets are statistically significant at 5% significance level. On the contrary, some countries in frontier markets (e.g. Bangladesh, Bosnia and Herzegovina, Ghana, Jamaica and Tunisia) are not statistically significant. Table 3 shows that the betas of frontier markets have an average of 0.795, which

is considerably lower than developed ($\beta=1.130$) and emerging markets ($\beta=1.211$). Hence, compare with emerging and developed countries, frontier countries are relatively less correlated with the world market. Supplementary, when I look at the relationship between average returns with three integration rankings (figure 6-8), it is clear to see that all rankings have a similar distribution of average returns for each market. In general, emerging and frontier markets have higher average returns with lower integration scores, whereas developed markets have lower average returns with higher integration scores. Therefore, it seems fair to predict that an average return of one country is negatively related to the integration level of that country.



By the same token, it is also appealing to see the relationship between average returns with the change in integration. The change of integration is defined as a difference between the recent and the last year's scores over the examined period (1996-2011) for three rankings. According to the figure 9-11, the changes in integration among three individual markets are

relatively small for the HF ranking than for the KOF and the EFW rankings. Developed markets have a smaller change in integration over the examined period compare with other two markets. This may be due to the fact that developed markets have already been integrated before the market liberalization; hence there is no substantial difference after liberalization. Put another way, emerging markets have a considerable difference in integration before and after market integration. Theoretically, higher integration level will lead to lower equity returns and hence higher stock prices. Thus, it seems profitable for the global investors to invest in emerging and/or frontier markets when the degree of market integration increases. Based on figure 9-11, it is not apparent to see a relationship between average returns with the change in integration level for all rankings. The vertical axis (average returns) in figure 9-11 is actually the same with the vertical axis in figure 6-8. The distribution of dots, at some extent, is similar with previous three figures in which emerging markets have a relatively high average returns than the other two markets. As a result, it seems fair to conclude that country's average return is irrespective with the change in integration level of that country.



3.2 Methodology

First and foremost, I separate all countries into three groups, namely developed markets, emerging markets and frontier markets, based on the latest MSCI Market Classification System. Additionally, as mentioned in the data section, there are three methods of measuring the financial market integration (the HF ranking, the KOF ranking and the EFW ranking). In order to have a complete overview of the degree of the financial market integration, I will take all three measurements into account when I make the portfolios. Specifically, based on the HF ranking, I construct the most/the least three integrated countries portfolio conditional on the integration ranking of previous year. For example, the portfolio consists of the most/the least integrated three countries in the year t are in accordance with the ranking of these three countries in the year $t-1$. Nevertheless, because the KOF and the EFW ranking are only offered until the year 2009, hence I make the portfolio returns conditional on the rankings of previous two years to make sure portfolio returns of all measurements are ranged from 1996 to 2011. For instance, the portfolio returns in the year t is based on the ranking in the year $t-2$. The integration ranking of all three measurements can be found in the Appendix D-F.

After the components of portfolios are determined, I start off finding the monthly total returns of each selected country. The monthly total return of country index, R_i , is calculated as a percentage change in the value from the previous month. Mathematically it is represented as a form $R_i = (P_{i,t} - P_{i,t-1}) / P_{i,t-1}$, where R_i is the monthly total return for country i , $P_{i,t}$ is the value index for country i in the year t and $P_{i,t-1}$ is the value index for country i in the year $t-1$. Then, I take the equally weighted average of monthly total returns of the most or the least integrated countries in terms of the previous mentioned three integration rankings. Precisely, it is represented as a form $PR_t = (R_{1,t} + R_{2,t} + R_{3,t})/3$, where PR_t is the equally weighted portfolio returns in the year t , $R_{1,t}$, $R_{2,t}$ and $R_{3,t}$ is the monthly total returns for the highly or lowly integrated three countries in the year t . The portfolio with the most integrated three countries is defined as $PR_{H,t}$, whereas the portfolio of the least integrated three countries is defined as $PR_{L,t}$. Theoretically, the least integrated countries have more country-specific risk which yield higher expected equity returns than the most integrated countries. Thus, to achieve the positive returns, the difference of portfolio returns is calculated between the least and the most integrated portfolios, which is denoted as $PR_{L-H,t}$.

According to the HF ranking, in the sample of developed markets, the portfolio with the most integrated countries has an average monthly total return of 0.397% with a standard deviation of 6.738%. In contrast, the least integrated portfolio has an average monthly total return of 0.507% with a standard deviation of 6.932%. Even though the difference of volatility between these two portfolios is not considerably large, average returns of the least integrated portfolio (0.507%) is substantially higher than the most integrated one (0.397%). This finding is in line with a theoretical implication that the highly integrated countries will have a lower equity return. Additionally, the difference of monthly portfolio returns has an average of 0.241% with a standard deviation of 5.05%. Particularly, figure 12 displays that the total returns of investing in the least integrated countries is considerably higher than the most integrated countries. In other words, it is valuable for the global investors to invest in the least integrated portfolio instead of the most integrated portfolio. Nevertheless, it is also valuable to mention that total returns of the least integrated countries declined dramatically compare with the most integrated countries during the period of the US credit crunch which happened in 2009. This means that global investors who invest in the least integrated countries suffer much more losses than in the most integrated countries in the period of financial crisis.

Figure 12 Total returns of investing in developed markets based on the HF ranking

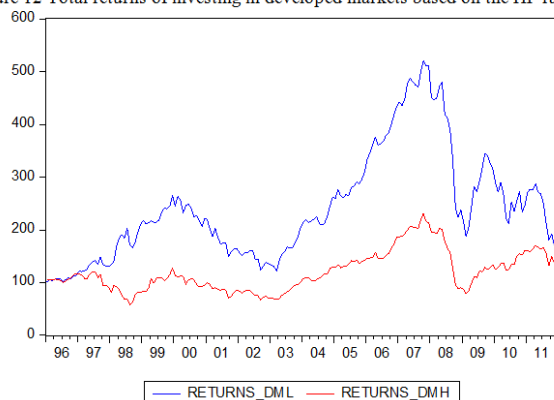
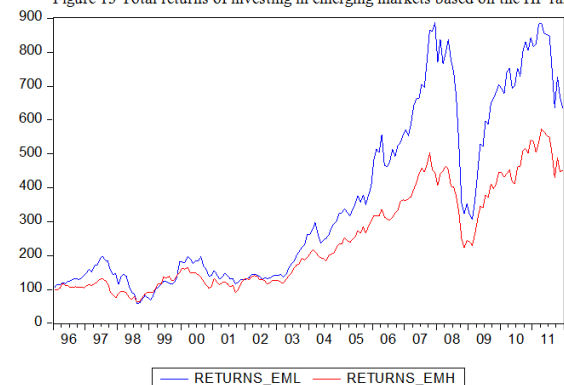


Figure 13 Total returns of investing in emerging markets based on the HF ranking



Subsequently, in the sample of emerging markets, the average portfolio returns of the least integrated countries (1.391%) is higher than the most integrated countries (1.075%). The standard deviation of the least integrated countries portfolio is 9.093%, whereas the most integrated portfolio with a standard deviation of 7.578%. Nonetheless, figure 13 depicts that there is no obvious difference of total returns between investing in the least and the most integrated portfolios over the period 1996-2003. Afterwards, the least integrated portfolio turns out to be more profitable than the most integrated one. During the US credit crunch, the total return of the least integrated portfolio has declined noticeably than the most integrated one. Furthermore, in the sample of frontier markets, similar with developed and emerging markets, the least integrated portfolio (0.861%) has an average higher portfolio returns than

the most integrated one (0.554%). The standard deviation of the least and the most integrated portfolios is 7.459% and 6.465% respectively. Based on figure 14, it is surprising to see that total return of investing in the most integrated portfolio is slightly higher than the least integrated one before the year 2006. This result is in contrast with the theoretical implication of lower equity returns for the most integrated portfolio. After that, the least integrated portfolio turns out to be more lucrative than the most integrated one. In the period of the US credit crunch, there is no massive difference of the reduction in total returns between these two portfolios. At last, in the sample of the world market, average total returns of the least integrated portfolio (1.113%) is extremely higher than the most integrated portfolio (0.397%). Figure 15 also depicts that investing in the least integrated countries yield exceedingly higher total returns after the year 2003. All in all, it seems profitable for the global investors to invest in the least integrated countries, especially for emerging markets which have the highest average total returns.

Figure 14 Total returns of investing in frontier markets based on the HF ranking

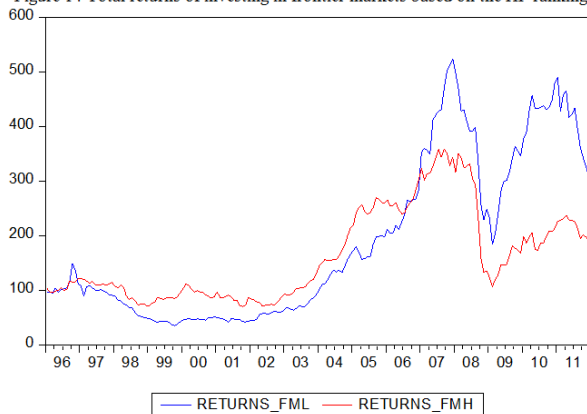
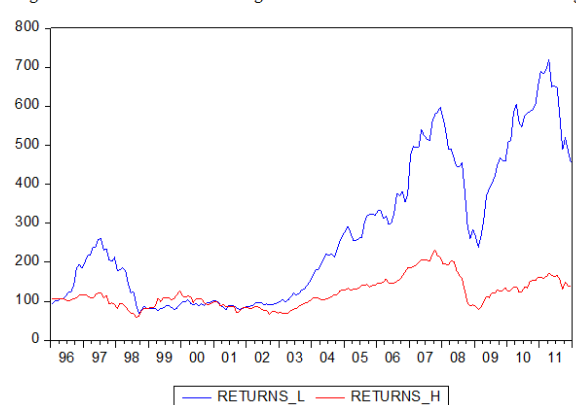


Figure 15 Total returns of investing in the world markets based on the HF ranking



According to the KOF ranking, average total returns between the most and the least integrated portfolios differ dramatically among three markets. Specifically, the least integrated portfolio has an average of 1.579% total returns, which is larger than the most integrated one (1.196%) in emerging markets. On the contrary, average return of the least integrated portfolio (1.176%) is slightly smaller than the most integrated one (1.198%) in frontier markets. This result contradicts the theoretical implication of higher equity returns for the least integrated portfolio. Besides, there is no substantial difference of average returns between the most (0.534%) and the least integrated portfolios (0.537%) in developed markets. Supplementary, the most integrated portfolio has a higher volatility than the least integrated one among three markets, and emerging markets are more risky compare with other two markets. Based on figure 17-18, it is clear to see that investing in the least integrated portfolio

generate higher total returns than the most integrated one over the period 1996-2011 in both emerging and frontier markets. Unexpectedly, figure 16 shows that there is no obvious difference of total returns between these two portfolios over the examined period in developed markets. At last, when I put all countries as one group together, I find that average total return of the least integrated portfolio (1.085%) is almost twice as large as the most integrated one (0.534%). Based on the figure 19, even though the most integrated portfolio yields slightly higher total returns than the least integrated one among the period 1997-2003, it is lucrative to invest in the least integrated portfolio after the year 2003. Overall, it seems sensible to invest in the least integrated counties, especially for emerging countries which generate the highest average returns over the period 1996-2011.

Figure 16 Total returns of investing in developed markets based on KOF ranking

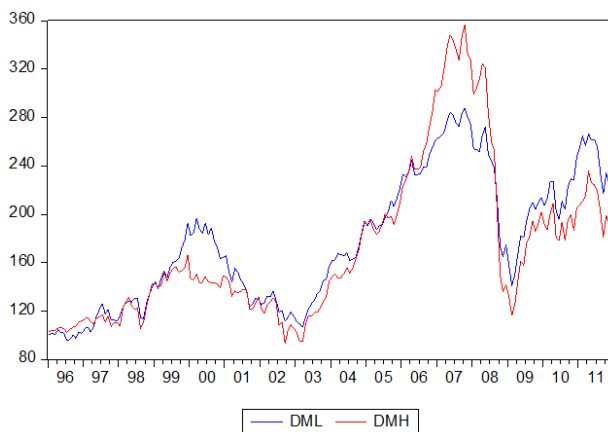


Figure 17 Total returns of investing in emerging markets based on the KOF ranking

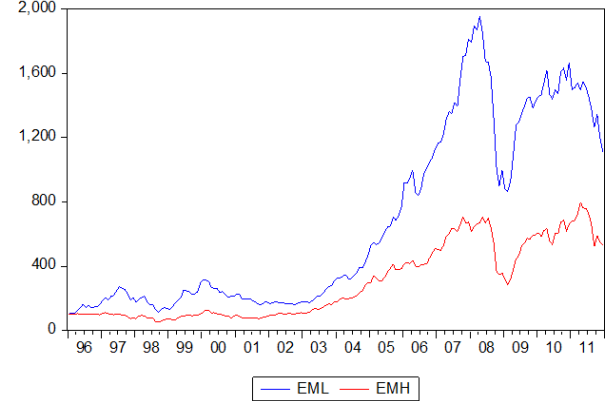


Figure 18 Total returns of investing in Frontier markets based on the KOF ranking

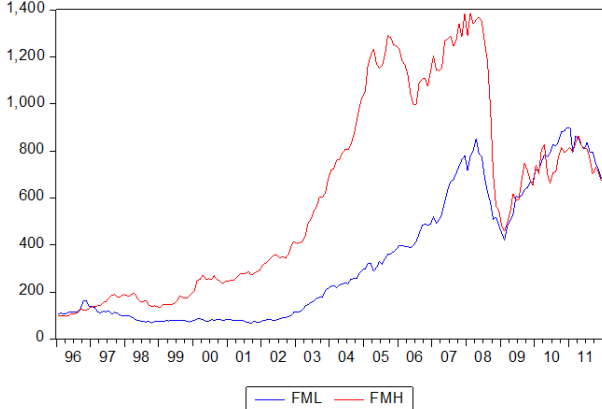
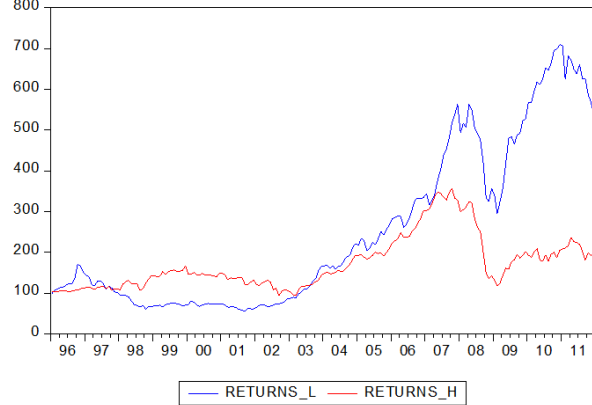


Figure 19 Total returns of investing in the world markets based on the KOF ranking



According to the EFW ranking, average returns of the least integrated portfolio is indeed larger than the most integrated one for all three markets over the period 1996-2011. Explicitly, the least integrated portfolio has an average of 0.553% total returns while the most integrated one has an average of 0.524% in developed markets. For emerging markets, average returns of the least integrated portfolio is 1.527% whereas the most integrated one has an average of

1.278%. For frontier markets, average return of the least integrated portfolio (1.205%) is almost twice as large as the most integrated one (0.691%). Similar with the KOF ranking, the volatility of emerging markets is somewhat higher compare with developed and frontier markets. Figure 20 shows that investing in the least integrated developed countries generate considerably higher total returns than the most integrated one. Likewise, figure 21-22 also show that it is more profit to invest in the least integrated emerging and/or frontier countries, though there is no substantial difference between these two portfolios over the period 1996-2006. Last but not least, when I take all markets into account, the least integrated portfolio has an average of 1.773% total returns, which is extremely larger than the least integrated one (0.708%). Based on the figure 23, it is apparent to see that the least integrated countries yield a substantial higher total returns compare with the most integrated one. Total return of the most integrated countries is more or less the same over the period 1996-2011. Overall, it is fair to say that it is profitable to invest in the least integrated countries, especially for the portfolio with the least integrated world market which yield the highest average total returns from 1996-2011. However, it is arguable to conclude that there exists a significant relationship between market integration and the expected equity returns. The following empirical tests will attest such relation.

Figure 20 Total returns of investing in developed markets based on the EFW ranking

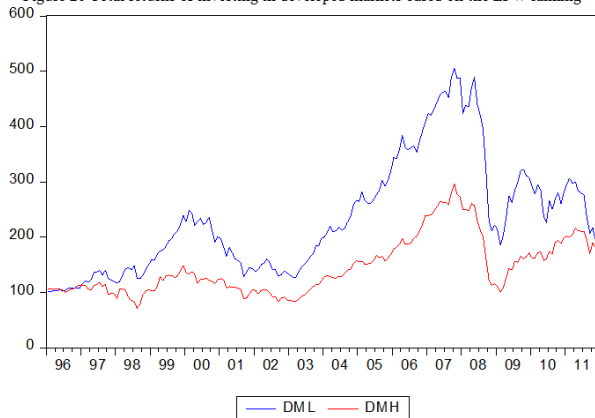


Figure 21 Total returns of investing in emerging markets based on the EFW ranking

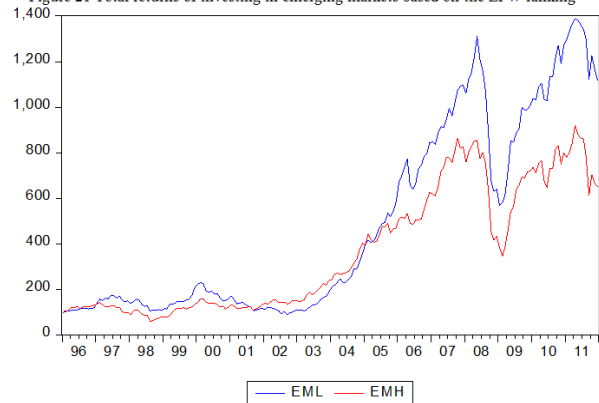


Figure 22 Total returns of investing in frontier markets based on the EFW ranking

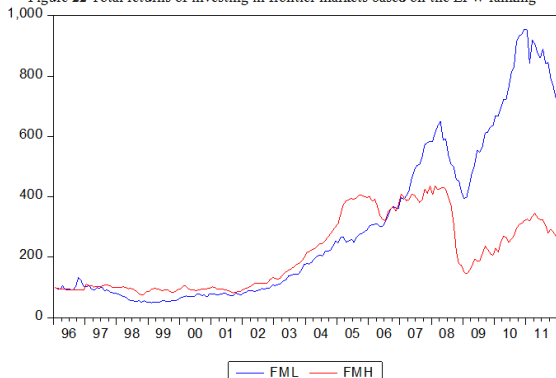
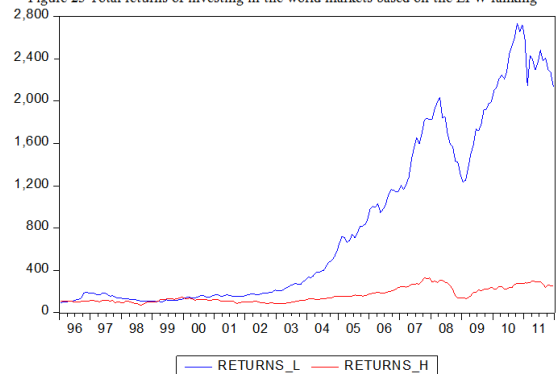


Figure 23 Total returns of investing in the world markets based on the EFW ranking



Next to the analysis of portfolio returns in terms of three integration rankings, the portfolio total returns are expected to be dependent on the systematic risk, which is measured by the MSCI world market beta. The determination of the world market beta for every portfolio is based on the CAPM in a form of $PR_{i,t} - r_{f,t} = \alpha + \beta^*(R_{M,t} - r_{f,t}) + \varepsilon_{i,t}$, where $PR_{i,t}$ is the equally weighted portfolio returns for the integration type i (the most or the least integrated) over the examined period (1996-2011), $r_{f,t}$ is the US risk free rate, $R_{M,t}$ is the world market return and β is the sensitivity of the portfolio returns to the world market returns. Because I split all countries into three groups, the world market beta (β) is determined for every market in the period 1996-2011. Thus, in the developed markets, the most integrated portfolio is denoted as $PR_{DM_H,t}$, which can be represented in a form of $PR_{DM_H,t} - r_{f,t} = \alpha + \beta^*(R_{M,t} - r_{f,t}) + \varepsilon_{i,t}$. Whereas the least integrated portfolio in developed markets is defined as $PR_{DM_L,t}$, which is represented in a form of $PR_{DM_L,t} - r_{f,t} = \alpha + \beta^*(R_{M,t} - r_{f,t}) + \varepsilon_{i,t}$. Correspondingly, the most and the least integrated portfolios in emerging and frontier markets is denoted as $PR_{EM_H,t}$, $PR_{EM_L,t}$, $PR_{FM_H,t}$ and $PR_{FM_L,t}$ respectively.

Finally, to measure a significant relationship between equity market integration and the equity returns, I take a difference between the least and the most integrated portfolios. Mathematically, it is represented in a form of $RP_{L,t} - RP_{H,t} = \alpha + \beta^*(R_{M,t} - r_f) + \varepsilon_t$, where α measures the relation between the level of integration with the equity returns. Specifically, if the degree of integration has no any effect on the equity returns, the difference between the least and the most integrated portfolios will be zero ($\alpha=0$). On the other hand, if the equity returns are related to the degree of integration, I postulate that the difference of the least with the most integrated portfolios will be non-zero ($\alpha \neq 0$). Therefore, the null hypothesis of this empirical testing is that there is no significant relationship between the degree of integration and the equity returns ($H_0: \alpha = 0$). This relationship will be examined respectively in the following four markets based on three integration rankings.

4. Empirical Results

4.1 The HF Ranking

4.1.1 Developed Markets

Table 4.1.1 shows that average portfolio returns of the most and the least integrated countries are significantly and positively related to the excess world market returns (a difference between the world market returns and the US risk free rate) in developed markets. Specifically, the sensitivity of the most integrated portfolio returns to the excess world market

returns is about 1.17, which is statistically significant (t -value = 19.290). Correspondingly, the least integrated portfolio returns has a beta of 1.21 with the excess world market returns, and it is statistically significant (t -value = 19.805). Therefore, empirically, the beta of the least integrated portfolio is relatively larger than the most integrated one. This finding is in contrast with an additional effect of market integration as documented by De Jong and De Roon (2005), who states that the beta of one country in relation to the world market portfolio will increase when the level of integration goes up. Remarkable, the R^2 in these two regressions are considerably high (66.20% for the most integrated portfolio; 67.36% for the least integrated portfolio), which means that the explanatory power of the excess world market returns on the portfolio returns is pretty large.

Table 4.1.1 Developed Markets (DM) portfolio returns analysis based on the HF ranking

	Most integrated DM portfolio returns		Least integrated DM portfolio returns		Difference of DM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	-0.19%	1.17	-0.09%	1.21	0.10%	0.04
t -value	-0.671	19.290	-0.322	19.805	0.239	0.454
p -value	0.503	0.000	0.748	0.000	0.812	0.650

Then, the fifth column of table 4.1.1 states that the difference between the least and the most integrated portfolios is slightly positive, but it is not statistically significant (t -value = 0.239). This means that there is no statistically significant difference of portfolio returns between the least and the most integrated countries in developed markets. In addition, sixth column shows that the difference of developed market portfolio returns is somewhat positively ($\beta = 0.04$) related to the excess world market returns, but it is not statistically significant (t -value = 0.454). As a result, I can conclude that there is no significant relationship between stock market integration and the equity returns with respect to developed markets.

4.1.2 Emerging Markets

Table 4.1.2 demonstrates that average portfolio returns of both the most and the least integrated emerging countries are statistically significantly and positively correlated with the excess world market returns. The beta of the most integrated portfolio ($\beta = 1.16$) is below the average of all emerging countries ($\beta = 1.211$), whereas the beta of the least integrated one ($\beta = 1.35$) is above the average. This means that the least integrated countries are in fact more correlated with the world market. In other words, it is not completely true that highly integrated countries will lead to a higher correlation in asset returns across countries. Therefore, it is less precise to estimate the market integration by only take correlation into account. This finding is consistent with the opinion of Longin and Solnik (1995), who also states that it is not possible to reach a conclusion of market integration via looking at

correlation alone. Similar with developed markets, the beta of the most integrated portfolio is smaller than the least integrated one in emerging markets, which also contradicts the additional effect of integration as proposed by De Jong and De Roon (2005). In addition, the explanatory power of the most or the least integrated portfolios on the excess world market returns is still large in emerging markets (R^2 for the most and the least integrated portfolio is 51.27%, 48.82% respectively).

	Most integrated EM portfolio returns		Least integrated EM portfolio returns		Difference of EM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.49%	1.16	0.75%	1.35	0.26%	0.20
<i>t</i> -value	1.277	14.137	1.588	13.463	0.545	1.946
<i>p</i> -value	0.203	0.000	0.114	0.000	0.586	0.053

Then looking at the relationship between stock market integration and the equity reruns, fifth column shows that there is no significant difference of portfolio returns between the least and the most integrated countries in emerging markets (*t*-value = 0.545). Additionally, sixth column shows that though the difference of emerging markets portfolio returns is positively related to the excess world market returns ($\beta = 0.196$), it is not statistically significant (*t*-value = 1.945). Nevertheless, it is significant at 10% significance level. As a result, I can conclude that there is no evidence to attest a significant relationship between stock market integration and the equity returns regarding emerging markets. Astonishingly, this finding is in contrast with previous researches which indeed find a significant relationship with respect to emerging markets (such as Henry (2000a), De Jong and De Roon (2005) etc).

4.1.3 Frontier Markets

Table 4.1.3 shows that average portfolio return of the most integrated frontier countries is significantly (*t*-value = 8.748) and positively ($\beta = 0.74$) related to the excess world market returns. Likewise, the excess world market return also has a positive effect ($\beta = 0.49$) on the portfolio returns of the least integrated frontier countries and it is statistically significant (*t*-value = 4.421). In contrast with developed and emerging markets, the beta of the most integrated portfolio is substantially higher than the least integrated one. This finding is in line with an additional effect of integration proposed by De Jong and De Roon (2005). Besides, the explanatory power of the excess world market returns on the most and the least integrated portfolio returns is 28.71% and 9.33% in frontier markets, which is extremely smaller than developed and emerging markets. This means that portfolio returns in frontier markets are not perfectly depend on the excess world market returns. There are other factors which may play

an important role for the portfolio returns determination in frontier markets, such as currency risk.

Table 4.1.3 Frontier Markets (FM) portfolio returns analysis based on the HF ranking

	Most integrated FM portfolio returns		Least integrated FM portfolio returns		Difference of FM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.09%	0.74	0.47%	0.48	0.38%	-0.25
<i>t</i> -value	0.233	8.748	0.919	4.421	0.718	-2.236
<i>p</i> -value	0.816	0.000	0.359	0.000	0.474	0.027

Subsequently, fifth column of table 4.1.3 displays that there is no statistically significant difference of portfolio returns between the least and the most integrated frontier countries (*t*-value = 0.718). Moreover, sixth column shows that the difference of portfolio returns in frontier markets is slightly negatively related to the excess world market returns ($\beta = -0.25$), and it is statistically significant (*t*-value = -2.236). This result is in contrast with a positive relationship between the difference of portfolio returns and the excess world market return in both developed and emerging markets, although they are not statistically significant. As a result, I can conclude that there is no evidence to attest a significant relationship between stock market integration and the equity returns with respect to frontier markets.

4.1.4 World Market

Table 4.1.4 demonstrates that the excess world market return has a statistically significant and positive effect on the portfolio returns of both the most and the least integrated countries in an international market (*t*-value of the most and the least integrated portfolio is 19.290 and 7.971 respectively). Specifically, the beta of the most integrated portfolio (1.17) is substantially larger than the least integrated one (0.85). This result is in line with an additional effect of integration which leads to a possible increase in the beta. Remarkably, as I described in the section 4.1.1 and 4.1.2, the R^2 of both developed and emerging markets is particularly large, and there is no big difference of R^2 between the most and the least integrated portfolios. In contrast, the R^2 of the most integrated portfolio (66.20%) is considerably higher than the least integrated portfolio (25.06%) in the world market. This may imply that average portfolio returns of the least integrated countries (1.113%), which is above the average total returns of all selected frontier countries (0.71%), is not perfectly explained by the excess world market returns.

Table 4.1.4 World Market (WM) portfolio returns analysis based on the HF ranking

	Most integrated WM portfolio returns		Least integrated WM portfolio returns		Difference of WM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	-0.19%	1.17	0.62%	0.85	0.81%	-0.32
<i>t</i> -value	-0.671	19.290	1.240	7.971	1.544	-2.866
<i>p</i> -value	0.503	0.000	0.216	0.000	0.124	0.005

Then, fifth column of table 4.1.4 shows that there is no statistically significant difference of portfolio returns between the least and the most integrated countries in an international context (t -value = 1.543). Moreover, the difference of portfolio returns in the world market is statistically significantly (t -value = -2.866) and negatively ($\beta = -0.32$) related to the excess world market return. This result is similar with the finding in frontier markets. As a result, I can conclude that there is no significant relationship between stock market integration and the equity returns with respect to an international market.

In summary, based on the HF ranking, financial market integration has no any significant effect on the portfolio returns with regard to all markets (developed, emerging, frontier as well as world markets). Put another way, there is no evidence to attest a significant relationship between stock market integration and the equity returns in terms of the HF ranking. Additionally, the portfolio returns of either the most or the least integrated countries are statistically significantly and positively related to the excess world market returns among all markets. Specifically, the beta of the most integrated portfolio is significantly smaller than the least integrated one in both developed and emerging markets. Conversely, the beta of the most integrated portfolio is significantly larger than the least integrated one in both frontier and world market. At last, it is also important to mention that the excess world market returns has a significant and negative effect on the difference of portfolio returns in both frontier and world markets, whereas it has a positive effect in developed and emerging markets although it is not statistically significant.

4.2 The KOF Ranking

4.2.1 Developed Markets

Table 4.2.1 displays that the excess world market returns has a significantly positive effect on the average portfolio returns of the most and the least integrated countries in developed markets (t -value for the most and the least integrated portfolio is 21.401, 21.172 respectively). Explicitly, the beta of the most integrated portfolio (1.14) is in fact above the average of beta in all developed countries (1.13). Whereas, the least integrated portfolio has a beta of 0.97 which is below the average of all developed countries. In other words, the most integrated portfolio has a higher beta than the least integrated one. This result is in line with an additional effect of integration. Moreover, the explanatory power of the excess world market returns is extremely large for both portfolios in developed markets (R^2 for the most and the least integrated portfolio is 80.68% and 92.15%).

	Most integrated DM portfolio returns		Least integrated DM portfolio returns		Difference of DM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	-0.05%	1.14	0.01%	0.97	0.05%	-0.17
<i>t</i> - value	-0.246	28.166	0.069	47.232	0.241	-3.677
<i>p</i> - value	0.806	0.000	0.945	0.000	0.810	0.000

Then looking at the relationship between market integration and the expected equity returns, fifth column of table 4.2.1 shows that there is no significant difference of portfolio returns between the least and the most integrated portfolio in developed markets (t -value = 0.241). Additionally, the difference of portfolio returns is statistically significantly (t -value = -3.677) and negatively (β = -0.17) related to the excess world market returns. As a result, I can conclude that there is no significant relationship between stock market integration and the equity returns with respect to developed markets.

4.2.2 Emerging Markets

Table 4.2.2 demonstrates that average portfolio returns of the most integrated countries is positively (β = 1.18) correlated with the excess world market returns, whereas the least integrated portfolio has a beta of 0.96 with the world market portfolio. It is obvious to see that the beta of the most integrated portfolio is somewhat larger than the least integrated one. Similar with developed markets, this result is consistent with an additional effect of integration. Additionally, the relationship between the most/least integrated portfolios with the world market portfolio is statistically significant (t -value for the most and the least integrated portfolios is 13.677 and 9.722). Supplementary, the explanatory power of the excess world market returns in emerging markets is still considerably large (R^2 for the most and the least integrated portfolios is 49.61% and 33.22%). However, in comparison with developed markets, the excess world market returns has a larger explanatory power on the portfolio returns of the most integrated countries rather than the least integrated one in emerging markets.

	Most integrated EM portfolio returns		Least integrated EM portfolio returns		Difference of EM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.60%	1.18	1.04%	0.96	0.44%	-0.23
<i>t</i> - value	1.481	13.677	2.252	9.722	0.896	-2.170
<i>p</i> - value	0.140	0.000	0.026	0.000	0.371	0.031

After that, fifth column of table 4.2.2 exhibits that portfolio returns of the least integrated countries is not differ significantly from the most integrated one in emerging markets (t -value = 0.896). In addition, the excess world market returns has a somewhat negative effect (β = -0.23) on the difference of emerging markets portfolio returns, and it is statistically significant (t -value = 0.031). As a consequence, I can conclude that there is no evidence to attest a

significant relationship between stock market integration and the equity returns regarding emerging markets.

4.2.3 Frontier Markets

Table 4.2.3 displays that there exists a statistically significant and positive relationship between the portfolio returns of the most/least integrated countries with the excess world market returns in developed markets (t -value for the most and the least integrated portfolio is 7.511 and 3.955). Explicitly, the beta of the most integrated portfolio (0.64) is approximately twice as large as the least integrated one (0.35). This result is in accordance with an additional effect of integration. Besides, in contrast with developed and emerging markets, the explanatory power of the excess world market returns on the portfolio returns is particularly small in frontier markets (the R^2 for the most and the least integrated portfolio is 22.89% and 7.61%). In other words, the correlation between the most/least integrated portfolios with the world market portfolio in frontier markets is correspondingly smaller than the correlation in developed and emerging markets.

	Most integrated FM portfolio returns		Least integrated FM portfolio returns		Difference of FM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.77%	0.64	0.83%	0.35	0.06%	-0.29
t -value	1.926	7.511	2.015	3.955	0.130	-2.777
p -value	0.056	0.000	0.045	0.000	0.897	0.006

Subsequently, the fifth column of table 4.2.3 shows that there is no significant difference of portfolio returns between the least and the most integrated frontier countries (t -value = 0.130). Based on the results of the sixth column, it is obvious to see that the difference of portfolio returns in frontier markets is slightly negative ($\beta = -0.29$) related to the excess world market returns, and it is statistically significant (t -value = -2.777). As a consequence, I can conclude that there is no evidence to find a significant relationship between stock market integration and the equity returns with regard to frontier markets.

4.2.4 World Market

Table 4.2.4 demonstrates that the excess world market returns has a statistically significant (t -value = 28.166) and positive ($\beta = 1.11$) effect on the most integrated portfolio returns. Similarly, the relationship between the least integrated portfolio returns and the excess world market returns is also statistically significant (t -value = 6.027) and positive ($\beta = 0.55$). However, the beta of the most integrated portfolio is almost twice as large as the least integrated one. This result is consistent with the additional effect of integration which leads to an increase in beta. Moreover, the explanatory power of the excess world market returns on

the most integrated portfolio returns is about 80.68%. Conversely, the excess world market returns has only around 7.61% explanatory power on the least integrated portfolio returns. This means that the relatively high least integrated portfolio returns is not perfectly depend on the excess world market returns.

Table 4.2.4 World Market (WM) portfolio returns analysis based on the KOF ranking

	Most integrated WM portfolio returns		Least integrated WM portfolio returns		Difference of WM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	-0.05%	1.14	0.68%	0.55	0.73%	-0.60
<i>t</i> -value	-0.246	28.166	1.593	6.026	1.598	-6.172
<i>p</i> -value	0.806	0.000	0.113	0.000	0.112	0.000

Then looking at whether a significant relationship exists, the fifth column of table 4.2.4 displays that the least integrated portfolio returns is not differ significantly from the most integrated one (*t*-value = 1.598) in an international context. In other words, there is no statistically significant difference of portfolio returns of the least and the most integrated countries in the world markets. Furthermore, the sixth column states that the difference of portfolio returns in the world market is slightly negatively related to the excess world market returns ($\beta = -0.60$), and it is statistically significant (*t*-value = -6.172). As a result, I can conclude that there is no evidence to attest a significant relationship between stock market integration and the equity returns in an international context. This result is in contrast with the previous findings of a significant relationship in the world markets, such as Stulz (1995, 1999a, b) and Errunza and Miller (2000).

To sum up, the degree of market integration has no any significant effect on the equity returns with regard to all markets (developed, emerging, frontier and world markers) in terms of the KOF rankings. These findings are inconsistent with previous works which indeed find a significant relationship between stock market integration and the expected equity returns, such as Stulz (1995, 1999a, b), Bekaert and Harvey (2000) and Errunza and Miller (2000). Nevertheless, the correlation between the portfolio returns and the excess world market returns is significantly positive. Specifically, the beta of the most integrated portfolio is significantly higher than the least integrated portfolio among all markets. This result is consistent with an additional effect of integration proposed by De Jong and De Roon (2005). In addition, the difference of portfolio returns in all markets is also statistically significantly related to the excess world market returns but it reveals a negative relationship. Supplementary, the explanatory power of excess world market returns is correspondingly larger on the most integrated portfolio returns than the least integrated one for all markets expect for developed markets.

4.3 The EFW Ranking

4.3.1 Developed Markets

Table 4.3.1 shows that there is a significant and positive relationship between the portfolio returns and the excess world market returns in developed markets. Particularly, the beta of the most integrated portfolio ($\beta = 1.13$) is slightly lower than the least integrated portfolio ($\beta = 1.15$), but both are statistically significant (t -value for the most and the least integrated portfolio is 21.401, 21.172 respectively). There is no doubt that this result contradicts the additional effect of integration. In addition, the excess world market returns has a similar impact on the portfolio returns of the most and the least integrated countries (the R^2 for the most and the least integrated portfolio is 70.68% and 70.23%).

	Most integrated DM portfolio returns		Least integrated DM portfolio returns		Difference of DM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	-0.05%	1.13	-0.03%	1.15	0.02%	0.02
t -value	-0.215	21.401	-0.114	21.172	0.072	0.222
p -value	0.830	0.000	0.909	0.000	0.942	0.825

Subsequently, fifth column of table 4.3.1 states that there is no significant difference of portfolio returns between the least and the most integrated countries in developed markets (t -value = 0.072). Besides, the difference of portfolio returns in developed markets is slightly positively related to the excess world market returns ($\beta = 0.02$), but it is not statistically significant (t -value = 0.222). As a consequence, I can conclude that there is no evidence to attest a significant relationship between stock market integration and the equity returns with regard to developed markets alone.

4.3.2 Emerging Markets

Table 4.3.2 demonstrates that the excess world market returns has a statistically significant and positive impact on the portfolio returns in emerging markets. Explicitly, the beta of the most integrated portfolio is about 1.23 while the beta of the least integrated portfolio is around 1.01. Hence, it is apparent to see that the most integrated portfolio has a higher beta than the least integrated one. This result is consistent with an additional effect of integration. Supplementary, the excess world market returns have a higher explanatory power on the most integrated portfolio returns ($R^2 = 57.32$) than the least integrated one ($R^2 = 45.14$). In comparison with developed markets, the explanatory power of emerging markets is relatively small.

	Most integrated EM portfolio returns		Least integrated EM portfolio returns		Difference of EM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.67%	1.23	0.98%	1.01	0.30%	-0.22
t -value	1.868	15.976	2.576	12.504	0.737	-2.491
p -value	0.063	0.000	0.011	0.000	0.462	0.014

Afterwards, fifth column of table 4.3.2 displays that there is no statistically significant difference of portfolio returns between the least and the most integrated countries in emerging markets (t -value = 0.737). Moreover, the difference of emerging markets portfolio returns is negatively ($\beta = -0.218$) related to the excess world market returns, and it is statistically significant (t -value = -2.491). As a result, I can conclude that there is no evidence to attest a significant relationship between stock market integration and the equity returns with respect to emerging markets alone.

4.3.3 Frontier Markets

Table 4.3.3 shows that both the most and the least integrated portfolio returns are statistically significantly and positively related to the excess world market returns in frontier markets. In particular, the beta of the most integrated portfolio ($\beta = 0.60$) is approximately twice as large as the least integrated portfolio ($\beta = 0.33$). Moreover, the explanatory power of the excess world market return is substantially higher on the most integrated portfolio returns ($R^2 = 23.66\%$) than the least integrated one ($R^2 = 7.07\%$). This finding is similar with the results in developed and emerging markets, but the difference of explanatory power between the least and the most integrated portfolios is not differ considerably in these two markets.

	Most integrated FM portfolio returns		Least integrated FM portfolio returns		Difference of FM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.27%	0.60	0.86%	0.33	0.59%	-0.27
t -value	0.728	7.673	2.109	3.803	1.239	-2.667
p -value	0.468	0.000	0.036	0.000	0.217	0.008

Then, it is valuable to see the relationship between stock market integration and the expected equity returns. Fifth column of table 4.3.3 states that the portfolio returns of least integrated countries is not differ significantly from the most integrated portfolio returns (t -value = 1.239) regarding frontier markets. Additionally, the difference of frontier markets portfolio returns is slightly negatively ($\beta = -0.27$) correlated with the excess world market returns, and it is statistically significant (t -value = -2.667). As a result, I can conclude that there is no evidence to find a significant relationship between stock market integration and the equity returns with regard to frontier markets alone.

4.3.4 World Markets

Table 4.3.4 displays that the most integrated portfolio returns is statistically significantly (t -value = 18.978) and positively ($\beta = 1.12$) related to the excess world market returns in an international context. By the same token, the excess world market returns portfolio returns also have a statistically significant (t -value = 3.804) and positive ($\beta = 0.33$) impact on the

least integrated portfolio returns. It is obvious to see that the beta of the most integrated portfolio is extremely higher than the least integrated one in the world market. This result is consistent with an additional effect of integration which leads to an increase in beta. Furthermore, similar with frontier markets, the explanatory power of the excess world market returns is dramatically larger on the most integrated portfolio returns ($R^2 = 65.47\%$) than on the least integrated one ($R^2 = 7.08\%$) in the world market. This may allude to that the extremely high average portfolio returns of the least integrated countries is not perfectly rely on the excess world market returns in a global context.

Table 4.2.4 World Market (WM) portfolio returns analysis based on the EFW ranking

	Most integrated WM portfolio returns		Least integrated WM portfolio returns		Difference of WM portfolio returns	
	constant (α)	world market beta (β)	constant (α)	world market beta (β)	constant (α)	world market beta (β)
Coefficients	0.13%	1.12	1.43%	0.33	1.30%	-0.79
<i>t</i> -value	0.484	18.978	3.500	3.804	2.773	-7.924
<i>p</i> -value	0.629	0.000	0.001	0.000	0.006	0.000

Subsequently, looking at the relationship between stock market integration and the expected equity returns, fifth column of table 4.3.4 demonstrates that the least integrated portfolio returns is indeed statistically significantly differ from the most integrated portfolio returns in the world market (t -value = 2.773). Put another way, there is a significant difference of portfolio returns between the least and the most integrated portfolios regarding the world market. Besides, the excess world market returns has a negative effect ($\beta = -0.79$) on the difference of world market portfolio returns, and it is statistically significant (t -value = -7.924). As a result, I conclude that there is evidence to attest a significant relationship between stock market integration and the equity returns with respect to the world market.

Summing up, based on the EFW ranking, there is indeed a significant relationship between stock market integration and the equity returns in the world market. However, this finding is not so robust because the degree of stock market integration has no significant effect on the expected equity returns in regard to either developed or emerging, or frontier markets. Moreover, the portfolio returns are statistically significantly and positively related to the excess world market returns among all markets (developed, emerging, frontier and world markets). Particularly, the beta of the most integrated portfolio is significantly higher than the least integrated one for all markets expect for developed markets. Last but not least, it is valuable to mention that the excess world market returns has a slightly negative and significant effect on the difference of portfolio returns in either emerging or frontier, or world markets. In developed markets, the difference of portfolio returns is somewhat positively related to the excess world market returns, but it is not statistically significant.

5. Conclusion

With the development of financial market liberalization, more and more countries are developing greater links in finance and/or trade with the world market. Put another way, a number of countries, especially for emerging countries, become highly interdependent with each other after market liberalization. Theoretically, the standard International CAPM predicts that the expected equity returns (the cost of capital) will decline when the degree of market integration increases. This negative relationship is due to the risk sharing across countries after integration in which less country-specific risk can be diversified away. Empirically, a range of previous literatures indeed find a significant relationship between stock market integration and the expected equity returns in regard to either developed or emerging or both markets. The majority of literatures examine such relationship with a special attention to emerging markets. Moreover, previous researchers concentrate on measuring the level of market integration and then to examine whether the implication of integration is indeed exists in reality. Relative to the previous works, my contribution of this research paper is to test the impact of stock market integration on the equity returns by relying on the time-varying three market integration rankings. Additionally, except for developed and emerging markets, I also extend the analysis of this relationship to frontier and world markets.

To test for the existence of a significant relationship between stock market integration and the equity returns, I use a data set of 16 years monthly total returns (1996-2011) of the MSCI country index for developed and emerging markets and rely on S&P/IFC indexes for frontier equity markets. The world market classification is based on the MSCI Market Classification Framework. The stock market integration is depend on three time-varying market integration rankings, namely the HF ranking, the KOF ranking, and the EFW ranking. As a result, I only find a significant relationship exists in the world market in terms of the EFW ranking. However, this result is not so robust because there is no evidence to attest a significant relationship with respect to other markets (e.g. developed, emerging and frontier markets) based on the EFW ranking. Furthermore, according to the HF and the KOF rankings, I still haven't found that there exists a significant relationship between stock market integration and the equity returns in regard to all markets. In sum, it is fair to conclude that stock market integration has no or small significant effect on the equity returns for all markets over the examined period 1996-2011. Supplementary, it is valuable to mention that the portfolio returns of all markets are statistically significantly and positively related to the excess world

market returns in terms of three market integration rankings. This implies that countries portfolio returns are highly correlated with the world market portfolio returns. Thus, the measure of correlation is actually not same with the measure of integration. As mentioned by Longin and Solnik (1995), fully integrated markets may with or without correlation in asset returns across markets. Therefore, it is not possible to conclude integration by only taking into account the correlation in asset returns.

Based on the data and empirical results, unexpectedly, I haven't found a significant relationship over the period 1996-2011. This result is inconsistent with a theoretical implication of integration as well as a significant relationship confirmed by previous researchers. There might be some limitations of this paper and data. One possible limitation is that three market integration rankings may not be a good proxy for stock market integration. These rankings take into account the dimension of economic globalization or freedom to trade internationally, but there might be other factors play an important role in stock market integration. On the other hand, I only take the three most or least integrated countries to make portfolios. It may be more sensible to have more countries included in the portfolios (such as the five most/least integrated countries). Moreover, I use the latest version of the MSCI Market Classification Framework to distinguish the world market, but the classification system may not be constant over time. Thus, it would be better to consider the change of the classification system. Alternatively, it might as well to use other market classification system (such as Standard and Poor's market classification) to distinguish the world market. Besides, the results will be robust if a longer period can be used to examine such relationship. These possible limitations/suggestions might be good for the further research.

6. References

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7. Appendix

Appendix A: MSCI Developed Markets Index - Country Coverage

Americas	Europe & Middle East	Pacific
Canada	Austria	Australia
United States	Belgium	Hong Kong
	Denmark	Japan
	Finland	New Zealand
	France	Singapore
	Germany	
	Greece	
	Ireland	
	Israel	
	Italy	
	Netherlands	
	Norway	
	Portugal	
	Spain	
	Sweden	
	Switzerland	
	United Kingdom	

Appendix B: MSCI Emerging Markets Index - Country Coverage

Americas	Europe, Middle, East & Africa	Pacific
Brazil	Czech Republic	China
Chile	Egypt	India
Colombia	Hungary	Indonesia
Mexico	Morocco	Korea
Peru	Poland	Malaysia
	Russia	Philippines
	South Africa	Taiwan
	Turkey	Thailand

Appendix C: MSCI Frontier Markets Index - Country Coverage

Americas	Europe & CIS	Africa	Middle East	Asia
Argentina	Bosnia & Herzegovina	Botswana	Bahrain	Bangladesh
Jamaica	Bulgaria	Ghana	Jordan	Pakistan
Trinidad & Tobago	Croatia	Kenya	Kuwait	Sri Lanka
	Estonia	Mauritius	Lebanon	Vietnam
	Lithuania	Nigeria	Oman	
	Kazakhstan	Tunisia	Qatar	
	Romania	Zimbabwe	United Arab Emirates	
	Serbia			
	Slovenia			
	Ukraine			

Appendix D: The HF Ranking

Year	All Markets		Developed Markets		Emerging Markets		Frontier Markets	
	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3
1995	Hong Kong	Egypt	Hong Kong	Israel	Taiwan	Egypt	Argentina	Bangladesh
	Singapore	India	Singapore	Sweden	South Korea	Poland	Jamaica	Nigeria
	United Kingdom	Bangladesh	United Kingdom	Italy	Malaysia	India	Tunisia	Bulgaria
1996	Hong Kong	Brazil	Hong Kong	Sweden	Taiwan	China	Argentina	Lithuania
	Singapore	India	Singapore	Italy	South Korea	Brazil	Jamaica	Bulgaria
	New Zealand	Nigeria	New Zealand	Spain	Chile	India	Tunisia	Nigeria
1997	Hong Kong	Russia	Hong Kong	Spain	Chile	China	Argentina	Bulgaria
	Singapore	Bulgaria	Singapore	France	Taiwan	India	Estonia	Bangladesh
	New Zealand	Ukraine	New Zealand	Italy	South Korea	Russia	Jamaica	Ukraine
1998	Hong Kong	India	Hong Kong	Spain	Chile	Russia	Estonia	Croatia
	Singapore	Bulgaria	Singapore	Italy	South Korea	Brazil	Argentina	Bulgaria
	New Zealand	Ukraine	New Zealand	France	Taiwan	India	Jamaica	Ukraine
1999	Hong Kong	Bangladesh	Hong Kong	Belgium	Chile	China	Estonia	Bangladesh
	Singapore	Bulgaria	Singapore	Italy	Taiwan	Russia	Argentina	Bulgaria
	New Zealand	Ukraine	New Zealand	France	Czech Republic	India	Mauritius	Ukraine
2000	Hong Kong	Ukraine	Hong Kong	Belgium	Chile	Egypt	Bahrain	Bangladesh
	Singapore	India	Singapore	Italy	Taiwan	Russia	Argentina	Ukraine
	New Zealand	Bulgaria	New Zealand	France	Czech Republic	India	Estonia	Bulgaria
2001	Hong Kong	Nigeria	Hong Kong	Belgium	Chile	Egypt	Estonia	Romana
	Singapore	India	Singapore	Italy	Taiwan	Russia	Bahrain	Ukraine
	Ireland	Ukraine	Ireland	France	Czech Republic	India	Argentina	Nigeria
2002	Hong Kong	Russia	Hong Kong	Portugal	Chile	China	Estonia	Romana
	Singapore	Romania	Singapore	Italy	Taiwan	India	Bahrain	Ukraine
	New Zealand	Ukraine	New Zealand	France	South Korea	Russia	Mauritius	Nigeria
2003	Hong Kong	Romania	Hong Kong	Italy	Chile	Turkey	Estonia	Romana
	Singapore	Nigeria	Singapore	Israel	Taiwan	India	Bahrain	Nigeria
	New Zealand	Bangladesh	New Zealand	France	South Korea	Russia	Lithuania	Bangladesh
2004	Hong Kong	Bangladesh	Hong Kong	Italy	Chile	China	Estonia	Bangladesh
	Singapore	Romania	Singapore	Israel	Taiwan	Indonesia	Bahrain	Romana
	New Zealand	Nigeria	New Zealand	France	South Korea	Russia	Lithuania	Nigeria
2005	Hong Kong	Turkey	Hong Kong	Israel	Chile	Morocco	Estonia	Argentina
	Singapore	Nigeria	Singapore	Portugal	Taiwan	Russia	Bahrain	Nigeria
	New Zealand	Bangladesh	New Zealand	France	South Korea	Turkey	Lithuania	Bangladesh
2006	Hong Kong	Morocco	Hong Kong	Portugal	Chile	India	Estonia	Bangladesh
	Singapore	Vietnam	Singapore	Italy	Taiwan	Indonesia	Lithuania	Vietnam
	Ireland	Nigeria	Ireland	France	South Korea	Morocco	Bahrain	Nigeria
2007	Hong Kong	Ukraine	Hong Kong	Portugal	Chile	Indonesia	Estonia	Ukraine
	Singapore	Vietnam	Singapore	Italy	Taiwan	Russia	Lithuania	Vietnam
	Ireland	Bangladesh	Ireland	France	South Korea	China	Bahrain	Bangladesh
2008	Hong Kong	Vietnam	Hong Kong	France	Chile	Indonesia	Estonia	Ukraine
	Singapore	Russia	Singapore	Portugal	Taiwan	Russia	Mauritius	Vietnam
	Ireland	Bangladesh	Ireland	Italy	South Korea	China	Bahrain	Bangladesh
2009	Hong Kong	Russia	Hong Kong	Portugal	Chile	Indonesia	Estonia	Vietnam
	Singapore	Ukraine	Singapore	France	Taiwan	Russia	Bahrain	Ukraine
	Australia	Bangladesh	Australia	Italy	Czech Republic	China	Mauritius	Bangladesh
2010	Hong Kong	Russia	Hong Kong	Portugal	Chile	India	Bahrain	Bangladesh
	Singapore	Vietnam	Singapore	France	Taiwan	China	Mauritius	Vietnam
	Australia	Ukraine	Australia	Italy	South Korea	Russia	Estonia	Ukraine

Appendix E: The KOF Ranking

Year	All Markets		Developed Markets		Emerging Markets		Frontier Markets	
	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3
1994	Singapore	Ghana	Singapore	Israel	South Africa	China	Jamaica	Pakistan
	Ireland	India	Ireland	United States	Malaysia	Russian	Botswana	Ghana
	Belgium	Bangladesh	Belgium	Japan	Chile	India	Nigeria	Bangladesh
1995	Singapore	Ghana	Singapore	United States	Malaysia	China	Jamaica	Pakistan
	Ireland	India	Ireland	Israel	Hungary	Russian	Botswana	Ghana
	Belgium	Bangladesh	Belgium	Japan	Czech Republic	India	Argentina	Bangladesh
1996	Ireland	Pakistan	Ireland	France	Hungary	Morocco	Estonia	Kenya
	Singapore	India	Singapore	United States	Malaysia	Russian	Jamaica	Pakistan
	Belgium	Bangladesh	Belgium	Japan	Czech Republic	India	Botswana	Bangladesh
1997	Ireland	Ghana	Ireland	France	Hungary	China	Estonia	Pakistan
	Singapore	India	Singapore	United States	Malaysia	Russian	Jamaica	Ghana
	Belgium	Bangladesh	Belgium	Japan	Czech Republic	India	Botswana	Bangladesh
1998	Ireland	Kenya	Ireland	France	Hungary	Egypt	Estonia	Pakistan
	Netherlands	India	Netherlands	United States	Czech Republic	Morocco	Jamaica	Kenya
	Belgium	Bangladesh	Belgium	Japan	Malaysia	India	Botswana	Bangladesh
1999	Ireland	Pakistan	Ireland	France	Hungary	China	Estonia	Kenya
	Netherlands	India	Netherlands	United States	Czech Republic	Morocco	Bahrain	Pakistan
	Belgium	Bangladesh	Belgium	Japan	Malaysia	India	Botswana	Bangladesh
2000	Ireland	Pakistan	Ireland	Australia	Hungary	Egypt	Estonia	Kenya
	Netherlands	India	Netherlands	United States	Czech Republic	Morocco	Bahrain	Pakistan
	Belgium	Bangladesh	Belgium	Japan	Malaysia	India	Botswana	Bangladesh
2001	Ireland	Kenya	Ireland	France	Hungary	Egypt	Estonia	Pakistan
	Belgium	India	Belgium	United States	Czech Republic	Morocco	Bahrain	Kenya
	Netherlands	Bangladesh	Netherlands	Japan	Chile	India	Lithuania	Bangladesh
2002	Ireland	Kenya	Ireland	Greece	Czech Republic	Morocco	Estonia	Pakistan
	Belgium	India	Belgium	United States	Hungary	Egypt	Bahrain	Bangladesh
	Netherlands	Bangladesh	Netherlands	Japan	Chile	India	Botswana	Lithuania
2003	Singapore	Pakistan	Singapore	France	Chile	Morocco	Estonia	Kenya
	Netherlands	India	Netherlands	United States	Czech Republic	Egypt	Bahrain	Pakistan
	Ireland	Bangladesh	Ireland	Japan	Hungary	India	Lithuania	Bangladesh
2004	Singapore	Pakistan	Singapore	Australia	Hungary	Egypt	Estonia	Kenya
	Ireland	India	Ireland	United States	Czech Republic	Morocco	Bahrain	Pakistan
	Belgium	Bangladesh	Belgium	Japan	Chile	India	Unit. Arab Em.	Bangladesh
2005	Singapore	India	Singapore	France	Hungary	Egypt	Estonia	Pakistan
	Ireland	Kenya	Ireland	United States	Czech Republic	Morocco	Bahrain	Kenya
	Netherlands	Bangladesh	Netherlands	Japan	Chile	India	Unit. Arab Em.	Bangladesh
2006	Singapore	India	Singapore	France	Hungary	Egypt	Estonia	Pakistan
	Netherlands	Kenya	Netherlands	United States	Czech Republic	Morocco	Bahrain	Kenya
	Ireland	Bangladesh	Ireland	Japan	Chile	India	Unit. Arab Em.	Bangladesh
2007	Singapore	India	Singapore	France	Hungary	Egypt	Estonia	Pakistan
	Netherlands	Kenya	Netherlands	United States	Czech Republic	Morocco	Bahrain	Kenya
	Ireland	Bangladesh	Ireland	Japan	Chile	India	Unit. Arab Em.	Bangladesh
2008	Singapore	Pakistan	Singapore	Australia	Hungary	Morocco	Estonia	Pakistan
	Ireland	Kenya	Ireland	United States	Czech Republic	Egypt	Unit. Arab Em.	Kenya
	Netherlands	Bangladesh	Netherlands	Japan	Chile	India	Bahrain	Bangladesh
2009	Singapore	Pakistan	Singapore	France	Hungary	Morocco	Estonia	Pakistan
	Ireland	Sri Lanka	Ireland	United States	Czech Republic	Egypt	Unit. Arab Em.	Sri Lanka
	Belgium	Bangladesh	Belgium	Japan	Chile	India	Bahrain	Bangladesh

Appendix F: The EFW Ranking

Year	All Markets		Developed Markets		Emerging Markets		Frontier Markets	
	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3	Top 3	Bottom 3
1990	Hong Kong	India	Hong Kong	Finland	Malaysia	Peru	Botswana	Bulgaria
	Singapore	Egypt	Singapore	Japan	Taiwan	India	Jordan	Argentina
	Belgium	Bangladesh	Belgium	Greece	Mexico	Egypt	Tunisia	Bangladesh
1995	Hong Kong	India	Hong Kong	Israel	Malaysia	Egypt	Lithuania	Pakistan
	Singapore	Nigeria	Singapore	Greece	Czech Republic	Brazil	Kenya	Nigeria
	Ireland	Bangladesh	Ireland	Japan	Mexico	India	Jamaica	Bangladesh
2000	Hong Kong	Morocco	Hong Kong	Australia	Czech Republic	Brazil	Estonia	Nigeria
	Singapore	Bangladesh	Singapore	Norway	Taiwan	India	Oman	Bangladesh
	Ireland	Pakistan	Ireland	Japan	Hungary	Morocco	Botswana	Pakistan
2001	Hong Kong	Morocco	Hong Kong	Norway	Hungary	Egypt	Estonia	Argentina
	Singapore	Bangladesh	Singapore	Australia	Czech Republic	India	Oman	Bangladesh
	Ireland	Pakistan	Ireland	Japan	Chile	Morocco	Botswana	Pakistan
2002	Hong Kong	Pakistan	Hong Kong	Australia	Chile	Colombia	Estonia	Tunisia
	Singapore	Bangladesh	Singapore	Norway	Hungary	Morocco	Oman	Pakistan
	Ireland	Egypt	Ireland	Japan	Taiwan	Egypt	Bahrain	Bangladesh
2003	Hong Kong	Pakistan	Hong Kong	Greece	Chile	India	Estonia	Tunisia
	Singapore	Bangladesh	Singapore	Australia	Hungary	Morocco	Oman	Pakistan
	Ireland	Egypt	Ireland	Japan	Taiwan	Egypt	Bahrain	Bangladesh
2004	Hong Kong	Morocco	Hong Kong	Norway	Hungary	India	Unit. Arab Em.	Tunisia
	Singapore	Pakistan	Singapore	Australia	Chile	Colombia	Estonia	Pakistan
	Ireland	Bangladesh	Ireland	Japan	Czech Republic	Morocco	Oman	Bangladesh
2005	Hong Kong	Colombia	Hong Kong	Norway	Chile	Russia	Unit. Arab Em.	Tunisia
	Singapore	Pakistan	Singapore	Australia	Czech Republic	Morocco	Estonia	Pakistan
	Unit. Arab Em.	Bangladesh	Ireland	Japan	Hungary	Colombia	Jordan	Bangladesh
2006	Hong Kong	Tunisia	Hong Kong	Norway	Chile	Colombia	Unit. Arab Em.	Tunisia
	Singapore	Bangladesh	Singapore	Greece	Hungary	Russia	Estonia	Bangladesh
	Unit. Arab Em.	Pakistan	Ireland	Japan	Taiwan	Morocco	Bahrain	Pakistan
2007	Hong Kong	Tunisia	Hong Kong	Norway	Chile	Colombia	Unit. Arab Em.	Tunisia
	Singapore	Bangladesh	Singapore	Greece	Hungary	Russia	Estonia	Bangladesh
	Chile	Pakistan	Ireland	Japan	Czech Republic	Morocco	Bahrain	Pakistan
2008	Hong Kong	Colombia	Hong Kong	Norway	Chile	Morocco	Unit. Arab Em.	Sri Lanka
	Singapore	Bangladesh	Singapore	Greece	Hungary	Russia	Estonia	Bangladesh
	Unit. Arab Em.	Pakistan	Netherlands	Japan	Czech Republic	Colombia	Ghana	Pakistan
2009	Singapore	Tunisia	Singapore	Norway	Hungary	Morocco	Unit. Arab Em.	Tunisia
	Hong Kong	Bangladesh	Hong Kong	Greece	Chile	Russia	Estonia	Bangladesh
	Ireland	Pakistan	Ireland	Japan	Thailand	Colombia	Bahrain	Pakistan