Country-specific equity market characteristics and foreign equity portfolio allocation

Chandra Thapa[a,*] and Sunil S. Poshakwale[b]

Updated version: 15 May 2011

*Corresponding Author

[a,*] Accounting and Finance Division, Stirling School of Management, Scotland, FK9 4LA, Tel: +44 (0) 1786 467341, Fax: +44 (0) 1786 467308, Email:chandra.thapa@stir.ac.uk

[b] Centre for Research in Economic and Finance, Cranfield School of Management, England, MK43 0AL, Tel: +44 (0) 1234 754404, Fax: +44 (0) 1234 752554, Email:sunil.poshakwale@cramfield.ac.uk

Country-specific equity market characteristics and foreign equity portfolio allocation

Abstract

Do country-specific equity market characteristics explain variations in foreign equity portfolio allocation? We study this question using comprehensive foreign equity portfolio holdings data and different measures of country-specific equity market factors for 36 host countries. Employing panel and cross-sectional econometric estimations, our investigation shows that foreign investors prefer to invest more in larger and highly visible developed markets, which are more liquid, exhibit a higher degree of market efficiency and have lower trading costs. The findings imply that by improving the preconditions necessary for well-functioning capital markets, policymakers should be able to attract higher levels of foreign equity portfolio investments.

JEL classification: G11, G14, G15, F3

Key words: Foreign equity portfolio allocations; stock market development; panel data models

1. Introduction

The global financial crisis and its consequences continue to preoccupy policymakers. Capital markets around the world have been volatile, and governments are facing the difficult task of financing the investment needs of their local economy. There is a vast body of literature on the positive role of finance on economic development (Goldsmith, 1969; McKinnon, 1973; Fry, 1988; Levine, 1992). Among the different forms of finance, equity financing is an important source, and the role of foreign investors in funding the requirements of domestic economies has never been more vital. Errunza (2001) suggests that foreign equity portfolio investors have a significant positive impact on the development of local equity markets, which in turn should drive domestic economic development. Given the importance of foreign equity portfolio investment, it is imperative for policymakers to appreciate factors influencing the country allocation decision of foreign investors. This paper investigates whether the investment decisions of foreign investors are affected by the host country-specific equity market characteristics.

The benefits of international diversification of portfolio investment are well established (see Grubel, 1968; Levy and Sarnat, 1970; Solnik, 1974a; Errunza, 1977, among others). The International Capital Asset Pricing (ICAPM) model suggests that international investors should hold the world market as the benchmark portfolio because it provides the best mean variance efficiency (Tesar and Werner, 1995; Solnik and McLeavy, 2004; Chan et al., 2005; Fidora et al., 2007). Studies also document the gradual removal of capital controls by developed countries beginning in the early 1980s (French and Poterba, 1991), and by developing countries by the late 1980s and early 1990s (Errunza, 2001; Harvey, 2003). However, despite increased access to financial markets across the globe, an extensive number of investigations demonstrate the prevalence of home bias, i.e., the tendency to overweight home markets relative to the theoretical prescription of the ICAPM (see Cooper and Kaplanis, 1994; Tesar and Werner, 1995; Warnock, 2001; Chan et al., 2005; Fidora et al., 2007).

The investigations on home bias document a number of potential barriers impeding foreign investors from holding the world market portfolio. These barriers may be direct legal restrictions due to different legal status accorded to foreign and domestic investors (Bekaert, 1995) or indirect barriers arising from differences in available information and investor

protection (Bekaert and Harvey, 1995; Errunza, 2001; Bekaert et al., 2003; Hunter, 2006). Similarly, market-specific risks, such as diversification opportunities, liquidity, transaction costs and level of host market efficiency, commonly known as stock market development factors, could also potentially impede foreign investment (Chan et al., 2005). However, empirical studies documenting the role of country-specific equity market factors on country allocation decisions are limited. The persistence of home bias indicates that, on aggregate, foreign investors allocate a relatively large fraction of their wealth to domestic assets. This suggests that if we are able to control for home bias, we should be able to explain the role of different country-specific equity market characteristics in explaining bilateral cross-country foreign equity country allocation.

Chan et al. (2005) note that a major factor limiting research on foreign equity portfolio investment is the lack of cross-border holdings data. We make use of the recently available IMF's Co-ordinated Portfolio Investment Survey (CPIS) foreign equity portfolio holding data. Similarly, as Chan et al. (2005) state, most existing studies are from the perspective of U.S. investors, and they leave the question open of whether the explanations for a wide cross-section of other source countries are similar or not. Furthermore, a very small number of existing studies, which use multiple source and host countries in their sample, only investigate the investments from developed into other developed countries. Since the U.S. and other developed countries' equity markets exhibit higher levels of development relative to emerging markets, it remains to be tested whether the inclusion of the latter markets as host countries along with developed markets yields similar results.

Our study makes three important contributions to the literature. First, we try to explain the role of country-specific equity market characteristics in explaining the cross-sectional and temporal variation of foreign equity country allocation. Apart from Gelos and Wei (2005), who include emerging markets only, and Chan et al. (2005), who explain foreign bias, no study has undertaken comprehensive empirical investigation modeling cross-country allocations. Second, as noted earlier, despite the theoretical suggestions of ICAPM, global investors do not hold the world market as their benchmark portfolio. The ICAPM makes a number of assumptions, such as that global financial markets are perfectly integrated and fully efficient, investors incur no transaction costs, purchasing power parity perfectly holds and there are no barriers to international investments. Most earlier studies on international investments offer abstract theoretical explanations of why foreign investors may not hold the

world market portfolio (see Solnik, 1974b; Black, 1974; Sercu, 1980; Stulz, 1981a,b; Adler and Dumas, 1983; Errunza and Losq, 1985; Eun and Janakiramanan, 1986; Cooper and Kaplanis, 1986, 1994). The majority of the equilibrium frameworks suggest that the violation of unrealistic ICAPM assumptions, which create costs/risks for global investors, should explain the under- or over-weighting of foreign countries relative to ICAPM. However, empirical evidence modeling the violations of the underlying assumptions are scarce and limited by the unavailability of high quality data. We fill the gap by using different proxies of the underlying assumptions to model cross-country allocation.

Finally, we pool bilateral data from 36 countries, developed and developing, spanning a period of six years (2001-2006), with more than 562 cross-section units yielding approximately 3,000 observations. Such a comprehensive dataset with wide cross-sectional and temporal variation affords us the statistical confidence for testing our hypotheses using panel and cross-section econometric estimations. Baltagi (1995) demonstrates that, compared to purely cross-section, panel data set-up supplies more information, more variability, less co-linearity, greater degrees of freedom and higher statistical efficiency, yielding reliable parameter estimates. Furthermore, the application of fixed effect model controls for individual heterogeneity; studies not controlling for unit-specific effects run the risk of producing biased estimates.

The findings show that country-specific equity market factors, particularly market size, liquidity, level of market efficiency and transaction costs, are the key factors influencing the country allocation decisions of foreign equity portfolio investors. We demonstrate that country-specific equity market characteristics, predominantly stock market development factors, explain almost 47% of the total variation in foreign equity portfolio allocations. One of the key implications of our study is that by improving the preconditions necessary for a well-functioning capital market, policymakers should be able to attract higher levels of foreign equity portfolio investments.

The rest of the paper is organized as follows. Section 2 briefly explains the the theoretical framework underlying our empirical analysis and provides a detailed discussion of the variables used. Section 3 reports and discusses empirical results and section 4 concludes the paper.

2. Data

We follow the theoretical framework developed by Cooper and Kaplanis (1986). They model portfolio allocation as follows:

$$x_{in} = M_n - (W_i c/hs^2), \qquad i \neq n$$

where x_i is a column vector of weights containing foreign portfolio weightings, the *n*th element (x_{in}) corresponds to the weight of individual *i*'s total wealth invested in risky assets of country *n*. c_i is the column vector of deadweight cost of investor *i* arising from different barriers to international investments. The *n*th element of c_i is c_{in}, which is the deadweight cost for holding the asset in country *n*. *Wi* is the proportion of world wealth owned by country *i*, *M* is a column with the corresponding *i*th element of whichis *Mi* and *Mi* is the proportion of the world market capitalization in country *i*'s market. Clearly, if there are not costs (*c*) all investors should hold M_n. However, with presence of deadweight costs, the above relationship shows that the greater the deadweight cost is (*c*), the lower the allocation from investors of country *i* into country *n* will be. In the following sections we first describe the proxy of foreign equity portfolio allocations (i.e. x_i), followed by the direct and indirect investment barriers that may potentially influence the country allocation decision of foreign investors (i.e. c_{in}).

2.1 Measure of bilateral foreign equity portfolio allocation

The main dependent variable in this study is the portfolio allocation (weights) from country *i* in country *j* and is defined as:

$$x_{ijt} = log\left(FPI_{ijt} \Big/ \sum_{j=1}^{36} FPI_{ijt} \right)$$

where x_{ijt} is the weight of foreign equity investment from country *i* into country *j* for year *t*, and FPI_{ijt} is the actual foreign portfolio investment (stock of holdings) in USD millions. Our bilateral data on the 36 recipients or host countries (see Table 1 below) is from the International Monetary Fund (IMF).

The Co-ordinated Portfolio Investment Survey (CPIS) of the IMF provides detailed and bilateral country-by-country foreign equity portfolio holding data. Most of the investments in the survey are from developed countries to other developed markets. The stock holding of developing countries is negligible. For this reason, we consider only developed countries as source countries.[1] The number of investor or source countries is 16 (Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and the United States). Following other studies (see Chan et al., 2005 and Fidora et al., 2007); we too exclude offshore financial centers, such as Luxembourg, which are considered tax havens.

Table 1 presents the sample averages of foreign portfolio equity allocation received by all the host countries *j* for the six-year period 2001-2006. As seen from the second column, Peru received the lowest allocation (0.02%), whereas investors' most favoured destination is the United States, with the highest allocation of 37.76. The top ten countries in terms of allocation are all developed markets (the United States, the United Kingdom, Switzerland, Sweden, Japan, Italy, Germany, France, Finland and Canada), whereas nine of the bottom ten are developing countries (Argentina, Chile, the Czech Republic, Malaysia, Peru, the Philippines, Thailand, Poland and Turkey).

…….....Insert Table 1 about here.....

2.2 Country-specific equity market proxies

As our investigation underscores the importance of country-specific equity market characteristics, we first describe proxies of country-specific equity market factors followed by the control variables. We use six different variables to capture key equity market features[2]. The first variable (*Stock market size*) encapsulates the relative breadth (size) of the equity market, reflecting the significance of the capital market in the economy. Levine and Zervos

[1] In terms of coverage of the survey, most of the financial market participants included in the survey are, but are not limited to, the primary end-investors (e.g. banks, security dealers, pension funds, insurance companies, mutual funds, non-financial corporations, households) and primary custodians who hold or manage securities on behalf of others. However, some caveats deserve due attention in using the data. Any investment below USD 500,000 is not reported. In addition, some data, despite being available, may not be reported by a country due to confidentiality reasons.

[2] We also consider *number of listed companies scaled by total population* and *trade volume scaled by GDP* as alternative measures. However, because these measures are highly correlated with stock market development and turnover ratio, we do not include them since they do not add any additional information. However, when regressed individually both these measures are highly significant in all our regressions.

(1996) claim that developed markets, which are bigger in size, are better at mobilizing capital and diversifying risk. Bekaert and Harvey (2000) and Chan et al. (2005) suggest that foreign investors tend to allocate more wealth to bigger and developed markets. Similarly, Chan et al. (2005) conjecture that bigger stock markets are more visible, more recognized and more developed, and therefore are able to attract more foreign equity portfolio investment. Following Levine and Zervos (1996) and Chan et al. (2005), we add the logarithmic ratio of stock market capitalization to GDP as a measure of stock market size. This variable is sourced from the World Development Indicator (WDI) of the World Bank. Table 1 (column 3) shows that the top ten countries ranking against this measure are all developed markets, with the exception of Chile and Malaysia. Similarly, the bottom ten countries generally represent emerging markets, with the exception of Austria, New Zealand and Portugal. The regression coefficient on this variable should carry a positive sign.

The next two variables we use are the proxies that capture relative development of the market microstructure. In a relatively more developed market, transaction costs would be lower. Solnik and McLeavey (2004) argue that the effect of transaction costs is often neglected in international portfolio management. They claim that the impact of transaction costs should be integrated in active global portfolio management, as these vary significantly amongst different countries. Higher transaction costs may reduce the expected return and diminish the benefits of global diversification and therefore the effect of transaction cost should be a key consideration, particularly when investing in emerging markets. Keim and Madhavan (1995), who highlight the importance of transaction costs in determining investment performance, also suggest that transaction costs may materially lower the expected value of an investment strategy, which otherwise may appear lucrative. Similarly, Rowland (1999) shows the inverse relationship between higher transaction costs and benefits of international portfolio diversification. Furthermore, De Roon et al. (2001) demonstrate that for US investors investing in emerging markets, the diversification benefits become smaller when short selling and transaction costs constraints are incorporated. Similarly, studies investigating the association between transaction costs and asset pricing generally conjecture that equities with higher transaction costs trade at lower prices compared to their expected cash flows (see Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996; Datar et al., 1998).

The available empirical findings imply that despite the inherent diversification benefit, foreign investors may prefer to underweight countries that have higher transaction costs. We

use a composite estimate of country level transaction cost associated with trading international securities. The transaction costs variable is estimated and maintained by Elkins-Sherry (E/S) and documented in the yearly Global Stock Market Factbook of *Standard and Poor (S&P).* E/S provides transaction cost analysis for global institutional investors, such as pension funds, investment managers and other investment companies. The estimates of total trading cost comprise three sub-components. The first is the average commission; the second is the average fee. It is worth noting that for the UK, the buying fee is significantly higher because of stamp duty. We have taken the average of the buy and sell figures, as investors pay more for buying but are compensated significantly less for selling. The third component is the average cost of market impact. Market impact is the difference between the price at which a trade is executed and the average of the stock's high, low, opening and closing prices during the trading period. More specifically, it is the average cost of trade versus the average price. Solnik and McLeavy (2004) define market impact as the difference between the actual execution cost and the price that would have prevailed in a case of no-trade by the manager. We aggregate all three components of transaction cost to form a composite measure denominated in basis points. As presented in Table 1 (column 4) the ten markets with the highest transaction costs are all emerging markets, with the exception of Greece. The Philippines has the highest transaction cost, with almost 1% per average transaction. Similarly, the ten countries with the lowest transaction costs are all developed markets, with Japan having the lowest average cost of 20 bps, followed by the U.S., with 25 bps. In our regression, we expect this variable to bear a negative sign, since higher transaction costs would be associated with lower equity portfolio allocations.

Following Bekeart and Harvey (2000), the other microstructure variable we use captures the liquidity of the market. As noted earlier, studies show assets with lower liquidity trade at a lower price relative to their expected cash flows (Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996; Datar et al., 1998). This suggests that illiquid assets demand an extra risk premium and therefore should have higher expected returns, which further implies that foreign investors should underweight countries with illiquid markets. Bekeart et al. (2007) claim that the effect of liquidity is more pronounced in emerging markets, where it takes considerable time to execute transactions. Following Levine and Zervos (1996), we use the turnover ratio (*Market liquidity*) as proxy of market liquidity. Bekaert and Hodrick (2008) further suggest that although turnover ratio is often regarded as an indicator of liquidity, it can also reflect the arrival of news that instigates trades. Damodaran (2010) remarks that one

of the minimum requirements for a market to be efficient, with prices therefore the best estimates of true values, is that trading should be inexpensive, instantaneous and easy. This conjecture implies that liquidity measures may also reflect the degree of market efficiency.

Furthermore, turnover also complements the *stock market development/size* measure, given the argument that a large market may not be the most active market. For example, the value of stocks traded in Canada for the year 2006 is USD 1,290,246 million (market capitalization of USD 1,700,708 million) with a turnover ratio of 81%. For the same year, value traded in Sweden is almost half of that in Canada, i.e. USD 677,122 million (market capitalization of USD 573,250 million), but the turnover ratio is 139%. We incorporate the average value traded as a percentage of mean market capitalization sourced from different issues of Global Stock Market Factbook of *S&P*. As seen from Table 1 (column 5), the majority of the countries with the highest turnover ratio are developed markets, with the exception of India, Taiwan and Korea. The regression coefficient is expected to take on a positive sign.

We further add two variables to reflect potential market volatility. The first variable we include is the three-year moving standard deviation (*Local equity market volatility*) of stock market returns, constructed using the previous 36 months' total return index denominated in local currency. We obtain the monthly total return index from Morgan Stanley Capital Investment (MSCI). Following the conceptual framework of Cooper and Kaplanis (1986), variance negatively affects returns, suggesting foreign investors may avoid countries with a certain level of volatility. As shown in column 6 of Table 1, except for Belgium most of the ten countries with the highest stock market volatility are emerging markets, indicating greater future uncertainty (risk) relative to developed markets. As such, investors may shy away or underweight markets with higher stock market volatility. The regression coefficient of this variable should carry a negative sign.

Solnik and McLeavy (2004) remark that currency risk premium must be earned by foreign investors for taking systematic risk which cannot be diversified away. They claim that despite diversification, the world market portfolio is sensitive to foreign exchange risk; therefore, the latter needs to be taken into consideration in international portfolio management. Such arguments conjecture that exchange rate movements should also affect investors' decisions (see Solnik and McLeavey, 2004). Following the risk-return relationship argument of the ICAPM, investors should underweight countries with higher movements in real exchange

rate. This may be particularly important when investing in emerging markets, which experience wide swings in foreign exchange rates. As the second measure of earnings volatility relevant to foreign investors, we use the three-year moving average standard deviation (*Exchange rate volatility*) based on monthly figures of trade weighted real effective exchange rate (REER) variable obtained from the Bank of International Settlement (BIS). The trade weighted effective exchange rate is a better indicator of the macroeconomic effects of exchange rates than purely a single bilateral rate (see Mark and Fung, 2006). The REER used in this study is the nominal effective exchange rate (NEER) adjusted by relative consumer prices levels. The NEER is calculated as the geometric weighted average of a basket of bilateral exchange rates, which implies that variation in the REER incorporates both developments in nominal exchange rate and the inflation differential vis-à-vis trading partners. Carrieri et al. (2006) note that the use of REER should be preferred to NEER because inflation rates are generally non-random and hence nominal exchange rate may not reflect the true effect of exchange rate risk. They note that because REER is measured taking account of the combined effect of changes in the inflation differential and changes in nominal currency value, it is a better proxy as it captures the true effect of exchange rate risk arising from the deviation of PPP. The BIS REER basket used in this study incorporates 52 economies, including emerging markets. For further details, please refer to Mark and Fung (2006) and Carrieri et al. (2006). The summary average for all countries over the six-year period is reported in Table 1 (column 7). The ten markets with the highest real exchange rate volatility are generally found in emerging countries, with the exception of Australia and New Zealand. Turkey reveals the highest exchange rate volatility. On the other hand, eight of the top ten countries with the lowest exchange rate volatility are developed markets. In our sample, Austria exhibits the lowest real exchange rate volatility, with 1.9% moving average standard deviation. We expect this variable to yield negative regression coefficient.

Finally, we add a dummy (*EM dummy*) taking the value of one for emerging markets and zero otherwise, following S&P/IFC for the classification of emerging markets. Existing literature suggests that compared to developed markets, emerging capital markets are smaller in size (Chan et al., 2005). Similarly, relative to developed markets, emerging markets are less efficient (Harvey, 1995a, b; Fama and French, 1998). Harvey (1995a, b) notes that returns in emerging markets are more predictable than in developed markets. Harvey (1995b) and Kawakatsu and Moorey (1999) provide empirical evidence on the lower degree of efficiency level for the emerging markets and attribute it to factors such as infrequent trading

and slow adjustment to information released in the market. Similarly, Fama and French (1998) and Rouwenhorst (1999) show that market characteristics in emerging markets can be exploited to generate excess return over a given benchmark. The empirical evidence on the level of stock market development in emerging markets and their level of efficiency suggests that the emerging market dummy should be negatively associated with portfolio allocation. The significance of the dummy should provide strong indication that foreign investors should prefer well-developed markets in terms of market breadth, depth (liquidity) and informational efficiency.

2.2 Control variables

The first issue to control is the widely studied home bias phenomenon. It is evident from the literature (see French and Poterba 1991; Tesar and Werner, 1995; Warnock, 2001; Karlsson and Norden, 2007; Chan et al., 2005; Fidora, et al., 2007) that investors tend to significantly overweight their home market and therefore actual portfolios deviate from the theoretically derived world market portfolio. Chan et al. (2005) note that if foreign investors overweight their local market, then the rest of their allocation should also be disproportionately lower. Consequently, *home bias* could be an important explanatory variable for explaining foreign allocation. As investors deviate from holding the world market portfolio, following Fidora et al. (2007) we construct the following bilateral home bias ($Hbias_{ijt}$) to control for the impact of home bias on foreign equity allocation:

$$HBias = 1 - \log(w_{ijt}/BWT_{ijt})$$

where $Hbias_{ijt}$ is bilateral home bias observed by investor country i for country j at time t. BWT_{ijt} is defined as the benchmark weight and is computed as:

$$BWT_{jt} = MC_{jt} / \left(\sum_{j=i}^{36} MC_{jt}\right)$$

where MC_{jt} is the market capitalization of the recipient or host country j at time t.

As seen from column 2 of Table 2 below, all investor countries exhibit significant home bias. Among the top ten countries ranking highest on the scale of *Home bias*, six are developing countries (Argentina, Chile, China, India, Peru and Taiwan) and four are developed countries

(Australia, Canada, New Zealand and Greece). This shows that investors manifest home bias not only towards developing countries but also towards developed countries, suggesting a strong rationale for controlling the impact of the domestic bias on foreign portfolio allocation. Following the evidence on home bias, this variable should yield negative regression coefficient.

…….....Insert Table 2 about here.....

We include the logarithmic value of the *GDP per capita* income and *GDP growth* figure for each country to control for the level of economic development and economic growth. Both these variables are obtained from the World Development Indicator. We also control for any capital control measure that a country might have imposed on inward foreign portfolio investment. As a proxy for the degree of financial liberalization we use the capital control intensity measure (*Equity market openness*) suggested by Edison and Warnok (2003). The latter measure is constructed by taking the ratio of market capitalization represented by S&P/IFC investable indices (correcting for foreign ownership) to the market capitalization denominated by S&P/IFC global indices. This variable ranges from zero to one, with one implying total domestic market capitalization freely open to foreign investors, and zero implying a completed closed market. Since these indices are mostly available for developing countries in the S&P's Global Stock Market Factbook, they have been set to one for all developed countries. For more details see Edison and Warnok (2003) and various issues of S&P Global Stock Market Factbooks. The *Equity market openness* variable is a time varying proxy and therefore captures the time variation in the financial liberalization process (see De Jong et al., 2005). The regression coefficient on this variable is expected to carry a positive sign. Our equity market openness measure is based on the assumption that all the developed markets' stocks are fully free floated, which may not be the case. Dahlquist et al. (2003) note that only a small portion of the market capitalization in most countries is available to international investors who are not controlling shareholders. They compute the percentage of firms closely held for many countries. We employ the variable (*Closely held firms*) of Dahlquist et al. (2003) as the percentage of closely held shares of market capitalization to complement the *Equity market openness* measure. As Dahlquist et al. (2003) imply, the *Closely held firms* variable is expected to capture the prevalence of ownership restrictions, particularly in countries with poor investor protection rights, and is expected to have negative regression coefficient.

We also control for the bilateral familiarity or information asymmetry variables. It is highly likely that bilateral investments may be influenced by long-term bilateral relationship, geographic proximity and market familiarity. We employ a language dummy (*Common language dummy*), which takes the value of one if a pair of countries shares a common language. Countries like the United States, the United Kingdom, Australia, New Zealand and India share a common language (i.e. English). Similarly, we also include the distance (*Log distance*) between the capital cities of the pair countries. On average, European countries are closer to each other, with Australia and New Zealand being the furthest. Both variables are obtained from www.nber.org/~wei/data.html and used by Subramanian and Wei (2007). Further, Chan et al. (2005) suggest that investors are more confident in holding stocks of foreign companies whose goods and services are well known to them. Hence, we include the bilateral trade (*Log bilateral trade*) obtained from the *Bilateral Trade Statistics* database of the IMF. It is constructed by adding the logarithmic value of the paired country's total export and import values. Countries such as the United States, the United Kingdom and Germany share the highest average bilateral trade. Most of the emerging countries score lower on this measure. All the bilateral familiarity measures used in our study predict the probability of bilateral information flow and measure the barriers that foreign investors may encounter when seeking inforamtion overseas. It is worth noting that the three bilateral familiarity variables and *Equity market openness* measure are orthogonalized with the home bias measure, as a number of studies show that the latter factors explain home bias to a significant extent (see Chan et al., 2005; Fidora et al., 2007).[3] This does not affect the competitiveness of the *Home bias* variable, three bilateral familiarity variables and the *Equity market openness* measure with any of our key variables of interest.

We also add a three-year moving average return (*Historical return*) to capture the prevalence of return chasing or feedback behavior (see Bohn and Tesar, 1996; Froot et al., 2001; Richards, 2005; Bekaert et al., 2002; Dahlquist and Robertson, 2004; Griffin et al., 2004). Following the return chasing hypothesis, we expect the regression coefficient on this variable to bear a positive sign.

[3] In fact, a simple regression of the three bilateral familiarity variables and *Equity market openness* measure explain almost 17% of the variation in home bias, and all four independent variables are statistically significant. Due to space constraints we do not report the results but they can be obtained from the authors on request.

Aggarwal et al. (2005) demonstrate that U.S. funds tend to invest in open markets exhibiting stronger shareholder rights and legal frameworks. However, in sharp contrast, Chan et al. (2005) claim that investor protection does not influence the decisions of foreign investors. We add a composite measure of investor protection sourced from the World Bank Governance Indicator. This variable is composed of two broader aspects of regulatory environment. The first is the regulatory quality based on a scale of 1-100, capturing the perceptions of local government's ability to formulate and implement sound policies effective for private sector development. The second, which is also measured on a scale of 0-100, is the rule of law. The latter captures the perception of the extent to which agents show confidence in and follow the rules of society, especially the quality of contract enforcement, property rights, the police and the courts. Both these variables are aggregated and scaled by 0.5 to yield a rating of 0-100. A higher rating denotes greater investor protection rights and therefore greater propensity of foreign investment. The regression coefficient on this variable should carry a positive sign, following the claim in existing literature that investors prefer countries having better investor protection measures in place. Following La Porta (1998), it is shown that the English common law system provides better legal protection rights to shareholders than the German and French civil law system. We generate a dummy (*English common law dummy*) which takes the value of one for common law countries and zero otherwise.

The summary statistics of all control variables are shown in Table 2. As expected, all the variables show that emerging markets have lower economic development, although higher economic growth. Developed markets score higher on the investor protection measure and, following the financial liberalization measures, developed markets are more open and firms' ownerships are less closely held relative to emerging markets.

3. Result of regression analysis

Do foreign investors allocate a greater share of their wealth to relatively more developed equity markets? Our univariate analysis, as shown in Table 1 and discussed earlier, does indicate so. To further substantiate our initial findings we run a number of regressions addressing several robustness issues. In contrast to the preferred fixed effect model, the use of the random effect estimations for the majority of our regressions is dictated by the inclusion of time invariant factors such as the *English common law dummy*, *Emerging market dummy*,

Common language and *Distance*. We first discuss the results of our key variables of interest and reserve examination of the control variables until the end of this section.

3.1 Basic regression

As multi-collinearity is not a major problem (see Table 3 below) for our country-specific equity market characteristic ($CSEMC_{jt}$) measures, except between *Transaction cost* and *Emerging market dummy*, we include all six variables in the following specification (1) without the controls.

$$w_{ijt} = \alpha + \beta . CSEMC_{jt} + \epsilon_{ijt} \quad (1)$$

…….....Insert Table 3 about here.....

The results are presented in Table 4. Column 2 shows that except for the exchange rate volatility, all other $CSEMC_{jt}$ variables are highly significant with correct predicted signs, even at 1% significance level. The overall R^2 of the above specification shows that $CSEMC_{jt}$ account for 47% of cross-sectional and temporal variation in the foreign equity portfolio allocation. The outcomes suggest that $CSEMC_{jt}$ is the influential factor in foreign investors' country allocation decision.

…….....Insert Table 4 about here.....

The statistical significance of the *Stock market size* variable with an estimate of 0.726 is in line with previous studies validating the claim that investors prefer to invest in relatively bigger markets. Consistent with the suggestions of existing studies (see Chan et al., 2005), the results confirm that because larger stock markets are more visible, more recognized and more developed, they are better at attracting higher levels of foreign equity portfolio investments.

The predicted signs of the coefficients and the statistical significance of two micro-structural variables, *Transaction cost* and *Market liquidity*, support the claim that foreign investors prefer to invest more of their wealth in more cost effective, more efficient and more liquid markets. The coefficient of -0.82 on transaction cost implies that investors favor markets with lower transaction costs. Similarly, a higher level of market liquidity with a positive coefficient of 0.280 clearly supports the conjecture that foreign investors are more inclined to overweight their portfolio in relatively more liquid markets, which also reflect a higher

degree of market efficiency. Again, these findings are consistent with our analysis of summary statistics supporting the evidence that markets which are relatively more liquid and more cost effective are the major recipients of foreign equity investments.

The estimate of *Local equity market volatility* is also significant, with an expected negative sign. The coefficient of -0.165 and test statistic of -3.17 provide indication that investors tend to avoid more volatile markets, as higher volatility implies higher risk of investment. The effect of higher volatility is more significant in smaller emerging markets that offer lower levels of industrial diversification for mitigating firm-specific risks. The *Exchange rate volatility* variable, reflecting the foreign exchange risk, is not statistically significant but bears the expected sign. Finally, the statistical significance of *Emerging market dummy* with an estimate of -2.045 and test statistic of almost 15 reconfirms that foreign investors favor bigger and more developed stock markets with higher liquidity and greater efficiency.

Although most of our variables are statistically significant, they may be biased in the absence of other control variables or may be plagued by endogeniety problems. To ensure the robustness of our results we undertake a number of additional regressions and tackle concerns that could challenge the rigor of our findings.

3.2 Omitted variable bias

The estimates of specification (1) may be biased in the absence of other factors, particularly if they are correlated with $CSEMC_{jt}$. Similarly, as we have used 36 countries with a six-year time dimension, there could be significant country-specific and time effects. To mitigate the omitted variable bias, we undertake two additional regressions. First, we run specification (2) including $CSEMC_{jt}$ and home bias variable. We report the results in Table 4 (column 3).

$$w_{ijt} = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias + \epsilon_{ijt} \quad (2)$$

As expected, the inclusion of the home bias measure significantly increases the adequacy of the model. The overall R^2 rises to 66% and the *Home bias* coefficient carries the expected sign and is statistically significant. This statistical significance of *Home bias* confirms the claim that foreign investors still prefer their home markets relative to the mean-variance prescription. All the coefficients of $CSEMC_{jt}$ are still statistically significant, even at 1% significance level, and bear expected signs. In contrast to the previous regression, the

Exchange rate volatility variable is now statistically significant. It signifies that investors tend to invest less in countries experiencing higher movement in their exchange rates. The size of all coefficients does change, which is understandable, as the addition of *Home bias* factor mitigates omitted variable bias to a considerable extent.

We further add all other observed control variables and time dummies in specification (3) below and report the results in Table 4 (column 4).

$$w_{ijt} = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (3)$$

As expected, the magnitudes of the estimates do alter but the adequacy of the model further improves, as indicated by R^2 of 82%. Although the size of the estimates changes, the coefficients of all our key variables are still statistically significant at the conventional significance level of 5%.

One of the key reasons for employing panel data framework is to allow for the unobserved time invariant unit-specific effects which, if correlated with any of the regressors, may potentially produce biased estimates. Although we have been able to control for most of the time varying and observed time invariant variables, unit-specific effects may also bias our estimates significantly from their true values. Examples of such effect could be special treaties between pair countries, favorite country, cultural ties and common colonial history. We address the issue of unobserved individual heterogeneity by running specification (4), which is similar to specification (3) but here we use fixed effect estimation instead of random effect estimation. However, we can only apply the fixed effect model at the cost of excluding any time invariant variables. Furthermore, although the estimates of fixed effect estimations are relatively more unbiased, they may not be the most efficient compared to random effect estimation because the former only uses the *within variations* in the dataset (see Wooldridge, 2002 for technical details).

$$w_{ijt} = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (4)$$

As shown in Table 4 (column 5), all our $CSEMC_{jt}$ measures are still statistically significant. This further substantiates that even after including all the observed and unobserved covariates, $CSEMC_{jt}$ have a strong influence on investors' country allocation decision.

3.3 The problem of free investability

Our *Home bias* measure, as constructed in Section 2.2, is based on the assumption that the entire market capitalization for a given country is freely available for investment to foreign investors. This may not be true, particularly for emerging markets. In order to address this issue we included two variables in our previous regressions which potentially control for this deficiency. The first was *Equity market openness* and the second *Closely held firms*. We further deal with the potential investability problem by constructing a freely floated home bias measure using the S&P/IFC's freely investable market capitalization variable instead of the S&P/IFC's global market capitalization. However, a caveat is worth noting here. The S&P/IFC's freely investable market capitalization is only available for emerging markets; therefore, for the developed markets we assume that the entire market value is freely available to foreign investors, which may not be true. Nonetheless, we believe the addition of the *Closely held firms* variable captures the deficiency, if any. We run the following specification (5) using the freely floated (*FA_Hbias*) home bias variable. We present the output in Table 4 (column 6).

$$w_{ijt} = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . FA\_Hbias + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (5)$$

The coefficient on home bias becomes smaller, as expected, but is still highly statistically significant. All our variables of interest, i.e, $CSEMC_{jt}$, are highly statistically significant with expected sign.

3.4 Indirect exposures

We next resolve the effect of investors having indirect exposure to foreign equities in major financial centers. Our dataset on international equity portfolio investments includes direct purchase in the domestic markets and investment in global shares and depository receipts. Solnik and McLeavey (2004) note that big and internationally active companies issue/list their stocks on multiple and major stock exchanges, such as London, New York or Tokyo, for greater investor base, broader visibility, higher liquidity, and to avoid stringent and costly home regulatory stipulation. If this is the case, market-specific development and stability features may not matter to foreign investors as they can have exposure to foreign stocks in their own major financial centers. To overcome the potential problem of major financial centers, we run the following specification (6) but exclude the U.S., the UK and Japan as investor countries.

$$w_{ijt} = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (6)$$

As shown in Table 4 (column 7), even after removing the investors from the major financial centers, the coefficients of all our $CSEMC_{jt}$ factors are still statistically significant, supporting the view that country-specific capital market features play a prominent role in foreign equity portfolio allocation decisions.

3.5 Year-wise cross-sectional regressions

We further investigate whether the results presented in the previous regressions are able to withstand the robustness test across the cross-sectional estimations for each year. We run the following regression (7) for each of the six years and report the results in Table 5. However, the estimates may not be the most efficient ones, as each of the six regressions does not include more than 490 observations and, unlike random effect estimations, it does not exploit any *within variation* information.

$$w_{ij} = \alpha + \beta_1 . CSEMC_j + \beta_2 . Hbias_j + \beta_3 . controls_j + \epsilon_{ij} \quad (7)$$

The results imply that generally, except for the two volatility variables (i.e. *Local equity market* and *Exchange rate volatility*), all the stock market development variables are statistically significant and bear the expected sign. This confirms that, even in the absence of *within variation* information, which avoids any persistency in our variable set and model, our study makes the strong assertion that stock market development factors, particularly size, transaction cost, liquidity and degree of market efficiency, are the key determinants of foreign equity portfolio allocations.

…….....Insert Table 5 about here.....

3.6 Relative importance of each CSEMC measure

What is the relative importance of each of the $CSEMC_{jt}$ factors? We demonstrate the incremental contribution of each of the factors in explaining variation in foreign equity portfolio allocation using the R^2 metric. We run six different specifications beginning with *Stock market size* only in the first regression and increasing the variable numbers by adding

each of the $CSEMC_{jt}$ factors subsequently. It is worth noting that the R^2 metric may not produce reliable results if the sample size varies substantially across the regressions. As shown in Table 6 below, the only difference in sample size observed is between the first regression and the remaining five regressions. However, the difference is less than 10% and should therefore not materially affect our result.

The outputs across all the year-wise regressions clearly show that the most important variable is the size of the stock market. As discussed earlier, the statistical significance of the *Stock market size* with an R^2 of 22% indicates that investors are more inclined to invest in more visible, more industrially diversified and more developed capital markets.

…….....Insert Table 6 about here.....

The second most important variable is *Transaction cost*, with an additional *Goodness of fit* contribution of 14%. The significance of transaction cost again confirms the claim that foreign investors may shy away from markets with significantly higher trading costs. Market liquidity adds a further 6%, but the volatility measures do not show signs of any further addition. *Emerging market dummy*, which further captures the market development features not reflected by other $CSEMC_{jt}$ variables, further explains the allocations by almost 4%. The statistical significance of market development variables, except for the volatility measures, clearly suggests that foreign investors favor investing in bigger, highly visible and more liquid stock markets.

3.7 Endogeneity

Finally, endogeneity may be a potential problem for our results. Errunza (2001) notes that the growth in foreign equity portfolio investment may itself trigger reform measures towards greater development of local capital markets. In the sample used, it is likely that our estimates may suffer from endogeneity problem arising from reverse causality. To resolve the reverse causality problem we first generate a fitted variable using specification (1) but only including the most consistently robust variables, i.e. *Stock market size, Transaction cost, Market Liquidity* and *Emerging market dummy* and we refer to it as *Development proxy*. Following

Gelos and Wei (2005), we use one-year lag value of the *Development proxy* and run the following specification (8) [4].

$$w_{ijt} = \alpha + \beta_1 . Development\ proxy_{jt-1} + \beta_2 . Hbias + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (8)$$

As reported in Table 7 below, the *Development proxy*, which is the fitted value of *Stock market size, Transaction cost, Market Liquidity* and *Emerging market dummy*, is highly statistically significant. This confirms that our results do not suffer from reverse causality problem.

…….....Insert Table 7 about here.....

3.8 Control variables

Not all the controls have the expected sign and statistical significance and are able to stand the robustness tests across the wide range of specifications. The most important and consistent across the extensive spectrum of estimations are the familiarity variables. The significance of bilateral trade measure in all specifications is an indication that investors regard the problem of information asymmetry as a potential barrier when investing in foreign securities (see Portes and Rey, 2005; Chan et al., 2005; Fidora et al., 2007). Similarly, investors tend to invest more of their wealth in countries nearer to them than farther from them, as reflected by the significance of the distance variable. The significance of common language across all specifications also shows that investors are more prepared to invest in countries sharing a common language as this mitigates the information asymmetry problem to some extent (see Chan et al., 2005; Fidora et al., 2007).

The issue of investor protection is debatable in the literature, with mixed conclusions reported by a number of existing studies (Aggarwal et al., 2005 and Chan et al., 2005). Aggarwal et al. (2005), using U.S. data, find that U.S. investors are inclined to allocate more funds to countries with better investor protection rights in place. However, Chan et al. (2005), using data on 26 countries (emerging and developed), show that investors are influenced more by stock market development and bilateral familiarity issues, and investor protection does not play any significant role in their investment decisions. In fact, their study finds that the

[4] We also use one-year lag values of the individual *CSEMCs*, and find all of the measures to be statistically significant at 5% significance level. We do not report the results but these can be obtained from the authors on request.

investor protection measures carry an unexpected sign, similar to what our results reveal for the World Bank's *Investor protection* measure, particularly for the cross-section estimations. However, we find that the legal dummy is statistically significant across all specifications. Bekaert et al. (2007) conjecture that foreign investors may be more concerned about those aspects of regulatory environment that directly affect foreign investments, such as repatriation risk, exchange control risk, etc. It could be that the legal dummy captures investor protection effects specifically related to foreign investment, as most of the countries following English common law have relatively higher levels of investor protection rights for foreign investors. However, the issue needs further investigation. The capital control measures (*Equity market openness* and *Closely held firms*) are generally consistent and carry the expected sign, indicating that despite motivation to invest, investors may face legal restrictions imposed by host countries. We do not find economic development, economic growth and historical returns to be significant and consistent in terms of predicted signs across different specifications, mostly for the cross-section models. Similar results are also reported by other studies (see Gelos and Wei, 2005; Chan et al., 2005).

4. Conclusion

This study presents a comprehensive and thorough assessment of the impact of country-specific equity market characteristics on the allocation decisions of foreign equity portfolio investors. We show that stock market development factors play an important role in explaining a significant proportion of the cross-sectional and time variation in foreign equity portfolio allocations. Our results confirm that foreign equity portfolio investors prefer to invest more of their wealth in larger, more liquid and more efficient markets with lower trading costs. The robust findings of our study imply that by improving the preconditions necessary for well-functioning capital market, policymakers should be able to attract higher levels of foreign equity portfolio investments.

References

Aggarwal, R., Klapper, L., Wysocki, P. D., 2005. Portfolio preferences of foreign institutional investors. Journal of Banking and Finance. 29, 2919-2946.

Alder, M., Dumas, B., 1983. International portfolio choice and corporation finance: A synthesis. Journal of Finance. 38, 925-984.

Amihud, Y., Mendelson, H., 1986. Asset pricing and the bid-ask spread. Journal of Financial Economics. 17, 31-56.

Baltagi, B. H., 1995. Econometric Analysis of Panel Data, second ed. Wiley, New York.

Bekaert, G., 1995. Market integration and investment barriers in emerging equity markets. The World Bank Economic Review. 9, 75-107.

Bekaert, G., Harvey, C. R., 1995. Time-varying world market integration. Journal of Finance. 50, 403-444.

Bekaert, G., Harvey, C., 2000. Foreign Speculator and Emerging Equity Markets. Journal of Finance. 55, 565-613.

Bekaert, G., Harvey, C. R., Lumsdaine, R. L., 2002. The dynamics of emerging market equity flows. Journal of International Money and Finance. 21, 295-350.

Bekaert, G., Harvey, C. R., Lundblad, C. T., 2003. Equity market liberalization in emerging markets. The Journal of Financial Research. 26, 275-299.

Bekaert, G., Harvey, C. R., Lundblad, C., Siegel, S., 2007. Global Growth Opportunities and Market Integration. Journal of Finance 62, 1081-831.

Bekaert, G., Hodrick, R. J., 2008. International Financial Management. Pearson Education International, New Jersey.

Black, F., 1974. International capital market equilibrium with investment barriers. Journal of Financial Economics. 1, 337-352.

Bohn, H., Tesar, L., 1996. U.S. equity investment in foreign markets: Portfolio rebalancing or return chasing? American Economic Review. 86, 77-81.

Brennan, M. J., Subrahmanyam, A., 1996. Market micro structure and asset pricing: On the compensation for illiquidity in stock returns. Journal of Financial Economics. 41, 441-464.

Carrieri, F., Errunza, V., Majerbi, B., 2006. Does emerging market exchange risk affect global equity prices? Journal of Financial and Quantitative Analysis. 41, 511- 540.

Chan, K., Covrig, V., Ng, L., 2005. What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. Journal of Finance. 60, 1495-1534.

Cooper, I., Kaplanis, C., 1986. Costs to crossborder investment and international equity market equilibrium, in: Edwards, J., Franks, J., Mayer, C., Schaefer, S. (Eds.), Recent Developments in Corporate Finance. Cambridge University Press, New York, pp. 209-237.

Cooper, I., Kaplanis, E., 1994. Home bias in equity portfolios, inflation hedging, and international capital market equilibrium. Review of Financial Studies. 7, 45-60.

Dahlquist, M., Pinkowitz, L., Stulz, R. M., Williamson, R., 2003. Corporate governance and the home bias. Journal of Financial and Quantitative Analysis. 38, 87-110.

Dahlquist, M., Robertson, G., 2004. A note on foreigners' trading and price effects across firms. Journal of Banking and Finance. 28, 615-632.

Damodaran, A., 2010. Applied Corporate Finance, third ed. John Wiley and Sons, New York.

Datar, V.T., Nail, N.N., Radeliffe, R., 1998. Liquidity and asset returns: An alternative test. Journal of Financial Markets. 1, 203-219.

De Roon, F.A., Nijman, T.E., Werker, B.J.M., 2001. Testing for mean-variance spanning with short sales constraints and transaction costs: The case of Emerging Markets. Journal of Finance. 56, 721-742.

De Jong, F., De Roon, F.A., 2005. Time-varying market integration and expected returns in emerging markets. Journal of Financial Economics. 78, 583-613.

Edison, H.J., Warnock, F.E., 2003. A simple measure of the intensity of capital controls. Journal of Empirical Finance. 10, 81-103.

Errunza, V.R., 1977. Gains from portfolio diversification into less developed countries' securities. Journal of International Business Studies. 8, 83-99.

Errunza, V.R., 1994. Emerging markets: Some new concepts. Journal of Portfolio Management. 20. 82-87.

Errunza, V.R., 2001. Foreign portfolio equity investments, financial liberalization, and economic development. Review of International Economics. 9, 703-726.

Errunza, V.R., Losq, E., 1985, International asset pricing under mild segmentation: Theory and test. Journal of Finance. 40, 105-124.

Eun, C.S., Janakiramanan, S., 1986. A Model of international asset pricing with a constraint on the foreign equity ownership. Journal of Finance. 41, 897-914.

Fama, E., French, K.R., 1998. Value versus growth: International evidence. Journal of Finance. 53, 1975-2000.

French, K.R., Poterba, J.M., 1991. Investor diversification and international equity markets. American Economic Review. 81, 222-226.

Fidora, M., Fratzscher, M., Thimann, C., 2007. Home bias in global bond and equity markets: The role of real exchange rate volatility. Journal of International Money and Finance. 26, 631-655.

Froot, K.A., O'Connell, P., Seasholes, M.S., 2001. The portfolio flows of international investors. Journal of Financial Economics. 59, 151-193.

Gelos, R.G., Shang-Jin, Wei, 2005. Transparency and International Portfolio Holdings. Journal of Finance. 60, 2987-3020.

Goldsmith, R., 1969. Financial Structure and Development. Yale University Press, New Haven.

Griffin, J. M., Nardari, F., Stulz, R. M., 2004. Are daily cross-border equity flows: Pushed or pulled? Review of Economics and Statistics. 86, 641-657.

Grubel, H.G., 1968. Internationally diversified portfolios. American Economic Review. 58, 1299-1314.

Harvey, C.R., 1995a. The risk exposure of emerging equity markets. The World Bank Economic Review. 9, 19-59.

Harvey, C.R., 1995b. Predictable risk and returns in emerging markets. The Review of Financial Studies. 8, 773-816.

Hunter, D.M., 2006. The evolution of stock market integration in the post-liberalization period - A look at Latin America. Journal of International Money and Finance. 25, 795-280.

Kawakatsu, H., Morey, M.R., 1999. An empirical examination of financial liberalization and the efficiency of emerging stock prices. The Journal of Financial Research. 22, 385-411.

Karlsson, A., Nordén, L., 2007. Home sweet home: Home bias and international diversification among individual investors. Journal of Banking and Finance. 31, 317-333.

Keim, D.B., Madhavan, A., 1995. Execution cost and investment performance: An empirical analysis of institutional equity trades. Working paper. University of Pennsylvania.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., 1998. Law and finance. Journal of Political Economy. 106, 1113-1155.

Levine. R., 1992. Financial structures and economic development. World Bank Working Paper. WPS-849.

Levine, R., Zervos, S., 1996. Stock market development and long-run growth. World Bank Economic Review. 10, 323-339.

Levy, H., Sarnat, M., 1970. International diversification of investment portfolios. American Economic Review. 60, 668-675.

McKinnon, R., 1973. Money and capital in economic development. Brookings Institution, Washington D.C.

Mark, K., Fung, S.S, 2006. The new BIS effective rate indices. BIS Quarterly Review. March, 51-65.

Portes, R., Rey, H. 2005. The determinants of cross-border equity flows, Journal of International Economics. 65, 269-296.

Richards, A., 2005. Big fish in small ponds: The trading behavior and price impact of foreign investors in Asian emerging equity markets. Journal of Financial and Quantitative Analysis. 40, 1-27.

Rouwenhorst, K.G., 1999. Local return factors and turnover in emerging stock markets, Journal of Finance. 54, 1439-1464.

Rowland, P.F., 1999. Transaction costs and international portfolio diversification. Journal of International Economics. 49, 145-170.

Sercu, P., 1980. A generalization of the international asset pricing model, Revue de L' Association Francaise de Finance. 19, 91-135.

Solnik, B., 1974a. Why not diversify internationally rather than domestically? Financial Analysts' Journal. 30, 48-54.

Solnik, B. 1974b. An equilibrium model of the international capital market. Journal of Economic Theory. 8, 500-524.

Solnik, B., McLeavey, D., 2004. International Investments, fifth ed. Pearson Addison Wesley, New York.

Subramanian, A., Wei, S., 2007. The WTO promotes trade, strongly but unevenly. Journal of International Economics. 72, 151-175.

Stulz, R.M. 1981a. On the effects of barriers to international investment. Journal of Finance. 36, 923-934.

Stulz, R.M., 1981b. A model of international asset pricing. Journal of Financial Economics. 9, 383-406.

Tesar, L.L., Werner, I.M., 1995. Home bias and high turnover. Journal of International Money and Finance. 14, 467-492.

Warnock, F.E., 2001. Home bias and high turnover reconsidered. Journal of International Money and Finance. 21, 795-805.

Wooldridge, J.M. 2002. Econometric Analysis of Cross Section and Panel Data. MIT Press. Cambridge.

Table 1
Summary statistics of key variables

Country	Portfolio allocation	Stock market size (% of GDP)	Transaction cost (BPS per average transaction in USD).	Market liquidity (%)	Local equity market volatility (%)	Exchange rate volatility (%)
Argentina	0.0005	51.20	74.21	10.38	50.57	15.98
Australia	0.0146	110.39	34.06	76.70	17.08	7.20
Austria	0.0045	30.05	30.61	76.68	25.85	1.91
Belgium	0.0108	72.08	29.34	25.13	33.36	2.36
Brazil	0.0054	45.14	45.99	35.50	52.10	15.50
Canada	0.0171	110.50	32.52	66.45	21.10	5.08
Chile	0.0004	104.53	73.63	11.71	24.64	7.36
China	0.0041	45.67	NA	88.30	32.68	6.36
Czech	0.0009	24.54	58.10	67.52	34.21	5.02
Denmark	0.0056	61.87	35.52	75.23	27.83	2.32
Finland	0.0210	115.00	43.13	116.28	26.81	2.89
France	0.1081	82.55	27.98	83.83	21.30	2.46
Germany	0.0882	46.52	27.53	131.00	26.77	3.38
Greece	0.0028	51.91	59.81	40.10	20.66	4.01
Hungary	0.0020	25.54	58.03	63.22	22.69	5.26
India	0.0031	51.35	62.82	133.67	31.27	4.41
Indonesia	0.0101	24.65	72.29	43.82	31.28	13.14
Italy	0.0343	45.63	31.38	120.27	23.14	2.68
Japan	0.0794	78.59	20.14	97.17	20.19	6.66
Korea	0.0107	65.31	59.73	249.15	18.24	5.24
Malaysia	0.0015	144.92	56.87	27.87	12.66	3.32
Mexico	0.0042	25.47	38.08	26.49	23.47	6.51
New Zealand	0.0015	39.56	37.59	41.80	18.47	6.88
Norway	0.0057	53.11	32.56	102.80	28.11	5.05
Peru	0.0002	34.37	66.07	7.50	27.29	3.79
Philippines	0.0004	45.19	90.21	12.96	25.91	5.51
Poland	0.0017	24.68	NA	31.84	42.50	7.76
Portugal	0.0027	40.10	33.97	50.73	17.63	2.04
Russia	0.0058	55.82	NA	45.98	21.36	13.19
Sweden	0.0209	107.61	31.16	117.16	33.76	4.17
Switzerland	0.0533	246.67	29.11	93.00	15.95	3.50
Taiwan	0.0058	76.05	53.75	182.28	14.51	4.36
Thailand	0.0018	60.42	58.42	101.51	32.18	3.76
Turkey	0.0019	32.82	56.97	44.96	49.18	16.77
United Kingdom	0.1573	138.75	78.38	112.83	16.85	3.90
United States	0.3776	133.22	25.07	160.50	20.49	3.76

Table 2
Summary statistics of control variables

Country	Home Bias	GDP Per Capita (in USD)	GDP Growth (%)	Equity market openness (0-1)	Closely Held Firm (%)	Log Bilateral trade	Log distance	Common language	Returns (%)	Investor protection (0-100)	English common law dummy
Argentina	1.92	7,503	3.25	0.93	52.68	6.36	8.90	0.00	20.76	31.78	0
Australia	1.65	22,414	3.16	1.00	24.85	7.77	9.08	0.33	19.91	95.05	1
Austria	0.76	24,914	1.74	1.00	54.85	8.15	6.95	0.13	26.76	95.10	0
Belgium	1.01	23,445	1.75	1.00	47.14	9.34	6.71	0.33	35.18	89.87	0
Brazil	1.03	3,842	2.92	0.94	67.13	7.71	8.69	0.00	31.06	51.34	0
Canada	2.21	24,783	2.61	1.00	48.82	8.37	8.21	0.53	15.79	94.45	1
Chile	2.71	5,400	4.18	0.92	64.94	6.54	8.89	0.00	21.71	88.63	0
China	1.76	1,282	9.76	0.49	68.74	9.50	8.43	0.00	10.30	41.43	0
Czech	0.33	6,240	4.13	0.99	78.10	7.57	6.80	0.00	38.89	76.50	0
Denmark	1.09	30,874	1.66	1.00	25.10	8.26	6.88	0.33	16.89	97.83	0
Finland	0.10	25,495	3.02	1.00	23.00	8.04	7.33	0.06	5.61	98.43	0
France	0.49	23,292	1.69	1.00	38.00	9.91	6.98	0.20	8.73	86.60	0
Germany	0.42	23,628	1.00	1.00	45.00	10.65	6.73	0.20	8.46	93.12	0
Greece	1.67	15,165	4.34	1.00	75.00	7.09	7.48	0.00	4.92	74.86	0
Hungary	0.32	5,493	4.24	0.97	49.48	7.44	7.08	0.00	26.56	79.19	0
India	1.91	537	7.32	0.60	40.32	7.67	8.44	0.38	26.52	49.81	1
Indonesia	1.46	894	4.85	0.91	68.97	7.14	8.79	0.00	27.97	27.01	0
Italy	0.81	19,540	0.90	1.00	38.00	9.57	7.19	0.05	9.25	74.19	0
Japan	1.47	37,954	1.43	1.00	38.00	9.27	8.62	0.00	6.42	84.75	0
Korea	1.16	12,535	4.64	0.95	39.23	8.39	8.44	0.38	27.70	71.97	0
Malaysia	1.44	4,143	4.64	0.93	52.15	7.68	8.73	0.00	11.76	65.40	1
Mexico	1.36	6,031	2.27	0.99	26.15	7.55	8.53	0.00	24.21	52.71	0

New Zealand	1.83	14,729	3.22	1.00	77.00	6.31	9.16	0.39	21.88	96.49	1
Norway	1.03	39,454	2.31	1.00	41.00	8.24	7.10	0.00	21.35	93.98	0
Peru	2.01	2,262	4.77	0.84	68.60	5.36	8.75	0.00	32.20	44.83	0
Philippines	1.58	1,068	4.64	0.56	51.13	6.70	8.68	0.37	5.67	44.15	0
Poland	0.83	4,952	3.56	0.97	64.26	7.79	7.07	0.00	18.26	67.55	0
Portugal	1.02	11,123	0.88	1.00	35.00	7.43	7.42	0.00	-1.70	84.93	0
Russia	1.30	2,211	6.22	0.67	NA	8.24	8.17	0.00	58.63	27.57	0
Sweden	0.73	29,062	2.64	1.00	21.00	8.77	7.15	0.00	9.73	95.52	0
Switzerland	0.42	34,611	1.43	1.00	26.00	8.69	6.84	0.40	13.80	96.87	0
Taiwan	1.73	14,298	3.51	0.76	22.26	NA	9.05	0.00	6.72	78.28	0
Thailand	0.92	2,322	5.06	0.60	57.83	7.52	8.61	0.35	27.77	59.69	1
Turkey	1.01	3,132	4.66	0.97	70.86	7.80	7.71	0.00	30.42	55.53	0
United Kingdom	0.51	26,256	2.51	1.00	10.00	10.12	6.91	0.33	6.92	95.37	1
United States	1.40	35,932	2.49	1.00	8.00	10.48	8.44	0.33	6.21	92.67	1

Table 3
Correlation between different measures of country-specific equity market characteristics

	Stock market size	Transaction cost	Market liquidity	Local equity market volatility	Exchange rate volatility	Emerging market dummy
Stock market size	1.00					
Transaction cost	-0.26	1.00				
Market liquidity	0.24	-0.24	1.00			
Local equity market volatility	-0.14	0.12	-0.11	1.00		
Exchange rate volatility	-0.29	0.35	-0.27	0.32	1.00	
Emerging market dummy	-0.38	0.70	-0.17	0.15	0.42	1.00

Table 4
Regressions out of different specifications

	CSEMC	With home bias as control	All controls and time dummies	All controls and fixed effect estimation	Controlling for free float	Controlling for major financial centers
Stock market size	0.726***	0.782***	0.674***	0.617***	0.680***	0.668***
	(15.55)	(44.72)	(31.13)	(27.98)	(24.06)	(27.61)
Transaction cost	-0.827***	-0.702***	-0.528***	-0.318***	-0.510***	-0.523***
	(-4.35)	(-11.26)	(-7.98)	(-4.91)	(-6.08)	(-7.06)
Market Liquidity	0.280***	0.0891***	0.0531***	0.0791***	0.0518***	0.0511***
	(7.67)	(5.07)	(4.06)	(7.23)	(2.60)	(3.56)
Local equity market volatility	-0.165***	-0.123***	-0.149***	-0.121***	-0.169***	-0.149***
	(-3.17)	(-5.95)	(-6.11)	(-4.85)	(-6.25)	(-5.49)
Exchange rate volatility	-0.776	-3.040***	-1.710***	-1.050***	-1.318***	-1.702***
	(-1.05)	(-12.45)	(-6.26)	(-4.37)	(-4.28)	(-5.55)
Emerging market dummy	-2.045***	-2.509***	-0.548***	NA	-0.392**	-0.587***
	(-14.91)	(-26.06)	(-4.56)		(-2.45)	(-4.34)
Home bias		-0.938***	-0.931***	-0.926***	-0.837***	-0.936***
		(-88.29)	(-100.78)	(-104.13)	(-71.55)	(-94.42)
GDP per capita			0.368***	2.469***	0.410***	0.373***
			(6.71)	(17.20)	(5.57)	(6.07)
GDP growth rate			0.185	-0.837***	0.537*	0.170
			(0.81)	(-3.97)	(1.73)	(0.65)

Equity market openness	1.134*** (7.68)	0.591*** (4.23)	1.489*** (8.38)	1.184*** (7.15)
Closely held firms	-2.675*** (-13.54)	NA	-2.956*** (-10.67)	-2.708*** (-12.24)
Bilateral trade	2.392*** (13.50)	1.255*** (8.38)	3.201*** (22.21)	2.094*** (9.91)
Distance	-0.0790** (-2.22)	NA	-0.0339 (-0.75)	-0.103** (-2.39)
Common language	0.340*** (4.46)	NA	0.197* (1.83)	0.354*** (4.24)
Historical returns	0.283*** (7.74)	0.309*** (8.84)	0.327*** (6.95)	0.289*** (7.05)
Investor protection	0.288*** (3.49)	0.539*** (6.51)	0.156 (1.52)	0.292*** (3.17)
English common law dummy	0.355*** (4.34)	NA	0.638*** (5.68)	0.311*** (3.37)
Time dummy 1	0.172*** (6.91)	0.254*** (10.86)	0.425*** (14.50)	0.178*** (6.23)
Time dummy 2	0.364*** (15.56)	0.435*** (20.48)	0.546*** (19.07)	0.370*** (13.90)
Time dummy 3	0.168*** (10.08)	0.239*** (15.42)	0.303*** (14.46)	0.172*** (9.13)

Time dummy 4			0.0743***	0.133***	0.179***	0.0764***
			(6.33)	(10.96)	(10.95)	(5.82)
Time dummy 5			0.0350***	0.0557***	0.0887***	0.0343**
			(2.89)	(4.85)	(5.28)	(2.54)
Within R^2	0.156	0.889	0.918	0.928	0.868	0.923
Between R^2	0.496	0.656	0.825	0.544	0.685	0.835
Overall R^2	0.477	0.661	0.824	0.547	0.683	0.833
Number of observations	3009	2915	2915	2915	2910	2360

Note: The dependent variable is the logarithmic equity portfolio allocation (weights) from country *i* into country *j* for time *t*. The independent variables are country-specific equity market characteristics, $CSEMC_{jt}$ (Stock market size, transaction cost, market liquidity, local equity market volatility, exchange rate volatility and emerging market dummy). The *controls and time dummies* include Home bias, GDP per capita, GDP growth rate, Equity market openness, Closely held firms, Bilateral trade, Distance, Common language, Historical return, Political risk (investor protection), English common law dummy and yearly time dummies. The sample size and inclusion of controls varies across different specifications. Except *fixed effect* (column 5) and *between effect* models (column 6), all estimations are based on random effect model. The first specification does not include any control (column 2). The second includes home bias as the only control (column 3), while the third includes home bias and all other controls including time dummies (column 4). The fourth specification includes all time variant controls, including time dummies, but uses fixed effect estimation (column 5). The fifth specification also includes all controls and time dummies but uses the free float home bias (column 6). Finally, the sixth specification includes all controls and time dummies but excludes the major financial centers' countries (USA, UK and Japan) from the sample (column 7).The test statistics are made robust allowing for clusters on each cross-sectional units and for tractable interpretation are reported as elasticity. The significance is reported against 10%(*), 5%(**) and 1%(***).

Table 5
Yearly cross-section regression outputs

	2001	2002	2003	2004	2005	2006
Stock market size	1.068***	0.689***	0.784***	0.972***	1.159***	1.191***
	(13.92)	(8.84)	(10.88)	(9.89)	(13.92)	(13.95)
Transaction cost	-3.340***	-2.718***	-0.366	-2.535***	-4.333***	-3.056***
	(-8.85)	(-9.63)	(-1.00)	(-6.62)	(-9.94)	(-8.40)
Market liquidity	0.548***	0.669***	1.192***	1.138***	1.296***	1.308***
	(6.68)	(10.73)	(14.57)	(11.40)	(15.02)	(13.77)
Local equity market volatility	0.348	-3.036***	0.607***	0.0413	-0.840***	-0.00276
	(0.87)	(-8.53)	(2.87)	(0.13)	(-2.94)	(-0.01)
Exchange rate volatility	7.924***	-2.564**	-3.082**	-1.616	16.89***	6.383***
	(7.40)	(-2.19)	(-2.37)	(-1.29)	(8.74)	(3.86)
Emerging market dummy	-0.963***	-0.167	-1.221***	-1.156***	-1.309***	-1.131***
	(-4.36)	(-0.90)	(-7.07)	(-6.57)	(-8.70)	(-7.73)
Home bias	-0.769***	-0.875***	-0.837***	-0.836***	-0.863***	-0.890***
	(-25.73)	(-30.08)	(-27.60)	(-24.87)	(-26.37)	(-26.32)
GDP per capita	0.575***	0.310***	0.0582	-0.0595	-0.242***	0.0327
	(3.65)	(2.94)	(0.63)	(-0.62)	(-2.75)	(0.43)
GDP growth	11.04***	1.044	-20.95***	-11.48***	-11.41***	-20.00***
	(4.26)	(0.59)	(-7.16)	(-2.89)	(-4.40)	(-7.63)
Equity market openness	0.272	4.256***	4.417***	3.175***	0.500	0.811*
	(0.48)	(7.98)	(6.05)	(5.71)	(0.98)	(1.66)
Closely held firms	-2.077***	-1.818***	-1.110***	-0.764***	-1.008***	-0.983***
	(-7.63)	(-6.63)	(-3.69)	(-2.72)	(-4.30)	(-4.23)

Bilateral trade	2.219***	2.148***	2.384***	2.481***	2.108***	2.235***
	(12.22)	(12.29)	(13.28)	(13.39)	(12.26)	(12.75)
Distance	-0.250***	-0.177***	-0.156***	-0.138***	-0.248***	-0.228***
	(-6.23)	(-4.58)	(-4.06)	(-3.57)	(-6.80)	(-6.61)
Common language	0.215**	0.401***	0.421***	0.451***	0.363***	0.354***
	(2.23)	(4.21)	(4.37)	(4.76)	(4.29)	(4.24)
Historical returns	-0.161	-5.907***	-1.898***	-0.972***	0.0121	1.258***
	(-0.49)	(-9.99)	(-5.23)	(-2.97)	(0.04)	(3.25)
Investor protection	-2.203***	-0.998***	-1.922***	-1.636***	-1.378***	-2.023***
	(-8.10)	(-5.12)	(-9.01)	(-7.17)	(-8.94)	(-12.25)
English common law dummy	0.367***	0.514***	1.039***	0.443***	0.367***	0.436***
	(2.80)	(4.82)	(8.24)	(4.16)	(3.98)	(5.02)
Adjusted R^2	0.913	0.916	0.910	0.907	0.919	0.912
Number of observations	492	493	490	475	475	490

Note: The dependent variable is the logarithmic equity portfolio allocation (weights) from country *i* into country *j* for time *t*. The independent variables are country-specific equity market characteristics, $CSEMC_{jt}$ (Stock market size, transaction cost, market liquidity, local equity market volatility, exchange rate volatility and emerging market dummy). The *controls* include Home bias, GDP per capita, GDP growth rate, Equity market openness, Closely held firms, Bilateral trade, Distance, Common language dummy, Historical return, Political risk (investor protection) and English common law dummy. The test statistics are made robust and for tractable interpretation are reported as elasticity. The significance is reported against 10%(*), 5%(**) and 1%(***).

Table 6

Relative importance of each CSEMC measures

	1st regression	2nd Regression	3rd regression	4th regression	5th regression	6th regression
Stock market size	0.849***	0.765***	0.790***	0.799***	0.780***	0.726***
	(21.26)	(16.93)	(17.46)	(17.80)	(16.44)	(15.55)
Transaction cost		-1.205***	-1.276***	-1.235***	-1.181***	-0.827***
		(-6.13)	(-6.51)	(-6.35)	(-6.28)	(-4.35)
Market Liquidity			0.313***	0.316***	0.313***	0.280***
			(7.94)	(8.04)	(7.93)	(7.67)
Local equity market volatility				-0.189***	-0.172***	-0.165***
				(-3.50)	(-3.20)	(-3.17)
Exchange rate volatility					-0.0109	-0.00776
					(-1.44)	(-1.05)
Emerging market dummy						-2.045***
						(-14.91)
Overall R^2	0.225	0.367	0.447	0.444	0.440	0.477
Incremental R^2	0.225	0.142	0.800	0.00	0.00	0.037
Number of observations	3288	3009	3009	3009	3009	3009

Note: The test statistics are made robust and for tractable interpretation are reported as elasticity. The significance is reported against 10%(*), 5%(**) and 1%(***). All the variables used are explained in Table 5.

Table 7
Reverse causality problem

	All controls and lagged development proxy
Development proxy	0.427***
	(16.45)
Home bias	-0.952***
	(-100.57)
GDP per capita	0.393***
	(7.63)
GDP growth rate	0.477
	(1.41)
Equity market openness	2.160***
	(14.50)
Closely held firms	-3.129***
	(-14.38)
Bilateral trade	2.421***
	(16.34)
Distance	-0.101
	(2.52)**
Common language	0.402***
	(3.92)
Historical returns	0.514***
	(15.79)
Investor protection	-0.138
	(-1.76)
English common law dummy	0.677***
	(6.85)
Time effect	Yes
Within R^2	0.921
Between R^2	0.830
Overall R^2	0.831
Number of observations	2390

Note: The dependent variable is the logarithmic equity portfolio allocation (weights) from country *i* into country *j* for time *t*. The independent variables *Development proxy* (fitted value of Stock market size, transaction cost, market liquidity and emerging market dummy). The *controls and time dummies* include Home bias, GDP per capita, GDP growth rate, Equity market openness, Closely held firms, Bilateral trade, Distance, Common language, Historical return, Political risk (investor protection), English common law dummy, and yearly time dummies.The test statistics *of random effect* estimation are made robust allowing for clusters on each cross-sectional units and for tractable interpretation are reported as elasticity. The significance is reported against 10%(*), 5%(**) and 1%(***).