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Country-specific equity market characteristics and foreign equity portfolio allocation

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

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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 in 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, to the best of our knowledge, no empirical study has specifically documented the role of country-specific equity market factors on country allocation decisions of foreign investors, except Chan et al. (2005), who use different predetermined variables, including stock market development factors, to explain the issue of home and foreign bias. 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[1]. 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 countries 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 use emerging markets only and focus on transparency measures, and Chan et al. (2005), who explain foreign bias, no study has undertaken comprehensive empirical investigation modelling cross-country allocations. Second, as noted earlier, despite the theoretical suggestions of the ICAPM, global investors do not hold the world market as their benchmark

[1] Fidora et al., (2007) use the same dataset using the average over the period of 2001-2003 and demonstrate the role of exchange rate risk in explaining bilateral home bias.

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 of the 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's weightings. However, empirical evidence modelling the violations of the underlying assumptions is 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 nine years (2001-2009), with more than 500 cross-section units yielding approximately 4,600 observations. Such a comprehensive dataset with wide cross-sectional and temporal variation affords us the statistical confidence to test our hypotheses using panel data econometric estimations. Baltagi (1995) demonstrates that, compared to purely cross-section data, panel data set-up supplies more information, more variability, less colllinearity, greater degrees of freedom and higher statistical efficiency, yielding reliable parameter estimates. Moreover, the application of fixed effect panel data model controls for individual heterogeneity; studies not controlling for unit-specific effects run the risk of producing biased estimates. Furthermore, and to the best of our knowledge, we are the first to demonstrate the impact of the 2007-08 global financial crisis on portfolio holdings, country allocations and parameter stability.[2]

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 54% of the total variation in foreign equity portfolio allocations. One

[2] We thank the anonymous referee for suggesting that we include the impact of the 2007-08 financial crisis in our investigation.

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 organised as follows. Section 2 briefly explains 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. Theoretical framework and data

We follow the theoretical framework developed by Cooper and Kaplanis (1986). A simple prescription of their framework modelling portfolio allocation, based on ICAPM context, is as follows:

$$w_{ijt} = M_{jt} - (P_{it}c_{ijt}/hs^2), \qquad i \neq j \tag{1}$$

where w_{ijt} is the weight (allocation) of foreign equity portfolio investors of country *i* invested in equities of country *j* for the time period *t*. For the same period, M_{jt} is the benchmark weight, i.e. the proportion of the world market capitalisation accounted by country *j*'s equity market as prescribed by the ICAPM. P_{it} is the proportion of total world equity wealth owned by country *i* in the time period *t*. c_{ijt} is the deadweight cost to investors of country *i* for holding the equities in country *j* for the period *t*. s^2 is the given level of variance of the equities' return and *h* is the *langrange* multiplier of an objective function which maximises the equities' returns for the given level of variance (for the objective function and detailed derivation, please see Cooper and Kaplanis, 1986). Clearly, if there are no costs, i.e. c_{ijt} is zero, all investors should hold is the M_{jt}. However, in the presence of deadweight costs, the above relationship shows that the greater the deadweight cost is (c_{ijt}), the lower the allocation will be from investors of country *i* into country *j* relative to the suggestion of the ICAPM. In the following sections we first describe the proxy of foreign equity portfolio allocations (i.e. w_{ijt}), followed by the direct and indirect investment barriers that may potentially influence the country allocation decision of foreign investors (i.e. c_{ijt}).

2.1 Measure of bilateral foreign equity portfolio allocation

The main dependent variable in all our regressions is the logarithmic value of portfolio allocations (w_{ijt}) from country *i* into equities of country *j*, where portfolio allocations (w_{ijt}) are defined as:

$$w_{ijt} = \left(FPI_{ijt} \Big/ \sum_{j=1}^{36} FPI_{ijt} \right) \quad (2)$$

Drawing on our theoretical framework (see equation 1), w_{ijt} is the weight of foreign equity investment from investors of country *i* into equities of 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 into other developed markets. The stock holding of developing countries is negligible. For this reason, we consider only developed countries as source countries.[3] 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 centres, such as Luxembourg, which are considered tax havens.

Table 1 presents the sample averages of foreign portfolio equity allocation (in percentage) received by all the host countries *j* for the nine-year period 2001-2009. 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 36.25%. The top ten

[3] 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 for confidentiality reasons.

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, Hungary, Malaysia, Peru, the Philippines, Thailand and Poland).

…….....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 five different variables to capture key equity market features.[4] 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 (1996) claim that developed markets, which are bigger in size, are better at mobilising 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 recognised 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 capitalisation 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, Malaysia and Taiwan. Similarly, the bottom ten countries generally represent emerging markets, with the exception of Austria, Italy, 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

[4] 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.

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; therefore, the effect of transaction costs 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 U.S. 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 costs 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 costs analysis for global institutional investors, such as pension funds, investment managers and other investment companies. The estimates of total trading costs 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 costs 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 costs, with 88 basis points (bps) per average transaction. Similarly, the ten countries with the lowest transaction costs are all developed markets, with Japan having the lowest average cost of 19 bps, followed by the U.S., with 22 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 and hence is also an indirect measure of market efficiency. 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 again implies that liquidity measures may also reflect the degree of market efficiency. Solnik and McLeavey (2004) also support the claim the markets with a higher degree of price efficiency are associated with a higher degree of liquidity.

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 capitalisation of USD 1,700,708 million) with a turnover ratio of 81%. For the same year, the value traded in Sweden was almost half of that in Canada, i.e. USD 677,122 million (market capitalisation of USD 573,250 million), but the turnover ratio was 139%. We incorporate the average value traded as a percentage of mean market capitalisation 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 host country's stock market returns, constructed using the previous 60 months' total return index denominated in local currency.[5] 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 in addition to the premium demanded due to local market volatility, currency risk premium must be earned by foreign investors for bearing systematic exchange rate risk which cannot be diversified away. They claim that despite diversification, the world market portfolio is sensitive to foreign exchange rate risk, and 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

[5] The use of local currency is dictated by theoretical consideration. Unlike local investors, foreign investors are exposed to two different types of volatility risks. The first is the risk arising from volatility in host country's equity return, which is borne by local and foreign investors. The second, which is only of concern to foreign investors, arises from the movement in the currency exchange rate. For further details, please see Solnik and McLeavey (2004). We thank the anonymous referee for clarifying this issue.

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, Japan and New Zealand. Turkey reveals the highest exchange rate volatility. On the other hand, nine of the ten countries with the lowest exchange rate volatility are developed markets. In our sample, Austria exhibits the lowest real exchange rate volatility, with 1.8% standard deviation. We expect this variable to yield a negative regression coefficient.

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:

$$HBias = 1 - \log\left(w_{ijt}/BWT_{ijt}\right) \tag{3}$$

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:

$$BWT_{jt} = MC_{jt} / \left(\sum_{j=i}^{36} MC_{jt} \right) \quad (4)$$

where MC_{jt} is the market capitalisation 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*, eight are developing countries (Argentina, Chile, China, India, Malaysia, Peru, the Philippines and Taiwan) and two are developed countries (Canada and New Zealand). 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 a 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 liberalisation 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 capitalisation represented by *S&P/IFC* investable indices (correcting for foreign ownership) to the market capitalisation denominated by *S&P/IFC* global indices. This variable ranges from zero to one, with one implying total domestic market capitalisation freely open to foreign investors, and zero implying a completely 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 Factbook. The *Equity market openness* variable is a time varying proxy and therefore captures the time variation in the financial liberalisation 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 capitalisation 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 capitalisation 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 a 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 information overseas. It is worth noting that the three bilateral familiarity variables and *Equity market openness* measure are orthogonalised with the free floated home bias measure (see Section 3.3), 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).[6] This does not

[6] In fact, a simple regression of the three bilateral familiarity variables and *Equity market openness* measure explains almost 26% of the variation in home bias, and all four independent variables are statistically

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 behaviour (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.

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.

Finally, since our time series period includes the 2007-08 financial crisis, we control for the time effect and the impact of the 2007-2008 financial crisis using three time dummies. The first is *Pre-crisis time dummy_2002_2006* for the years 2002-2006 (2001 is the base dummy),

significant. Due to space constraints we do not report the results but they can be obtained from the authors on request.

the second is the *Crisis-period time dummy_2007_2008* for the peak of the crisis period 2007-2008 and the third is the *Post-crisis time dummy_2009* for the year 2009, when global financial markets began to stabilise.

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 liberalisation measures, developed markets are more open and firms' ownerships are less closely held relative to emerging markets.

3. Results 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 (bias and efficiency). 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*, *Common language* and *Distance*. Before reporting the results, it is worth noting the caveat of using the panel data model. In pooling the data the estimated values of the slope coefficients are assumed to be identical across countries, i.e., $\beta_j=\beta$. If this assumption holds, then this will lead to a more precise estimate. However, given our dataset of cross-countries, homogenous parameter is a very strong assumption and is apparent that the slope coefficients are not identical.[7] Hence, in our estimations each of our pooled estimators represents an average slope coefficient allowing us to comment on the average predictive relationship between the variables. However, we demonstrate the issue of parameter heterogeneity, across countries and time, in one of our regressions in section 3.6 below.

We first discuss the results of our key variables of interest and reserve examination of the control variables until the end of this section. Given that our data is at country level and matched pairs, it is fair to assume that the "clustered errors" i.e. the observations within groups (*ij)*, may be correlated, inducing correlation in the error term. To address the issue of clustering, i.e. the key source of heteroskedasticity, we use the robust variance matrix

[7] A similar assumption is made for parameter heterogeneity over time.

estimator for correcting the standard errors for the within correlation among the units in each of the clusters. Wooldridge (2002) notes the resulting variance matrix, which is corrected for clustering, is robust to any kind of intra-cluster correlation and arbitrary heteroskedasticity, provided *N*(cross-section units) is large relative to the number of units in each cluster. In our case *N* is over 500 and the number of units within any cluster is a maximum of nine years of country allocation. In almost all our random effect GLS estimations, we correct the standard errors using the cluster robust variance matrix (see equation 7.26 of Wooldridge (2002), page 152 and page 330), which not only produces efficient cluster robust standard errors, but also the unrestricted Ω matrix of the robust variance matrix estimator allows for arbitrary serial correlation. For reference and technical details on the correction, please see Wooldridge (2002), pages 329-330.

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, we include all five variables in the following specification (5), without the controls.

$$\log(w_{ijt}) = \alpha + \beta.CSEMC_{jt} + \epsilon_{ijt} \quad (5)$$

…….....Insert Table 3 about here.....

The results are presented in Table 4. Column 2 shows that except for the *Exchange rate volatility* measure, all other $CSEMC_{jt}$ variables are highly statistically significant with correct predicted signs. Except for the *Local equity market volatility*, which is statistically significant only at 10% significance level, *Stock market size, Transaction costs* and *Market liquidity* are significant even at 1% significance level. The overall R^2 of the above specification shows that $CSEMC_{jt}$ accounts for 54% of cross-sectional and temporal variation in the foreign equity portfolio allocation. The outcomes suggest that $CSEMC_{jt}$ are the influential factors in foreign investors' country allocation decision.

…….....Insert Table 4 about here.....

The statistical significance of the *Stock market size* variable, with an estimate of 0.51, 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 recognised 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 costs* 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 -0.46 on *transaction costs* implies that investors favour markets with lower transaction costs. Similarly, a higher level of market liquidity with a positive coefficient of 0.33 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. The estimate of *Local equity market volatility* is also significant, with an expected negative sign. The coefficient of -0.11 and test statistic of -1.84 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. Again, these findings are consistent with our analysis of summary statistics supporting the evidence that markets which are relatively bigger in size, more liquid and more cost effective are the major recipients of foreign equity investments.

Although most of our variables are statistically significant, they may be biased and the test statistics inefficient in the absence of other control variables, or they 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 rigour of our findings.

3.2 Omitted variable bias and cross-sectional dependence

The estimates of specification (5) 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 (6) including $CSEMC_{jt}$ and *Home bias* ($Hbias_{ijt}$) variables. We report the results in Table 4 (column 3).

$$\log(w_{ijt}) = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias_{ijt} + \epsilon_{ijt} \quad (6)$$

As expected, the inclusion of the home bias measure significantly increases the adequacy of the model. The overall R^2 rises to 67% 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* measure is now statistically significant and the negative sign 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 and further improves the efficiency of test statistics.

We further add all other observed control variables and the time dummies in specification (7) below and report the results in Table 4 (column 4).

$$\log(w_{ijt}) = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias_{ijt} + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (7)$$

As expected, the magnitudes of the estimates do alter, but the adequacy of the model further improves, as indicated by the R^2 of 79%. Although the size of the estimates changes, the coefficients of all our key variables, except the local volatility measure, are still statistically significant at the conventional significance level of 5%, except for *Local equity market volatility*, which is significant only at 10% significance level.

One of the key reasons for employing a 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, favoured country, cultural ties and common colonial history. We address the issue of unobserved individual heterogeneity by running specification (8),

which is similar to specification (7), but here we use fixed effect estimation instead of random effect estimation.

$$\log(w_{ijt}) = \alpha + \beta_1.CSEMC_{jt} + \beta_2.Hbias_{ijt} + \beta_3.controls\ and\ time\ dummies + \epsilon_{ijt} \quad (8)$$

Furthermore, we also correct the standard errors of fixed effect estimation for heteroskedasticity that may arise from cross-sectional dependency using the Driscoll and Kraay (1998) standard errors for coefficients estimated. These standard errors are robust to general forms of cross-sectional and temporal dependence. Because this nonparametric technique of estimating standard errors places no restrictions on the limiting behaviour of the number of panels, the size of the cross-sectional dimension does not constitute a constraint on feasibility even if the number of panels is much larger than *T*. For further technical details of the correction, please see Driscoll and Kraay (1998). However, it is worth noting that we can only apply the fixed effect model at the cost of excluding any time invariant variables. Furthermore, although the coeffiicents 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).

As shown in Table 4 (column 5), all our $CSEMC_{jt}$ measures, except the local equity market volatility factor, are still statistically significant. This further substantiates that even after including all the observed and unobserved covariates, and controlling for cross-sectional dependency, the three measures of $CSEMC_{jt}$, i.e. size, trading cost and liquidity, have a strong influence on investors' country allocation decision.

3.3 Home bias and free investability

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.

However, home bias may itself be created by investment restrictions imposed by host countries, whereby the entire market capitalisation for a given country may not be freely available for investment to foreign investors. This may be particularly true for emerging markets. In order to address this issue we include two variables in our previous regressions that potentially control for this deficiency. The first is *Equity market openness* and the second *Closely held firms*. We further deal with the automatic impact of home bias and potential investability problem by constructing a freely floated home bias measure using the *S&P/IFC's* freely investable market capitalisation variable instead of the S&P/IFC's global market capitalisation used to construct our *benchmark index*.

As investors deviate from holding the world market portfolio, following Fidora et al. (2007) we construct the following bilateral home bias (FA_Hbias) to control for the impact of home bias on foreign equity allocation:

$$FA\_Hbias_{ijt} = 1 - \log\left(w_{ijt}/M_{jt}\right) \tag{9}$$

where FA_Hbias_{ijt} is bilateral home bias observed by investor country *i* for country *j* at time *t*, and M_{jt} is as defined earlier but constructed using the *S&P/IFC's* freely investable market capitalisation instead of the *S&P/IFC's* global market capitalisation. However, a caveat is worth noting here. The *S&P/IFC's* freely investable market capitalisation 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 (10) using the freely floated (*FA_Hbias*) home bias variable, excluding the *benchmark index*. We present the output in Table 4 (column 6).

$$\log\left(w_{ijt}\right) = \alpha + \beta_1.CSEMC_{jt} + \beta_2.FA\_Hbias_{ijt} + \beta_3.controls\ and\ time\ dummies + \epsilon_{ijt} \tag{10}$$

As expected, the FA_Hbias is highly statistically significant. All our variables of interest, i.e. $CSEMC_{jt}$, are highly statistically significant with expected signs.

3.4 Indirect exposures

We next resolve the effect of investors having indirect exposure to foreign equities in major financial centres. 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 centres. To overcome the potential problem of major financial centres, we run the following specification (11) but exclude the U.S., the U.K. and Japan as investor countries.

$$\log(w_{ijt}) = \alpha + \beta_1 . CSEMC_{jt} + \beta_2 . Hbias_{ijt} + \beta_3 . controls\ and\ time\ dummies + \epsilon_{ijt} \quad (11)$$

As shown in Table 4 (column 7), even after removing the investors from the major financial centres, the coefficients of $CSEMC_{jt}$ factors, except for the *local market volatility* variable, i.e. size, trading cost and liquidity, 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 Endogeneity

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 the endogeneity problem arising from reverse causality. To resolve the reverse causality problem we first generate a fitted variable using specification (5) but only including the most consistently most robust variables, i.e. *Stock market size*, *Transaction costs* and *Market liquidity*, and we refer to it as *Development proxy*.[8] Following Gelos and Wei (2005),

[8] Alternatively, we also use a common factor generated using principal component analysis, but the statistical results are similar as the common factor has a correlation of 0.92 with the *Development proxy*.

we use one-year lag value of the *Development proxy* and run the following specification (12).[9]

$$\log(w_{ijt}) = \alpha + \beta_1.Development\ proxy_{jt-1} + \beta_2.Hbias_{ijt} + \beta_3.controls\ and\ time\ dummies + \epsilon_{ijt} \quad (12)$$

As reported in Table 5 below, *Development proxy*, which is the fitted value of *Stock market size, Transaction costs* and *Market Liquidity*, is highly statistically significant.[10] This confirms that our results do not suffer from reverse causality.

…….....Insert Table 5 about here.....

3.6 Cross-country heterogeneity and impact of the 2007-08 financial crisis

As noted earlier, the estimated coefficients show an average predictive relationship between the variables. However, given our dataset is at country level, it is highly probable that the size of the estimates may vary across countries. To demonstrate this point, we select the Indian and the United States country dummies (arbitrary selection) and interact them with our *Development proxy*. We call these interactive variables *Development_India* and *Development_USA* respectively.

Similarly, since our dataset includes the 2007-08 financial crisis period, the question to be asked is: do the statistical and economic relationships between development proxy and foreign equity portfolio allocation hold during the 2007-08 financial crisis? Here we make an attempt to answer this question by including time interactive variables. We interact the three time dummies, i.e. *Pre-crisis time dummy_2002_2006, Crisis period time dummy_2007_2008* and *Post-crisis dummy_2009*, with our *Development proxy* and refer to them as *Development_2002_2006, Development_2007_2008* and *Development_2009* variables. We run the following specification (13).

$$\log(w_{ijt}) = \alpha + \beta_1.Dev.proxy_{jt} + \beta_2.country\ \&\ time\_interacive + \beta_3.Hbias_{ijt} + \beta_4.controls + time\ dummies + \epsilon_{ijt} \quad (13)$$

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

[10] The development proxy and most of the variables are also statistically significant at the conventional 5% significance level when we run the first difference estimation.

We report the results in Table 6 below. As seen, all the interactive variables are statistically significant. The sizes of the estimates for *Development_India*, 1.408[11] (1.491-0.0830) and for *Development_USA*, 1.033[12] (1.491-0.458) are different. Clearly, our analysis shows that if market development factors improve equally for India and the United States, foreign investors are, on a relative basis, willing to allocate proportionally more in the Indian equity market. This should not be surprising because, as shown in Table 2 (column 2), the home bias for India is greater (2.07) than the United States (1.33). Hence, following the prescription of the ICAPM, any identical improvement in the stock market development factor should reduce the Indian home bias correspondingly more than the home bias observed for the United States.

Clearly, the above differential analysis demonstrates that each country may have an asymmetric effect on foreign equity portfolio allocations to changes in their stock market development factors, depending on the level of home bias observed by foreign investors and possibly on other market characteristics which may influence home bias, particularly bilateral familiarity factors.

In terms of the impact of the 2007-08 financial crisis on the relationship between *Development proxy* and country allocation, all the time interactive variables are statistically significant. However, in terms of their economic impact on the average relationship, they are different. The relatively smaller differential coefficient of -0.111 for the *Development_2002_2006* factor, with the average size of 1.38[13] (1.491-0.111), demonstrates that during the pre-crisis period (2001-2006), the size of the average parameter was relatively stable. However, during the crisis period of 2007-2008, the average size reduced from 1.491 to 0.734[14] (1.491-0.757). Clearly, the deep and far-reaching global financial crisis of 2007-2008 had a systematic effect in almost every country around the world, particularly those that are financially integrated with the global economy. This suggests that the differential coefficient of -0.757 for the *Development_2007_2008* factor, though material, is not unexpected. However, even during the crisis period, we see the relationship between market development and country allocation still holds, as indicated by the statistically significant coefficient of 0.734 (1.491-0.757) with the linear combination test statistic of 15.13.

[11] The linear combination test statistic is 32.18.
[12] The linear combination test statistic is 21.04.
[13] The linear combination test statistic is 31.10.
[14] The linear combination test statistic is 15.13.

The size of the *Development_2009* variable, i.e. -0.567, which is smaller than the crisis period factor size of -0.757, indicates that when the global financial markets began to stabilise, the predictive relationship between market development and country allocation seems to be gradually reverting to its average.

…….....Insert Table 6 about here.....

3.7 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 five 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 four regressions. However, the difference is less than 10% and therefore should not materially affect our result.

The outputs across all the year-wise regressions clearly show that two most important variables is the size of the stock market and transaction costs. The statistical significance of the *Stock market size* with an R^2 of 20% again indicates that investors are more inclined to invest in more visible, more industrially diversified and more developed capital markets.

…….....Insert Table 7 about here.....

The second but almost equally important variable is *Transaction costs*, with an additional *Goodness of fit* contribution of 21%. The significance of transaction costs again confirms the claim that foreign investors may shy away from markets with significantly higher trading costs. Market liquidity adds a further 13%, but the volatility measures do not show signs of any further addition. The statistical significance of market development variables, except for the volatility measures, clearly suggests that foreign investors favour investing in bigger, highly visible and more liquid stock markets.

3.8 Foreign equity portfolio holdings, allocations and 2007-08 financial crisis

In almost all of the regressions discussed above, we observe that the *Crisis period time dummy_2007_2008* is not only statistically significant but bears the expected sign and is much bigger than the *Pre-crisis time dummy_2002_2006* and the *Post crisis period time dummy_2009*. Given the severity of the global financial crisis, this is expected. To evaluate the impact of the crisis on foreign equity portfolio holdings and the allocation of individual host countries in our sample, we produce the average holdings figures in Table 8 and the average allocation figures in Table 9 below.

As shown, the total of the average holdings for all our sample countries for the year 2006 were USD 540 billion and for 2007 were USD 626 billion. However, during the 2008 peak financial crisis year, this figure dropped to USD 346 billion.

…….....Insert Table 8 about here.....

…….....Insert Table 9 about here.....

If we observe the changes in the value of holdings (column 6 and 7) over time, it is evident that although the crisis began in the summer of 2007, the real impact was felt in the year 2008, particularly after the collapse of Lehman Brothers. In fact, for almost all the host countries, 2007 (column 3) saw elevation in the foreign equity portfolio holdings compared to the average of 2006. However, in the year 2008 (column 4), and as reported in column 6, all the host countries lost significant value of their shares relative to the year 2007. Given the nature of widespread, globally systematic and the deep impact of the 2007-08 financial crisis on world equity markets, it is not surprising that most of the developed host countries lost relatively more of their foreign equity holdings compared to the emerging host countries. However, as the markets began to stabilise in 2009, it was again the developed markets which recouped relatively much greater shares of their losses, as seen by the increase in their holdings for the year 2009 (column 5) and their differences over the year 2008 (column 7).

If we conduct similar analyses for the changes in allocation over the four-year period, as reported in Table 9, although for most of the host countries the allocation decreases in the year 2008, with the exception of the United States, on average the cross-section of average allocation is relatively stable over the four-year period. This signifies that although the

valuation of the holdings has changed over time, the global country allocations of the foreign investors seem to be fairly steady in our sample.

3.9 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. If we follow the efficient random effect model, the most important and generally 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 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. 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. Though the economic development measure (*GDP per capita*) also seems to be generally consistent, we do not find the economic growth (*GDP growth*) and *Historical returns* measures to be significant and consistent in terms of predicted signs across different specifications. Similar results are also reported by other studies (see Gelos and Wei, 2005; Chan et al., 2005).

4. Conclusion

Foreign equity portfolio investment is a vital channel through which countries attract overseas investment. Foreign equity portfolio investors play a pivotal role in the development of local (host) equity markets, which in turn drives the 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. Following the International Capital Asset Pricing Model (ICAPM), a host country should receive their share of foreign equity portfolio investments, i.e. the proportion of their local market capitalisation in the world market portfolio. However, despite the conjectural prescription, foreign investors do not exploit investment opportunities offered by world market capitalisation. Relative to the suggestion of ICAPM, why do foreign investors not hold the world market portfolio, and what role do country-specific equity market characteristics play in the country allocations of foreign investors?

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. Although each individual host country may demonstrate an asymmetric effect, on average we show that stock market development factors, particularly, size, trading cost and market liquidity (market efficiency), play important roles 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. This assertion also holds when taking account of the recent 2007-08 financial crisis. The robust findings of our study 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.

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Table 1
Summary statistics of key variables

Country	Portfolio allocation (%)	Stock market size (% of GDP)	Transaction costs (BPS per average transaction in USD)	Market liquidity (%)	Local equity market volatility (%)	Exchange rate volatility (%)
Argentina	0.04	41.49	68.30	10.68	44.27	12.45
Australia	1.63	112.77	31.31	83.62	15.76	7.64
Austria	0.55	30.13	30.50	69.81	24.74	1.80
Belgium	1.06	67.35	28.22	38.98	29.15	2.30
Brazil	0.79	53.46	43.06	46.18	42.81	14.06
Canada	1.91	112.12	30.41	76.23	18.91	5.69
Chile	0.04	106.99	66.63	15.07	21.41	7.39
China	0.69	66.86	46.67	116.52	31.80	6.46
Czech Republic	0.09	26.61	51.70	65.00	30.07	5.10
Denmark	0.57	61.97	32.06	82.55	24.57	2.24
Finland	2.05	104.11	37.66	121.25	25.31	2.75
France	11.29	80.79	24.76	96.02	19.25	2.38
Germany	9.37	45.76	25.60	140.68	23.73	3.19
Greece	0.34	48.62	54.66	44.54	21.71	4.03
Hungary	0.18	24.71	51.29	76.30	24.00	5.97
India	0.50	66.07	59.07	121.26	30.03	4.78
Indonesia	0.74	27.75	65.35	53.41	29.76	11.92
Italy	3.35	40.08	29.18	125.56	20.72	2.49
Japan	7.61	78.51	19.34	111.56	19.28	7.23
Korea	1.16	72.50	55.16	235.45	19.60	6.03
Malaysia	0.16	140.49	51.27	31.86	13.57	3.35
Mexico	0.43	27.99	35.73	27.86	21.97	6.90
New Zealand	0.16	38.37	34.65	51.72	16.68	7.22
Norway	0.69	55.61	30.24	117.43	26.52	5.32
Peru	0.02	44.01	70.82	7.25	28.08	3.90
Philippines	0.05	47.15	88.23	17.63	24.14	5.61
Poland	0.21	27.41	39.07	37.16	36.35	7.68
Portugal	0.53	40.84	31.76	62.46	17.54	1.97
Russia	0.79	60.64	31.05	55.59	25.10	13.04
Sweden	1.94	103.77	28.64	125.25	28.77	4.38
Switzerland	5.50	239.93	27.13	102.38	15.03	3.66
Taiwan	0.65	84.61	51.20	178.57	16.88	4.39
Thailand	0.19	59.28	53.37	96.20	29.51	3.81
Turkey	0.24	32.83	51.12	73.61	43.13	14.97
United Kingdom	14.98	129.84	50.02	146.71	15.45	4.36
United States	36.25	125.51	21.73	195.36	18.04	4.02

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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	Return (%)	Investor protection (0-100)	English common law dummy
Argentina	2.34	7,479.47	3.95	0.67	52.68	7.27	8.90	0.00	22.64	30.20	0
Australia	1.58	29,546.95	3.08	1.00	24.85	8.38	9.08	0.33	17.49	95.18	1
Austria	0.58	32,140.75	1.36	1.00	54.85	8.68	6.93	0.14	21.13	95.73	0
Belgium	0.92	30,423.49	1.33	1.00	47.14	9.66	6.69	0.34	25.67	89.56	0
Brazil	1.29	5,207.14	3.11	0.79	67.13	8.34	8.69	0.00	30.03	50.41	0
Canada	2.11	30,673.48	1.77	1.00	48.82	8.86	8.21	0.54	14.18	94.69	1
Chile	2.96	6,863.07	3.52	0.73	64.94	7.38	8.89	0.00	20.26	89.39	0
China	2.25	1,909.66	10.12	0.42	68.74	9.80	8.43	0.00	14.83	42.32	0
Czech Republic	0.74	10,185.78	3.26	0.79	78.10	8.24	6.77	0.00	34.26	77.65	0
Denmark	1.03	39,892.49	0.65	1.00	25.10	8.75	6.86	0.33	15.76	98.21	0
Finland	0.02	32,748.32	1.81	1.00	23.00	8.56	7.32	0.06	6.74	97.75	0
France	0.45	29,463.45	1.11	1.00	38.00	10.08	6.97	0.20	8.51	87.23	0
Germany	0.32	29,685.63	0.54	1.00	45.00	10.70	6.73	0.20	9.63	93.14	0
Greece	1.32	19,738.74	3.41	1.00	75.00	7.79	7.46	0.00	6.70	74.68	0
Hungary	0.44	8,236.56	2.31	0.92	49.48	8.10	7.06	0.00	23.14	80.07	0
India	2.07	729.01	7.54	0.50	40.32	8.36	8.44	0.37	26.99	50.30	1
Indonesia	1.33	1,313.77	5.11	0.72	68.97	7.84	8.79	0.00	28.91	30.30	0
Italy	0.65	25,155.57	0.03	1.00	38.00	9.82	7.17	0.05	7.64	72.64	0
Japan	1.43	37,770.97	0.50	1.00	38.00	9.55	8.62	0.00	5.63	85.71	0
Korea	1.27	14,741.10	3.93	0.87	39.23	8.86	8.44	0.37	24.47	73.23	0
Malaysia	1.73	5,215.52	4.14	0.75	52.15	8.26	8.72	0.00	12.45	65.41	1

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Mexico	1.54	7,121.63	1.29	0.84	26.15	8.17	8.53	0.00	24.47	51.76	0
New Zealand	1.87	19,672.13	2.29	1.00	77.00	7.14	9.15	0.39	17.04	96.77	1
Norway	0.93	54,671.32	1.85	1.00	41.00	8.76	7.10	0.00	20.59	94.08	0
Peru	2.44	2,887.32	5.27	0.67	68.60	6.46	8.75	0.00	33.05	43.95	0
Philippines	1.82	1,283.09	4.40	0.47	51.13	7.40	8.68	0.36	9.65	44.88	0
Poland	1.12	7,355.22	3.87	0.80	64.26	8.46	7.06	0.00	16.98	67.72	0
Portugal	0.97	14,925.42	0.54	1.00	35.00	8.06	7.40	0.00	1.83	84.13	0
Russia	1.44	4,653.04	4.83	0.63	0.00	8.80	8.16	0.00	46.45	27.46	0
Sweden	0.74	35,707.03	1.48	1.00	21.00	9.17	7.13	0.00	10.69	95.68	0
Switzerland	0.37	43,729.69	1.34	1.00	26.00	9.11	6.83	0.40	12.10	96.34	0
Taiwan	1.75	15,137.29	2.91	0.74	22.26	#N/A	9.06	0.00	7.50	77.60	0
Thailand	1.15	2,819.51	3.98	0.51	57.83	8.15	8.61	0.34	22.48	58.56	1
Turkey	1.22	5,042.78	3.16	0.76	70.86	8.41	7.70	0.00	29.02	55.94	0
United Kingdom	0.44	31,329.40	1.47	1.00	10.00	10.24	6.91	0.33	7.60	95.48	1
United States	1.33	39,490.76	1.58	1.00	8.00	10.54	8.44	0.33	5.84	92.66	1

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

	Stock market size	Transaction costs	Market liquidity	Local equity market volatility	Exchange rate volatility
Stock market size	1.00				
Transaction costs	-0.21	1.00			
Market liquidity	0.27	-0.31	1.00		
Local equity market volatility	-0.16	0.17	-0.14	1.00	
Exchange rate volatility	-0.23	0.29	-0.21	0.31	1.00

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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	0.513***	0.620***	0.603***	0.542***	0.599***	0.587***
	(12.00)	(23.62)	(23.09)	(12.91)	(22.79)	(20.27)
Transaction costs	-0.455***	-0.362***	-0.282***	-0.178*	-0.280***	-0.296***
	(-7.23)	(-7.70)	(-4.14)	(-1.73)	(-4.12)	(-3.94)
Market liquidity	0.330***	0.290***	0.267***	0.154***	0.268***	0.267***
	(6.71)	(9.96)	(7.10)	(4.83)	(7.10)	(6.42)
Local equity market volatility	-0.108*	-0.132***	-0.0508*	-0.0739	-0.0537**	-0.0453
	(-1.84)	(-4.07)	(-1.86)	(-1.42)	(-1.97)	(-1.48)
Exchange rate volatility	-0.103	-0.283***	-0.209***	-0.289***	-0.197***	-0.216***
	(-1.38)	(-5.70)	(-3.88)	(-9.73)	(-3.68)	(-3.61)
Home bias		-0.744***	-0.753***	-0.749***	-0.751***	-0.773***
		(-37.80)	(-43.23)	(-17.56)	(-42.95)	(-42.82)
GDP per capita			0.444***	0.542***	0.444***	0.453***
			(5.38)	(5.26)	(5.39)	(4.97)
GDP growth			0.921**	1.233	0.992**	0.860*
			(2.29)	(1.41)	(2.40)	(1.91)
Equity market openness			0.608**	0.906*	0.599**	0.587**
			(2.51)	(1.77)	(2.41)	(2.22)
Closely held firms			-2.449***	NA	-2.459***	-2.442***
			(-10.52)		(-10.58)	(-9.42)
Bilateral trade			1.075***	0.757***	1.071***	1.195***
			(6.81)	(9.67)	(6.78)	(6.87)
Distance			-0.294***	NA	-0.299***	-0.242***
			(-6.94)		(-7.07)	(-5.07)
Common language			0.498***	NA	0.501***	0.579***
			(4.46)		(4.51)	(4.63)
Historical return			-0.266***	-0.135**	-0.259***	-0.268***

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			(-6.06)	(-2.52)	(-5.89)	(-5.49)
Investor protection			-0.0365	0.565***	-0.0514	-0.0107
			(-0.25)	(3.64)	(-0.35)	(-0.07)
English common law dummy			0.254**	NA	0.258**	0.208*
			(2.36)		(2.40)	(1.76)
Pre-crisis time dummy_2002_2006			0.0319*	0.0861***	0.0352*	0.0252
			(1.79)	(4.32)	(1.96)	(1.27)
Crisis period time dummy_2007_2008			-0.182***	-0.0616	-0.179***	-0.264***
			(-3.07)	(-0.93)	(-3.00)	(-4.08)
Post-crisis time dummy_2009			-0.0774	0.0985***	-0.0696	-0.161**
			(-1.09)	(3.19)	(-0.98)	(-2.04)
Overall R^2	0.54	0.67	0.79	0.74(FE)	0.79	0.80
Number of observations	4616	4478	4478	4478	4478	3618

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 costs, market liquidity, local equity market volatility and exchange rate volatility). 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 the three time dummies. The sample size and inclusion of controls varies across different specifications. Except *fixed effect* (column 5), 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 centres' countries (U.S. U.K. and Japan) from the sample (column 7). In all the *random effect* estimations, the test statistics are made robust allowing for clusters in each cross-sectional unit. Furthermore, the fixed effect model uses Driscoll and Kraay's (1998) standard errors for correcting cross-sectional dependence. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported at 10%(*), 5%(**) and 1%(***) significance levels.

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Table 5
Reverse causality

	All controls and lagged development proxy
Development proxy	0.934***
	(18.76)
Home bias	-0.706***
	(-34.54)
GDP per capita	0.0899*
	(1.71)
GDP growth	3.090***
	(4.91)
Equity market openness	0.440
	(1.61)
Closely held firms	-3.122***
	(-15.70)
Bilateral trade	1.158***
	(7.39)
Distance	-0.372***
	(-8.86)
Common language	0.547***
	(5.08)
Historical return	0.351***
	(4.72)
Investor protection	0.308***
	(2.87)
English common law dummy	0.275**
	(2.55)
Pre-crisis time dummy_2003_2006	-0.184***
	(-7.85)
Crisis period time dummy_2007_2008	-0.481***
	(-11.81)
Post-crisis time dummy_2009	0.106*
	(1.94)
Overall R^2	0.79
Number of observations	3874

Note: The dependent variable is the logarithmic equity portfolio allocation (weights) from country *i* into country *j* for time *t*. The independent variable is one year lagged *Development proxy* (fitted value of Stock market size, transaction costs, and market liquidity). 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 the three time dummies. The test statistics *of random effect* estimation are made robust allowing for clusters in each cross-sectional unit. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported at 10%(*), 5%(**) and 1%(***) significance levels.

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Table 6
Parameter stability

	Parameter heterogeneity across countries (India and USA) and time
Development proxy	1.491***
	(35.69)
Development_India	-0.0830***
	(-3.19)
Development_USA	-0.458***
	(-17.11)
Development_2002_2006	-0.111***
	(-5.60)
Development_2007_2008	-0.757***
	(-17.22)
Development_2009	-0.567***
	(-10.11)
Home bias	-0.805***
	(-47.97)
GDP per capita	0.467***
	(8.27)
GDP growth	1.411***
	(4.38)
Equity market openness	0.955***
	(4.52)
Closely held firms	-2.041***
	(-10.36)
Bilateral trade	0.156
	(1.03)
Distance	-0.440***
	(-10.59)
Common language	0.608***
	(6.36)
Historical return	-0.251***
	(-6.63)
Investor protection	-0.323***
	(-3.12)
English common law dummy	0.173
	(1.56)
Pre-crisis time dummy_2002_2006	-0.653***
	(-6.12)
Crisis period time dummy_2007_2008	-4.190***
	(-19.25)

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Post-crisis time dummy_2009	-3.116*** (-11.11)
Overall R^2	0.81
Number of observations	4478

Note: The dependent variable is the logarithmic equity portfolio allocation (weights) from country *i* into country *j* for time *t*. The key independent variables of interest include *Development proxy* (fitted value of Stock market size, transaction costs and market liquidity), the two country interactive variables (*Development _India* and *Development_USA*), which are Indian and USA dummy variables interacted with *Development proxy*, and the three time interactive variables (*Development_2002_2006*, *Development_2007_2008* and *Development_2009*), which are 2002_2006, 2007_2008 and 2009 time dummies interacted with *Development proxy*. 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 the three time dummies. The test statistics *of random effect* estimation are made robust allowing for clusters in each cross-sectional unit. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported at 10%(*), 5%(**) and 1%(***) significance levels.

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Table 7
Relative importance of each CSEMC measure

	1st regression	2nd regression	3rd regression	4th regression	5th regression
Stock market size	0.599***	0.492***	0.524***	0.524***	0.513***
	(15.19)	(12.52)	(13.21)	(13.26)	(12.00)
Transaction costs		-0.625***	-0.468***	-0.458***	-0.455***
		(-8.88)	(-7.36)	(-7.29)	(-7.23)
Market liquidity			0.346***	0.338***	0.330***
			(6.63)	(6.57)	(6.71)
Local equity market volatility				-0.128**	-0.108*
				(-2.07)	(-1.84)
Exchange rate volatility					-0.103
					(-1.38)
Overall R^2	0.20	0.41	0.54	0.54	0.54
Number of observations	4895	4616	4616	4616	4616

Note: The test statistics are made robust and for tractable interpretation the coefficients are reported as elasticity. The significance is reported at 10%(*), 5%(**) and 1%(***) significance levels. All the variables used are explained in Table 4.

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Table 8
Changes in foreign equity portfolio holdings during 2007-2008 crisis period

	Average foreign equity portfolio holdings (USD million)					
Country	2006	2007	2008	2009	Difference (2008-2007)	Difference (2009-2008)
Argentina	196	250	93	116	-157	23
Australia	13,021	17,010	8,715	16,003	-8,295	7,288
Austria	3,419	4,093	1,609	2,243	-2,485	634
Belgium	5,829	6,281	2,724	5,090	-3,556	2,366
Brazil	8,016	14,940	6,710	15,615	-8,230	8,905
Canada	24,956	31,088	15,595	26,343	-15,493	10,748
Chile	436	513	404	774	-109	370
China	7,475	12,401	6,778	10,936	-5,623	4,158
Czech Republic	430	609	417	488	-193	71
Denmark	3,217	4,391	2,439	3,359	-1,952	920
Finland	7,721	12,198	6,003	5,977	-6,195	-26
France	45,819	54,639	31,308	40,581	-23,331	9,273
Germany	37,800	51,814	26,492	34,346	-25,322	7,854
Greece	2,530	4,253	1,350	1,481	-2,903	130
Hungary	967	964	382	556	-582	174
India	4,439	9,049	4,197	6,278	-4,852	2,082
Indonesia	11,231	1,629	759	1,575	-870	816
Italy	17,824	20,450	9,485	12,404	-10,965	2,918
Japan	65,675	61,905	38,713	43,576	-23,192	4,863
Korea	11,303	14,213	6,006	10,174	-8,208	4,169
Malaysia	1,261	2,004	887	1,394	-1,117	507
Mexico	6,524	7,068	3,831	5,129	-3,237	1,298
New Zealand	661	681	366	581	-315	215
Norway	4,741	6,481	2,417	3,710	-4,064	1,293
Peru	142	193	151	237	-42	85
Philippines	585	970	432	570	-537	138
Poland	888	1,371	663	983	-708	320
Portugal	1,193	4,395	3,976	3,978	-419	2
Russia	5,539	9,012	2,877	5,557	-6,135	2,680
Sweden	9,168	9,459	4,492	6,878	-4,968	2,386
Switzerland	32,154	37,941	24,891	34,496	-13,049	9,604
Taiwan	7,685	8,547	4,544	8,259	-4,003	3,716
Thailand	1,462	2,047	967	1,637	-1,080	670
Turkey	1,557	2,425	1,129	2,106	-1,296	977
United Kingdom	81,542	87,256	47,896	68,811	-39,360	20,916
United States	113,385	123,277	76,166	105,559	-47,111	29,392

Source: CPIS-IMF (descriptive calculated by authors)

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Table 9
Changes in foreign equity portfolio allocations during 2007-2008 crisis period

	Average foreign equity portfolio country allocation (%)					
Country	2006	2007	2008	2009	Difference (2008-2007)	Difference (2009-2008)
Argentina	0.021	0.031	0.018	0.024	-0.013	0.006
Australia	1.688	1.924	1.764	2.202	-0.160	0.438
Austria	0.798	0.858	0.711	0.664	-0.147	-0.047
Belgium	1.175	1.205	0.808	1.036	-0.397	0.228
Brazil	0.769	1.271	1.000	1.632	-0.270	0.631
Canada	2.026	2.193	2.149	2.607	-0.044	0.458
Chile	0.043	0.040	0.055	0.077	0.016	0.021
China	0.901	1.257	1.234	1.425	-0.023	0.191
Czech Republic	0.105	0.112	0.120	0.091	0.008	-0.029
Denmark	0.635	0.604	0.590	0.579	-0.015	-0.011
Finland	1.661	2.177	2.016	1.684	-0.161	-0.333
France	11.113	11.579	12.388	12.811	0.809	0.424
Germany	9.254	10.862	10.454	10.046	-0.408	-0.409
Greece	0.546	0.721	0.406	0.315	-0.315	-0.090
Hungary	0.209	0.182	0.127	0.126	-0.055	0.000
India	0.518	0.971	0.815	0.878	-0.156	0.063
Indonesia	1.175	0.170	0.132	0.227	-0.037	0.094
Italy	3.577	3.646	3.086	2.876	-0.560	-0.210
Japan	8.816	7.432	7.351	6.092	-0.081	-1.259
Korea	1.225	1.453	1.221	1.398	-0.232	0.177
Malaysia	0.156	0.216	0.182	0.209	-0.034	0.026
Mexico	0.461	0.466	0.444	0.452	-0.022	0.008
New Zealand	0.138	0.172	0.163	0.186	-0.008	0.022
Norway	0.917	1.074	0.823	0.946	-0.251	0.123
Peru	0.025	0.020	0.022	0.025	0.003	0.002
Philippines	0.070	0.081	0.060	0.069	-0.020	0.009
Poland	0.213	0.285	0.259	0.297	-0.026	0.038
Portugal	0.221	0.817	1.366	0.947	0.549	-0.419
Russia	1.295	1.537	0.894	1.236	-0.643	0.342
Sweden	2.076	1.822	1.479	1.645	-0.343	0.166
Switzerland	5.177	5.432	6.186	5.853	0.754	-0.332
Taiwan	0.734	0.744	0.676	0.958	-0.068	0.281
Thailand	0.181	0.225	0.195	0.244	-0.030	0.049
Turkey	0.352	0.421	0.273	0.327	-0.148	0.054
United Kingdom	14.362	13.736	13.552	13.132	-0.184	-0.420
United States	33.637	32.427	34.395	32.875	1.969	-1.521

Source: CPIS-IMF (allocation constructed by authors)