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The impact of sub-optimal international portfolio allocations on cost of capital, stock market development and investor protection standards

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Abstract

Both developed and emerging markets have liberalised their stock markets by removing investment restrictions on equity capital inflows and outflows. The aim is to attract foreign investors and also to allow domestic investors to diversify internationally. However, existing literature shows that local investors overweight the domestic market (home bias), whilst foreign investors under or overweight foreign markets (foreign bias). Current studies have mainly investigated factors that determine home and foreign bias. The study uses comprehensive macro and micro level data to examine the implications of home and foreign bias on three research questions.

The first empirical study investigates the impact of home and foreign bias on cost of capital. We mainly use five measures to proxy for cost of capital. We find compelling evidence supporting the hypothesis, those countries that exhibit higher home bias, experience higher cost of capital. Similarly, consistent with theory, we find that countries that have higher foreign bias enjoy lower cost of capital.

In the second empirical study, we examine the impact of home and foreign bias on stock market development. Economic reasoning suggests, that countries that have home bias should have lower level of stock market development, while the countries where foreign equity portfolio investors invest more, should be associated with higher development. Our findings, based on rigorous analysis, confirm that prevalence of higher degree of home bias impedes stock market development. Likewise, higher foreign bias in equity portfolio allocations has significant positive implications for the development level of domestic stock market.

Finally, in our third empirical research, we examine whether varying degrees of home and foreign bias have any impact on country level investor protection standards. We report two findings. First, we find strong evidence that supports the hypothesis that home bias leads to weak investor protection. Second, consistent with theory, countries that experience higher foreign bias, tend to have better investor protection.

The findings suggest that provision of encouraging optimal international portfolio allocations to increase risk sharing, could be a crucial policy measure for governments. Policy makers in emerging countries can improve macroeconomic fundamentals and good governance to attract and retain foreign investors.

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Tables of Contents

List of Tables

Chapter 1: Introduction and summary of findings

1.1 Introduction

Several studies provide theoretical and empirical evidence of how equity investors could benefit from international portfolio diversification (see Sonlink, 1974; Bekaert and Urias, 1996; Stulz, 1999a; and De Roon et al. 2001). Following on the mean-variance approach of Markowitz (1952) and Solnik (1974), the international capital asset pricing model (ICAPM) suggests that equity portfolio investors should hold the implied world market portfolio as the optimal benchmark (see Adler and Dumas, 1983; and Lewis, 1999). However, in real world practice, a number of studies show that investors in both developed and emerging economies ignore the theoretical prescription of ICAPM, by sub-optimally investing across international markets. Such sub-optimal international allocations generate what the literature terms as the varying degrees of home and foreign biases in their international portfolio allocations. Home bias relates to an overinvestment in the domestic stock market, relative to the theoretical optimal investment based on the countries' world market capitalisation weight. Similarly, foreign bias refers to the phenomenon whereby foreign investors either overweight or underweight their investment across foreign countries. In this study we refer to the phenomenon of home and foreign bias as sub-optimal portfolio allocations.[1]

It is conceivable that the sub-optimal international portfolio allocations, which lead to the home and foreign biases, should reduce the potential benefits that the countries can obtain from financial liberalisation or optimal international portfolio diversification. So far, the review of existing literature reveals that most of the studies have focussed on explaining the causes of home and foreign biases.[2] However, exceptionally scant studies examine the implications of such sub-optimal investments. In this study we empirically examine the impact of sub-optimal portfolio allocations on cost of capital, stock market development and investor protection. This chapter provides the introduction and structure of the study.

[1] For further details on the differences between home and foreign bias see Dahlquist et al. (2003) and Chan et al (2005).

[2] Such explanations include differences in stock market development, corporate governance, accounting standards, hedging motives, departure from purchasing power parity, political risk, liquidity risk, information asymmetry and capital control (see Alder and Dumas, 1983 Solnik, 1974, and Cooper and Kaplanis, 1986, 1994 and Stulz, 2005).

We introduce the current study in this chapter which is structured as follows: Section 1.2 offers an overview of the study; Section 1.3 provides the importance and motivation of the study; Section 1.4 explains the objectives, the research design and the methods of the research; Section 1.5 offers the analysis of the key research findings; Section 1.6 provides the contributions of the research; and Section 1.7 shows the structure of the thesis.

1.2 Overview of the Study

The central aim of the research is to examine the impact of sub-optimal equity portfolio allocation (home and foreign bias) on three research questions. Current studies show, that in spite of financial liberalisation and the suggestions by ICAPM, both domestic and foreign investors' deviate from holding optimal portfolio allocation. Therefore, the study specifically seeks to examine whether, and how, the phenomenon of home and foreign bias have any varying impact on cost of capital, stock market development and investor protection.

The first empirical study examines the impact of home and foreign bias on cost of capital. The conjecture is that when a country attracts sufficient foreign investment, it will subsequently lead to more sharing of risk between domestic and foreign investors, increase good governance and stock market liquidity, which, in turn, reduces cost of capital. Conversely, countries that experience higher home bias tend to have segmented markets, and therefore experience less risk sharing and higher cost of capital. We use five alternative cost of capital measures which have been widely used in the existing literature: historical realised returns of the market (HRR_m), sovereign credit risk rating (*rCred*), country equity risk premium (*CERP*), dividend yield (*DY*), and *Tobin's Q* to proxy for cost of capital. This is mainly to ensure that home and foreign bias measures are not sensitive to a particular cost of capital proxy. We use data from the Coordinated Portfolio Investment Survey *(*CPIS*)* of the International Monetary Fund (IMF) to construct home bias *(CPIS_HB)* and foreign bias *(CPIS_FB)*. The study therefore examines the impact of home and foreign bias on cost of capital. Additionally, we construct global fund country bias *(GF_FB)* using a unique and novel global fund data to investigate the impact of country bias on cost of capital. Stulz (1999a) and Henry (2000a) provide a theoretical argument of why financial globalisation reduces cost of capital. Previous studies have largely investigated the effects of financial liberalisation on cost of capital, using event studies and cross-listings on the US stock exchange.

The second empirical study examines the impact of home and foreign bias on stock market development. Errunza (2001) theoretically argues that when a country attracts sufficient foreign investment, stock market development improves because foreign investors will demand better investor protection. He notes that the active participation of foreign equity portfolio investors (FEPIs) infuses confidence among the local investors to trade nationally and internationally, driving up the level of competition in domestic markets. As such, with the increasing presence of FEPIs, the trading activities of domestic investors also grow, which further helps the market to become more active/liquid and price efficient, leading to efficient allocation of resources in the economy. Using a sample of 46 countries, Vagias and Dijk (2011) provide strong evidence, confirming the conjecture that foreign portfolio investors enhance market liquidity.

Kar (2001) shows that India liberalised its equity market in 1992, the increased activities of foreign investors began to play a crucial role in the institutionalisation of the market. He notes that post 1992, there were significant reforms observed within a span of six years, such as automation of trading system which increased transparency and efficiency, introduction of electronic book entry transfer system helped remove the inefficiencies and risks associated with a paper-based system, and the establishment of regulatory framework by securities exchange board of India to protect investors etc.

We use four different stock market development measures which have vastly been employed in the development and finance literature; market capitalisation as a percentage of GDP *(MGDP)*, stock value traded as a percentage of GDP *(TRGDP)*, turnover ratio *(TURN)*, and transaction cost *(TRCOST)*. This is to ensure that our sub-optimal portfolio allocation measures (home and foreign bias), are robust to all the stock market development proxies. Stulz (1999a) theoretically suggests that home bias increases cost of capital. Therefore, home bias will subsequently impede on stock market development, as home bias will lower the valuations of firms because there is an inverse relationship between cost of capital and valuation of firms.

Existing studies mainly examine the importance of stock market development in relation to economic growth (see King and Levine, 1993; Rajan and Zingales, 1998; and Carlin and Mayer, 2003). If home bias persists in a country, the domestic country stock market will be segmented. Theory suggests that, the segmentation of the domestic market, as a result of

home bias, will reduce stock prices and value trading, increase transaction cost and lower the importance of the stock market in the economy. However, when foreign investors allocate their investment towards the implied world market capitalisation weight, then it implies that the country is far more favoured by foreign investors. This will then lead to high participation in the stock market by investors. Subsequently, it will create an efficient trading technology, greater liquidity and improved transparency. This suggests that higher foreign bias will lead to better stock market development.

The third and final empirical study investigates the impact of home and foreign bias on investor protection. Existing studies have extensively examined the importance of investor protection on several variables, particularly in the areas of stock market development, economic growth and development. For instance, Eleswarapu and Venkataraman (2006) demonstrate that companies providing better investor protection enjoy high turnover and liquidity. La Porta et al. (1997) show that better investor protection standards relate to high number of listed companies. Stulz (2005) shows that countries providing better investor protection to minority investors, experience economic growth.

Even though investor protection is important for stock market development and economic growth, limited studies have investigated factors that influence or determine investor protection. We conjecture that when a country attracts sufficient foreign investment, the foreign investors will demand better protection and prevent companies from engaging in corrupt practices and expropriation of resources. Beck et al. (2000a) argue that countries will be compelled to improve the level of investor protection if they are to succeed in attracting foreign investors into the country, as they will be competing with other countries for foreign investors. When the domestic equity market is primarily dominated by local investors as a result of home bias, the domestic market becomes segmented, thereby reducing the level of investor protection provided to minority investors. Additionally, government will pursue poor policies that reduce return on investment.

To provide robustness to our analysis, we examine the impact of home and foreign bias on investor protection using four proxies of investor protection standards; government effectiveness *(Gov_Eff),* control of corruption *(Con_Cor),* regulatory quality *(Reg_Qual),* and rule of law *(Rule_Law)* which we obtain from World Governance Indicators (WGI). We also

employ alternative measures of investor protection from two governance sources to check the robustness of our results.

1.3 Research Importance and Motivation

Reviews of the existing literature provide reasons for home and foreign bias. However, there is little research that has examined the implications of domestic and foreign investors, deviating their equity investment allocation from the implied weight suggested by the ICAPM. We are motivated to embark on this empirical research, based on the following three factors:

First, existing literature shows the importance of cost of capital (see section 2.3.1). For instance, financial markets use cost of capital as the discount rate they apply to cash flow to calculate equity prices. A decrease in cost of capital makes projects more profitable as a reduction in cost of capital improves the net present values (NPV) of projects, which increases investment of corporations and thereby increases shareholders' wealth. Stulz (1999a) provides theoretical explanations for why financial liberalisation leads to greater flow of foreign equity investment, which tends to reduce cost of capital in the host country through enhanced risk sharing. However, subsequent study by Henry (2000a) shows that financial liberalisation has little effect on cost of capital. We, show why international portfolio investment has not had the expected impact on cost of capital. Therefore, we are motivated to examine empirically, the varying impact of sub-optimal portfolio allocation (home and foreign biases) on cost of capital.

Second, reviews of the international finance literature show the important role stock markets play with respect to economic growth and development (see section 2.4.1). Rousseau and Sylla (2001) illustrate that a developed stock market leads to efficient allocation of resources, which, in turn, promotes economic growth. Levine and Zervos (1995a) demonstrate that an increase in stock market liquidity relates to economic growth. Errunza (2001) suggests that when a country liberalises the stock market, the country will attract foreign investors and will lead to stock market development. A review of the existing literature shows that even with the apparent importance of stock market development, existing studies have not examined the impact of home and foreign bias on stock market development.

Third, a substantial body of research mainly focus on the role and importance of investor protection standards (see section 2.5.1). For example, Stulz (2005) demonstrates that better investor protection, that protects minority investors, leads to economic growth. La Porta et al. (1997) argue that countries that provide better investor protection, experience high liquidity. Friedman et al. (2003) note that better investor protection, reduce expropriation risk, and provide sustained firm level performance during financial crises. There are limited studies that examine factors that influence country level investor protection. Prevailing studies predominantly examine the impact of investor protection on several variables (see Wei, 2000; Islam and Montenegro, 2002; IMF, 2005). To the best of our knowledge, no studies have examined the effect of home and foreign bias on investor protection standards. We are therefore motivated to examine the impact of home and foreign bias on country level investor protection standards.

1.4 Research Objectives and Hypotheses

The main objective of this research is to examine the impact of home and foreign bias on three research areas; cost of capital, stock market development, and investor protection standards. Our three empirical studies employ home and foreign bias data of 44 countries for a 10 year period, 2001 to 2010. We develop nine hypotheses and test those using Newey-West autocorrelation and heteroskedasticity correction standard errors. We use pooled ordinary least squares (OLS) with panel data modelling, due to the wide cross sectional variations and sequential differences in foreign portfolio investment. Employing panel data provides accurate inference of the model parameters. We use lagged-values, and the Heckman selection model to provide robustness to our result.

The first research hypothesis is that home bias measures increase cost of capital, whilst foreign and country bias reduces cost of capital (see Chapter 6). When domestic investors overinvest in their home market, risk sharing between home and foreign investors reduces, and therefore, increases cost of capital. However, countries that attract sufficient foreign investment, experience an increase in risk sharing amongst investors, which, in turn, reduces the cost of capital.

The second research objective, investigates the impact of home and foreign bias on stock market development (see Chapter 7). We hypothesise that the prevalence of home bias will

inhibit stock market development, whilst foreign bias will improve stock market development. When a country attracts sufficient foreign investors into the domestic market, their participation and demand for good governance will boost the confidence of domestic investors. Consequently, it will cause an increase in stock market liquidity, bid up prices; increase the efficiency of trading technologies, and the number of dealers and brokers, which will improve stock market development.

The third research objective is to examine the impact of home and foreign bias on investor protection (Chapter 8). We hypothesise that when home investors over-allocate their investment in deviation from the implied optimal weight suggested by ICAPM, it reduces the investor protection standards provided to minority investors. Alternatively, when a country is favoured by foreign investors who reside in countries where good governance practices exist, the foreign investors will demand and export good governance to the host countries. This will lead to an improvement in a country's level investor protection standards, which will protect minority investors from expropriation by company insiders and majority shareholders.

1.5 Research Gaps and Contributions

We present the contributions of our research in this chapter. The existence of home and foreign bias, suggests that domestic and foreign investors, allocate a greater percentage of their equity to their domestic market, in deviation from the global weight suggested by ICAPM. Earlier studies mainly provide explanations to the home and foreign bias phenomena. A review of the existing literature suggests, that there is limited research on the implications of sub-optimal portfolio allocation (home and foreign bias), due to unavailability of cross country equity investment data. We, therefore, take advantage of the high value bilateral foreign equity portfolio holdings survey data, provided by the Coordinated Portfolio Investment Survey (CPIS) of the International Monetary Fund (IMF). Additionally, we employ a novel fund level allocation data, provided by the Emerging Portfolio Fund Research (EPFR).[3]

In our first empirical study, we make several unique and important contributions to the home and foreign bias literature. First, current studies predominantly examine the causes of home

[3] See appendix 1 for the Emerging Portfolio Fund Research data.

and foreign bias (see French and Poterba, 1991; Chan et al, 2005; Gelos and Wei, 2005; Bekaert and Wang, 2010), with only Lau et al. (2010) investigating the implications of these biases. In this study, we investigate whether varying degrees of home and foreign biases have implications for cost of capital. Furthermore, the relevant literature is either based on event studies, investigating how the cost of capital changes in the post financial liberalisation period, or analyses the influence of depository receipts on the cost of capital.[4]

Theory suggests that the reduction of cost of capital post-liberalisation is driven by the increased risk sharing between domestic and foreign investors; enhanced stock market liquidity and an improvement of good governance (see Doidge et al. 2004; Foerster and Karolyi, 2000). Similarly, a number of studies investigate the impact of floating ADRs/GDRs on cost of capital.[5] We use direct measures of sub-optimal international portfolio investments (i.e. home and foreign bias) to study their effects on cost of capital. Furthermore, rather than solely using home bias measure, which focuses on domestic investors (see Lau et al. 2010), we use two additional relative measures of international portfolio investment, known as foreign bias.[6] However, as Bekaert et al. (2009) note, ADR companies exhibit representation problems and hence, do not provide full exposure to foreign stock markets. Clearly, ADRs ignore the investments of local investors in foreign markets and foreign portfolio investors investing directly in non-cross-listed domestic firms. Countries receiving relatively higher investments, i.e. international investors exhibiting greater foreign bias, should be more integrated with world capital markets and should demonstrate a relatively lower cost of capital. The two foreign bias measures are based on aggregate macro and individual global fund level micro data.

Second, the aggregated measures of foreign and home bias measures used in existing studies do not consider the individual objectives or focus of funds. Although on a theoretical basis, each fund should be globally diversified, however in practice, a fund's objective could be a

[4] For example, Kim and Singal (2000) and Chari and Henry (2004a) show that the post financial liberalization cost of capital of the liberalized economy significantly decreases. Stulz (1999) and Henry (2000) also find similar results, suggesting that the reduction in cost of capital is driven by increased risk-sharing and improved corporate governance. De Jong and de Roon (2005) document that, the increased time-varying integration (i.e. the process of gradual financial liberalization of the domestic equity market) is associated with a reduction in the cost of capital.

[5] For example, Foerster and Karolyi, (1999), Errunza and Miller (2000) and Karolyi (2004) demonstrate that firms issuing American Depositary Receipts (ADRs) experience a fall in the cost of capital, driven by the increased global risk sharing effect. For more recent evidence see Edison and Warnock (2008) and Hail and Leuz (2009).

[6] See section 3.1.1 and 3.1.2 for details on the construction of home and foreign biases.

single country, single region or global diversification, targeted to suit the preferences of different investor groups. For example, if the focus of the fund is diversification only within the European Union (EU), it will have no allocations across countries outside the EU. Additionally, if the focus of a fund is on a single country or region, it will significantly affect the aggregate measure of home and foreign bias. To address this issue of potential bias in the measure of sub-optimal allocations of international investors, we construct a foreign bias measure that uses unique micro firm level global funds' allocation data across 44 countries. These global funds that we use, carry the sole objective of global diversification across all investable countries. The use of global funds is the most restrictive and robust measure of foreign bias, significantly reducing what we refer to as the fund-focus bias in the construction of foreign bias measures used in the existing literature.

In addition to using the two conventional proxy of cost of capital, i.e. dividend yield and historical risk premium, we also use sovereign bond rating, based on implied cost of capital, and expected country equity risk measure (Jewel and Livingston, 1998; Lau et al. 2010; Damodaran, 2012). We use $Tobin's\ Q$ to examine the impact of home and foreign bias on firm performance (firm valuation), as there is an inverse relation between firm valuation and cost of capital.

Consistent with theory, our comprehensive empirical analysis and extensive robustness tests provide strong evidence that a higher degree of home bias is associated with a higher cost of capital. Correspondingly, a higher degree of foreign bias, i.e. foreigners tilting their country specific portfolio weight towards the global optimum, reduces the host country's cost of capital.

In our second empirical study, we explore the impact of home and foreign bias on stock market development. Prior studies on stock market development have investigated the importance of stock market development. Very few studies have examined factors that influence or determine stock market development. For instance, Claessens et al. (2006) show macroeconomic fundamentals and institutional environment affect stock market development. Billmeier and Massa (2009), find that institutions and remittances impact positively on stock market development. In this regard, this study advances the existing literature on stock market development and makes significant contributions towards understanding the impact of home bias on stock market development.

The study makes four important contributions. First, it adds to the scant but growing literature on the implications of home bias in international equity portfolio investments. In spite of several studies explaining the potential reasons of home and foreign biases (see Chan et al, 2005), a comprehensive study, delving into the possible implications of such biases is highly limited, and to our knowledge, none on the consequences of stock market development. The only study that is remotely related to ours is that of Lau et al. (2010), who demonstrate the implications of sub-optimal portfolio investments on cost of capital. Our study, rather than solely using home bias measure, which focuses on domestic investors (see Lau et al. 2010), we use two alternative measures of international portfolio investment, known as foreign bias. Countries receiving relatively higher investments, i.e. international investors exhibiting greater foreign bias, should be more integrated with world capital markets and should experience a relatively lower cost of capital. The two foreign bias measures are based on aggregate macro and individual global fund level micro data.

Further, the aggregated measures of foreign and home biases used in existing studies do not consider the individual objectives or focus of funds. Although on a theoretical basis, each fund should be globally diversified, in practice, a fund's objective could be a single country, single region or global diversification, targeted to suit the preferences of different investor groups. For example, if the focus of the fund is diversification only within the European Union (EU), it will have no allocations across countries outside the EU. Additionally, if the focus of a fund is on a single country or region, it will significantly affect the aggregate measure of home and foreign bias. To address this issue of potential bias in the measure of sub-optimal allocations of international investors, we construct a foreign bias measure that uses unique micro firm level global funds' allocation data across 44 countries. The global funds that we use have the sole objective of global diversification across all investable countries. The use of global funds is the most restrictive and robust measure of foreign bias, significantly reducing what we refer to as the fund-focus bias in the construction of foreign bias measures used in the existing literature.

Second, we examine the impact of foreign bias on stock market development. Previous studies focus largely on factors determining foreign bias. For instance, Chan et al. (2005) investigate factors that influence foreign bias using mutual fund equity allocation. More recently, Chan et al. (2009) investigate the implications of foreign bias on firm value. Whilst, Beugelsdijk and Frijns (2010) examine how culture and cultural distances between stock

markets explains foreign bias. As far as existing literature is concerned, our study is the first to examine the impact of foreign bias on stock market development.

Third, another distinct contribution of our study, relative to existing studies, is that our study uses a unique dataset of micro global fund allocation data across 44 countries, to examine the impact of foreign bias using global fund foreign bias on stock market development.

Additionally, we also add to the growing literature that connects international integration and financial deepening of the local markets, post market liberalisations (Hargis and Ramanlal, 1997; Levine and Zervos, 1998, Errunza, 2001, Chan et al. 2009 and Bekaert et al. 2011). However, this literature is based on the assumption that liberalisation leads to increased participation of the foreign investors in the local market, which as Bekaert and Havery (2003) note, may not be the case, due to the presence of various direct, indirect and emerging market specific risk barriers. Our measure of home and foreign biases are direct measures of the variations in the degree of participation of foreign and domestic investors in international diversifications relative to the normative suggestions of ICAPM.

Our study has important policy implications, because existing studies show that a large and more efficient stock market leads to economic growth (see Levine and Zervos, 1996, Bencivenga et al. 1996; Rousseau and Wachtel, 1998; Levine et al, 2000; Beck et al, 2000b; Rousseau and Sylla, 2001). However, alternative studies, for instance (see Devereux and Smith, 1994; Stiglitz, 2000; Eichengreen, 2002), show that financial liberalisation has not had the expected positive impact on economic growth. We thereby provide evidence that cross-country pervasiveness of home bias inhibits stock market development. Additionally, we show that when foreign investors increase their investment towards the global portfolio weight as implied by ICAM, stock market development improves.

In our third empirical study, we provide novel contributions to the investor protection literature. Existing literature primarily examines the importance of investor protection by explaining economic growth and development. In spite of the importance of investor protection, to the best of our knowledge, very few studies have addressed the factors that determine investor protection. For instance, Wei (2000) shows that corruption negatively relates to an open economy, as resources will be committed to improve institutional quality. Islam and Montenegro (2002) demonstrate that trade openness is robustly associated with

institutional quality. The IMF (2005) shows that trade openness has a positive impact on both institutional transitions and the quality of economic institutions. Busse and Groning (2007) analyse the importance of trade liberalisation towards good governance. They find evidence that suggests trade openness has a positive influence on good governance. We extend the existing studies by examining the impact of home bias on investor protection.

There is no single published study that has addressed the effect of foreign bias on investor protection standards. To the best of our knowledge, our study is the first to examine the impact of foreign bias on investor protection. We employ four proxies of investor protection which aim to capture investors' rights, how these rights are enforced at courts and government policies that enhance return on investment. The proxies also capture government policies that increase return on investment. The proxies are government effectiveness (*Gov_Eff*), control of corruption (*Con_Cor*), regulatory quality (*Reg_Qual*), and rule of law (*Rule_Law*). We obtain data from World Governance Indicators, which has widely been used in the governance literature (see Knack et al. 2003; Andres, 2006, and Liu and San, 2006).

The study also applies global fund foreign bias to examine its effects on investor protection. We construct the variable, using funds which have the sole objective of global diversification. Finally, we also address the concern of endogeneity, using alternative estimation statistical techniques that include lagged predetermined values of home and foreign biases, and the Heckman selection model.

1.6 Research Findings

We present the research findings in consistence with the research objectives. The first empirical study tests three hypotheses, by examining the impact of sub-optimal portfolio allocation (home and foreign bias) on cost of capital. The study uses five measures to proxy for cost of capital. Consistent with the existing theory, the result in Chapter 6, provides strong and robust evidence that high degrees of home bias exhibited by domestic investors, increase cost of capital, due to lack of risk sharing. Nonetheless, the study finds that foreign bias leads to a reduction in cost of capital via increased international risk sharing and higher liquidity. As there is an inverse relation between cost of capital and firm valuation, we perform a robustness test using Tobin's Q. The result shows that home bias reduces firm valuation through an increase in cost of capital. We also find that foreign bias increases firm valuation, as a result of reduction in cost of capital.

The second empirical research tests three hypotheses, by examining the impact of sub-optimal portfolio allocation on stock market development. We employ four proxies of stock market development. The research findings in Chapter 7 provide compelling evidence that the prevalence of home bias in a country inhibits stock market development. The reason for this is that the domestic stock market will be dominated by large institutional investors who will buy-and-hold, and will adversely affect the liquidity of the stock market. Consistent with the theory, we find that foreign bias has a statistically and significant positive impact on stock market development at the 1% level. The participation of foreign investors enhances liquidity; increases risk sharing, and improves good governance. We use lagged values, and the Heckman selection to address endogeneity problems, and the results suggest our main analysis is robust.

In our third empirical study, we test three hypotheses by investigating the impact of sub-optimal portfolio allocation on investor protection. We use four different proxies of investor protection. In line with the theory, the research findings in Chapter 8 demonstrate that home bias leads to weak investor protection. This is explained by the market being segmented and dominated by domestic institutional investors who tend to be corporate insiders. This is consistent with the suggestions provided by Errunza (2001) that home bias leads to weak investor protection. We also find that foreign bias improves country level investor protection standards. This is characterised by foreign institutional investors from well governed countries, exporting good governance to the host countries. We perform a sensitivity test which confirms that our main result is robust to endogeneity, and not sensitive to different data sources of investor protection measures. The estimated coefficients remain statistically significant and maintain the same sign in all the regressions we run.

1.7 The Structure of the Thesis

The thesis is organized in nine chapters. In Chapter 1, we introduce the thesis, research importance and motivation, research objectives, main research findings and the structure of the thesis. Chapter 2 offers a background and literature review of the study. Chapter 3 presents the research questions and hypotheses' development. Chapter 4 reports the data sources used in the research. Chapter 5 discusses the research methods. Chapter 6 presents the analysis and the findings of the first research question, the sub-optimal portfolio allocation impact on cost of capital. Chapter 7 presents the research findings of the second

research question i.e. the impact of home, foreign, and country bias on stock market development. Chapter 8 reports the research findings for the third research question i.e. the impact of home and foreign bias on investor protection. Chapter 9 summarises and concludes the research. It also provides the limitations, policy implications and recommendations for future studies.

Chapter 2: Background and literature review

2.1 Introduction

This chapter will review and discuss related existing literature. The chapter is organised as follows: Section 2.2 offers a general background to the study; Section 2.3 provides a literature review of the flow of foreign portfolio investment in relation to cost of capital; Section 2.4 reviews flow of foreign portfolio investment in relation to stock market development; Section 2.5 reviews and discusses flow of foreign portfolio investment in relation to investor protection; Section 2.6 reports gaps in the existing literature; Section 2.7 summarizes and concludes the chapter.

2.2 Background

In this section, we present the general background of the thesis. We mainly report factors that influence foreign portfolio investment. For instance, we provide a literature review on portfolio theory, the case for international portfolio diversification, stock market liberalisation and integration, stock market segmentation and, finally, the phenomenon of home and foreign bias.

2.2.1 Portfolio theory

Markowitz (1952) developed modern portfolio theory, based on a standard mean-variance framework where he demonstrates how an optimum portfolio can be achieved, based on expected return, variance and the covariance of securities' return. In his publication in 1952 "Portfolio Selection," Markowitz applied mathematical methods to explain that the risk of a portfolio reduces by adding securities that are less than perfectly correlated in a portfolio. In other words, he shows that the risk of a portfolio reduces when two assets that are not perfectly correlated are added to a portfolio. Due to the possibility of portfolio risk reduction through diversification, he argues that portfolio risk measured by variance, will not only be influenced by the individual variances of the return on the assets, but also by the degree of the covariance of all the assets. The risk of an asset does not significantly depend on the risk of each individual asset, but on the general contribution of each asset to the portfolio risk. The "law of large numbers" cannot be entirely applied to the diversification of risk in a portfolio choice because, in practice, the returns on individual assets could be correlated. This indicates

that portfolio risk, generally, cannot be eliminated, irrespective of the different types of securities added to a portfolio.

According to ICAPM, a country's risk premium depends on the covariance of that country's market portfolio return with the world market portfolio return. If the covariance with world stock markets is high, then the market portfolio of the country is risky from the perspective of the global markets. The capital asset pricing model (CAPM), suggests that the expected return on a security, is equal to the risk-free rate plus a risk premium. In an efficient market, efforts to reduce the risk level of the portfolio by simply adding less-risky investment also reduces the expected return of the portfolio. International portfolio diversification does not reduce the expected return of the portfolio; however, diversification lowers the risk of the portfolio by eliminating non-systematic risk without sacrificing the expected return of the portfolio. Solnik and McLeavey (2004) argue that international portfolio diversification improves the sharp ratio, due to international reduction of unsystematic risk. The next section explains why investors should construct an internationally diversified portfolio.

2.2.2 The case for international portfolio diversification

The fundamental argument for international portfolio diversification is that it assists foreign investors to reduce unsystematic risk without suffering any decline in returns.[7] The expansion of investment opportunities through international portfolio diversification enhances the risk adjusted performance of a portfolio. The potential gains from international portfolio investment provide the opportunity for international investors to partake in the economic growth of other countries. Different countries have different opportunities for real economic growth as countries have different social, economic and political development. Foreign equity investors will benefit if there is higher return and lower correlation between the domestic and foreign securities. Investment in countries with higher economic growth, particularly in emerging markets, will assist international investors to obtain higher returns on investment.

[7] With regard to international diversification, systematic risk relates to risks that affect all countries, such as the 2008 global financial credit crisis. Unsystematic risk relates to a particular country, for instance, governance issues.

Studies suggest that foreign investors can therefore, participate and enjoy high economic growth opportunities in emerging countries.[8] Bartram and Dufey (2001) argue that, there is high volatility in emerging markets; however, due to the low correlation with developed market returns, emerging markets significantly contribute to the reduction of unsystematic risk of a portfolio. When international investors construct portfolios that include developed and emerging markets, the risk associated with the portfolio reduces without any reduction of the portfolio returns. Increasing the number of securities in a portfolio reduces a portfolio's unsystematic risk, but the systematic risk remains unchanged as the securities return will be impacted by sets of factors that are common to all the markets. The variance of a portfolio will significantly be influenced by the degree of international diversification. Odier et al. (1995) examine the risk-return characteristics of emerging markets relative to developed markets. They find evidence of substantial higher returns in emerging markets; however, the returns are associated with higher levels of market volatility. They show a correlation of 0.31 between returns of emerging markets and the world index of developed markets, implying that emerging markets might provide better benefits of diversification than a portfolio solely invested in developed markets.

International portfolio diversification shows that, other things being equal, when there is a low correlation between international stocks markets, it presents an opportunity to international investors to reduce the volatility or the unsystematic risk of the portfolio. This implies that, a low correlation between international stock markets provide, to an active investor, the opportunity to gain higher returns. An experienced and skilful investor can potentially adjust the international asset allocation of global portfolio towards the stock market with higher returns. Solnik and McLeavey (2004) note that international stock markets do not move up and down together as there are variations in macroeconomic conditions in different countries. The case for international portfolio diversification has two constituents. First, the potential benefits of risk reduction by keeping international diversified securities. Second, the potentials of an added foreign exchange risk diversification. As investors add more securities to the portfolio, the risk of the portfolio reduces substantially at the initial stage, then asymptotically towards the level of systematic risk of the market. A

[8] Several Eastern European countries, Latin America, Asia, and Middle East are classified as emerging countries due to their low income and high economic growth rate.

well-diversified domestic portfolio will have a beta tilting towards 1.0. Companies within the same country tend to be affected by the same macroeconomic conditions.

Apparently, there is a high correlation between firms within the same country. As a result, stock prices of firms within the domestic market usually move up and down together because they encounter similar domestic macroeconomic factors such as monetary announcements, interest rate movement, budget deficits and the national GDP growth, which leads to a positive correlation amongst firms within the same country. A foreign stock market provides opportunities for domestic investors to spread the risk in their portfolio as the domestic country and the foreign countries face different macroeconomic conditions, the stock market return of the two countries will not be highly positively correlated, therefore domestic investors can diversify away the local market risk.

When a portfolio is well diversified, the variance of the portfolio return relative to the variance of the market's return reduces to the level of systematic risk. This implies that international portfolio market risk is lower than that of a domestic portfolio. This typically happens when the returns on domestic stocks are not closely correlated with the returns of foreign stocks. The potential benefits from international diversification should induce investors to participate in foreign securities. The inclusion of foreign securities reduces portfolio risk for a given level of return. There are several theoretical models and empirical studies that provide evidence of benefits from international portfolio diversification.

Driessen and Laeven (2007) find the benefits of international portfolio diversification are larger in developing countries, relative to developed countries. They argue that emerging countries are associated with high investment risk; however, investors from emerging countries can engage in risk sharing by including securities from developed countries. Studies suggest that investors from developing countries benefit most from international diversification, relative to investors from developed countries. A previous study by Huberman and Kandel (1987), Bekaert and Urias (1996) show the potential substantial cost investors from developing countries can incur if they fail to diversify internationally.

Contributing to the work of Markowitz (1952), Evans and Archer (1968) demonstrate empirically that portfolio diversification reduces portfolio risk. Grubel (1968) extends the portfolio theory developed by Markowitz, by showing the effects of a portfolio that includes

long-term assets and claims dominated in foreign currency. He finds that international portfolio diversification offers gains to investors through risk reduction and benefits from growth in other countries. He demonstrates empirically by employing data of 11 major stock markets on ex post-realised rates of return from investment. He further shows that international diversification not only depends on interest rate differential but also on the growth rate in total assets holdings in two countries. Studies in the US with regard to benefits of international portfolio diversification by Huberman and Kandel (1987), Bekaert and Urias (1996), De Roon et al. (2001), provide further support that US investors can obtain substantial gains from international portfolio diversification through increased risk sharing. Other studies suggest that the large size of the global market capitalisation and integration provide justification for international portfolio diversification.

The global stock market has experienced substantial growth since 1970. The New York Stock Exchange, which in 1970 accounted for 60 per cent of the world market capitalisation, was the most significant market in the world (Solnik and McLeavey, 2004). Towards the end of 2001, the US stock market capitalisation was around $25 trillion which stood at 50 per cent of the world market capitalisation. Solnik (1974) employs weekly data for the period 1966 to 1971 of a large sample of individual stocks from seven European countries and the US. He shows the significant gains that can be achieved by investors through portfolio diversification in foreign and domestic stock markets. By holding a well-diversified equity portfolio, investors combine assets from countries to reduce portfolio risk. When more securities from several countries are added to the portfolio, the less the portfolio is affected by the poor performance of one particular country. The entire portfolio risk will be influenced by not only the number of securities included in the portfolio, but in addition, by the riskiness of each individual security and the extent to which they correlate with each other. For instance, a portfolio of 20 securities from the same country, experience less diversification benefits than a portfolio that includes securities selected from 20 countries. Solnik (1974) suggests that American portfolio managers can improve diversification benefit by selecting stocks listed on the New York and American stock exchanges instead of holding equities from the 30 Dow Jones Industries. Furthermore, he demonstrates that an internationally diversified portfolio is associated with less risk than a domestic dominated portfolio because, as diversification increases, portfolio risk declines.

Bartram and Dufey (2001), show the potential benefits that investors can derive from international portfolio diversification. They demonstrate that international portfolio investors can experience considerable gain through (i) participation in the growth of foreign markets; (ii) hedging of investors' consumption; and, (iii) diversification effects. Fletcher and Marshall (2005) employ the Bayesian approach of Wang to examine the benefits of international portfolio diversification for UK investors, between January 1988 and 2000. They find substantial increase in Sharpe and certainty equivalent return performance via portfolio diversification. Dimson et al. (2002), show that international portfolio investment offers domestic investors the opportunity to reduce portfolio risk. Examining the importance of international portfolio diversification, Hentschel and Long (2004) find considerable benefits to investors in developed equity markets. Li et al. (2003) suggest that even when short sales constraints are imposed, investors still benefit significantly from international portfolio diversification. Shawky et al. (1997) offer a comprehensive review of issues relating to international portfolio diversification. They argue that international portfolio diversification provides reasonable means in reducing portfolio risk, without reducing equity returns.

Lessard (1976) employs multivariate analysis on a group of Latin-American countries. He finds that international diversification consistently reduces portfolio risk. Eun and Resnick (1994) analyse the gains from international portfolio diversification from a Japanese and US perspective. They employed monthly return data for national bond and stock market indices for the period January 1978 to December 1989. They conclude that the potential gains from international diversification are much greater for US investors than for Japanese investors. Additionally, Japanese investors gain more from international diversification through increased international risk sharing, while for US investors, the gains accrue, not so much in terms of lowering risk, but in terms of higher returns. Mayshar (1979) maintains that when investors hold securities concentrated in a relatively few undiversified portfolios, the securities own variance or standard deviation will substantially affect its required equilibrium returns. Bekaert and Harvey (1995) provide evidence on the variations of the degree of the integration of emerging equity markets over time. They show the potential diversification benefits that can be achieved from investing in emerging equity markets. In spite of the theoretical models and empirical evidence of the benefits of portfolio diversification, studies suggest that the gains from international portfolio diversification to a large extent depend on the correlation between the domestic and foreign markets.

Levy and Sarnat (1970) argue that even though Markowitz (1952) provides a positive reason for diversification of risky assets, the extent to which portfolio diversification reduces portfolio risk, depends on the correlations across stock markets. If there is a positive high correlation amongst stock markets, no amount of diversification can reduce the portfolio risk. Portfolio diversification's theoretical and practical importance can be experienced in the sense that, if a country's stock market returns are highly but not perfectly correlated, then there is an opportunity to reduce risk through diversification. When there is a relatively less degree of positive correlation between economies, it implies that there is the opportunity for portfolio risk reduction through international diversification. Markowitz (1952; 1959) suggests that as long as correlations of returns between markets are not perfect, it offers a necessary but not sufficient condition for portfolio diversification.

Studies by Grubel (1968) and Lessard (1973) find that the correlation between international equity markets are low and, therefore, offer the opportunity to diversify portfolios to reduce risk. In a related study on international portfolio diversification, Errunza et al. (1999) argue that investors can gain from international portfolio diversification through investment in multinational companies, American depository receipts, and country funds that trade in the USA. Harvey (1995) demonstrates that the correlations across emerging markets are low, and thereby, provides opportunities for domestic investors to reduce portfolio risk beyond what they could achieve if they had kept only domestic equity. However, in recent times, international stock market linkages have experienced increased correlations between stock markets and therefore reduced the benefits of international diversifications.

A study by Goetzmann et al. (2002) show the seemingly increasing correlations amongst stock markets towards the end of the 20th century, which have resulted in the reduction of diversification benefits. Rajan and Friedman (1997) examine the impact of country risk on portfolio choice, in the context of the Markowitz portfolio selection model. They conclude that international portfolio diversification opportunities exist and that market segmentation plays a substantial role in the generation of those benefits. Nevertheless, as global markets become less segmented over time, international markets will become more highly correlated and the benefits of international diversification may reduce. Heston and Rouwenhorst (1994) re-examine industry versus country diversification by investigating the behaviour of individual shares from Europe. They conclude that country-specific factors are more important than industry factors when explaining diversification gains.

2.2.3 Stock market liberalization and integration

The previous section demonstrates the benefits that investors can derive from international portfolio diversification. This section provides a literature review on stock market liberalisation and integration. Stock market liberalisation is whereby a country removes investment restrictions and relaxes capital controls on equity investment to attract foreign portfolio investments to promote economic growth. Essentially, the national government allows foreign investors to hold domestic companies' equities without restrictions, and domestic investors are simultaneously allowed to purchase securities from foreign countries.

The last four decades have witnessed both developed and emerging countries liberalising their financial markets under the expectation of faster economic growth. There are several forms of financial liberalisation which include capital account liberalisation, banking sector liberalisation, and stock market liberalisation. Theories of stock market liberalisation suggest that the removal of cross-border investment restrictions will lead to global stock market integration.[9]

Existing studies, for instance, Bekaert and Harvey, (2003) suggest that stock market liberalisation will lead to stock market integration. In finance, stock markets are regarded as integrated if financial assets of similar risk have identical expected return irrespective of the country of domicile. The expected return of an integrated market is determined by the covariance of the domestic country index return with the world market index return and possibly with currency deposit rates. In an integrated stock market, common rewards are associated with risk exposure. More significantly, the rewards for risk are not important in an integrated market, as systematic risk is common to all integrated countries. The quest for a deeper understanding of stock market liberalisation and integration has become a major research and policy issue. Generally, evidence suggests that the outcome of stock market liberalisation and integration depends on factors such as the pace of implementation, the sequence of the liberalisation, the degree of macroeconomic stability before, during and after the liberalisation period, and the institutional structures of the liberalising economy.

Studies provide several factors that motivate countries to liberalise and integrate the domestic stock market with the global stock market. Existing studies suggest that political and

[9] Integration means financial stock markets are globalized or interlinked with each other and are affected by world common factors.

economic factors influence a government's decision to liberalise the stock market. Contributing to factors that influence national governments to liberalise the stock markets, Kaya et al. (2012) show that political and economic factors influence government decision to liberalise the stock market. Among the economic factors, the level of financial development, structure of the economy, the quality of investor protection and the level of the government's involvement in the economy play significant roles towards the likelihood of stock market liberalisation. Political factors take account of the influence of foreign governments and agencies through the allocation of foreign financial aid. The economic factors include the level of financial development, the structure of the economy, the quality of investor protection, and the level of the government's involvement in the economy.

It is widely recognised that stock market liberalisation is an integral part of financial sector development. Theory and empirical evidence suggest that countries can derive substantial economic benefits by allowing foreign investors to access the domestic stock market. Errunza, (2001) postulates that stock market liberalisation via flow of foreign investors will lead to a decline in cost of capital, improvement in stock market development, and better country level investor protection standards.

Financial liberalisation and integration helps international investors to diversify their portfolio by bidding up the prices of local securities and avoiding sectors that are inefficient. Generally, prior to financial liberalisation, the domestic price of risk (variance) exceeds the global price of risk (the covariance). Therefore, we expect equity risk premium to decline when a completely segmented country liberalises its stock market. Holding expected future cash flows constant, the fall in the equity risk premium will lead to a permanent decline in the aggregate cost of capital, increase stock price valuation and subsequently stimulate investment and GDP growth. Studies by Harvey (1995), and Bekaert and Harvey (1995, 1998), demonstrate that stock market integration have a positive influence on stock prices.

Financial theory predicts that when a country liberalises the stock market, foreign investors will participate in the liberalised country's stock market. The positive impact of liberalisation works through a reduction of cost of capital, real interest rates and unsystematic risk as the relevant benchmark for pricing risk changes from the local market index to a world market index. Consequently, companies in the liberalising countries will experience increase in stock prices and the rate of capital accumulation will rise. Existing studies suggest that stock

market liberalisation can play an important role in increasing economic growth. In principle, stock market liberalisation offers a channel for companies to raise capital at a lower cost than from the banks. Due to the fact that, although, interest on loans borrowed from the bank can be deducted on the company's tax return, the debt involves borrowing money to be repaid, plus interest.

Kim and Singal (2000) argue that, the opening of a country's stock market to foreign investors is associated with an increase in stock price indexes in the liberalising country. Henry (2000b) shows that stock market liberalisation is related to an increase in a country's overall level of private investment. Chari and Henry (2004a, b) find that an increase in a firm's investment correlates positively with expectations of increase in its future earnings after financial liberalisation. Gupta and Yuan (2004) find a positive relation between liberalisations and growth using alternative methodologies. Schmukler and Vesperoni (2003) provide evidence of a decrease in a firm's long-term debt following liberalisation. In a sample of 1,141 firms from 28 countries, Mitton (2006) studied the impact of financial liberalisation on five standard measures of operating performance; growth, investment, profitability, efficiency, and leverage. Though the study avoided methodological problems of earlier studies, he provides further evidence that opening stock market to foreign investors is associated with a broad range of improvements in operating performance for the liberalising firms. Galindo et al. (2001), show that stock market liberalisation improves capital allocation efficiency of firms in 12 developing countries. Levine and Zervos (1998) find that stock markets become more liquid following liberalisation in a study of 16 countries. Stulz (1999a) argues that financial globalisation allows financial resources to flow to areas where productivity is efficient, high, and offers countries the opportunity to enjoy the benefits of their comparative advantages.[10]

Studies suggest that financial liberalisation may improve the supply and allocation efficiency of funds for investment. For instance, it is often thought that financial liberalisation improves the allocative efficiency of savings. However, Laeven (2003) argues that the consequence of financial liberalisation on the supply of funds for investment is theoretically ambiguous. In a

[10] It is reasonable to expect foreign investors to invest in countries where there are weak regulation poor investor protection standards as a result of benefits of international portfolio diversification and high expected returns especially in emerging countries. The foreign investors will seek to invest in these countries with poor investor protection standards with the hope of higher returns and also influencing investor protection standards.

segmented market, McKinnon (1973) and Shaw (1973) argue that an interest rate ceiling, which is another common feature of repressed financial systems, distorts the allocation of credit and may lead to under-investment in projects that are risky but have a higher expected rate of return. Obstfeld (1994) shows that stock market liberalisation, increases the pool of funds allocated towards risky investment projects due to improved risk sharing.

Laeven (2003) estimates a dynamic investment model using annual panel data for 394 listed firms in 13 developing countries for the period 1988 to 1998. He finds that financial liberalisation affects small and large firms differently. Small firms in developing countries gain from financial liberalisation, but in the case of large firms, the allocation efficiency benefits from financial liberalisation is rather offset by the adverse effects of losing access to preferential credit. Galindo et al. (2002) show a positive correlation between financial liberalisation and improvements in allocative efficiency of investment in some countries using firm-level data from 12 developing countries. Laeven (2003) argues that, successful financial liberalisation requires better political treatment of large and well-connected firms. In recent times, Abiad et al. (2008) find robust evidence that capital account liberalisation and integration improves capital allocation efficiency across countries. Although, countries have removed the implicit and explicit investment constraints global equity investors' face towards their investment, nonetheless, due to the phenomenon of home and foreign bias, it is less likely that financial liberalisation will result in full integration of the global stock market. Therefore, there is a certain degree of segmentation in some countries.

The financial market is segmented when there is a cross-border regulatory restriction on capital outflows and inflows. The restrictions could include discriminatory taxes or separate legal status given to foreign investors in terms of ownership restrictions. Furthermore, prevalence of home bias by domestic investors can also segment a liberalised market. Existing studies show that investors exhibit varying degrees of home and foreign bias for several reasons.[11] In a completely segmented market, domestic investors mainly hold securities from their home country without holding a world diversified market portfolio. As a result, resident investors will have to bear all the risk associated with the investment. This subsequently makes the equity risk premium embedded in a segmented market aggregate valuation, proportional to the variance of the country's aggregate return. Consequently,

[11] Cross-country variations in the quality of corporate governance mechanisms, accounting standards, legal institutions, stock market regulations, investor protection, information asymmetry, direct and transaction cost.

securities are priced off at the local market return. In a fully segmented market, the country's expected return is determined solely by the variance of return in that market multiplied by the price of variance. Because risk is shared locally, the price of variance will largely depend on the weighted relative risk aversions of investors in the domestic country.

When a financial market is segmented, domestic investors are restricted from purchasing shares in foreign countries, which includes capital mobility and foreign exchange controls. Similarly, foreign investors encounter investment restrictions in the form of barriers on foreign equity investment.[12] Other forms of restrictions include imposing limits on the percentage of a firm's shares that foreign investors can purchase. Domowitz et al. (1998) show that stock market segmentation reduces the gains that investors can achieve from risk sharing via international diversification. In a segmented market, domestic investors are mainly prevented from holding an international diversified portfolio, which increases cost of capital. National governments sometimes place investment restrictions to ensure that it attracts foreign investment, whilst the control of companies remains with domestic citizens. This is to avoid conceding ownership control to foreign investors.

In a segmented market, companies issue restricted shares that can only be purchased by domestic investors and unrestricted shares where foreign investors can buy them. Studies show that unrestricted shares, trade at a premium price relative to restricted shares. For instance, Hietala (1989) on Finland, Lam et al. (1990) on Singapore, Bailey and Jagtiani (1994) on Thailand, Stulz and Wasserfallen (1995) on Switzerland, and Domowitz et al. (1998) on Mexico. They show that there is an economically significant stock price premium for unrestricted shares, relative to restricted shares.

Studies suggest that market segmentation leads to underdevelopment of stock markets as a result of stock market illiquidity, weak regulatory mechanisms and inadequate disclosures by companies. Errunza and Miller (2000) argue that market segmentation leads to higher cost of capital as the funding options available to companies are internally generated. Particularly, in the case of emerging markets, it is only government agencies and large companies that have access to the stock market. Market segmentation has a negative effect on the size and liquidity of a stock market. Segmentation makes stock markets become very small and

[12] Eun and Janakiramanan (1986) provide ownership restrictions in 16 countries.

inactive as a result of only local investors holding shares in the domestic companies. Errunza and Losq (1985) suggest that restricting foreign investors from buying securities in a segmented country will cause securities to trade at a premium, to the extent that they are spanned by investors' home market securities. Errunza and Losq (1989) argue that controlling capital flows, makes it impossible for investors to construct a world market portfolio to reduce portfolio risk. Therefore, the removal of investment barriers through financial liberalisation will lead to an increase in securities' aggregate market value.

2.2.4 Home and foreign bias phenomenon

In spite of financial liberalisation, which has led to the removal of direct and indirect legal investment restrictions, existing studies show that investors still deviate from holding internationally diversified portfolio, due to the home and foreign bias phenomenon (see Erruza and Losq, 1985; Cooper and Kaplanis, 1994; Bekaert and Harvey, 1995; Errunza, 2001; Warnock, 2002; Bekaert, 1995; Bekaert and Harvey, 2003; Dahlquist et al. 2003; Chan et al, 2005; Gelos and Wei, 2005; Hunter, 2006).

Home bias relates to higher inward investment, i.e., over weighting of the home market relative to the suggestion of the ICAPM benchmark. Similarly, foreign bias refers to the tendency of over or under weighting of foreign markets against the suggestion of ICAPM benchmark allocations. A number of studies (see Stapleton and Subrahmanyam, 1977; Errunza and Losq, 1985; Janakiramanan, 1986; Stulz, 1999b; Bekaert and Harvey, 2003) conjecture that the prevalence of home bias in portfolio allocations will segment financial markets from the global markets, and therefore, will reduce international risk sharing benefits. This implies that a higher degree of home bias should be associated with a higher cost of capital and vice versa.

Existing studies provide theoretical and empirical explanations for home bias, which include information asymmetry, differential accounting standards, poor investor protection standards, political risk, currency risk and economic development. Errunza (2001) notes that domestic investors are better informed about their local markets than foreign investors. Therefore, such informational asymmetry leads to home bias, which, in turn, leads to higher cost of equity capital. Chan et al. (2005) argue that emerging markets are characterised with poor information disclosure, therefore, investors from developed countries, experience

informational disadvantage and tend to underweight foreign investment. Other explanations for home bias include: Warnock's (2002) high transaction cost, Dahlquist et al. (2003) differences in corporate governance, Errunza and Losq's (1985) barriers to international capital flows, Baxter and Jermann's (1997) hedging motives, and Cooper and Kaplanis' (1994) departure from purchasing power parity. Other reasons also include the level of protection given to minority investors (see Bekaert and Harvey, 1995; Errunza, 2001; Hunter, 2006), Gelos and Wei (2005) country level transparency, Bekaert (1995) separate legal status given to domestic and foreign investors. Home bias segments stock markets and thus has implications on cost of equity capital, stock market development, and investor protection.

Few studies have examined the implications of home bias (see Lewis, 1999; Karolyi and Stulz, 2003; Chan et al. 2009; Lau et al. 2010). Stulz (1999a) demonstrates, theoretically, that home bias segments markets and thereby reduces firm value through an increase in cost of equity capital. Other studies provide empirical evidence to support the argument that home bias lowers risk sharing (see Errunza and Losq, 1985; Janakiramanan, 1986; Stapleton and Subrahmanyam, 1977). If foreign investors underweight their investment in the domestic market, risk sharing between the foreign and local investors reduces and therefore lowers cost of capital benefit of financial liberalization (Carrieri et al. 2006).

We provide the background to the study in this section. In the subsequent section, we offer a literature review that relates to the empirical studies in chapters 6, 7, and 8. In Chapter 2.3, we provide a literature review for the first empirical study in chapter 6. Similarly, in Chapter 2.4, we offer a literature review for the second empirical study in chapter 7. Finally, in Chapter 2.5, we provide a literature review for the third empirical study in Chapter 8.

2.3 Literature review for Chapter 6: Sub-optimal portfolio allocation and cost of capital

This section provides a literature review for Chapter 6. We are motivated to undertake the empirical studies in Chapter 6 as a result of the importance of cost of capital. Additionally, current studies mainly use event studies to examine the effect of financial liberalisation on cost of capital. A review of the existing literature demonstrates that there are limited studies that directly examine the effects of sub-optimal portfolio allocation on cost of capital.

2.3.1 Importance of cost of capital

Cost of capital is fundamental to a variety of corporate decisions, and is generally conceived to be the expected return investors demand for holding securities in a company. It is used to determine the hurdle rate for investment projects. Additionally, the market applies it as the discount rate to companies' expected cash flows to derive the stock price. We define cost of capital to be the minimum expected rate of return required by equity investors for providing capital to the firm. Existing studies have extensively used average historical market return, log country credit risk rating, country equity risk premium, dividend yield, and implied cost of capital to proxy for cost of capital. When CAPM is used to compute expected return on equity, it comprises of the risk-free rate of interest and risk premium. Cost of equity capital is sometimes referred to as the expected cost of equity capital because it is a forward-looking concept. For publicly traded companies, stock price is observable, but the market's expectations of future cash flows are not. As a result, neither component is directly observable from realised prices or returns.

Streams of research provide factors that affect cost of capital. For instance, Hail and Leuz (2009) examine cost of capital effects of changes in growth expectations around US cross-listings. They find that cross-listing on US exchange reduces cost of capital, due to the improvement of investor protection standards for outside investors. Bhattacharya and Daouka (2002) analyse the impact of insider trading laws on cost of capital and conclude that, introduction of insider trading laws do not change cost of capital but, after first prosecution, leads to a decrease in cost of capital. Hail and Leuz (2006) provide compelling evidence that a country's legal institutions and securities regulations' effectiveness relate to cross-country variations in cost of capital.

The optimal investment policies of corporations are directly affected by cost of capital. A good understanding of the precise effect of home and foreign bias on cost of capital is important for managers, governments and equity investors for a number of reasons. First, managers require accurate estimates of cost of equity capital for a company's capital budgeting decisions and project evaluation. When firms consider whether to undertake an investment project, the present value of the project is given by the expected cash flows they expect to receive from the project, discounted at their required rate of return. A decrease in cost of capital makes all projects whose return has a positive covariance with the return on the market portfolio more advantageous, especially if the project has a positive covariance with the return on the market portfolio. Studies suggest that firms from segmented markets that can access an international capital market will experience a lower cost of capital via enhanced risk sharing. A reduction in cost of capital will cause net present value (NPV) to increase and will stimulate corporate investment to maximise shareholders' wealth within the economy. Alternatively, when cost of capital rises, firms will find fewer projects yielding returns higher enough to warrant new investment.

Second, governments and policy makers are concerned with the level of cost of capital in their country. Countries will immensely benefit from a fall in cost of capital as there will be an increase in physical investment following a large flow of foreign portfolio investment as projects which previously had negative NPV prior to the financial liberalisation, will turn into positive NPV. The effects of positive NPVs will generate jobs, result in capital flight reversal and higher growth rates of outputs, and have a broader positive impact on economic welfare than a financial windfall to domestic equity investors. Companies' investment in new assets and capacity is determined by whether they anticipate to generate higher return on those investments than the cost attached to the investment capital. If equity risk premium increases, cost of equity capital will subsequently increase, leading to less investment in the overall economy and lower economic growth.

Third, cost of capital is important to equity portfolio investors. It is useful in determining the fair price of securities as the discounted value of all future dividend payments over the holding period of the securities. There is an inverse relationship between cost of equity capital and firm valuation or share price. If the required return demanded by investors is high, investors will offer to pay low price per share. A fall in cost of capital will cause an increase in share price and maximise shareholders' wealth.

2.3.2 Financial globalization and cost of capital

Both developed and emerging countries liberalised their stock market in the 1970s and 1980s respectively by allowing unrestricted inflow and outflow of foreign equity investment. In equity market liberalisation, countries remove the implicit and explicit investment barriers investors' face towards investment, and therefore, foreign investors can buy or sell local securities without restrictions. Similarly, local investors can also buy or sell foreign securities. Studies suggest that when a country liberalises its stock market, equity risk premium of the country will reduce, due to the improved risk sharing between domestic and foreign investors. Furthermore, foreign investors will demand better corporate governance.

The international capital asset pricing model suggests that investors should hold an optimally world market capitalisation weight to benefit fully from diversification (see Solnik, 1974; Adler and Dumas, 1983; and Lewis, 1999). However, in spite of financial liberalisation, the global financial market has some fragments of segmentation, as investors in both developed and emerging markets exhibit varying degrees of home and foreign bias. Prevailing studies show that domestic investors generally deviate from holding optimal global portfolio weight as a result of the home bias phenomenon, which segments a market from the rest of the world. Recent studies by Chan et al. (2005) show the persistence and prevalence of home bias across 48 developed and emerging countries.[13]

Bekaert and Harvey (2000) find that financial liberalisation reduces cost of capital, even though the reduction is smaller than the theoretical predictions, which may be attributable to home bias. For other studies that have examined the implication of home bias (see Lewis, 1999; Karolyi and Stulz, 2003; Chan et al. 2009; Lau et al. 2010). Stulz (1999b) demonstrates, theoretically, that home bias can reduce firm value through an increase in cost of equity capital. Previous studies mainly investigate factors that determine home and foreign bias. For instance, French and Poterba (1991) empirically examine and provide explanations for home bias, which includes domestic investors' optimistic high expected return on domestic equity market than foreign markets, capital controls which involve explicit limits on cross-border investment, transaction cost and institutional factors. However, this study examines the implications of home and foreign bias on cost of capital.

[13] See chapter 2.7 for theoretical and empirical reasons for home bias.

Segmented markets are associated with stock market illiquidity. This, therefore, increases transaction cost and limits the shares that firms can issue, as corporations can raise capital from few investors. The equity premium embedded in the aggregate valuation will be proportional to the variance of the country's aggregate cash flow when the country is segmented as a result of home bias. Several studies provide empirical evidence to demonstrate that the impact of globalisation on cost of capital is small due to home bias of domestic investors which reduces risk sharing. Errunza and Losq (1985), Eun and Janakiramanan (1986), and Stulz (1981b) show that cost of capital does not reduce much, owing to the indirect investment restriction explained by the home bias phenomenon which segments stock markets. Stulz (1999a) suggests that the impact of globalisation on cost of capital depends on the degree of home bias. As home bias falls, cost of capital correspondingly falls. The success of globalisation depends on how broad the investor base is in the domestic market.

Intuitively, when a country removes cross-border capital investment restrictions, foreign equity investors will take the opportunity to diversify and share investment risk globally, as prescribed by ICAPM to reduce portfolio unsystematic risk. The increase in global risk sharing reduces cost of capital, partly due to investors' expectations of a lower risk premium. This will, in turn, lower the discount rate use in selecting potentially acceptable investment opportunities, therein improving a firm's chances of accepting a higher number of profitable projects. A lower risk premium demanded by investors will translate into a lower cost capital for the firms. Consequently, investors will be expected to react positively because of higher expected future dividend pay-outs and growth in the market value.

Financial theory suggests that financial liberalisation will lead to financial market integration. Because when a country's government allows foreign investors to buy shares in the domestic stock market, foreign equity investors will take the opportunity to diversify investment risk globally. Adler and Dumas (1983) postulate that in an integrated stock market, the expected return of the country will depend on the covariance of the country's stock index return with the world market portfolio return, and probably with currency deposit rates. The increase in global risk sharing reduces cost of equity capital, partly due to investors' expectations of a lower risk premium and increased liquidity. This will lower the discount rate to improve a firm's chances of accepting a higher number of profitable projects. The theory of the international capital asset pricing model predicts that, sufficient flow of foreign investment to

a country decreases cost of capital due to improved risk sharing between domestic and foreign investors, especially if the correlations between a country's stock market and the world stock market is not positively correlated (see Stapleton and Subrahmanyan, 1977; Errunza and Losq, 1985; Eun and Janakiramana, 1986; and Stulz, 1999a, b). In a partially integrated market, the risk premium of the country depends on the weighted average of the covariance of the country's index return with world portfolio return and the country`s variance with the degree of the country`s market integration as the weight (Bekaert and Harvey 1995; de Jong and de Roon, 2005).

Stulz (1999b) shows that when a country opens its stock market to foreign investors, cost of capital declines, owing to the increase in risk sharing and good governance. Existing studies demonstrate the effect of home bias on security prices. For example, Chan et al. (2009) examine the effects of home bias on firm valuation via Tobin's Q at both country and firm level. They find that greater risk sharing between domestic and foreign investors, reduces the cost of equity capital and thereby increases firm valuation. Their study confirms earlier theoretical research by Stulz (1999a) who suggests that when a country opens its capital market to foreign investors, cost of equity capital declines through enhanced risk sharing, capital market efficiency, better legal system, shareholders' activism, improved corporate governance and adequate disclosures. Henry (2000a) uses data from 12 emerging markets and finds that equity valuation increases by two per cent in the eight month period before liberalisation. He concludes that stock market liberalisation decreases a country's cost of capital. In a related study, Bekaert and Harvey (2000) show, empirically, that cost of capital falls between 5 and 75 basis points after capital market liberalisation. They find insignificant evidence of changes in realised returns but show a substantial reduction in dividend yields from the pre- to the post-liberalisation period.

Fischer (2003), Rogoff (1999), and Summers (2000) argue that emerging countries should experience a decline in cost of capital, enjoy increased physical investment and GDP growth when they receive a large flow of foreign portfolio investment. Consistent with this, is evidence provided by Tesar and Werner (1998), Bekaert and Harvey (1998), and Errunza and Miller (1998), who document that the local price of risk (variance) exceeds the global price of risk (covariance). Therefore, equity risk premium should expectedly fall when a country's stock market becomes integrated with the rest of the world. Holding expected cash flow constant, the decline in the equity risk premium will lead to a permanent fall in the aggregate

cost of capital and subsequent revaluation of the aggregate equity price index. Kim and Singal (2000) find evidence that emerging markets' stock returns are abnormally high in the months leading to stock market liberalisation.

Other studies suggest that when firms from segmented markets gain access to the international market through ADR, the firms become integrated with the rest of the world and should therefore experience a fall in cost of capital. A study by Foerster and Karolyi (1999) demonstrate a rise in stock prices of companies from segmented markets that cross-list, via a fall in cost of capital. They find significant average excess returns of 19 per cent during the year before listing, and an additional 1.20 per cent during the listing week, but incur a substantial average decline of 14 per cent the year following the listing. The stock market beta, relative to its home market index on the average, declines dramatically from 1.03 to 0.74 per cent. However, the global beta, relative to the world market index, does not experience any significant change. Miller (1999) examines return around the announcement of the ADR programme and the return around the day when the actual listings take place. He finds a positive return both around the announcement date and around the listing date.

Errunza and Miller (2000) use a firm level data set of 126 firms from 32 countries to study the impact of American Depository Receipts (ADR) on cost of capital. They find firms in the sample experience substantial decline in realised abnormal returns. They attribute the reduction of 42.2 per cent to the introduction of ADR after controlling for confounding effects. In contrast, Bekaert and Harvey (1998) find mixed results of the effect of financial liberalisation on the cost of capital using market level data and after controlling for concurrent economic reforms. Henry (2003) argues that, capital stock growth rate increases by 1.1 per cent following liberalisation, from an average of 5.4 per cent per year in the pre-liberalization period, to an average of 6.5 per cent in the post liberalization period. He shows that developing countries' stock market liberalisation reduces cost of capital and subsequently leads to an investment boom. He concludes that in the face of compelling empirical evidence, arguments that financial liberalisation is not bringing about any real benefit, does not hold any truth.

Miller (1999) investigates the stock price impact of international dual listing. He analysed a sample of 181 firms from 35 countries that participated in a depository receipt programme over the period 1985 to 1995 using cross-sectional regression. Miller finds abnormal returns

during and around the liberalisation announcement date, and concludes that firms gain from listing shares outside their domestic market. In a more recent work by Edison and Warnock (2008), they use monthly data of equity flows from US to emerging markets between 1989 and 1999 and find that cross-listing of emerging market equity on the US exchange, results in a sharp short horizon inflows, whereas the reduction of capital control, results in inflows over longer horizons, mainly in Asia. In a recent study, Hail and Leuz (2009) use a sample of 40,000 firms' yearly observations from 45 countries over the period from 1990 to 2005, to empirically examine whether cross-listing in the US exchange reduces firms' cost of capital. They find convincing evidence that cross-listing on the US exchange, leads to a significant decrease in firms' cost of capital after controlling for traditional proxies for risk, analyst forecast bias and firm-fixed effects.

Bekaert and Harvey (1998) examine the impact of financial liberalisation on cost of capital using event studies. They find that an increase in foreign equity flow, leads to a lower cost of capital, large market size relative to GDP, and economic growth. Similarly, De Jong and de Roon (2005) investigate time-varying market integration and expected returns in 30 emerging markets. They find annual expected return, on average, decreases by 11 basis points. Lau et al. (2010) examine the impact of home bias on cost of equity capital. They find international differences in cost of equity capital are significantly associated with varying degrees of home bias from a sample of 38 countries. Their study shows that countries will experience substantial decline in cost of capital if home bias decreases.

Henry (2000a) finds that cost of capital falls when a country attracts sufficient portfolio investment as a result of financial liberalisation. He shows that countries, on average, enjoy 3.3 per cent abnormal returns per month in real dollar terms in the eight month period leading to stock market liberalisation, due to an increased risk sharing between domestic and foreign investors. The standard international asset pricing model (IAPM) theoretically predicts that countries will experience a lower cost of capital when it liberalises its stock market as a result of increased risk sharing between domestic and foreign investors.

When a country's stock market becomes integrated with the rest of the world through attraction of sufficient foreign investors, the country's equity premium will be proportional to the covariance of the country's aggregate cash flows with the world portfolio. Bekaert and Harvey (1995) suggest that emerging markets that are integrated with the rest of the world,

will experience market equilibrium valuation which incorporates an equity premium that lies in the region between the autarky and fully integrated premium. Prior studies (see Stulz, 1999a, b; Tesar and Werner, 1998; Bekaert and Harvey, 2000; Errunza and Miller, 1998) show that in a segmented market (home bias) the domestic price of risk (variance) is higher than the world price of risk (covariance). Bekaert and Harvey (2000) find that stock market liberalisation reduces aggregate dividend yield owing to the change in cost of capital, but is not attributable to the change in profits of companies or increase in cash flow.

The overwhelming expectation of stock market liberalisation is that countries will attract sufficient foreign investors, which will create competition amongst foreign and domestic investors. Foreign investors will come with financial and technological skills, which can help firms to effectively manage risk. Obstfeld (1994) shows that globalisation allows economies to concentrate more and embark on riskier projects as countries can undertake cross-border investment to diversify risk. Subsequently, aggregate investment increases as diversification reduces cost of capital.

Harvey (1991) provides support to the suggestion of international portfolio diversification using a sample of several countries. However, he finds an inconsistent return of the Japanese portfolio with ICAPM over this sample period because of the extremely large return of Japanese stocks in the 1990s. Chan et al. (1992) provide evidence in support of international portfolio diversification, by showing that the risk premium of the US market depends on the extent of correlation between US portfolios and international stock markets. DeSantis and Gerrard (1997) also provide support to ICAPM of international portfolio diversification. The key intuition of ICAPM is that, the risk premium of countries that are integrated with the global stock market depends on their covariance with the global stock market portfolio. Therefore, for financial globalisation to effectively reduce cost of capital, the shareholder base should be truly global without any home bias.

Other studies show that cost of capital declines, due to better governance after stock market liberalisation. Kim and Singal (2000) argue that foreign investors will demand greater transparency and better disclosure rules, which will enhance capital allocation efficiency. Foreign investors will also require accountability of management and better investor protection against controlling investors. This will subsequently reduce the risk associated with the investment and will thereby reduce cost of capital. Kim and Singal (2000) find that

stock returns rise immediately after stock market liberalisation but subsequently fall. Henry (1998) demonstrates that countries that liberalise their stock market, experience higher revaluation of the domestic stocks as a result of the lower cost of capital.

2.3.3 Gaps in the cost of capital literature

Reviews of the existing literature show the prevalence of home and foreign bias in international portfolio allocation. However, there is limited empirical evidence of the impact on cost capital. Previous studies directly examine financial liberalisation and cost of capital. Liberalisation could coincide directly with macroeconomic reforms, and the impact on cost of capital may not necessarily be as a result of the financial liberalisation. Further, existing studies provide explanations for home and foreign bias without investigating their implications. The first empirical chapter examines the implications of sub-optimal portfolio allocation on cost of capital via home and foreign bias. We show that domestic and foreign investors play varying roles in influencing the cross-country cost of capital

The theory notes that relative to the ICAPM, as the magnitude of domestic bias in the equity portfolio allocations decreases, it facilitates the benefits of global risk sharing between foreign and domestic investors. Similarly, following the same ICAPM prescription, the increase in foreign bias towards a particular host country by foreign investors should also positively influence global risk sharing.

The increased international diversification of home investors (i.e. decreasing home bias) and foreign investors (i.e. increasing foreign bias) should integrate the host capital market into the world capital market. The benefits of such growing market integration should ultimately manifest itself in the reduction of cost of capital. This suggests that the cross-sectional and temporal variations in home and foreign bias should, in part, explain the differences in the cross-country cost of capital. To be specific, the empirical result in Chapter 6 shows that home bias is positively associated with a higher cost of capital. Similarly, we demonstrate that foreign bias has a negative impact on cost of capital.

2.4 Literature review for chapter 7: International portfolio investment and stock market development

2.4.1 Importance of stock market development

Existing studies mainly examine the importance of stock market development in relation to economic growth and development. The reasonable expectation of the phenomenon is that developed stock markets experience high liquidity and serve as a channel for investors to diversify risk. Countries that have well developed stock markets are associated with better flow of information regarding companies' activities and good governance. Furthermore, the existence of a well-developed stock market increases the pool of equity funding available for riskier investment projects, which is fundamental and a prerequisite for economic growth. For instance, several projects with high returns require long-run commitments of capital; however, investors are reluctant to relinquish control of their savings for long periods. Without a liquid stock market that assists savers to purchase and sell shares whenever they require access to their savings, less investment may occur in high return projects. Generally, developed stock markets contribute immensely towards capital accumulation and technological innovation. Studies show that countries with well-developed stock markets, experience less information asymmetry and financial resources are allocated to the most productive sectors of the economy (see Rousseau and Wachtel, 1998; Levine et al. 2000; Beck et al. 2000b; Rousseau and Sylla, 2001).

A growing body of literature shows that stock markets provide services that boost economic growth. For instance, Bencivenga et al. (1996), and Levine (1991) argue that stock market liquidity is important for economic growth. Levine and Zervos (1996) use cross-country sample data of 41 countries over the period 1976 to 1993 to empirically examine the relation between stock market development and long-run economic growth. They find that stock market development has a positive impact on economic growth. Cameron (1967) and McKinnon (1973) provide a conceptual description and empirical evidence of how financial systems affect economic growth.

Other studies document the impact of stock market development on economic growth (see Levine, 1997; Rajan and Zingales, 1998; Calderon and Liu, 2002). King and Levine (1993) show that the level of stock market development predicts economic growth, capital accumulation and productivity. Carlin and Mayer (2003) find a significant relationship

between financial systems and economic growth. Garrestsen et al. (2004) show a causal association between economic growth and stock market development. They find that a 0.4 per cent increase in stock market, leads to a one per cent rise in economic growth. Beck et al. (2006) find higher capital market development relates to economic growth. Bose (2005) provides a theoretical explanation to the positive relation between stock market development and economic growth. Claessens et al. (2006) use panel data to demonstrate that stock market development and internationalisation relate positively to stock market liberalisation and economic development.

Diamond and Verrecchia (1982), and Jensen and Murphy (1990) argue that an efficient stock market helps mitigate the principal-agent problem by influencing corporate control. Laffont and Tirole (1988), and Scharfstein (1988) show that a well-functioning stock market makes corporate takeovers possible to mitigate the principal-agent problem and promote efficient allocation of resource to spur economic growth. Stock markets promote the acquisition of information about firms (see Grossman and Stiglitz, 1980; Kyle, 1984; Holmstrom and Tirole, 1993). In larger and more liquid stock markets it is easier for an investor to obtain information about firms, which stimulates investors' interest to research and monitor firms.[14]

2.4.2 Foreign portfolio investment and stock market development

The removal of cross-border equity investment restrictions in several economies have led to an upsurge in cross-country equity investment. Studies suggest that flow of foreign equity investment via foreign institutional investors improves stock market development. This is explained by the fact that financial globalisation through cross-border portfolio allocation, enhances risk sharing, reduces cost of capital and subsequently improves the valuation of firms. Furthermore, foreign investors will require greater transparency and better disclosure practices which are important for the efficient allocation of financial resources. Foreign investors will also demand accountability of management and better investor protection to minimize risk of expropriation by managers and corporate insiders.

[14] For literature of the impact of stock market development on economic growth and development (see Schumpeter, 1911; Gelb, 1989; Ghani, 1992; King and Levine, 1993; Atje and Jovanovic, 1993; Levine and Zervos, 1996; Levine and Zervos, 1998; Rousseau and Wachtel, 1998; Demirgüc-Kunt and Maksimovic, 1998; and Beck et al. 2000b).

Previous studies suggest that foreign institutional investors help improve the monitoring of management. They employ direct and indirect measures to influence management to adopt policies that improve shareholders' wealth, which includes threat of selling shares, and active use of ownership rights through voting. The participation of foreign institutional investors has the potential to reduce agency problems of managerial discretion, caused by the separation of ownership and control. Existing studies demonstrate that foreign institutional investors serve as a credible mechanism for transmitting information to domestic investors. Davis and Kim (2007) and Gillan and Starks (2003) show that foreign institutional investors are known for taking a more active role in promoting changes in corporate governance practices as they are independent of management. Ferreira et al. (2010) conclude that international portfolio investors serve as a mechanism to enhance international financial integration. Intuitively, as the demand for capital increases, countries will be motivated to improve investor protection and corporate governance standards to attract foreign equity investment. Poor corporate governance standards deter investors' participation of the stock market. Chan et al. (2005) show foreign investors hold less investment in countries that have poor investor protection, weak disclosure requirements, and poor securities' regulations.

The participation of foreign investors in the domestic market will increase stock market liquidity because foreign investors from well governed countries will demand better investor protection, which will reduce risk and improve stock market development. Studies show that foreign institutional investors have a positive impact on the Chinese stock market development. They demonstrate that through informational frictions, the participation of foreign institutional investors in the domestic stock market, influences state-owned enterprises' liquidity. The finance literature provides two main channels through which foreign investors could influence stock market development. First, through liquidity or the altering of the levels of trading activities on the stock market; and, second, by changing the informational environment on the market. Stoll (2000) refers to the two mechanisms as real and informational friction effect, respectively. He suggests that the participation of foreign investors can influence the real frictional element of market liquidity by altering the level of trading activity of the stock market. Khanna and Palepu, (2000) argue that foreign investors can monitor corporate management better than domestic investors and produce more timely and accurate forecasts than local analysts.

Innately, the presence of foreign investors will elicit more trade and enhance trading activities which reduces real friction cost by spreading fixed real cost over more trades. Concerning the informational impact on liquidity, it is arguable that foreign investors are better informed traders.[15] Stulz (1999a, b) suggests that the liquidity of the stock market increases when international institutional investors increase their participation in the domestic stock market, because foreign institutional investors will demand better information disclosure and engage in high trading activities.

Existing studies have examined the impact of financial liberalisation on stock market liquidity. For instance, Levine and Zervos (1998) and Bekaert et al. (2002) show that financial liberalisation improves stock market liquidity through increased participation of the domestic stock market by foreign investors. A recent study by Bekaert et al. (2007) shows a positive impact of trade openness on emerging market liquidity. Henry (2000b) demonstrates how participation in the stock market by foreign investors improves liquidity, and private investment booms. Apparently, countries with high market liquidity tend to have average transaction costs which rely on the number of investors participating in trading activities.

Theory predicts that greater participation of informed institutional investors will lead to more information efficiency and thereby generate higher liquidity.[16] Kyle (1985) uses a theoretical model to examine the impact of informed traders and their information advantage on liquidity and price efficiency. A number of studies provide evidence of a positive relationship between the participation of foreign institutional investors and stock market development. Mendelson and Tunca (2004) show that stock price captures extra information about security value and trading risk. Studies demonstrate that information efficiency is enhanced by competition amongst informed investors (Subrahmanyam, 1991; Holden and Subrahmanyam, 1992).[17]

Other studies find that the participation of foreign equity investors enhances a more liquid stock trading environment. Tesar and Werner (1995) examine foreign portfolio investment in five OECD countries and find a higher stock turnover rate in foreign equity holdings in local

[15] Other studies suggest that domestic investors are better informed than foreign investors (see Choe et al. 2000; Hau, 2001).
[16] The process whereby information is disseminated through increased trading is referred to as information efficiency.
[17] For the impact of multiple informed traders' strategic trading on liquidity (see, Foster and Viswanathan, 1996; Back et al. 2002).

equity holdings. A more recent study by Vagias and van Dijk (2011) investigates foreign equity investment in 46 countries. They provide compelling evidence that a foreign equity portfolio flow leads to higher local stock market liquidity. Foreign institutional investors can enhance stock market liquidity via its beneficial association with positive corporate governance and information environment, particularly in emerging markets. Foreign institutional investors can exert their management expertise to restrain corporate insiders from diverting resources for private use, as well as deterring them from insider information trading. Wei et al. (2005) argue that foreign institutional investors serve as an effective corporate governance mechanism to improve firm value in China. Gul et al. (2010) note that the presence of foreign investors may prompt the management to disclose price-sensitive information in a timely manner. Consequently, it reduces insider trading and improves information environment uncertainty faced by liquidity traders. Therefore, it encourages trading activities and enhances stock market liquidity. Bae et al. (2006), show that participation of foreign institutional investors attracts the coverage of security analysts.

Chou et al. (2012) find that foreign institutional investors are better informed and price stabilising traders, whilst local institutional and individual investors lack these attributes. In essence, foreign institutional investors are net buyers when the market is liquid. However, individual investors are simultaneously net sellers. Their results imply that foreign institutional investors create trading requirements which benefit liquidity. Foreign investors are perceived to have a positive influence on trading activities as a result of having access to sophisticated skills and a pool of investment professionals. Especially, in emerging markets, equity investors closely monitor the trading activities of foreign institutional investors. Several studies, for instance, Grinblatt and Keloharju (2000) and Seasholes (2000) argue that foreign institutional investors are better informed than local investors due to their possession of a vast knowledge of global financial markets. They show that foreign investors have better access to expertise and talent and, therefore, are smarter than domestic investors. Grinblatt and Keloharju (2000) find that foreign investors buy more stocks that perform better in the next 120 trading days than the local individual investors. Seasholes (2000) shows that foreign investors buy (sell) prior to the announcement of good (bad) earnings in Taiwan. Froot et al. (2001), and Froot and Ramadorai (2008) empirically demonstrate that foreign investors are well-informed because their trading activities lead to price momentum. They show that foreign investors' equity demands predict not only prices in foreign markets, but also prices of closed-end country funds, suggesting that foreigners have access to more information than

domestic investors. However, Choe et al. (2005) find no evidence that foreign investors are better-informed in Korea. Similarly, Griffin et al. (2002) find that foreign investors are not better informed because they do not time the market at the daily frequency.

2.4.3 Adverse effect of foreign investment flow on stock market development

Other studies, in contrast, show that there is a negative impact on liquidity when foreign institutional investors vastly increase their investment in the domestic country. A theoretical framework developed by Bolton and Von Thadden (1998) and Kahn and Winton (1998) shows that foreign institutional investors come at a liquidity cost. They suggest that foreign investors become passive investors who engage in buy-and-hold activities. They argue that foreign investors are good at gathering private information which, in the long run, results in information asymmetry and inactive trading. Additionally, by virtue of being large shareholders of the firms, they become corporate insiders who tend to interfere with the company business decisions. These mechanisms are inclined to reduce stock market development via illiquidity and inactive trading. Bolton and Von Thadden (1998) model the cost and benefits of institutional investors' monitoring of managers. They show that the presence of block ownership reduces the number of shares tradable to the public and results in inactive trading of companies' shares. This eventually segments the stock market and reduces the benefits of stock market liberalisation. They argue that a decline in foreign block ownership leads to an immediate reduction in free-float shares, tradable among ordinary investors and such decline is not attributable to holding changes of domestic large shareholders.

Several studies suggest that foreign institutional investors are experienced, better trained and well informed of the activities of companies.[18] They exploit their superior information advantage which, ultimately, dampens stock market liquidity. Studies show that it accordingly increases the degree of information asymmetry (see Dennis and Weston, 2001; Agarwal, 2007; Brockman and Yan, 2009). Kaln and Winton (1998) provide a model, whereby large shareholders have better access to management, which helps them to trade at the expense of uninformed liquidity traders. A study by Rubin (2007) shows that the concentration of institutional ownership negatively relates to stock market liquidity as block holders may have access to private information regarding the value of the firm.

[18] See Ali et al. 2004; Ke and Petroni, 2004; and Bushee and Goodman, 2007.

Foreign institutional investors are less likely to have a positive effect on stock market liquidity, owing to being perceived to be well informed traders (Grinblatt and Keloharju, 2004 and Seasholes, 2004). Kyle (1985) argues that the trading activities of foreign institutions lead to high transaction costs to compensate for losses suffered by liquidity traders. Glosten and Milgrom (1985) show that informed trading is highly likely to widen spreads.

Rhee and Wang (2009) find that financial liberalisation has a positive impact on stock market liquidity as a result of macroeconomic, institutional and regulatory reforms, which coincides with financial liberalisation but not as a result of direct participation of foreign investors. They argue that the presence of foreign investors impacts negatively on the Indonesian stock market development. De la Torre et al. (2007) show that foreign investors' direct participation in the domestic market, has a negative association with emerging market liquidity. Greater institutional ownership leads to larger spreads and smaller quoted depth (see Heflin and Shaw, 2000; Sarin et al. 2000; and Dennis and Weston, 2001). Agarwal (2007) demonstrates that liquidity increases with institutional holding and begins to reduce upon reaching 40%.

Ng et al. (2011) use a sample of 40 countries to examine the liquidity effects of foreign institutional investors. They find a negative impact of foreign institutional investors on stock market liquidity. They show that the number of institutional investors reduces the number of free-float shares available to the public which reduces stock turnover. Their results support the conjecture that inactive trading of foreign institutional investors reduces trading friction in the stock market. Ng et al. (2011) argue that foreign institutional investors are informed investors who reduce the incentives of the participation of liquidity traders.

Several studies argue that foreign institutional investors create wider bid-ask spreads and higher adverse selection components of spreads (Heflin and Shaw, 2000). In an international context, the adverse liquidity effect may be exacerbated by foreign institutional investors, as studies arguably suggest that foreign investors are sophisticated investors who possess superior information about the domestic market (Seasholes, 2004; Froot and Ramadorai, 2008). Brockman and Yan (2009) demonstrate that higher institutional ownership, leads to lower stock turnover. However, other studies, for instance, Heflin and Shaw (2000), argue that the negative liquidity effect could be attributed to the information asymmetry between

institutional shareholders and other investors. Alternative studies argue that it is debatable to suggest that foreign investors' destabilise the domestic stock market and reduce stock market liquidity (see Tesar and Werner, 1995; Choe et al. 1999; Boyer et al. 2006; and Vagias and Dijk, 2011).

In terms of information differential, Chou et al. (2012) find that foreign institutional investors are better informed price stabilising traders, relative to local investors. They note that foreign investors are perceived to have a positive influence on trading activities, as a result of having access to sophisticated skills and a pool of investment professionals. This is particularly true in emerging markets, where all equity investors closely monitor the trading activities of foreign institutional investors. Several other studies, for instance, Grinblatt and Keloharju (2000) and Seasholes (2000), also argue that foreign institutional investors are better informed than local investors, as the former possess better knowledge of global financial markets. Empirically, Froot and Ramadorai (2008) demonstrate that foreign investors are well-informed because their trading activities lead to price momentum. Similarly, Dvorak (2005) also reports that foreign institutions have better information, due to their expertise and experience.

Bekaert and Harvey (2003) and Lau et al., (2010) note that higher domestic portfolio investments, relative to the theory keeps the domestic cost of capital higher, as risks are shared only among domestic investors and the market is globally segmented. Higher cost of capital deters significant real investments and retards the growth of the local stock markets with fewer issuances, concentrated industrial base and inefficient pricing.

Based on the above discussions, economic conjectures suggest that equity market liberalisation and subsequent integration have a positive effect on the development of stock markets, through increased participation of foreign investors in domestic markets and of domestic investors in foreign markets. However, Bekaert and Harvey (2003) and Errunza et al., (2013) note that despite the removal of explicit barriers leading to formal liberalisation of the markets, the observed gains of liberalisation are not as expected. The inadequate benefits have been attributed to the presence of implicit or indirect barriers to international investments, both for developed and, relatively more so, for emerging markets. Such barriers could be weak investor protection, poor accounting standards, higher trading costs, and market liquidity risks etc. These implicit barriers do not allow investors to optimally diversify

their portfolio in line with the theoretical suggestions of the International Capital Asset Pricing Model (ICAPM) (see Bekaert and Wang, 2010), leading to home and foreign biases.[19] Studies confirm that the prevalence of home and foreign biases in equity portfolio investment, segregates stock markets from the world capital markets, and thereby prevents international risk sharing (see, for example, Lau et al., 2010). This implies that the sub-optimal international portfolio diversification, adversely affects the cost of equity capital and other benefits, including the financial deepening of the market. Thus, if the degree of financial integration is influenced by the sub-optimal cross-country portfolio allocations, then the degree of home and foreign biases should influence stock market development. Accordingly, we hypothesize that home bias (domestic portfolio investors allocating disproportionately more investments in the domestic market, i.e. lower presence of foreign investors) should inhibit the development of local stock markets. Alternatively, foreign biases (disproportionately greater presence of foreign investors) should accelerate the development of the host stock markets.

2.4.4 Gaps in the stock market development literature

This study reconciles with existing findings, that a decline in cost of capital, following stock market liberalisation is much smaller than theory predicts (Bekaert and Harvey, 2000). The flow of foreign portfolio investment is expected to improve stock market development through enhanced institutional quality, as foreign institutional investors from developed countries are likely to have well-research skills, strategies and realistic stock valuation skills.

Theoretical conjectures suggest that growing international portfolio investments should drive the development of the host stock markets. Empirical evidence suggests foreign investors may demand better market reforms to induce confidence in the efficient pricing and execution of the market. They may provide the much needed liquidity and international risk sharing benefits, which should further help in the development of domestic stock markets. However, the development effect is based on the assumption that foreign and domestic investors take advantage of the international diversification opportunities by optimally

[19] The presence of home bias indicates that local investors hold a significantly higher percentage of their securities in the domestic market relative to the theoretical prescription of the ICAPM benchmark. Correspondingly, foreign bias relates to the tendency of foreign investors to over or under weight foreign markets compared to the ICAPM benchmark. For further details on the differences between home and foreign bias, see Dahlquist et al., (2003) and Chan et al., (2005).

investing in different international markets. Despite such conjecture, the literature suggests that portfolio investors do not optimally diversify their portfolio internationally, consequently resulting in home and foreign biases. The prevalence of such biases should inhibit the integration of the host stock market and influence stock market development. Drawing on such theoretical conjecture, this study addresses the issue of whether the observed cross-country differences in stock market development are explained by the variations in equity portfolio investors' home and foreign biases.

Therefore, in this study, we examine whether the cross-sectional and temporal variations observed in home and foreign biases in international equity investments can explain the heterogeneous development of stock markets across the globe.[20] Empirically, we test such conjecture, using standard measures of home and foreign biases[21] in equity investments and alternative proxies of country level stock market development.[22] Two important conclusions emerge.

In this study (see Chapter 7), we construct the home and foreign bias measures using two sets of comprehensive data from 44 countries, covering a sample period of 2001-2010. We examine the implications of sub-optimal portfolio allocations on stock market development, using the classical measures of country level stock market development. The extensive univariate, correlation, and regression analyses suggest that higher home bias significantly deters stock market development as a result of sub-optimally lower international diversification by domestic investors. Similarly, positive foreign bias, i.e. the tendency to favour a particular foreign (host) country in their country allocations, has a positive influence on the development of stock markets for the host country.

Studies on stock market development are dominated in the area of the importance of stock market development towards economic growth and development. From the theoretical

[20] Theoretical justification for this is derived in Appendix A by blending the two strands of literature. The first strand of arguments relates to the implications of globalization on cost of capital and the second shows how the variations in cross-country liquidity risks and stock market development affect expected returns. In its simplest form the Appendix demonstrates how the sub-optimal international diversification of equity portfolio investors affects liquidity and market development.

[21] They are Home bias (*CPIS_HB*), foreign bias (*CPIS_FB*), and global fund foreign bias (*GF_FB*).

[22] Four proxy measures we use are (i) market capitalization as a percentage of GDP, (ii) value of stocks traded as a percentage of GDP, (iii) stock turnover ratio (value of stocks traded as a percentage of market capitalization), and (iv) transaction costs.

perspective, countries that experience high degree of home bias will suffer weak stock market development. The explanation is that the domestic stock market will be dominated by large institutional investors who will buy-and-hold and will, therefore, adversely affect international risk sharing, stock market liquidity and development. However, foreign bias, whereby foreign investors hold a well-diversified equity investment towards a country ICAPM implied weight improves risk sharing and liquidity and, subsequently, enhances stock market development.

The results of our findings in Chapter 7 imply that countries, particularly emerging markets, contemplating the development of the depth and breadth of their local stock markets, should initiate effective policy measures which encourage the international diversification of their domestic investors and attract foreign portfolio investors.

2.5 Literature review for chapter 8: International portfolio investment and investor protection standards

This section provides a literature review that connects two strands of literature. The first focuses on the importance of investor protection. The second strand of the literature focuses on the role domestic and foreign institutional investors' play to influence country level governance across the world. We are motivated to investigate this study as a result of the importance of investor protection standards and the limited studies that examine factors that determine country level investor protection standards.

2.5.1 Importance of investor protection

The issue of investor protection relates to the agency problem as explained by Jensen and Meckling (1976). They show that managers expropriate resources of the company to benefit themselves, instead of returning profit to outside investors. Several studies show the extent managers use resources of the company at the expense of outside investors. For example, managers can make poor investment decisions that destroy shareholders' value through unreasonable acquisitions and empire building. In order to restrain corporate insiders from expropriating company resources, outsider investors will need to rely on the country's judicial system to enforce law, via an efficient and independent judicial system. Contract design should offer outsider investors the right to discipline company insiders or replace

managers (La Porta et al. 1998). Countries that have better investor protection will enact and enforce securities laws that restrain manipulations by corporate insiders.

There are a myriad of researches that examine the important role investor protection plays in an economy. Current studies suggest that improvement in country level investor protection such as control of corruption; institutional quality and judicial efficiency promote economic growth and stock market development. Stulz (2005) argues that strong institutional qualities that provide better investor protection to minority investors and restrain corporate insiders from expropriating firms' resources for their own benefit, leads to economic growth. Better governance assists firms to cheaply raise finance, which is immensely important for firms with huge growth opportunities that cannot internally raise capital but could access the stock market. Empirical evidence supports the theory that quality corporate governance has a positive impact on growth opportunities (see Durnev and Kim, 2005; Klapper and Love, 2004). Haidar (2009) show that country level investor protection explains cross-country variations in GDP growth and by this means, countries with better investor protection experience faster growth than countries with weak investor protection.

Shleifer and Vishny (1997) show that country level investor protection affects stock market development and the capabilities of firms' quest in raising external financial resources. La Porta et al. (1997) argue that countries that exhibit good governance, experience a large and liquid stock market. Engelen and Van Essen (2010) demonstrate that better legal protection for equity investors, boosts investors' confidence concerning their ability to obtain higher return on their investment. Spamamman (2010) shows that minority investors experience better protection when directors of companies seek to work in their interest. Djankov et al. (2008), Djankov et al. (2007) provide empirical evidence that adequate investor protection, positively relates to increased availability of credit. Existing studies by Laeven and Majnoni (2005) show that the efficiency of the judicial system of a country improves loan recovery. Stronger legal protection for creditors is more likely to improve firm performance during financial crisis, as credit protection provisions for creditors offer assurance to creditors against default. Levine (1999) shows a positive association between investor protection and several measures of capital market development.

Studies in the US show that better firm level governance positively relates to firm value (see Gompers et al. 2003; Bebchuk and Cohen, 2005; and Bebchuck et al. 2009). Strong and well-

enforced outsider rights reduce the acquisition of private control benefits. Countries that have an unbiased judicial system that protects minority investors, reduce corporate insider's ability to obtain private control (see Claessens et al. 2000; Nenova, 2000; Dyck and Zingales, 2002). Other studies show that better investor protection increases companies' insiders cost of diverting resources (see Shleifer and Vishny, 1997; La Porta et al. 2000; Shleifer and Wolfenzon, 2002) and therefore increase firm value (Durnev and Kim, 2005; Dahya et al. 2008; Aggarwal et al. 2007).

Several studies show how better investor protection improves firm performance. For instance, Mitton (2002) demonstrates that better corporate governance is important for firm value. Friedman et al. (2003) suggest that adequate country level governance reduces expropriation risk and provides a sustained firm performance during financial crisis. Leuz et al. (2003) argue that poor financial reporting is associated with countries with weak legal protection and, accordingly, inhibits contribution to the efficient and competitive functioning of financial markets. Doidge et al. (2004) show that the level of investor protection of a country, relates to a country's financial and economic development; their findings suggest that when economic and financial development is poor, the incentives to improve firm-level, governance are low due to the substantial cost involving outside financial resources to adopt better governance mechanisms. They show that good governance is important due to its inverse relation with the cost of capital. Better governance reduces the cost of capital because investors will expect the firm to be well-governed when they provide funds.

Doidge et al. (2004) argue that country level governance characteristics play a significant role to influence governance systems in poorly developed countries. In a poorly developed country that has weak investor protection; it is overwhelmingly difficult for firms to engage in good governance. Therefore, the rights of minority investors will largely be determined by the country characteristics. Country level governance is very important, as it is expensive for firms in poorly investor protected countries to adopt good governance mechanisms when accessing capital markets for the first time. The benefits for firms in implementing good governance may not justify the high cost associated with the implementation. So, country level governance is tremendously important, as is firm-level governance. Reduction in the expropriation of minority investors increases the participation in equity investment. Castro et al. (2004) demonstrate theoretically, the relationship between investor protection and economic growth. They show that an improvement in investor protection enhances risk

sharing, which indicates larger demand for capital. The demand effect provides support for the positive association between investor protection and economic growth. Weak investor protection indicates higher interest rates attributable to a shift of demand schedule. A higher interest rate translates into lower income for entrepreneurs.

Mitton (2004) uses Credit Lyonnais Securities Asia (CLSA) data of 365 firms from 19 emerging countries to examine the impact of firm level corporate governance on dividend pay-outs. He reports a positive relation between better governance and high dividend pay-out. He suggests that firm-level investor protections are not a substitute but rather complementary. Country-level investor protection plays a substantial role in preventing expropriation. Leuz et al. (2010) find that foreign investors allocate less investment in firms that are domiciled in countries with weak outsider protection. Therefore, weak country governance inhibits countries from attracting sufficient foreign investment. Dyck and Zingales (2004) suggest that poor investor protection standards create opportunities for expropriation of minority investors by managers and majority shareholders. To a large extent, the value of private benefits of control that insiders may enjoy or consume, relates to the level of investor protection.

La Porta et al. (1997, 1998, 1999a and 2002) show that countries with better legal protection of investors, experience better developed stock markets and higher firm valuations than countries with poor investor protection. Daouk et al. (2006) demonstrate that improvement of capital market governance index, relates to reduction of implied cost of equity capital. Hail and Leuz (2006) show that firms experience a decline of cost of capital when they operate from countries with extensive disclosure requirements, stronger security regulations, and stricter enforcement mechanisms. La Porta et al. (2000) argue that legal protection is very important to outside investors. When outsiders provide finance to a company, they face risk of expropriation and are exposed to the likelihood that they might not realise their expected investment return, due to expropriation by corporate insiders.

Management's expropriations of minority investors occur through several channels, including stealing of profit. In other circumstances, managers sell assets and outputs to companies under their control, below market prices. La Porta et al. (1999b) use a sample data of firms from 27 developed countries and show that countries with better investor protection have higher equity valuation via Tobin's Q, than countries that provide weak investor protection.

They also demonstrate that higher insider cash flow ownership, weakly relates to higher corporate valuations which are more pronounced in countries that provide poor investor protection.

Johnson et al. (2000a) demonstrate that countries that provide inferior investor protection, experience substantial market decline during a financial crisis. They show that during the 1997-1998 Asia crises, the level of investor protection was a key predictor of currency depreciation in 25 countries. Giannetti and Koskinen (2004) show that stocks have lower expected return when investor protection is weak in a country and reduces firms' access to the stock market to raise finance. Recent and growing studies, for instance (see Gompers et al. 2003; Core et al. 2006; Cremers and Nair, 2005; and Yermack, 2006), argue that poor investor protection standards, relates to a lower stock return. McKinsey and Company (2003) report show that foreign and domestic investors put greater emphasis on investor protection when making investment decisions.

Investors domiciled in strong corporate governance countries prefer to invest in their own countries, which reduce the benefits that can be derived from diversification. Weak investor protection reduces the participation of foreign investors in countries with poor investor protection. Guiso et al. (2001, and 2003) show that variations in cross-country investors' participation in the stock market largely depends on whether the countries have good protection for minority investors. Shleifer and Wolfenzon (2002) demonstrate that firms experience higher valuations and dispersed ownership in countries with better protection. La Porta et al. (2002) find better investor protections have a positive association with Tobin's Q.

2.5.2 Investor protection and foreign investors

Investor protection relates to agency problems. Bris and Cabolis (2004) refer to shareholder protection, as protection provided by corresponding Corporate Law or Commercial Code to shareholders of a company. In principle, the law applicable to companies is the law of the country of the nationality of the firm. The relevant investor protection standards against expropriation, is not determined by the law of the country of nationality of the shareholders, but is accordingly determined by the country where the firms operate, or the country where firms' assets are located (Horn, 2001).

Expropriation of investors by the state includes actions taken by the state that reduces return on corporate investment. Governments are required to institute policies that can restrain corporate insiders from expropriating outside investors. However, in most countries, the state is unable to protect investors' rights. Such countries experience high prevalence of ineffective government, weak control of corruption, poor regulatory quality, and an ineffective rule of law which inhibits enforcement of investors' rights. Stulz (2005) provides a model whereby the state expropriates minority investors by taking actions that reduce shareholders' wealth, ranging from outright confiscation, to regulations that favour the constituency of government officials in positions of authority. Stulz (2005) argues that agency problems are higher when institutions that are expected to protect minority investors are weak within a country.

Johnson et al. (2000a) show that controlling shareholders expropriate for their own benefits when a country's institutions are weak. It is conceivable that laws and regulations that protect minority investors will relate positively to the cost of extracting private benefits of control. The laws amongst others, includes laws that make it difficult for controlling shareholders to expropriate resources of the company, providing outside investors opportunities to influence and contribute to the policies of the company, laws that allow outside investors to seek for damages, as well as laws that demand sufficient disclosure from the firm. The participation of foreign investors in the domestic market can help improve the investor protection standards given to minority investors.

Studies suggest foreign institutional investors within a country can influence the level of investor protection in a country. For instance, Shleifer and Vishny (1986) show the role that active foreign institutional investors play in reducing agency problems. They demonstrate that active shareholders can monitor the activities of controlling shareholders to reduce agency problems. Giannetti and Simonov (2006) argue that when foreign investors, from countries with better institutions become controlling shareholders, they can play an important role to reduce expropriation of outside investors.

When corporate managers reduce expropriation, firms will be able to raise finance from foreign investors. Furthermore, foreign investors will expect consumption of private benefits in countries with poor investor protection, and will therefore, seek to buy equity from countries that provide better investor protection. Eventually, countries with weak investor

protection will be compelled to improve the level of investor protection standards provided to minority investors.

2.5.3 Domestic institutional investors and investor protection

Countries that experience home bias will have the domestic market dominated by large corporate insiders who will develop close ties and connive with the state to expropriate minority investors. For instance, Stulz (2005) demonstrates that high prevalence of home bias implies that the stock market is controlled by concentrated institutional investors who seek to expropriate minority investors. Furthermore, domestic institutional investors will feel obliged to be loyal, and therefore, compromise with management and the state. A report by BusinessWeek (2006) demonstrates that Fidelity investors played an active role in governance issues in Europe but were relatively passive on governance issues in the US. Studies suggest that in a segmented market, governments will most likely take actions that will reduce return on investment but benefit corporate insiders through corrupt practices. However, when foreign investors participate in the domestic market, they will exert pressure on the state to improve governance. The state can enhance governance by reducing bureaucracy and corruption.

Domestic institutional investors will seek to promote and protect potential business relationships with firms and the state, which will compromise their monitoring role. Likewise, it will reduce the pressure they can exert on the state to improve investor protection. Large domestic institutional investors who are interested in building relationships with companies and the state, will contribute little to good governance. When domestic institutional investors are not interested in monitoring management, they tend to compromise their ability to influence protection provided to minority investors. Since minority domestic investors hold relatively few shares in the company, they will have less incentive to monitor as they can easily liquidate their investment when the company performs poorly. A recent study by Giannetti and Laeven, (2009) provides evidence that in Sweden, corporate ownership by local pension funds affiliated with controlling shareholders does not improve firm valuation, but increases the control premium.

Furthermore, when a stock market is segmented as a result of home bias, Douma et al. (2006), show that domestic institutional investors do not perform their monitoring role

properly, partly due to the fact that in emerging countries there are more owner managers who hold a large percentage of shares and, as a result, they adversely influence the legal system to prevent moral hazard on the part of management. Firth et al. (2008) show that, in several countries, the government is a majority shareholder who exerts political pressure on local investors and state institutions. Therefore, political pressure can impact negatively on the monitoring role of domestic institutional investors.

2.5.4 Foreign institutional investors' activism and investor protection

Financial globalisation through foreign institutional investors has contributed to the increased participation of institutional investors holdings globally. This is mainly to diversify portfolio risk and enjoy an increasingly faster growth in developing economies. Subsequently, in recent years, there has been an increased proportion of foreign investors' participation in the stock markets of developing countries, particularly as investment in emerging markets offers better returns to international institutional investors, such as pensions and mutual funds. This trend has also led to the question of whether foreign investors can influence country level investor protection.

A considerable body of research has focused on the role of institutional investors as corporate monitors. Grossman and Hart (1980) argue that only large institutional investors can achieve sufficient benefits to have incentive to monitor. Indeed, Shleifer and Vishny (1986) suggest that large institutional investors may have a greater incentive to monitor corporate managers and insiders.

The monitoring of management and the state to improve investor protection could be expensive, particularly, when the market is segmented. Nonetheless, when the market is integrated, foreign institutional investors can increase the monitoring of managers. They will exert pressure on companies and the state to improve the governance systems of the country as they can seek investment elsewhere. Stulz (1999b) suggests that foreign institutional investors are more likely to perform arms-length monitoring that ends up increasing firm value to benefit minority shareholders.

Globalisation through foreign investors, increases the monitoring of management and reduces information asymmetry and agency cost. Errunza (2001) conjectures, that foreign investors

from better governed countries will export good governance and demand better investor protection, which can improve the host country's governance mechanisms. Additionally, the participation of foreign investors will create competition for financial resources between countries. It is conceivable that competition for financial resources will compel countries to reduce rent seeking activities and improve investor protection standards (Rajan and Zingales, 2000).

Previous research, by Gillan and Starks (2003) argue that foreign institutional investors have become increasingly willing to use their ownership rights and activism, to exert pressure on managers and the state to act in their best interest. Apparently, foreign investors bring along highly competent analysts and researchers, who have varying degrees of experience in a vastly differing economic and political environment. Therefore, countries seeking to attract foreign portfolio investors will be compelled to improve governance and provide better investor protection, trading and delivery systems, to boost the confidence and participation of domestic investors. Attracting foreign portfolio investors will significantly influence developing countries governance, especially in the absence of large domestic investors.

Globalisation will subject countries to competition for foreign investment and will accordingly coerce countries to invest in building strong institutions. Doidge et al. (2007) argue that financial globalisation helps firms to learn better investor protection standards from countries with good governance. Flow of foreign capital and globalisation influence the level of a country's resource endowment through international technology transfers and productivity. Existing studies suggest that globalisation can improve institutional quality and investor protection. Better institutions relate to greater transparency, less corruption, and better protection of property rights, which promote market fundamentals, leading to stock market development and economic growth. Good governance contributes to positively influencing individuals and corporate investment decisions. Errunza (2001) assesses the benefits of foreign portfolio investment to the host country. He argues that the involvement of foreign investors in the domestic stock market will enhance investor protection standards. He posits that foreign investors will require timely and better access to information concerning protection of minority rights and quality of stock market trading rules and regulations.

Investors from countries that have good governance will demand and influence the governance system prevailing in the host country. This will force the domestic country to

improve on institutional quality to attract foreign investors. Rent seeking and corrupt practices which reduce shareholders' wealth will be harder to engage when several countries compete for investment. As globalisation increases countries' investment base, better institutional quality will be demanded by foreign investors to manage risk. High risk and greater opportunities work together to break the effectiveness of existing networks and rules, which creates demand for better institutions.

Intuitively, foreign investors from countries that provide better investor protection will export good governance to the host countries that offer weak investor protection to minority investors. Kang and Kim (2010) show instances where foreign investors are involved in governance activities in the host country in areas such as hostile takeover threats, proxy contests, expressions of opposition to amending anti-takeover provisions, efforts to seek representatives on the targets board, threat of top executive takeover or involvement in the selection of a new top executive and demands for asset downsizing. Doidge et al. (2004) note that financial globalisation coerces firms to improve investor protection. Further studies argue that an open economy relates positively to good governance. For example, Smarzynsk and Wei (2000), and Bonaglia et al. (2001) find that financial globalisation is positively associated with a better investor protection granted by a country. Their findings are explained by foreign investors exporting and demanding good governance and investor protection in the host country. Internationalisation via ADR can influence corporate managers to improve investor protection by aligning the interests of insiders with that of minority investors. Coffee (1999) and Stulz (1999b) provide discussions on how ADR programmes allow foreign firms to adopt US quality institutions. Particularly, when foreign firms are listed on the US stock market, they become subjected to the US securities laws and regulations. Furthermore, they are monitored by the Securities and Exchange Commission (SEC).

Foreign investors can substantially influence the governance system in the host country through the following channels. First, foreign institutional investors could offer policy-makers, information on better regulatory issues prevailing in other countries and their home country. Second, foreign institutional investors can indirectly compel a government to reform by threatening to exit the country for a more favourable investor protection country, which could have serious repercussions on the economy through share price volatility. Aggarwal et al. (2011) examine the role of foreign institutional investors in promoting better governance practices across 23 countries for the period 2003 to 2008. They find institutional investors

contribute to the promotion of good governance across countries. Foreign institutional investors could potentially influence the host country to adopt good governance practices, by threatening management of the use of voting rights (voice), or threat of selling their shares ("voting with their feet"). Foreign institutional investors usually have the resources to monitor, and the ability to influence managers and policy-makers to improve on good governance. Nesbitt (1994), Smith (1996) and Guercio and Hawkins (1999) provide evidence that institutional investors can force managers to focus more on corporate finance.

Further studies show how financial globalisation through foreign institutional investors reduces risk of expropriation. Stulz (2005) notes that financial globalisation lowers the ability to expropriate because domestic investors will move their investment to foreign markets and foreign investors will avoid investing in countries that have poor governance. Stulz (2005) suggests that financial globalization via foreign institutional investors helps domestic investors learn better governance mechanisms from countries with strong investor protection. In the absence of globalisation, and for that matter, the absence of foreign investors, the financial market will be segmented. Financial globalisation reduces the ability of state rulers redirecting resources toward some firms and away from others, as such practice makes foreign investors avoid domestic firms. Financial globalisation makes it difficult for the state to expropriate investors, because they will exit the host country when they feel threatened.

Studies show that foreign institutional investors actively participate in governance issues in foreign countries. For instance, Gillan and Starks (2003) provide a theoretical argument of the important role foreign institutional investors' play to influence good governance across the world. Ferreira and Matos (2008), using a data set of equity portfolio holdings of 27 countries, examine the role of institutional investors around the world. They find that foreign investors with little business ties with firms, engage in the monitoring of firms globally. There have been instances whereby, due to the monitoring activities of foreign institutional investors, a UK based hedge fund, The Children's Investment Fund (TCIF) in 2005, forced the management of Deutsche Borse to stop a takeover of a firm on the London Exchange, which led to the resignation of both the chief executives and the chain of the supervisory board (Economist, 2008). Becht et al. (2008) show, empirically, foreign investors activism in Central Europe.

Foreign portfolio investors can employ the services of investment bankers to play a key role of certification. Investment banks may risk their reputations in recommending good companies and countries to investors. More often than not, investment banks stand in a better position to evaluate companies' and countries' prospects to foreign institutional investors. Foreign investors will participate actively in monitoring the board, as a board that lacks credibility is less likely to take actions that will improve shareholder value. Active foreign investors will seek to replace a weak board that does not discipline managers. Foreign investors can influence the country to adopt good governance that improves investor protection. At the firm level, companies may seek to improve investor protection provided to minority investors.

Huang and Zhu (2012) employ data of qualified foreign institutional investors in China and find evidence consistent with Stulz (1999b), that foreign institutional investors are less prone to political pressure and more likely to perform arms-length monitoring than the domestic mutual funds. Huang and Zhu (2012) show that flow of large foreign institutional investors help promote the market principle in corporate governance in emerging markets, which reduces the "twin agency" problem from the state ruler's discretion.

Foreign investors can instil the concept of shareholder value and free market culture amongst local investors. La Porta et al. (2000) show that financial markets are more developed in countries where there is better protection of investors' rights. Gillan and Starks (2003), suggest that foreign institutional investors are often believed to play a significant role in prompting changes in corporate governance practices than domestic money managers. Wei (2000) shows that corruption negatively relates to an open economy as resources will be committed to improving institutional quality. Islam and Montenegro (2002) demonstrate that trade openness robustly, and positively, relates to institutional quality. The IMF (2005) shows that trade openness has a positive impact on both institutional transitions and the quality of economic institutions. Rajan and Zingales (2003) analyse the importance of trade liberalisation towards good governance. They find that trade openness has a positive influence on good governance.

2.5.5 Institutional investors' activism

Shleifer and Vishny (1986) show how institutional investors monitor managers and seek ways to improve firm value. According to Watts and Zimmerman (1986), corporate insiders have the tendency to pursue their own interests. However, Monks and Minow (1995) argue, that international investors can ensure that management focus mainly in pursuing the maximisation of shareholders' wealth. Studies by Li et al. (2006) examine the monitoring of managers by institutional investors. They show that a strong governance environment, acts to strengthen the monitoring ability such, that more institutions are encouraged to hold concentrated positions. Additionally, the report suggests that institutional investors who hold a long-term investment perspective, have a tendency of monitoring management more actively than institutional investors with short-term perspectives (Chen et al. 2007).

Management will be less able to pursue their own interests at the expense of shareholders when there is effective monitoring by active shareholders. In equity finance, the firm receives cash from outside investors without a contractual agreement to give anything back. For equity financing to be possible, investors must expect to receive sufficient cash flows flows, to provide them with an expected return, comparable to what they would expect to earn on other investments of the same risk. However, (i) managers have access to information that investors do not have about the firm's investment, and (ii) managers have incentives, both to issue equity when they feel their stock is overvalued and take projects that do not necessarily increase shareholders value. Monitoring of activities of managers is costly and does not provide a complete solution for corporate governance (Stulz, 1999b). The extent to which management finds it in their own interests to maximise shareholders' wealth, depends critically on the firm's corporate governance system. It is possible for managers to be monitored efficiently, particularly when it also has strong incentives to increase value.

Henry (2003) contends that financial globalisation may affect factor productivity of a country by promoting better corporate governance and signalling higher quality of state governance.[23] In other words, financial globalisation, i.e. encouraging international portfolio diversification, which integrates the local with world capital markets, may have a lasting effect on the improvement of investor protection standard. However, the significant departure from the theoretical benchmarking in international equity portfolio diversification, referred to as home

[23] In modern finance, it is axiomatic that investor protection regulations and practices are pivotal for the welfare of corporates and countries (La Porta et, al, 1997, 1998, 2000, 2002).

and foreign bias, is a ubiquitous phenomenon, and is well documented in the literature (see Cooper et al., 2014 for review). In this study we investigate whether the puzzle of sub-optimal diversifications (i.e. home and foreign bias) has any implication on the quality of investor protection standards.

Literature advances sound economic arguments, as we explain below, that encouraging international equity portfolio diversification, particularly allowing inward foreign equity portfolio investments, should improve the quality of investor protection standards (see Smarzynsk and Wei, 2000 and Bonaglia et al., 2001). Consistent with this economic reasoning, our empirical results reveal that countries where investors span their equity portfolio in line with the theoretically optimal international benchmark, are associated with higher quality of investor protection standards. Such positive implications may arise through indirect or 'collateral' benefits of greater financial integration. As elaborated in the following paragraphs, in a financially open economy, foreign equity portfolio investors play a catalytic role in improving the quality of both corporate and state governance.

With regard to influence on corporate governance, studies document several channels through which international portfolio diversification may influence the governance of the firms in host countries. For example, Kang and Kim (2010) note that foreign investors, particularly institutional investors, may play an influential role in domestic governance practices by employing various corporate governance mechanisms. Such disciplinary methods may take the form of hostile takeover threats, proxy contests, expressing opposition to or attempting to amend anti-takeover provisions[24], initiating efforts to seek representatives on the target boards, threatening replacement of top executives and demanding asset downsizing. Likewise, Boubakri et al. (2005) note that foreign ownership could lead to improvements in post-privatisation performance of newly privatised firms, because foreign investors normally demand high information disclosure standards, inject funds into newly privatised firms, and, for the sake of reputation, maintain stern control of manager's actions. Stulz (2005) offers strong theoretical conjecture, which argues that the growing presence of foreign investors lowers the ability of insiders to expropriate minority investors. Similarly, the framework of Kho et al. (2009) implies that foreign investors, particularly those from countries with better

[24] For example, in 2005 *The Children's Investment Fund (TCI)*, a UK based hedge fund, which had a major share of the German Deutsche Borse, forced the management to stop a takeover of London Exchange which led to the resignation of both the chief executives (Economist, 2008).

investor protection institutions, becomes a valuable inside monitor because the laws of their own countries restrict their ability to consume private benefits from other insiders. On empirical front, using data on China's split-share structure reform, Huang and Zhu (2014) confirm that involving foreign institutional investors in corporate governance practices, can significantly lower the possibility of expropriation by controlling shareholders in emerging markets.

With reference to the standard of state governance, studies report that competition for international financial resources should compel policymakers to reform their state and corporate governance regulatory and observance environment[25] (see Errunza, 2001 and Rajan and Zingales, 2003). Addressing the implications of state governance, Stulz (2005) argues that financial globalisation makes it difficult for the state itself to expropriate investors, as they risk losing the much needed foreign investments if they do not heed to the demands of foreign investors.[26] Similar sentiments are echoed by Rajan and Zingales (2003) who conjecture, that competition for financial resources becomes stronger when foreign investors become involved in the domestic economy. As a result, the growing interest of foreign investors drives reform[27] in the domestic investor protection regulations (see Beck et al., 2000 and Rajan and Zingales, 2000). For example, responding to foreign investors' pressure, domestic regulatory bodies signal their intention to improve the quality of governance through the adoption of international accounting standards. Errunza (2001) also posits, that with their increasing interest, foreign investors demand the formulation and observance of regulations, which compels corporates to disseminate timely and relevant information to the investor fraternity. Using data of emerging markets, Huang and Zhu (2012) show that the flows of foreign institutional investors helps promote the market-based principle of corporate governance, thus reducing the "twin agency" problem from the state ruler's discretion.

[25] For example, in 2007 Japan implemented the *Financial Instruments and Exchange Law*, which amended or abolished many laws that regulated foreign securities firm and was intentionally based on UK's Financial Services Authority's framework (Report by Herbert Smith, 2008 on Contemporary issues facing financial services institutions in Asia, http://documents.lexology.com/cd07ed3a-b7d3-4b63-ab50-bcffa0e01dc1.pdf)

[26] TCI initiated legal action against the Indian government under the provisions of bilateral investment treaties between India and UK over the under-pricing of coal by Coal India Limited, in which TCI holds 1% stake (see: http://www.business-standard.com/article/economy-policy/tci-starts-legal-action-against-indian-govt-under-uk-cyprus-treaties-112032900095_1.html).

[27] Demand from foreign investors may also lead to withdrawal/deferment of reforms. For example, in March 2012 India announced imposition of a controversial general anti-avoidance rules (GAAR) on transactions made by foreign investors, without much clarity, to be effective from 1 April 2012. Foreign portfolio investors demanded immediate reversal of the reform. After intense pressure from the foreign institutional investors India deferred the introduction of GAAR until April 2013 and after further negotiations it was postponed until 2016 (Source: Financial Times, 7 May 2012 and 3 September 2012)

The above discussion convincingly underlies the importance of international portfolio diversification for firm and state governance. In terms of theoretical guidance on what should be the optimal international portfolio diversification, the International Capital Asset Pricing Model (ICAPM) suggests that equity portfolio investors should hold the world market as a benchmark of their global portfolio (see Stulz, 1981 and Chan et al, 2005). However, despite the theoretical recommendations, studies note that both domestic and foreign investors deviate from holding the implied world market portfolio, which tends to segment international financial markets, particularly emerging markets (see Lau et al, 2010). Such deviation from theoretically suggested optimal allocations, results into what the literature refers to as home and foreign bias in international portfolio diversification. Home bias refers to the phenomenon in which domestic investors tend to over allocate their home market, relative to the theoretical conjecture, thus leaving a significantly lower share of the country's wealth to be held by foreign investors. Similarly, foreign bias indicates that foreign investors tend to either over or underweight foreign markets, relative to implied benchmark (see Chan et al., 2005 and Bekaert and Wang. 2010). How do home and foreign biases affect the governance quality?

Janakiramanan (1986) and Stulz (1999) conclude that the prevalence of home and foreign bias in equity portfolio investments explains the degree of international integration/segmentation (i.e. degree of financial globalisation) of the domestic equity markets with the world capital markets. Higher degrees of home bias reflect lower degrees of financial globalization and vice versa. Alternatively, higher degrees of foreign bias imply higher degree of financial globalization and vice versa (see Lau et al, 2010 for the theoretical presentation). As a result, greater home bias indicates a more internationally closed market and thus lower presence of foreign investors as domestic investors allocate sub-optimally higher investments in their own market. Alternatively, in a relatively open and financial integrated market, higher foreign bias (i.e. higher level of foreign investments relative to implied theory) signifies greater presence of foreign investors. This should incentivise foreign investors to demand higher quality of IPS (from state and firms).

2.5.6 Gaps in the investor protection standards literature

There is a large body of research on investor protection that is chiefly dominated by the importance of investor protection. Our study adds to the two strands of literature. First, and

as noted above, to the best of our knowledge, this is the first study which examines the effect of sub-optimal international portfolio diversifications, i.e. the implications of home and foreign biases, on the quality of investor protection standards. Few related studies which investigate the determinants of investor protection are focused on the role of economic openness. For example, Islam and Montenegro (2002) demonstrate that trade openness is positively associated with institutional quality, but do not investigate the effect of financial openness. Similarly, Busse and Groning (2009) also demonstrate the importance of trade liberalisation on good governance practices, but again do not account for financial openness.

In this study, we hypothesise that the greater degree of home (foreign) bias should be related to lower (higher) quality of investor protection standards. A vast body of literature is devoted to explain the causes of home and foreign biases[28]. However, studies investigating the implications of such biases are very limited. To the best of our knowledge, there is no study that examines the implications of home and foreign biases on the quality of investor protection standards. Using a sample of 44 countries over a period of 2001-2010, our study reports the following two important findings.

First, results suggest that the sub-optimal international portfolio diversifications of domestic and foreign investors have significant influence on the quality of investor protection standards. Specifically, markets where investors observe a higher degree of home bias (lower presence of foreign investors) are associated with poor quality of corporate and state investor protection standards. Similarly, relative to more closed markets (lower foreign bias), countries that allow/attract greater foreign portfolio investments (greater foreign bias) demonstrate a higher level of investor protection standards. Our results hold, after carefully accounting for several other possible determinants of investor protection standards, and for the potential reverse causality arising from the possibility that improvement in investor protection may cause a higher presence of foreign investors, i.e. lower home bias and higher foreign bias. The outcome of our study supports the view that financial globalisation and the consequent demand of foreign investors, has significant positive effect on the improvement of state and corporate investor protection standards (Stulz, 1999) and Doidge et al., 2007).

[28] See Chan et al, 2005 and Bekaert et al., 2010

Second, the results also confirm that mostly the developed markets exhibit a lower level of home bias, compared to their emerging markets counterpart. We also find that most developed countries report stronger positive foreign bias, i.e. these countries are preferred by international investors, compared to the emerging markets. These findings are consistent with existing studies (see Bekaert and Wang, 2010 and Chan et al., 2005). We further add to this literature, by providing new evidence on the observance of biases in the cross-country allocations by the sophisticated global fund managers whose sole objective is to create a broad based optimal global diversification. We uncover that the manifestation of investment biases, is not only reserved to the aggregate and macro data which may include country, regional or global funds, but such biases are also observed by the most sophisticated global fund managers.

Our study may be remotely related to Lau et al, (2010) who also demonstrate the implications of home and foreign biases. However, their focus is on the level of cost of capital, whereas our study examines the influence of home and foreign biases on the quality of investor protection standards.

Second, the results of our study also add to the growing debate, which states that the impact of international diversification and consequent risk sharing benefits should not only be limited to cost of capital and growth responses (see Henry, 2003 and Kose et al., 2010). Rather, the beneficial results should be examined through the influence of financial globalisation on factor productivity, such as improvement of micro and macro institutional quality, including corporate and state governance.

Our result suggests that when the domestic market is dominated by large institutional investors, they tend to be corporate insiders who will develop close ties with the government to expropriate minority investors. Furthermore, the government will pursue policies that will reduce return on investment. However, when countries attract large foreign investors, the foreign investors from well governed countries will export good governance to the host country, which tends to improve investor protection.

Chapter 3: Research questions and hypothesis development

3.1 Research questions

As noted earlier, there have been an extensive number of studies investigating the causes of sub-optimal international portfolio allocations, i.e. home and foreign biases. However, studies examining the implications of such biases are limited. As such, in this study, we address the following three research questions:

RQ1. What is the impact of sub-optimal portfolio allocations on the cost of capital?

RQ2. What is the role of international portfolio investment on stock market development?

RQ3. What is the effect of international portfolio investment on investor protection?

In the following sections we develop our hypotheses related to the above research questions.

3.2 What is the impact of sub-optimal international portfolio allocation on cost of capital?

3.2.1 Financial liberalisation and cost of capital

In this study, we examine the impact of sub-optimal portfolio allocation on cost of capital across 44 countries. The intriguing question from the perspective of governments and policy makers is whether there is any impact on cost of capital if a country attracts sufficient foreign investment. Specifically, we investigate the impact of home and foreign bias on cost of equity capital.

Cost of capital is an important input in the capital budgeting evaluation of investment projects. Higher cost of capital, leads to lower net present value, undermining the acceptance possibilities of prospective projects. Such non-feasibility of investment projects, particularly owing to higher cost of capital, harms the prospects of making positive effects in the real economy, leading to slower growth and lost employment opportunities. Theory suggests that financial liberalisation should integrate domestic stock markets with global capital markets which, in turn, should reduce countries' cost of capital (see Bekaert and Harvey, 2003) triggered by international risk sharing. The perceived reduction in cost of capital as a result of financial liberalisation should further trigger economic growth, driven by increased real investments. Bekaert and Harvey (2000), Bekaert et al. (2002) and Henry (2000b)

demonstrate that real investment increases in the aftermath of equity market liberalisation. For instance, Bekaert et al. (2001) show that economic growth increases by 0.7% to 1.4% annually post liberalisation. Consequently, from a national policy makers' point of view, appreciating the determinants of cost of capital cannot be understated.

Studies suggest that foreign and domestic equity investors should seek to diversify globally to reduce the country-specific investment risks of their portfolio (Solnik, 1974).[29] The theoretical implications of financial liberalisation and the subsequent flow (outward and inward) of foreign equity investments are well documented. For instance, Bekaert and Harvey (2003) posit a simple model, based on the extension of static integration/segmentation equilibrium models,[30] by examining the effects of financial liberalisation on cost of capital. The model predicts that in a financially segmented market, the volatility of the local market is much greater than its covariance with world markets. Keeping the variance and covariance constant, the theory predicts an increase in stock price (decrease in cost of capital) as the market moves from being segmented from the world capital market, into being a more integrated state, driven by increased cross-country portfolio investment.

Following on from the above discussion, Errunza (2001) further notes that when markets liberalise, the enhanced quality and quantity of information demanded by international investors should diminish the prevalent informational asymmetries and, hence, lower the cost of capital. For example, Merton (1987), focusing on market segmentation transpiring from incomplete information, demonstrates that the cost of capital, decreases with the size of the investor base, due to more efficient risk sharing. Financial liberalisation should not only affect the investor base but also alter investor composition (domestic versus international) as foreigners actively trade in the local market. The impact of changes in the investor base is pivotal, as the local securities will be priced more favourably by foreign investors. In fact, the very essence of the cost of capital/segmentation hypotheses is the migration from local pricing and shareholder base, to global pricing and more diversified international shareholder base. As such, Errunza (2001) suggests that removing inward capital-flow restrictions and the consequent inflows of foreign equity investments should reduce the cost of capital of domestic equities.

[29] Also see Stapleton and Subrahmanyan, 1977 and Stulz, (1999a)
[30] See Errunza and Losq, 1985; Eun and Janakiramana, 1986; Errunza et al. 1999 and Martin and Rey, (2000)

Using an equilibrium framework, Errunza and Losq (1985) show that the opening of equity markets to foreign investors should lower the cost of capital. Although there is a strong theoretical case of resultant fall in the cost of capital by allowing foreign investors into local markets, Bekaert and Harvey (2003) note that the removal of direct and indirect legal restrictions, may deter foreign investors from investing optimally in home (host) markets.

Henry (2003) finds that when emerging countries open their stock markets to foreign investors, aggregate dividend yield reduces by 240 basis points. Furthermore, the growth rate of capital stock increases by an average of 1:1 percentage points per year. Several studies suggest that liberalising the stock market will lead to a decline in cost of capital, investment booms, and the growth rate of output per worker increases. Financial liberalisation can, however, help investors diversify globally to share risk. This is contrary to an increasingly popular view that capital account liberalisation brings no real benefits and seems untenable.

Despite the positive effect, Bekaert and Harvey (2000), focusing on emerging markets; find that financial liberalisation has a disappointingly small effect on cost of capital. One potential reason is the sub-optimal allocations of investments by portfolio investors across the foreign markets (see Errunza, 2001). The International Capital Asset Pricing Model (ICAPM) suggests that international investors should hold the implied world market portfolio as the optimal benchmark (see Chan et al. 2005). However, equity portfolio investors in both the developed and emerging markets, exhibit varying degrees of home and foreign bias in their international portfolio allocations, which tends to segment global financial markets.[31]

Investors' deviation from holding optimally portfolio allocation influences the degree of market integration/segmentation. Such sub-optimal allocations by foreign investors, imply that a varying degree of cross-country home and foreign biases should explain the differences in host countries' cost of capital, i.e. higher negative bias (more segmented market) should be correlated with lower cost of capital and vice versa.

[31] For recent evidence on causes of home and foreign/country bias, see Chan et al., (2005) and Bekaert and Wang (2010)

3.2.2 Theoretical framework

Following the theoretical framework of Lewis (1999) we present the standard model, showing the pricing relationship against the sub-optimal holdings of domestic investors in country *l*.[32]

$$E(r_l) = \gamma \frac{w_l - w_l^*}{1 - w_l^*} Var(r_l) + \gamma \frac{1 - w_l}{1 - w_l^*} Cov(r_l, r_w) \quad (3\text{-}1)$$

Where:

$E(r_l)$ = is country *l*'s risk premium

γ = relative risk aversion parameter and we assume identical level of relative risk aversion for all investors in the country *l*.

w_l = proportion of domestic investors portfolio allocated to domestic equities of country *l*.

w_l^* = country *l*'s market share in the world market portfolio.

$Var(r_l)$ = variance of the local market return of country *l*.

$Cov(r_l, r_w)$ = is the covariance of return between asset *l* and world market.

If we assume that domestic investors in country *l* only invest in local securities. In this case equation (3-1) reduces to:

$$E(r_l) = \gamma Var(r_l) \quad (3\text{-}2)$$

When local investors invest mainly in domestic equities, the expected return of their portfolio is proportional to the variance of the domestic market return. This conjecture in the pricing modelling is similar to that of an asset pricing modelling in a completely segmented market. Equation (3-2) shows the impact of home bias on cost of capital. In the absence of international diversification, the price of the domestic market portfolio is determined only by its own return variance. In a situation where local investors do not exhibit home bias and keep domestic equity in relation to the country's share in the world-market portfolio, i.e. $w_l = w_l^*$, equation (3-1) is then expressed as:

$$E(r_l) = \gamma Cov(r_{l,} r_w) \quad (3\text{-}3)$$

[32] As it is standard model, we do not report the derivation of the entire model (for full derivation see Lau et al. (2010).

If domestic investors do not exhibit home bias, it signifies that they are diversifying their portfolio internationally and thus make the local stock market fully integrated with the rest of the world. In reality, equity investors show varying degrees of home bias.[33] The percentage of their domestic equity holdings falls within the interval of $(w_l^*, 1)$ and thus equation (3-1) could be written as:

$$E(r_l) = \gamma \frac{w_l - w_l^*}{1 - w_l^*} \{Var(r_l) - Cov(r_l, r_w)\} + \gamma Cov(r_l, r_w) \quad (3\text{-}4)$$

Equation (3-4) shows the association between the degrees of home bias on the cost of capital. The greater extent that local investors hold their domestic country's equities (w_l), the higher the degree of home bias they exhibit.[34] The term $(w_l - w_l^*)/(1 - w_l^*)$) in equation (3-4) could be interpreted as the degree of market integration within the framework of Bekaert and Harvey (1995). A country with a lower level of integration or higher segmentation will have a larger value of w_l. The high proportion of home bias or market segmentation will therefore result in higher cost of capital, if the following condition prevails:

$$Var(r_l) > Cov(r_l, r_w) \quad (3\text{-}5)$$

It is well documented in the literature that the $Cov(r_l, r_w)$ is smaller than $Var(r_l)$ (see Stulz, 1999).

In theory, foreign investors should also benchmark the optimal allocation, i.e. w_l^* for country *l*. However, studies (e.g. see Chan et al. 2005) show that in case of bilateral foreign portfolio investments, foreign investors relatively under (over) allocate the benchmark weight suggested by ICAPM exhibiting what is termed as foreign bias. Suppose if the foreign allocation from country *k* into country *l* is w_{kl} then foreign bias for country *l* exhibited by investors in country *k* is defined as $\log(w_{kl}/w_l^*)$. This ratio could be negative (under-allocation) or positive (over-allocation). Clearly, on average, a higher degree of foreign bias from all foreign investors for country *l* implies relatively lower home bias. This suggests that a higher (lower) degree of foreign bias should be associated with a higher (lower) degree of

[33] See Chan et al, (2005) for evidence.
[34] Bekaert and Harvey (1995) develop a regime-switching model to show the effects of the differing proportions of market segmentation which is equal to equation (8).

market integration, which in turn, should be related to lower (higher) cost of capital for investors in country *l.* Thus, this measure of foreign bias, constructed in the literature, should be inversely related to cost of capital.

The flow of resources into a liberalising country will reduce cost of capital, increase investment and raise output (Fischer, 1998; Summers, 2000). Theories suggest that risk-free rate and equity premium which are the two components of cost of capital will reduce when segmented countries liberalise their stock market. Henry (2000a) suggests that investment does increase post-reforms, but the effects of liberalisation on investment remains significant, after controlling for reforms. Bekaert et al. (2001) find that the increase in growth due to liberalisation is slightly larger than one percentage point after controlling for a number of variables. Generally, more financial liberalisation is thought to reduce the imperfections of financial markets, resulting in a reduction in the cost of capital and an increase in the level of investment (Henry, 2000a and Bekaert and Harvey, 2000).

In the context of this paper, we explain financial liberalisation to be when the government of a country decides to allow foreigners to purchase shares in that country's stock market. In other words, government allows the inflow and outflow of foreign equity investment without restrictions, and simultaneously allows domestic equity investors to buy and dispose of foreign stocks. Financial liberalisation can take several forms such as: openness of the bond market, financial sector, particularly, the banking sector and foreign exchange reforms. The process of financial liberalisation is very complex, with no generally agreed economic model that significantly explains the dynamics of the process. This means that even though there are general equilibrium models of economies in integrated states and those economies that are segmented, there is a lack of a model that identifies the mechanisms which transform a country from a segmented to an integrated economy. The ICAPM predicts that stock market liberalisation may virtually reduce the liberalising country's cost of equity capital, corresponding with allowing for risk sharing between domestic and foreign investors (see Stapleton and Subrahmanyan (1977), Errunza and Losq (1985), Eun and Janakiramanan (1986), and Stulz (1999a, b)).

Bekaert and Harvey (2003) prescribe a simple model to attain some intuition of financial globalization, where the model traces the impact of market integration on stock prices from the perspective of an emerging market. The model largely extends the standard static

integration/segmentation model (Martin and Rey, 2000). Within the context of a simple quadratic utility specification, Bekaert and Harvey (2003) examine the three-period problem for the global market and emerging market. They made the assumption that there is a single stock left of each asset. Dividends are paid out in period three, whilst there remain two trading periods. The government in an emerging economy may or may not integrate the market with the global financial market in period two. There is a price taking equity investors in each market who invest in period three.

The theory of ICAPM predicts that sufficient flow of foreign investment to a country, decreases cost of equity capital, due to improved risk sharing between domestic and foreign investors, especially when there is a negative correlation between the country's stock market and the world stock market (see Errunza and Losq, 1985; Eun and Janakiramana, 1986; Stulz, 1999a). The expected return will depend on the global price of risk and global covariance of risk. The implication is that, holding expected future cash flow constant, there should be a significant increase in a country's equity price index. Moreover, there should be an observation of an increase in physical investment following the flow of foreign portfolio investment, as projects which previously had negative net present values (NPV) prior to the liberalisation will turn into positive NPV. The effects of the positive NPVs will lead to growth of GDP, creation of jobs and capital flight reversal.

When financial markets are not segmented Adler and Dumas (1983) postulate that the expected return of the country will depend on the covariance of the country's stock index return with the world market portfolio return and probably with currency deposit rates. They formalize the notion that with the removal of investment restrictions and integration of the country's stock market with the rest of the world, local investors have the option to buy foreign securities, and foreign investors could also purchase domestic securities. This creates the possibility of global risk sharing between domestic and foreign investors and thus reduces expected return. On the other hand, when markets are segmented, the expected return of the country depends on the variance of the country`s stock market index return. When financial markets are not integrated globally, securities are mainly owned by domestic investors. In a partially integrated market, the risk premium of the country depends on the weighted average of the covariance of the country's index return with world portfolio return, and the country`s variance with the degree of the country`s market integration as the weight (Bekaert and Harvey 1995; de Jong and de Roon, 2005).

Studies show that financial liberalisation significantly reduces cost of capital. Stulz (1999b) suggests that when a country opens its stock market to foreign investors, cost of capital declines, due to increased risk-sharing and improved corporate governance. Even though there are opportunities of global risk sharing between domestic and foreign investors, investors face varying degrees of investment constraints. In spite of financial liberalisation, the global financial market has some fragments of segmentation, as equity portfolio investors in both the developed and emerging markets, exhibit varying degrees of home and foreign bias. Existing studies demonstrate the effect of home bias on security prices. Chan et al. (2009) provide evidence using mutual fund data, to show that home bias affects firm value.

Earlier research by Stulz (1999b) suggests that, when a country opens its stock market to foreigners, its cost of equity capital is expected to decline through enhanced risk-sharing, corporate governance, capital market efficiency, better legal systems, shareholders' activism and adequate disclosures. Henry (2000a) using data from 12 emerging markets, finds that equity valuation rises by two per cent in the eight month period before liberalisation and concludes that stock market liberalisation decreases countries' cost of equity capital. Another stream of research by Bekaert and Harvey (2000) shows that cost of capital usually declines after capital market liberalisation with varying effects between five and 75 basis points. They find insignificant evidence of change in realized returns but find substantial reduction in dividend yields between the pre and post-liberalisation period. Recent empirical work by Hail and Leuz (2009) investigates whether cross-listing in US exchange, reduces a firm`s cost of capital. Using a sample of 40,000 firms from 45 countries, they provide evidence that cross-listing on US exchange, leads to a significant decrease in a firm`s cost of capital after controlling for traditional proxies, for risk, analyst forecast bias and firm-fixed effects.

Fischer (2003); Rogoff (1999), and Summers (2000) argue that, emerging countries should experience a decline in cost of capital, and enjoy increased physical investment and output (GDP) when they receive a large flow of foreign portfolio investment from developed countries. Consistent with this, is empirical evidence produced by Tesar and Werner (1998), Bekaert and Harvey (1998), and Errunza and Miller (1998) who document that the local price of risk (variance) exceeds the global price of risk (covariance), so it is expected that equity risk premium falls when a segmented country liberalises its stock market. Holding expected cash flow constant, the decline in the equity risk premium will lead to a permanent fall in the aggregate cost of capital and attendant revaluation of the aggregate equity price index. Kim

and Singals (2000) find evidence that emerging markets' stock returns are abnormally high in the months leading to liberalisation. A study by Foerster and Karolyi (1999) demonstrates that stock prices of companies from segmented markets that cross-list, are expected to rise as a result of a subsequent fall in expected returns, as the additional built-in-risk premium, compensating for these barriers dissipates. They find significant average excess returns of 19 per cent during the year before listing and an additional 1.20 per cent during the listing week, but a substantial average decline of 14 per cent is incurred during the year following the listing. The stock market beta, relative to its home market index declines dramatically from 1.03 to 0.74 on average but its global beta, relative to the world market index does not experience any significant change.

Errunza and Miller (2000) use firm level data of a sample of 126 firms from 32 countries to study the impact of financial liberalisation, thus the introduction of American Depository Receipts (ADR) on cost of capital. They generally conclude that market liberalization reduces cost of capital. All the firms in their sample, experienced substantial decline in realised abnormal returns. They attribute the reduction of 42.2% to the introduction of ADR after controlling for impact of market and confounding effects. They suggest that it was extremely difficult for previous research to find the relationship between stock market liberalisation and cost of capital. Accordingly, they argue that segmented emerging markets, prior to financial integration, do have a high, steady, state of return due to the high risk premium. However, during liberalisation, the discount rate declines and equity valuation increases. In contrast, Bekaert and Harvey (1998) find mixed results on the impact of financial liberalisation on the cost of capital using market level data, after controlling for concurrent economic reforms. Henry (2003) further argues that capital stock growth rate increases by 1.1 per cent following liberalisation, from an average of 5.4 per cent per year in the pre-liberalisation period, to an average of 6.5 per cent in the post-liberalization period. He concludes that liberalisation of the stock market by developing countries, reduces cost of capital and leads to an investment boom; additionally, the growth rate of output per worker increases. He concludes that the arguments of financial liberalisation do not bring about any real benefit and do not hold any truth in the face of empirical evidence.

Miller (1999) investigates the stock price impact of international dual listing, by analysing a sample of 181 firms from 35 countries that participated in a depository receipt programme during the period 1985 to 1995, using cross-sectional regression. He finds abnormal returns

during and around the announcement date, and concludes that firms gain from listing shares outside their domestic market. Firms listing on major US exchanges such as the NYSE, NASDAQ instead of OTC, experience greater abnormal returns. Bekaert and Harvey (1998) examine the impact of stock market liberalisation on cost of capital by focusing on changes in returns and dividend yields pre, post, and during the liberalisation period to account for the re/evaluation effect, using cross-section time-series for a sample of emerging markets. They find that increases in equity flows are associated with lower cost of capital, higher correlation with world market returns, lower asset concentration, lower inflation, large market size relative to GDP, greater trade, and slightly higher per capital economic growth.

More recent work by Edison and Warnock (2008) use monthly portfolio equity data flows from the US to emerging markets between 1989 and 1999 and find that cross-listing of emerging market-equity on the US exchange, results in sharp, short-horizon inflows, whereas the reduction of capital controls, results in inflows over longer horizons mainly in Asia. Emerging markets do not enjoy wide foreign buying, nor does foreign investment in the cross-listed firm increase. They find that firms obtain funding during the time of cross-listing and that ends the story. De Jong and de Roon (2005) examine time-varying market integration and expected returns in 30 emerging markets. They find that the average annual decrease in segmentation of 0.055 reduces cost of capital by 11 basis points. Hail and Leuz (2009) analyse cost effects and changes in growth expectations around US cross-listings, using large panel data of more than 40,000 firms' yearly observations from 45 countries during the period 1990 to 2005. They find strong evidence that cross-listings on US exchange are associated with a significant decrease in firms' cost of capital after controlling for traditional proxies for risk; analyst forecast bias, and firm-fixed effects. More recently, Lau et al. (2010) investigated the impact of home bias on cost of equity capital and find that international differences in cost of equity capital are significantly associated to varying degrees of home bias for 38 countries in their sample. Their study implies that countries could experience substantial decline in cost of capital if home bias decreases, and also if risk sharing between domestic and foreign investors increases.

3.2.3 Contributions

Employing five proxies of cost of capital measures and extensive robustness tests, our study provides a comprehensive and rigorous investigation to show how home and foreign bias

explains variations in cross-country cost of capital. Within the context of existing literature, our study makes the following contributions. First, except for Lau et al. (2010), most of the existing studies examine the effect of financial globalisation on cost of capital, either based on event study, investigating how the cost of capital changes post financial liberalisation period, or demonstrate the influence of depository receipts on the cost of capital. For instance, Kim and Singal (2000) and Chari and Henry (2004) show that the post financial liberalisation cost of capital significantly decreases. Stulz (1999) and Henry (2000a) also find similar results, suggesting that the reduction in cost of capital is driven by increased risk sharing and improved corporate governance.[35] De Jong and de Roon (2005) document that the increased time varying integration, i.e., the process of gradual financial liberalisation of the domestic equity market is associated with reduction in the cost of capital. However, the assumptions underlying these studies are that domestic investors are actively and optimally involved in international diversifications investing abroad, and foreign investors optimally invest in foreign countries. However, an extensive number of studies, as discussed above, demonstrate that home investors shun the optimal benefits of international markets and over-allocate in their home markets, leading to home bias. Similarly, foreign investors do not allocate optimally in foreign markets, resulting in foreign bias.

Furthermore, only a scant number of studies investigate the impact of floating ADRs/GDRs on cost of capital. For example, Errunza and Miller (2000) demonstrate that firms issuing American Depositary Receipts (ADRs) experience a fall in cost of capital, driven by the increased global risk sharing effect (see Foerster and Karolyi, 1999; Doidge et al. 2004 for further evidence).[36] However, as Bekaert et al. (2009) note, ADR companies exhibit representation problems and, hence, do not provide full exposure to foreign stock markets. Clearly, ADRs ignore the investments of local investors in foreign markets and foreign portfolio investors investing directly in non-cross-listed domestic firms. Unlike other studies which use liberalisation events or ADRs/GDRs, we directly employ sub-optimal measures of international portfolio investments (i.e. home bias) to study its effects on the cost of capital. Financial liberalisation could coincide with macroeconomic reforms which may make it difficult to assess the actual impact of liberalisation on cost of capital

[35] Also see Errunza and Miller (2000), Chari and Henry (2004a) and Doidge et al. (2004).
[36] For more recent evidence see Edison and Warnock (2008) and Hail and Leuz (2009).

Second, instead of only using home bias measures, which focus on domestic over-investment by domestic investors (see Lau et al. 2010), we employ an additional relative measure of international portfolio investment, known as foreign bias. Clearly, following the above discussion on the theoretical arguments of global risk sharing and market integration, countries receiving relatively higher investments, i.e., international investors exhibiting greater foreign bias, should be more integrated with world capital markets, and hence, should demonstrate a relatively lower cost of capital.

Furthermore, we employ micro level data to construct other foreign bias measures (global fund foreign bias) to examine its impact on cost of capital. The former is the standard macro data from the International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS) data. The aggregate measures of foreign and home bias measures used in the existing studies, ignore the individual objectives or focus of funds. Even though, on a theoretical basis, each fund should be globally diversified. On practical grounds, a fund's objective may be single country, single region or global diversifications, to suit the needs of different tastes of portfolio investors. For example, if the focus of the fund is diversification only within the EU, it will have no allocation across countries outside the EU. Additionally, if the focus of a fund is on a single country or region, it will significantly affect the aggregate measure of home and foreign bias. To overcome this issue of potential bias in the measure of sub-optimal allocation of international investors, the second foreign bias measure we construct, uses unique micro firm level global funds' allocation data across 44 countries.

The global funds that we employ carry the sole objective of global diversification across all investable countries. The use of global funds is the most restrictive and robust measure of foreign bias we could compute, significantly mitigating what we call the fund-focus bias in the measurement of foreign bias measures used in the existing literature.

Finally, we further contribute to Lau et al. (2010) by providing robust analysis using *Tobin's Q* as an alternative measure of the cost of capital. We also address the concern of endogeneity using alternative estimation methods, such as lagged predetermined values of home and foreign biases, and the Heckman selection model.

We robustly test our hypotheses using Newey-West autocorrelation and heteroskedasticity-corrected standard errors. Consistent with theory, our comprehensive empirical analysis and

extensive robustness tests provide strong evidence that a higher degree of home bias is associated with a higher cost of capital. Correspondingly, a higher degree of foreign bias, i.e., foreigners tilting their country specific portfolio weight towards the global optimum, reduces the host country's cost of capital.

We use four proxies of cost of capital; historical realised return of the market ($HRRm$), sovereign credit ratings (*rCred*), country equity risk premium (*CERP*), and dividend yield (DY) to test the following hypothesis.

H_1 Countries that exhibit higher home bias are associated with higher cost of capital.

H_2 Countries with higher foreign bias relate to lower cost of capital.

H_3 Pervasiveness with higher global fund foreign bias allocation is associated with lower cost of capital.

3.2.4 Summary of findings

The findings of the study demonstrate that after controlling for a multitude of conventional risk variables, which existing studies show to affect cost of capital, our study provides robust support to the hypothesis, that when domestic investors exhibit home bias and over-invest in their home market, cost of capital increases. However, when foreign investors allocate investment towards the implied global weight as suggested by ICAPM, cost of capital reduces as a result of increased international risk sharing. This suggests that the cross-sectional and temporal variations in home and foreign bias, largely explain the differences in cross country cost of capital. To be specific, higher home bias (higher foreign bias) should be associated with higher (lower) cost of capital. In this study, we provide comprehensive robust and extensive tests of such conjectures. We discuss the empirical results in Chapter 6.

3.3 What is the role of international portfolio investment on stock market development?

3.3.1 Equity portfolio investment and stock market development

Previous studies have investigated the effects of financial liberalisation on stock market development. For instance, Levine and Zervos (1998) show that financial liberalisation increases various indicators of stock market development, including market capitalisation to GDP, value traded relative to GDP, turnover ratio, and number of listed companies. They use a sample of 16 countries and find that stock markets become more liquid following stock market liberalisation. Galindo et al. (2001) demonstrate that stock market liberalisation improves capital allocation efficiency of firms in 12 developing countries. Equally, Bekaert and Harvey (2000) show that equity market liberalisation improves risk sharing and thereby reduces cost of capital. Several authors stress the role of foreign investors in stimulating stock market development. Chari and Henry (2004a) provide evidence that financial liberalisation increases risk sharing. Obstfeld (1994) shows that increased risk sharing through international equity diversification improves resource allocation. He finds that financial liberalisation increases the allocation efficiency of domestic investment and raises total factor productivity growth without any need for technological change. However, Chari and Henry (2004b), and Gourinchas and Jeanne (2002) argue that it is not obvious that capital account liberalisation directed at increasing international allocative efficiency would have any effect on domestic allocative efficiency.

Financial theory postulates that financial liberalisation integrates the domestic stock markets with the global stock market and, subsequently, leads to stock market development. For instance, Errunza (2001) argues that financial liberalisation leads to stock market development, which helps to achieve efficient risk sharing, and resource allocations, as well as assists to mobilise and improve the structure of external finance. An efficient stock market, via the pricing mechanism, will differentiate companies and reward well managed and profitable companies with lower cost of capital at the expense of less profitable firms. Several emerging countries have followed policies towards liberalising their stock market in order to attract foreign equity inflows. McKinnon (1973) argues that financial liberalisation relates positively to increased financial development. Galindo et al. (2002), show that financial liberalisation under certain circumstances, promotes financial sector development. Bekaert et al. (2005) analyse the impact of financial liberalisation on stock market development.

In this study, we seek to examine whether home and foreign bias, exhibited by local and foreign investors respectively, have any varying impact on stock market development. We provide inter-related theoretical argument to demonstrate how home and foreign bias affect stock market development.

Current studies suggest that financial liberalisation will lead to a higher flow of foreign equity investment and will help integrate stock markets. Stulz (1999a) argues that both foreign and domestic investors should look to diversify globally to reduce investment risk associated with a country. Large institutional investors increase their investment in emerging markets, primarily to benefit from diversification of risk and to partake in the high economic growth in emerging countries. Errunza (2001) theoretically shows that when countries attract sufficient foreign equity investment and the domestic equity investors diversify investment globally, it improves stock market development.

A review of international equity allocation shows less international portfolio diversification due to the prevalence of the home bias phenomenon. The question is whether home bias will inhibit stock market development? The adverse effect of home bias on stock market development or when domestic investors over-invest in the local stock market in deviation from the theoretical optimal weight suggested by ICAPM, is explained by the fact, that first, the domestic stock market will, to a large extent be segmented, and the risk sharing opportunities between domestic and foreign investors will reduce and will subsequently increase cost of capital. Home bias indicates less participation in the domestic stock market and it will be expensive for investors to trade since investors cannot easily sell their securities to raise funds. This will reduce the incentive to invest in projects of a lengthy duration.

Second, financial theory[37] and empirical evidence show a positive relation between home bias and cost of capital, because when home bias persists in a country, few dealers and brokers will be operating in the stock market, and poor trading technology will increase transaction costs. If home bias positively drives cost of capital, it implies that firms will experience reduction in stock prices and stock market valuation. Additionally, it will reduce the value of trading, increase high transaction costs and decrease the significance of the stock market in the economy. Third, the domestic market will be dominated by large institutional

[37] For more of the theory, see Stulz (1999a)

investors who will buy-and-hold, and successively create an illiquid stock market which will reduce the participation of domestic investors. Large institutional investors will dominate companies and expropriate minority investors, leading to lower investor confidence and poor stock market development.

Next, we show the transmission mechanism of how foreign bias can impact positively on stock market development. In the case of foreign bias, whereby a country attracts sufficient flow of foreign investment, the stock market will become integrated with the global market and enhance global risk sharing between domestic and foreign investors. Subsequently, it will reduce cost of capital and improve stock market valuation. Adler and Dumas (1983) demonstrate that countries' expected returns depend on the covariance of the country's return, with global stock market return.

Additionally, foreign investors that participate in the domestic stock market will demand better investor protection, boost the domestic investors' confidence and improve stock market liquidity. La Porta et al. (1997) suggest that equity market liberalisation will compel foreign investors from countries with good governance systems to insist on better governance, which will promote stock market development. Hargis and Ramanlal (1997) provide the link between stock market integration and stock market development. They show that stock market integration boosts stock market development via increased market capitalisation and higher stock market liquidity of companies. Intuitively, as more foreign investors participate in the domestic market, they will demand better trading techniques and technology which will, in turn, increase value traded and a decline in transaction costs.

Furthermore, the participation of foreign investors will increase the number of brokers and dealers who will compete amongst themselves for investors. Subsequently, it will lead to a decline in transaction costs (i.e. fees, commissions, market impact). Foreign investors who participate in the domestic market will require timely and quality information, adequate investor protection and trading regulations.

A growing body of literature addresses the general merits of opening stock markets to foreign portfolio investors. Contributing to the positive impact of financial liberalisation on stock market development, Galindo et al. (2002) show that financial liberalisation under certain circumstances, promotes financial sector development. Foreign bias implies that international

investors have favourable expectations of the growth prospects in a particular country; they will seek to participate in the growth opportunities in those countries, bid up share prices and will make more financial resources available for investment. Higher participation of foreign investors in the domestic market will have an inverse relation with cost of capital and will, therefore, improve stock market development.

3.3.2 Contributions

Existing studies relate to the impact of financial liberalisation on stock market development and a vast amount of literature has investigated the importance of stock market development in relation to economic growth and development. For instance, earlier research that has found a positive association between stock market development and economic growth, has been examined by (King and Levine, 1993; Levine, 1997; Rajan and Zingales, 1998). Carlin and Mayer (2003) provide compelling evidence that there is a positive relationship between the development of countries' financial systems and economic growth. Bose (2005), in his theoretical model, reveals that stock market development positively relates to economic development.

Despite the importance of stock market development, limited studies have examined factors that influence stock market development. As far as we are aware, no study has investigated the effect of home bias on stock market development. Our study, therefore, contributes to the stock market literature by examining the impact of home bias on stock market development, whilst we control for variables shown in existing studies to drive stock market development.

Second, as far as existing literature is concerned, our work is the first to examine the impact of foreign bias on stock market development. Previous studies focus largely on what determines foreign bias. For example, Chan et al. (2005) investigate factors that influence foreign bias, using mutual fund equity allocation. Chan et al. (2009) study the impact of foreign bias on firm value, whilst Beugelsdijk and Frijns (2010) investigate how culture and cultural distances between stock markets explain foreign bias.

Third, another distinct contribution of our study, relative to existing studies is that our study uses a unique dataset of micro global fund allocation data across 44 countries to examine the impact of global fund foreign bias on stock market development.

Our study is important for policy implication because existing studies show that large and more efficient stock markets lead to economic growth (see Levine and Zervos, 1996, Bencivenga et al, 1996; Rousseau and Wachtel, 1998; Levine et al, 2000; Beck et al, 2000a; Rousseau and Sylla, 2001). However, alternative studies, for instance (see Devereux and Smith, 1994; Stiglitz, 2000; Eichengreen, 2002), show that financial liberalisation has not had the expected positive impact on economic growth.

We thereby provide evidence that cross-country pervasiveness of home bias inhibits financial development. Additionally, we offer evidence that when foreign investors increase their investment towards the global portfolio weight as implied by ICAM, stock market development improves.

We test the following hypotheses:

H_4 Countries with a prevalence for higher home bias, experience poor stock market development.

H_5 Countries with a higher foreign bias, experience better stock market development.

H_6 Countries with a higher global fund foreign bias, enjoy better stock market development.

3.3.3 Summary of findings

We examine how home and foreign bias affects stock market development. We show that home bias segments stock market and thereby reduce risk sharing between domestic and foreign bias. This study finds robust evidence that domestic investors increasing their bias toward home equity reduce stock market development. The phenomenon is explained by the fact that large domestic institutional investors will buy-and-hold their investment and will adversely affect stock market liquidity and development. Similarly, foreign investors increasing their investment towards the optimal global market capitalisation will improve stock market development. This is due to the fact that the foreign bias tends to integrate the domestic stock market with the global stock market and will increase global risk sharing between domestic and foreign investors and subsequently leads to higher stock market valuation. An endogenous treatment effect provides robust support to the main analysis. The

policy implications of our study provide convincing evidence that countries should seek to attract sufficient foreign investment and help domestic investors diversify to enhance stock market development.

3.4 What is the effect of international portfolio investment on investor protection?

3.4.1 Sub-optimal portfolio allocation and investor protection

Current literature indicates the significant role that investor protection standards play in influencing cost of capital, stock market development, stock market returns, and corporations' efforts in raising financial resources, economic growth and development.[38] Existing studies show that significant variations in financial systems among countries are shaped by the magnitude of legal protection afforded to minority investors against expropriation by company insiders. Previous literature demonstrates that better investor protection relates to higher stock market valuation (La Porta et al. 1997), more valuations of listed companies relative to assets (Claessens et al. 1999; La Porta et al. 2002), high dividend pay-outs (La Porta et al 2000), lower correlation of ownership and control (La Porta et al. 1999b), lower private benefits of control (Zingales, 1994) and higher correlation between investment opportunities and actual investment (Wurgler, 2000). La Porta et al. (1998) argue that better investor protection increases an investor's willingness to provide finance, which reflects in lower cost of capital and more availability of external financial resources.

Klapper and Love (2004) demonstrate that firm-level governance has a strong positive association with country-level investor protection. For instance, improving the efficiency of a country-level legal system from low to medium value increases the average firm-level governance by about half a standard deviation. A more recent study by Chen et al. (2009) shows firm-level corporate governance and country-level investor protection tend to substitute each other in reducing cost of capital, because when contract enforcement is weak within a country, companies will be unable to overwrite the legal system prevailing in a country and the flexibility of companies to improve corporate governance would be

[38] Myriad studies provide the importance of investor protection in explaining cost of capital (Doidge et al. 2004; Chen et al. 2009), stock market returns (Shleifer and Wolfenzon, 2002; Giannetti and Koskinen, 2010; Gompers et al. 2003; Cremers and Nair, 2005; Core et al. 2006), corporations efforts in raising financial resources, economic growth and development (Stulz, 2005; Doidge et al. 2004). See also (Johnson et al. 2000a; Guiso et al. 2003; Levine, 1999; La Porta et al. 2002; Eleswarapu and Venkataraman, 2006).

restricted. Countries that have better investor protection are associated with better firm-level corporate governance. Correspondingly, firm-level corporate governance tends to work well in countries with better country-level investor protection. Chen et al. (2009) argue that minority rights protection includes rights given by law and the effectiveness of enforcement. Better country-level investor protection helps firm-level corporate governance mechanisms to work effectively.

We are primarily motivated to empirically examine this research question by the awareness of recent research which has shown the importance and increased interest in the corporate governance topic among investment banks, rating agencies, and other specialised financial institutions, as country-level investor protection data has recently become available.

To date, limited studies examine factors that determine country level investor protection. Research on institutional investors mainly focuses on the importance of investor protection. In contrast, little direct evidence is presented on the impact of sub-optimal portfolio allocation on investor protection. Better country-level investor protection implies that there are strong institutions within a country that provide rights to investors, and also an effective judicial system that enforces the rights of the investors. We explore the impact of sub-optimal portfolio investment (specifically, via home and foreign bias) on investor protection, which is relevant to international investors and has important policy implications, particularly for emerging countries.

In this study, better investor protection means good governance or quality institutions that protect and enforce the rights of investors. Institutions have sets of rules and norms that shape the social, political and economic interactions among members of the society. Institutional quality is determined by the legal and administrative framework within which investors, corporations, and government institutions operate and interrupt to generate wealth. The role of institutions does not only involve the legal framework, but also includes the attitude of the government towards market freedom and efficiency. Countries with quality institutions have an efficient and independent judiciary that protects the interests of minority investors, property rights and intellectual property protection, efficacy of corporate boards, and less corrupt practices.

The study investigates and tests the proposition of whether a varying degree of sub-optimal portfolio allocation (i.e. home and foreign bias) is important in explaining cross-country variations in investor protection standards. The existence of good governance relates to adequate provision of better investor protection. Specifically, we focus on a particular type of governance that relates to investor protections, which capture two components. First, the investor protection captures the legal rights component, whereby investors are granted legal rights. Second, it captures the enforcement component, whereby the quality of a country's institutions determines the extent to which these rights are respected and enforced legally in court.

Governments throughout the world have a responsibility to achieve sustained high rates of economic growth. They are required to implement policies to reduce unemployment and provide economic opportunities for greater proportions of the population, which can improve the standard of living of the citizens. In most countries, even though much progress has been made towards the stabilisation of the macroeconomic conditions, evidence suggests that sustained economic and national development remain relatively slow, especially, in developing countries, due to weak institutions that fail to protect investors. This has generally led to the acceptance that better investor protection is an essential issue in a development policy. Prior theoretical studies (see Stulz, 1981b; 1999b; Errunza and Losq; 1985) suggest that both domestic and foreign investors should construct a globally diverse equity portfolio to reduce the risk of the portfolio. A study by Oman (2001) shows that the rapid growth of international portfolio investment by the Organisation for Economic Co-operation Development (OECD) and institutional investors, for instance pension funds, has become a driving force for improved corporate governance in emerging markets. Good economic institutions are most likely to flourish in a rent-free environment, whereby small groups are unable to take advantage of a monopoly position of a particular industry or have privileged access to natural resources.

In theory, the issue of investor protection can be explained by globalisation. The advent of financial liberalisation provides equity investors with the opportunity to diversify to reduce portfolio risk. Existing literature suggests that external mechanisms, such as flow of foreign equity investment via institutional investors can help strengthen good governance in the domestic country. Bonaglia et al. (2001) provide a theoretical argument of the link between

globalisation/integration and good governance. We, therefore, provide an argument based on sound theory to explain why home and foreign bias can influence investor protection.

Existing studies suggest that home bias has the consequence of segmenting stock markets, and current literature shows that segmented countries experience poor governance or weak investor protection. The phenomenon of home bias adversely affecting investor protection and is explained by the fact that when domestic investors over-invest in their country, they become controlling shareholders. Subsequently, they will expropriate minority investors, and the country will thereby experience weak investor protection. Errunza (2001) argues that segmented countries experience poor investor protection. The level of a country's investor protection determines whether foreign and local investors will invest in the domestic country (Chan et al. 2005). Weak investor protection is associated with countries with less developed stock markets, and Forbes (2010) shows that foreign investors hold a large proportion of equity in the US, if the domestic stock market is less developed. Janakiramanan (1986) and Stulz (1999a) conclude, that the pervasiveness of home bias in an equity portfolio investment, segments domestic stock markets from the global market. Additionally, home bias reduces the opportunity of domestic investors learning good governance from their foreign counterparts. Therefore, domestic corporations and investors will have no option but to operate in the domestic markets that have poor securities laws. This means that we can hypothesize that domestic investors' over-investing in their local stock market will negatively impact on investor protection standards or good governance.

Next, we provide the transmission mechanism to show how foreign bias impacts on investor protection from the following perspective. Errunza (2001) suggests that the participation of foreign investors in the domestic market will promote good governance. Particularly, competition for foreign equity investment between countries will influence good governance and the regulatory environment. Ceteris paribus, countries that spend resources to improve governance will attract foreign equity investment than those with poor investor protection standards. The argument rests on the theoretical perspective that countries will succumb to pressures from foreign investors to improve investor protection. The justification for the argument is that foreign investors could enjoy better investor protection elsewhere and they will then put pressure on the state to improve investor protection vis-à-vis domestic investors.

When foreign investors allocate more investment towards the host country, studies suggest that it improves investor protection. Rajan and Zingales (2000), and Beck et al. (2000) argue that competition for financial resources comes to bear between countries, and it compels countries to reduce rent seeking activities and rather improve on investor protection. Conceivably, countries will improve on investor protection standards to attract foreign investors. Rent seeking and corrupt activities that reduce shareholders' wealth will come at a cost when several countries are competing for the same foreign investors. Globalisation increases countries' international investment base and foreign investors will demand better institutions to manage risk.

Rajan and Zingales (2003) argue that competition for financial resources becomes harder when foreign investors become involved in the domestic economy. The participation of foreign investors will enhance good governance through the adoption of international accounting rules and regulatory standards. Errunza (2001) assesses the benefits of foreign portfolio investment to the host country. He argues that the involvement of foreign investors in the domestic stock market will lead to good governance and better investor protection. He posits, that foreign investors will demand timely and better access to information on protection of minority rights and quality stock market trading rules and regulations.

Studies suggest that a surge in foreign equity investment inflow will have a positive impact on investor protection. For example, foreign investors from countries with good governance that protect minority investors will export good governance to the host country. Similarly, the domestic investors will learn good governance from their foreign counterparts. Kang and Kim (2010) provide instances where foreign investors engage in governance activities in the host countries in areas such as: hostile takeover threats, proxy contests, expressions of opposition to amend anti-takeover provisions, efforts to seek representatives on the targets board, threat of top executive takeover and demands for asset downsizing.

Doidge et al. (2004) show that financial globalisation helps firms to align themselves to the high level of investor protection prevailing in the host countries. In other words, foreign investors assist in exporting better governance to host countries that have weak investor protection. Smarzynsk and Wei (2000) and Bonaglia et al. (2001) demonstrate that financial globalisation is positively associated with the degree of investor protection granted by a country. They argue that trade openness relates positively to good governance. They attribute

the positive impact to foreign investors exporting and demanding good governance in the host country.

Stulz (2005) notes that financial globalisation lowers the ability to expropriate minority investors, as any attempt of expropriation will compel the investors to move their investments to alternative countries with better investor protection standards. Similarly, foreign investors will avoid investing in the domestic market if it offers weak investor protection. Stulz (2005) suggests that financial globalisation helps controlling shareholders to learn better investors' protection mechanisms from countries with strong investor protection. Globalisation assists companies to gain access to a pool of specialised skills and knowledge. Oman (2001) suggests that international investors' single most important determinant of investment decision is based on a good governance system as it relates to a country's policy credibility. Arndt and Oman (2006) argue that foreign investors drive up the domestic country's government interest in good governance. La Porta et al. (1997) advocate that a better legal environment keeps entrepreneurs from expropriating investors' funds, and thereby increases investors' preparedness to provide financial resources. The differences in outside investor protection against expropriation by insiders accounts for discrepancies in the nature and effectiveness of stock market development.

The prevailing assumption is that financial globalisation via foreign equity investment inflows will make it difficult for the state to expropriate domestic investors because investors will seek investment outside the domestic country when there is pervasiveness of poor governance. The quality of investor protection prevailing in a country is important for international portfolio investors, due to their investment exposure to risk. We can hypothesize that foreign bias, whereby foreign investors increase portfolio weights towards ICAPM implied weight will have a positive effect on investor protection.

3.4.2 Contributions

Despite the importance of investor protection, limited studies examine factors that influence investor protection. Current studies examine the impact of investor protection on several variables.[39] For instance, Wei (2000) shows that corruption negatively relates to an open economy, as resources will be committed to improving institutional quality. Islam and

[39] See Chan et al. (2005)

Montenegro (2002) demonstrate that trade openness is robustly positively associated with institutional quality. The IMF (2005) displays that trade openness has a positive impact on both institutional transitions and the quality of economic institutions. Busse and Groning (2009) analyse the importance of trade liberalisation towards good governance. They find that trade openness has a positive influence on good governance.

To the best of our knowledge, there is no single empirical study that examines the implications of home and foreign bias on investor protection. It is likely that investor protection, in addition to factor accumulation and technological change, explains cross-country variations in growth performance. We provide evidence to show that sub-optimal portfolio allocation of investors has a varying impact on four proxies of investor protection we obtain from World Governance Indicators. The study makes several contributions to the existing literature that seeks to understand factors that influence country-level investor protection.

First, we contribute and extend the existing international finance literature by showing that higher degrees of home bias of domestic investors reduce investor protection standards, owing to the fact that the country will become segmented when the stock market is dominated by large domestic institutional investors who will develop close ties with companies and the state, thereby adversely influencing the protection provided to minority investors.

Second, we contribute and demonstrate that foreign bias, where foreign investors allocate investment towards the implied weight recommended by ICAPM, will lead to better investor protection because foreign institutional investors from well governed countries will export and demand good governance and put pressure on the state to improve investor protection. The state trying to maintain a good reputation and efforts to attract sufficient foreign investment, will improve on investor protection. Gillan and Starks (2003) suggest that foreign institutional investors play a significant role in prompting changes in corporate governance practices than domestic money managers. Previous studies fail to examine whether countries' investor protection improves when foreign investors increase their investment in the host country towards the implied world market capitalisation weight.

Third, our study makes additional contribution by using a micro global fund's allocation dataset of 44 countries to examine the effects of global fund foreign bias (*GF_FB*) on investor protection. The study employs four measures of country level governance indicators to capture protection offered to investors against expropriation, and how the protection is enforced. We use data constructed by World Governance Indicators (described in Chapter 4.3) to test the following hypotheses:

H_7 Higher home bias is related to a lower level of investor protection standards.

H_8 Higher foreign bias is associated with higher levels of investor protection standards.

H_9 A higher country global fund bias is related to higher investor protection standards.

3.4.3 Summary of findings

Despite the important role of investor protection towards economic growth, as far as we are concerned, no single study has empirically examined the implications of the sub-optimal portfolio allocation (home and foreign bias) phenomenon on investor protection. The study represents the first attempt to empirically examine the effects of home and foreign bias on investor protection. Current studies show that investor protections have positive effects on economic growth and development.

Our findings provide compelling evidence that home bias inhibits investor protection, whilst foreign bias improves investor protection. The robust findings of our study show that about 71-81 per cent of variation in cross-country investor protection is explained by home and foreign bias. The policy implications of the study, particularly for emerging countries, is that encouraging domestic investors to diversify abroad will reduce their controlling influence in firms and will improve investor protection. Similarly, countries can experience better investor protection when they attract sufficient foreign equity investment as a result of foreign investors from better governed countries, demanding and exporting good governance to the host country.

Chapter 4: Data

4.1 Home and foreign bias measures

We use three different datasets to construct the measure of home and foreign bias exhibited by portfolio investors in the country allocations. The first dataset we employ is the standard aggregate country level cross-country equity portfolio holding (in USD millions) data, sourced from the Coordinated Portfolio Investment Survey (*CPIS*) of the International Monetary Fund (IMF). The CPIS collects data on stocks of cross-border holdings of equities for 76 participating countries. For detailed descriptions of these standard data please refer to Bekaert and Wang (2010). We use the annual cross-country portfolio holdings *CPIS* data for the period 2001 to 2010 to construct our equity home bias (*CPIS_HB)* and equity foreign bias *(CPIS_FB)* measures, as described below. Dictated by the availability of data on our key cost of capital proxies and other control variables, we are able to use data on 44 countries out of the list of the 45 highly investable MSCI All Country Index.

The second dataset we use is unique fund level country allocation data from Emerging Portfolio Fund Research (*EPFR)* to create the global fund's foreign bias (*GF_FB*) measure. *EPFR* avails asset allocation data trading in traditional and alternative funds domiciled globally. The aim of the country allocations is to provide a complete and comprehensive picture of fund managers' allocations driving global markets. We use the yearly average (using monthly allocations) country allocations of 122 global equity funds with the total size of all the funds being approximately US$120 billion. These funds are domiciled across nine countries for the period of 2001 to 2010. As these are purely global funds at a micro level, we should expect the foreign bias to be minimal, compared to the CPIS aggregate data which include various (undisclosed) funds' type and style.

The EPFR is a fairly novel database and had been employed by existing researchers to address different issues (see Jotikasthira et al. 2012; Wei et al. 2010; Broner et al. 2006; Gelos and Wei, 2005). In order to maintain consistency with CPIS data, we incorporate the same sample period of 2001 to 2010 for the EPFR data. Furthermore, as the funds are domiciled only in nine countries (see appendix 1) we are unable to construct a robust measure of home bias, due to the smaller number of observations for our empirical analysis (90

observations only). Appendix 1 provides a detailed summary of information on the yearly average statistics of EPFR funds.

Finally, for the construction of ICAPM benchmark allocation, the third dataset we use is the country level market capitalisation figures of S&P/IFC obtained from the World Development Indicator (*WDI*) of the World Bank. In the following section we describe the construction of our home and foreign bias measures.

4.1.1 Equity home bias

The equity home bias (*EHB*) measure captures the degree to which domestic investors overweight their domestic equity market, relative to the prescription of the ICAPM benchmark. Following the existing literature (e.g. see Ahearne et al. 2004; Chan et al. 2005), we define home bias as:

$$EHB_{lt} = \log\left(\frac{w_{llt}}{w^*_{lt}}\right) \tag{4-1}$$

where w_{llt} represents domestic investors' weightings in the domestic market capitalisation of country l for the period *t* and is defined as:

$$w_{llt} = \frac{h_{llt}}{GPH_{lt}} \tag{4-2}$$

where h_{llt} is the stockholdings of domestic investors in their domestic market *l* and GPH_{lt} is the global holdings of domestic investors for the period *t* across all 44 countries, including domestic. w^*_{lt} is the ICAPM world benchmark allocation for country *l* for time period *t*, which is the same for all investors in all countries and is defined as:

$$w^*_{lt} = \frac{cap_{lt}}{\sum_{l=1}^{44} cap_{lt}} \tag{4-3}$$

cap_{lt} is the total market capitalisation of country *l* and is obtained from WDI. A value of zero for EHB_{lt} in equation (4-1) indicates that investors have no bias towards their home market, while positive values show the presence of home bias.

It's worth noting that CPIS only reports the bilateral foreign equity portfolio holdings with no investments in domestic markets for each host country *l*. Following the existing literature (Fidora et al. 2007) the construction of domestic holdings (h_{llt}) and global portfolio holdings of domestic investors (GPH_{lt}) are as follows:

$$h_{llt} = MCAP_{lt} - \sum_{k=1}^{43} FPH_{klt,\ k\neq l} \tag{4-4}$$

where $MCAP_{lt}$ is the market capitalisation of equities issued in country *l* and $FPH_{klt,\ k\neq l}$ is the holdings of all equities of country *l* by foreign investors domiciled in country *k*. The GPH_{lt} is thus constructed as:

$$GPH_{lt} = h_{llt} + \sum_{k=1}^{43} FPH_{lkt,\ l\neq k} \tag{4-5}$$

FPH_{lkt} is the holdings of foreign securities (*k*) by investors domiciled in country *l* at time *t*. As the EHB_{lt} is constructed using CPIS data, we denote this variable as *CPIS_HB* in our empirical analysis.

4.1.2 Equity foreign bias

Relative to the ICAPM prediction, equity foreign bias implies the disproportionate allocation of investors domiciled in country *k* into the foreign securities of countries *l*. Following Chan et al. (2005) we compute the equity foreign bias as

$$EFB_{klt} = \log\left(\frac{W_{klt}}{W_{lt}^{*}}\right) \tag{4-6}$$

where w_{klt} is the allocation of country *k*'s investors in equities issued by country *l* for the period *t* and is defined as

$$w_{klt} = \frac{h_{klt}}{\sum_{l=1}^{43} h_{klt}} \tag{4-7}$$

where h_{klt} denotes country *k*'s investors' stockholdings of equities in a foreign country *l* for the period *t*. w_{lt}^{*} , as defined in equation (4-3), is the ICAPM benchmark allocation for investing in country *l* for period *t* .

For each pair countries, i.e, *kl*, equity foreign bias could be either positive, where foreign investors' (in country *k*) overweight foreign equity market more than that suggested by the implied global weight, or it could be negative, where foreign investors underweight their investment away from the implied global weight.[40] For regression analysis we take the average equity foreign bias ($AEFB_{lt}$) exhibited by all source country investors ($k=1.....n$) for the country *l* for each period *t* as shown below:

$$AEFB_{lt} = \frac{\sum_{l=1}^{n} EFB_{klt}}{n} \tag{4-8}$$

Foreign bias measures based on CPIS-IMF and EPFR Global Funds' data are denoted as $CPIS\_FB$ and GF_FB respectively. The number of source countries, i.e. *n*, for *CPIS_FB* is 43 (i.e. the same as host countries, excluding the country for which foreign bias is measured, $k \neq l$) and the *n* for the *GF_FB,* i.e. the number of funds exhibiting foreign bias for each country, is 121, excluding the fund if its country of domicile is the same as the country of allocation, i.e.$k \neq l$.

4.2 Sub-optimal international portfolio allocations and cost of capital

We begin the discussion on data by describing the four different costs of capital measures we incorporate in our primary analysis, followed by a measure of home bias and two measures (using macro and micro data) of foreign biases. Finally, following the existing literature we discuss the control factors that could potentially compete with our measures of home bias and foreign biases. We employ four variables as proxies for country-level cost of capital measures: historical realised market risk premium, sovereign bond credit-risk rating, based on implied cost of capital proxy, Damodaran's (2012) default spread-based country risk premium and, finally, the dividend yield.

4.2.1 Historical realised returns of the market

Following Lau et al. (2010) the first proxy we employ is the historical realised return of the markets ($HRRm$) which is the historical average of excess country equity market return over

[40] Note, on aggregate the foreign bias should be negative for each country (*l*) which exhibits home bias. However, given the fact that CPIS does not report the holding all countries in the world, on average, the foreign bias could be positive or negative. Such figures are also reported in the existing literature (see Chan et al. 2005 and Lau et al. 2009).

the risk free rate. For each year, the yearly average stock market returns are computed using the monthly US dollars country stock market indices, sourced from Morgan Stanley Capital International (MSCI). As all returns are denominated in US dollars, we use the yearly average of the monthly return on US Treasury bills as a proxy for the risk free rate for all countries. One of the fundamental assumptions of using the historical risk premium as a proxy for the expected risk premium is that the long term average premium is mean reverting. Although this measure may be prudent for the developed markets where long historical data are available, yielding a lower degree of standard errors, the same luxury could not be accorded for most of the emerging markets which have a relatively shorter history of stock return data. We address this issue by employing alternative average risk premium measures as discussed in the following sections.

4.2.2 Sovereign credit-risk rating measures of cost of capital

As noted above, the disadvantage of using a historical equity risk premium measure, particularly for emerging markets, is that it may yield a higher degree of standard errors, owing to the shorter history of the data used. As such, following the existing literature, we use two additional proxies based on sovereign country credit risk ratings. The first is the proxy of implied cost of capital, estimated using the sovereign credit ratings and is denoted as *rCred*. The second is Damodaran's (2012) country risk premium which is based on sovereign default spread, but adjusted for relative risk of equity versus bond markets' expected return. We denote it as *CERP*. In this section we describe the first measure (*rCred*), followed by the description of the second (*CERP*) in Section 3.1.3.

Following Jewel and Livingston (1998), for each country we use sovereign bond risk rating, denominated in foreign currency, as the proxy of implied cost of capital. The basic idea is that sovereign country credit ratings display fundamental forward looking information on country's risk and, unlike expected return measures based on historical data, do not suffer from the noise of past shocks to a country's growth opportunities. Previous studies show that country credit-risk rating, highly correlates with implied cost of capital, and thereby, could be used as an alternative proxy of cost of capital. For instance, Hail and Leuz (2006) find the sovereign credit ratings measure is highly and significantly correlated (the average correlation coefficient being 0.64) with implied cost of capital. Further, Bhattacharya and Daouk (2002) also suggest that country credit rating is a reliable proxy for *ex ante* risk exposure, particularly for segmented emerging countries. We obtain country credit-risk

ratings of 10-year local currency denominated sovereign bonds from Damodaran's website. Following Reeb et al. (2001) we convert the qualitative credit ratings into numerical values, based on a scale of 1-22. We assign a value of 1 to *AAA=1, AA+=2, AA=3*….all the way to *D=22* and take their natural log into our regressions. We expect a positive (negative) association between *rCred* and home bias (foreign bias) in our estimations.

4.2.3 Country equity risk premium

As an alternative proxy, we employ the country equity risk premium ($CERP$) constructed and maintained by Damodaran (2012). The $CERP$ measure follows the concept of demanding incremental CERP for investing in a particular market, relative to a matured market as a base country. Damodaran uses the United States as the base country and S&P 500 as the representative stock market. For each country the incremental premium, relative to the base country which reflects the additional country risk premium, is computed by taking the default spread (over the base country) following Moody's risk ratings of sovereign bonds in local currency. The resultant premium is subsequently scaled by the ratio of the country's equity market volatility to bond market volatility. For instance, in calculating the equity risk premium for Brazil, Damodaran first determines the default risk premium spread of a 10-year local currency denominated government bond, over the 10-year US sovereign bond. The resultant premium is subsequently adjusted for the additional risk of the equity market by scaling it with the ratio of standard deviations of Brazil's equity to bond market. The standard deviations of the bond market are estimated, using returns on the 10-year sovereign bonds and those of the local equity market using the national stock index, e.g. Bovespa for Brazil. For more detail see Damodaran (2012).

4.2.4 Dividend Yield

Following its extensive use in the existing literature (see Bekaert and Harvey, 2000; Lau et al. 2010) we employ dividend yield (DY) as an additional proxy of cost of capital. Within the framework of the capital asset pricing model, Lau et al. (2010) suggest that dividend yield is a stable and easily measurable proxy of cost of capital. Furthermore, Bekaert and Harvey (2005) also show that, relative to historical realised returns, dividend yield is a better proxy of cost of capital, particularly for emerging markets where returns are relatively more volatile than those of their developed counterparts. We obtain DY measures for all countries from Thompson Reuters and World Federation of Exchanges.

4.2.5 Control variables

Following the extant literature we use a number of control factors which could potentially compete with our measure of home and foreign bias measures. Although a host of controls are suggested, not all have been shown to have the expected sign on country level cost of capital measures (See Lau et al. 2010). With the view of mitigating omitted variable bias, we use market capitalisation (*MKTCap*) as a proxy of size, market beta (*Beta*) to capture the basic CAPMs systematic risk, book-to-market (*BM*) ratio, one year lagged stock performance (*Retn_1*) to control for momentum effect, exchange rate risk (*Exch*), expected inflation (*Infl_1*), turnover ratio (*Turn*) as a measure of liquidity, stock market integration (*LSMI*), real gross domestic product growth (*RGDPG*), rule of law (*Law*) for variations in legal institutions, country political risk (*PolRisk*), macro-economic risk (*EconRisk*) and macro-financial risk (*FinRisk).*

Following Kang and Stulz (1997), we employ the log of market capitalisation (*MKTCap*) in USD millions to control for the size and information of the market. Hail and Leuz (2005) note that a larger stock market provides more transparent information which could potentially reduce information costs and, hence, lower cost of capital. We expect *MKTCap* to be negatively related to cost of capital measures. *ICAPM* predicts a positive association between a firm's beta and risk premium. We compute beta for each market as the covariance of the *MSCI* country index return with *MSCI* All Country World index return, using monthly figures for the past five years. The resulting covariance is then divided by the variance of *MSCI* world index return. Following Gebhardt et al. (2001), we use book-to-market ratio (*BM*) to capture differences in growth opportunities. High *BM* captures lower growth opportunities, lower accounting conservatism, and high perceived risk. We calculate *BM* as the log country level ratio of book-to-market. We construct the total country level book value, by adding the constituents of each market and scale it by the total market capitalisation. We source the book value figures from Worldscope.

Consistent with Jegadeesh and Titman (1993), we use the previous year's stock performance (*Retn_1*) to capture the momentum effect on the cost of capital. We measure *Retn_1* as the average *MSCI* monthly index return over the past year. We further employ one year lagged inflation risk (*Infl_1*) to control for macroeconomic effect. We control for inflation (*Infl_1*) to ensure our analysis is not driven by variations in expected inflation rates as Brandt and Wang (2003) present evidence that equity risk premium is positively related to the inflation rate. We

obtain one year lagged annual inflation rates for each country from *WDI*. To control for the correlation between exchange return and equity return *(Exch),* for each country we compute a three-year moving average covariance between the monthly stock market index return and the monthly depreciation of the domestic currency with respect to the dollar. The exchange rates are sourced from Thompson Reuters (see Adler and Dumas, 1984).

It is well established in the literature that investors demand liquidity premium for investing in markets with different levels of liquidity (see Jones, 2003; Gibson and Mougeot, 2004; Bekaert et al. 2006; Chordia et al. 2011). We control for market liquidity using the turnover (*Turn*) ratio obtained from *WDI*. Earlier studies (Bekaert and Harvey, 1995; Chan et al. 2005) argue that trade openness may drive the cost of capital. As such, we further control for stock market integration (financial and economic) on the cost of capital by using the log average of a country's annual exports and imports, scaled by *GDP* (*LSMI*). We also expect that countries with higher economic growth would attract foreign investors, implying global potential risk-sharing, owing to growth-reputation, which may reduce the cost of capital. We control for economic growth using the real gross domestic product growth (*RGDPG*) sourced from *WDI*.

La Porta et al. (1998) argue that countries with sound and effective legal systems protect outside investors from expropriation risk. We use the International Country Risk Group (*ICRG*) rule of law and order (*Law*) index (0-6) to capture the variations in the quality and observance of legal rules. We obtain the data from Political Risk Services Group's country risk ratings. Further, studies such as that of Erb et al. (1996), also note that differences in country risk ratings may influence equity returns. Following Erb et al. (1996), we use the extensively employed three broad country risk measures, i.e. Political risk (*PolRisk*), economic policy risk (*EconRisk*) and financial policy risk (*FinRisk*) to control their effect on the cost of capital.

The objective of the broad country risk ratings is to provide a common but forward looking platform for assessing the political, economic and financial policy stability in countries covered by ICRG. The *political risk rating* is rated on a scale of 0-100 and comprises 12 components, rated on the basis of pre-set questions for each component. The *political risk rating* captures issues such as, government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tension, law and order, ethnic tensions, democratic accountability and bureaucratic quality. The

economic policy risk is measured on a scale of 0 (low) to 50 (high), incorporates five potential sources of economic risk (GDP per head, Real GDP growth, inflation rate, budget balance as a percentage of GDP, and current account as a percentage of GDP). The *financial policy risk* measure which ranges between 0 (low) and 50 (high), captures five potential sources of financial risk components (foreign debt as a percentage of GDP, exchange rate stability, foreign debt as a percentage of total export and services, current account as a percentage of exports and services, and international liquidity). For all the broad country risk measures, the annual average based on the monthly ratings is used in this study. For further details on the methodology see ICRG (2012).

4.3 International portfolio investment and stock market development

In order to test the effect of home and foreign bias on stock market development hypotheses, we adopt four variables widely used in finance and economic literature; for instance, (Levine and Zervos, 1996; Demirguc-Kunt and Maksimovic, 1996; and Chan et al. 2005) to proxy for stock market development. We also provide the relevance and problems using these proxies. The stock market development measures include market capitalisation as a percentage of GDP (*MGDP*), stock value traded as a percentage of GDP (*TRGDP*), stock turnover ratio (*TURN*) and, finally, transaction cost (*TRCOST*). Our second empirical study focuses on the impact of home and foreign bias on stock market development.

4.3.1 Market capitalisation as a percentage of GDP

The first measure we use as proxy of stock market development, is the ratio of market capitalisation to gross domestic product (*MGDP*). This proxy captures the size and importance of the stock market relative to the entire economy and the extent to which investors can diversify risk. Large stock markets may not function well, and taxes may also inhibit companies from listing. La Porta et al. (1998) demonstrate that *MGDP* captures the breadth of the market, as well as the importance of the stock market in the economy. Levine and Zervos (1996) argue that large size stock markets do not necessarily function effectively, as taxes may distort the incentive to list on the stock exchange. Several studies, for instance (see Levine, 1997; Rousseau and Wachtel, 2000; Durham, 2004), use *MGDP* as an indicator of stock market development. The latter measure also captures the size and market diversification prospect of a country's stock market. A number of studies (La Porta, 1997, 1998, 2000) use this measure as an indicator of market development under the assumption

that stock market size is positively correlated with the ability to mobilise capital and diversify risk. We use this measure under the assumption that this proxy is less arbitrary than other individual measures of stock market development.

4.3.2 Stock value traded as a percentage of GDP

The second stock market development proxy we use is stock value traded during the year as a percentage of GDP (*TRGDP*), which is referred to as the value traded ratio. This proxy is used to complement the market capitalisation to GDP measure as bigger markets may not necessarily be the most active market. *TRGDP* captures stock market liquidity but it does not capture trading cost or the uncertainty that drive trading on a particular market. *TRGDP* positively captures liquidity on the economy. Market capitalization and value traded ratios provide further information about the country's stock market than using a single measure. *TRGDP* is not a direct measure of trading cost or the uncertainty associated with trading on a particular exchange. Although *TRGDP* may not be a direct measure of microstructural sophistication, studies (Levine, 1991 and Bencivenga et al. 1996) motivate the use of value traded to GDP as an indirect measure of liquidity, particularly reflecting liquidity level relative to the size of the economy.

4.3.3 Turnover ratio

The third proxy for stock market development is turnover ratio, which we use to capture the degree of trading activity of the stock market, as some stock markets may be large and inactive. Bekeart and Hodrick (2009) document that market turnover is used as a proxy of liquidity. Other studies suggest that, it is used as an indicator of the rate at which information arrives in the market, that instigates trades and is also related to costs of trading equities because high trading costs cause investors to trade less (see Levine and Zervos, 1998; Amihud and Mendelson, 1986 and Bekeart and Hodrick, 2009). Large stock markets do not indicate liquid market, as a large but inactive market will have large market capitalisation, but small turnover ratio. High turnover ratio indicates low transaction cost. Turnover reflects the ability to trade equity easily and is important to the market by easing tension and providing an asset to savers who can quickly and inexpensively sell when required. Kyle (1984) and Holmstom and Tirole (1993) argue that a liquid stock market can increase incentives for investors to obtain information about firms and improve corporate governance. Turnover ratio does not directly capture the theoretical definition of liquidity. A large but inactive stock market will have a large market capitalisation ratio but small turnover ratio. Whilst value

traded ratio reflects trading relative to the size of the economy, turnover ratio captures trading relative to the size of the stock market. Consequently, it shows that a small and liquid stock market will have a high turnover ratio but a small value traded ratio. Price effect, influences the value traded. To gauge the price effects, we use *TURN* to capture liquidity and is the inverse of transaction cost. High *TURN* implies low transaction cost. Following Demirguc-Kunt and Maksimovic (1999), Megginson et al. (1994), and Boehmer et al. (2005), we measure turnover ratio as the value of stock traded as a percentage of stock market capitalisation, as price affects value traded and market capitalisation.

4.3.4 Transaction cost

Both the above measures of liquidity are indirect factors of market microstructure. We also employ a relatively direct measure of market liquidity, which shows how costly it is to undertake a trade at an average value in a particular market. Transaction costs play a substantial role in shaping the return profile of an investment given a certain level of risk. Solnik and McLeavy (2004) show that transaction cost may materially reduce expected returns and hence potential benefits of diversification. As higher transaction costs are a drain on the expected returns of portfolio, markets with lower transaction cost should attract more investors, relative to markets with higher transaction costs.

Following Chan et al. (2005) and Thapa and Poshakwale (2010), we use a composite measure of market level transaction costs (in basis points), incorporating three different sub-components of costs related to equity trading.[41] These country level yearly trading cost figures are estimated and maintained by Elkins/McSherry (E/M) and reported in the yearly global stock market fact book of *Standard and Poor (S&P).* E/M provide analyses of the global trading costs for 150 global institutions (pension funds, investment managers, banks and brokers) by showing estimates of the country level transaction cost figures for international investors. E/M's estimates of market level transaction cost, based on an average transaction in USD, are generated by aggregating three sub-components.

The transaction cost has three components: commission, fees, and market impact. Solnik and McLeavy (2004) show that investors pay commission to brokers for access to brokerage research facilities and services. Investors pay fees for accessing extra services, which include

[41] These are the only aggregate country level proxies for average transaction cost measures sourced from the literature and are available for country level studies in the panel data framework.

post-trade settlement costs. The S&P global stock market fact book (2007) defines market impact, as the difference between the price at which a trade is executed and the average of stock's high, low, opening and closing prices during the trade. In other words, the market impact indicates the influence that large investors, for instance, institutional investors have on stock prices when they purchase or dispose of equity. It is measured as the change in price, divided by the volume of trade.

4.3.5 Control variables

We control for several factors which may have a possible effect on stock market development. Existing literature shows that stock market development is impacted by portfolio flow (*Flow*), savings (*Sav*), private credit (*PCred*), exchange rate (*Exch*), expected inflation (*Infl*), interest rate (*Int*), one year lagged stock performance (*Retn_1*) to control for momentum effect, stock market integration (*LSMI*), gross domestic product per capita (*GDPPC*). We use market capitalisation (*MKTCap*) to capture price effect and law and order (*R_Law*). We use legal origin (*Legal_O*), financial risk (*FinRisk*), and corruption (*Cor*) to allow for variations in institutional quality. We briefly discuss the economic rationale for including these variables in the model.

First, we use *Flow* to capture the extent of flow of foreign direct investments on stock market development, which reflects the degree of capital flows restrictions imposed by a country. Foreign investors are more likely to make direct investments in countries where stock markets are subject to less investment controls on foreign direct investments, and will thereby improve stock market development. For example, Errunza and Rosenberg (1982), show that foreign capital inflows have a positive effect on stock market development. We measure *Flow* as the logarithm of net foreign direct investment as a percentage of GDP. We obtain data from World Bank Indicators (WBI) of the World Bank.

The second control variable is savings (*Sav),* and it reflects the degree to which savings impact on stock market development, as investments are driven by the mobilisation of domestic financial resources. The positive effect of domestic saving on investment is corroborated by Obstfeld and Rogoff (2000). Countries with high levels of savings, experience a greater level of capital flows for investment, which leads to high stock market development. For instance, Garcia and Liu (1999) demonstrate that macroeconomic variables such as the savings rate have a positive impact on stock market development. We measure

Sav as the natural logarithm of a country's gross domestic savings and we expect a positive association with stock market development. We source annual data from World Bank Indicators of the World Bank.

The next control variable is private credit (*PCred*). We use *PCred* to capture financial intermediary development and the activity of commercial banking to provide domestic long-term finance to the private sector (see Bekaert et al. 2005; Claessens et al. 2006). Private credit refers to financial resources provided to the private sector such as: loans, purchase of non-equity securities, trade credits and other accounts receivable that establish a claim for repayment. We expect *PCred* to be positively related to stock market development. Following King and Levine (1993a) and Beck et al. (2000a), we calculate *PCred* as domestic credit to the private sector scale by GDP. We access the data from World Bank Indicators.

The next three control variables we include in the model capture macroeconomic stability. Existing studies, for instance Boyd et al. (2001), demonstrate that macroeconomic stability influences stock market development. Countries with macroeconomic stability will attract significant investors to participate in the stock market, and thereby, help with stock market development. A better macroeconomic environment leads to financial development (see Bencivenga and Smith, 1992; Huybens and Smith, 1999). We use these three indicators: interest rate (*Int*), exchange rate exposure (*Exch*) and one year lagged inflation risk (*Infl_1*) to control for macroeconomic effect on stock market development. Billmeier and Massa (2009) argue that countries with poor domestic economic fundamentals, force investors to use international markets more extensively and have therefore, been blamed for capital flight. Better macroeconomic fundamentals boost domestic investors' confidence and willingness to participate in the stock market, which generates more savings for investment. Boyd et al. (2001) note that, macroeconomic stability promotes stock market development.

High interest rates force investors to reduce their investment in equity, and participate more in bonds and savings with financial institutions, than investment in equity. If companies borrow at high interest rates to expand business, it will increase cost of debt. This can reduce companies' profit and dividend payments, which will result in the reduction of the share price, thereby reducing market capitalisation. We expect real interest rate (*Int*) to be negatively related to stock market development. Exchange rate exposure captures the risk associated with foreign country equity investment. Countries with stable exchange should

experience higher flow of foreign investment, thereby improving stock market development. Following Lau et al. (2010), we construct exchange rate (*Exch*) exposure for each country as a three year moving average covariance of the monthly stock market index return, with the monthly depreciation of the domestic currency with respect to the dollar. The exchange rates are sourced from Thompson Reuters (see Adler and Dumas, 1984). If stock returns correlate with exchange rate changes, stocks are implicitly exposed to the exchange rate risk.

We control for inflation (*Infl*) to ensure our analysis is not driven by variations in expected inflation rates, as inflation suggests high consumer prices. This usually slows sales and reduces companies' profit. High inflation leads to high interest rates as the Central Bank will raise interest rates to reduce inflation. The high levels of inflation will bring down stock prices and thereby reduce market capitalisation and value traded. Brandt and Wang (2003) present evidence that equity risk premium is positively related to inflation rate. Stable and moderate inflation levels reflect macroeconomic stability. High levels of volatility of the price will lead to high degrees of uncertainty in stock markets and less incentive for investors to trade in stock markets. The Fisherian hypothesis suggests that the rate of return on equity moves with the rate of inflation. Expected rate of return on equity, consists of real returns, plus the expected rate of inflation. Real return does not move systematically with the rate of inflation. Equity investors will, on average, be fully compensated for the erosion in purchasing power. However, Nelson (1976) and McCarthy et al. (1990) find a negative relation between stock returns and inflation.

Next, we control for return momentum (*Retn_1*). The economic reasoning is that, past positive return will encourage momentum investors to buy more equity, leading to stock market development. Investors are momentum traders or return chasers and they base their equity investment decisions on stock markets' past performance. Investors are more likely to invest in the stock market when past returns are high, which leads to stock market development. Following Jegadeesh and Titman (1993), we use the preceding year's stock performance (*Retn_1*) to capture the momentum effect on stock market development. Consistent with Bohn and Tesar (1996), we expect *Retn_1* to have a positive effect on stock market development.

We use log stock market integration (*LSMI*) to capture the marginal effects of the degree of trade openness on stock market development. Existing literature shows that trade openness

positively drives stock market development (see Bekaert and Harvey, 2000; 2003; Edison and Warnock, 2003; Henry, 2000b; Kaminsky and Schmukler, 2003; Kim and Singal, 2000; Do and Levchenko, 2004; Huang and Temple, 2005). We calculate stock market integration, by using the natural logarithm average of a country's exports and imports scaled by GDP. Earlier research by Bekaert and Harvey (1995) incorporates time-varying measures of market integration.

Drawing from the existing literature, for instance Bartram and Dufey (2001) who suggest that economic growth and development relate positively to stock market development, we use gross domestic product per capita *GDPPC* to capture income level and overall economic development. With a better economic outlook or higher expected GDP growth with the expectation of economic expansion, stock prices may rise. Investors may buy more stocks with the expectation of future profits and higher prices. If the economic outlook is uncertain, investors may reduce their investment, which reduces market capitalisation. Levine (1997) finds that stock markets tend to develop as income per capita increases and institutional environment improves. We expect income to have a positive effect on stock market development. Annual data is obtained from World Development Indicators. We use market capitalisation (*MKTCap*) to capture price effect on firm size, which are also included as a risk proxy that could explain cross-country variation in stock returns (see Fama and French, 1992; 1993). Evidence shows that *MKTCap* has a positive impact on stock market development. We measure *MKTCap* as the logarithm of a country's previous fiscal year-end market capitalisation.

We control for institutional quality, as it may influence stock market development. Quality institutions have sets of rules, practices and norms that shape social and political interactions. Better institutions are linked to more transparent, less corrupt, good governance, better protection of the minority investors and property rights. This subsequently improves investor confidence and thereby leads to stock market development. Karolyi (2004) shows that poorly functioning stock markets, are a result of weak political, legal and other institutional factors. Literature on capital flight suggests that when institutional weakness persists in a country, as argued by Collier et al. (1999), Schineller (1997) and Sheets (1996), domestic investors tend to invest a greater proportion of their investment abroad, which adversely affects stock market development. Domestic investors may be inclined to avoid poor domestic institutional environments and invest in foreign countries where there is better protection of investors.

Weak domestic institutional environments negatively affect stock market development, whilst improved institutional fundamentals, both explicitly and implicitly, positively impact on stock market development. Legal and institutional environments have been found in the existing literature, to have effects on stock market development (Beck et al. 2003; La Porta et al. 1997; 2000a, b; Pistor et al. 2000). We use rule of law (*R_Law*) to capture institutional quality.

Furthermore, we use legal origin (*Legal_O),* financial risk *(FinRisk)* and corruption (*Cor)* to capture institutional quality effects on stock market development. Existing studies suggest that countries with better legal institutions relate to efficient stock markets (see Lombardo and Pagano, 1999; La Porta et al. 1998; Demirguc-Kunt and Maksimovic, 1998). Ergungor (2008) argues that countries with efficient judicial systems have a positive influence on stock market development. La Porta et al. (1997) argue that the type of legal regime is a good proxy for the degree of investor protection and investors may be reluctant to invest in markets with a poor legal system and high rates of corruption. For instance, La Porta et al. (2002) demonstrate that well-functioning legal institutions lead to higher share prices.

Following La Porta et al. (1998), we use *Legal_O* to control for the type of legal origin on stock market development. La Porta et al. (1998) show that countries with common law legal origin, experience higher levels of investor protection than civil law origin countries. Civil law countries have more concentrated investors, and the underlying assumption is that better shareholder protection will improve stock market development. Shleifer and Vishny (1997) argue that better investor protection reduces the extent of expropriation by corporate insiders, and thereby improves stock market development.

We employ financial risk *(FinRisk)* policy measure of ICRG to capture a country's ability to meet its debt liability. We expect *FinRisk* measure to have negative impact on stock market development. We expect high *FinRisk* to reduce investors' confidence in the economy and will thereby reduce their participation in the stock market. Investors will sell their shares which will in turn, lower share price, and thereby adversely market capitalisation. Karolyi (2004) argues that growth of ADR in emerging countries is the consequence of poor functioning stock markets, which thereby create incentives for firms to leave.

Finally, we use corruption (*Cor*) to capture country-level institutional quality in preventing corrupt practices.[42] Corruption exposes equity investors to the risk of expropriation through insider trading and economic mismanagement by corrupt government officials. The prevalence and persistence of corruption will reduce investors' participation in the stock market, which will reduce stock market development. Lombardo and Pagano (2000) demonstrate that corruption negatively relates to stock market development. Bekaert et al. (2005) suggest that corruption inhibits the economic and financial environment and reduces the efficiency of government and business by enabling people to assume positions of power through political patronage, rather than ability. We expect corruption to have a negative effect on stock market development. We source annual corruption data from ICRG.

4.4 International portfolio investment and investor protection

Data on governance are available from several sources which are mainly based on surveys. The study employs four measures of investor protection standards or governance indicators constructed by World Governance Indicators (WGI) for the period 2001-2010. The data captures three components of investor protection. First, the legal rights granted to minority investors. Second, the enforcement component, which captures the quality of a country's institutions in determining the extent investor's rights are respected and enforced. Third, the sound business and institutional environment in which corporations operate to create value for shareholders. Since 1996, WGI has employed data from 31 sources, including the Economist Intelligence Unit, Global Insight and Political Risk Services to provide six broad dimensions of governance indicators for 215 countries. WGI constructs the governance measures by averaging together data from several underlying sources that correspond to the concept of governance we seek to capture. WGI's careful construction of the measures, its worldwide coverage, and the suggestions that the data achieves maximum precision, makes the data very attractive.

The WGI dataset have widely been used in existing studies (see Knack, Kugler and Manning, 2003; Neumayer, 2002; Apodaca, 2004; Hart et al. 2005; Llamazares, 2005; Andres, 2006; Das and Andriamananjara, 2006; Jung, 2006; Liu and San, 2006). Other studies use the data to examine the association between governance and growth (see, for instance, Kaufmann et

[42] Studies show that better legal and institutional environments have positive effects on stock market development (see Beck et al. 2003; La Porta et al. 1997; 1998; 2000; Pistor et al. 2000).

al. 2002; Dollar and Kraay, 2003; Kaufmann and Kraay, 2003; Naude, 2004; Me´on and Sekkat, 2005). We focus on four governance indicators which capture the concept of our study which relate to investor protection; government effectiveness, rule of law, regulatory quality, and control of corruption. WGI data have the advantage of being constructed from aggregate information from various sources, which probably makes it contain less measurement error than other governance data sources. Kaufmann et al. (1999) argue that other existing governance indicators serve as imperfect proxies as they cover much smaller concepts of institutional quality. The governance measures we use in the study are continuous variables by virtue of averaging three years of an ordered variable which takes discrete values that range from 0 to 100.[43]

4.4.1 Government effectiveness (quality of institutions)

The first investor protection measure we employ is the composite rating referred to as Government effectiveness *(Gov_Eff).* Government effectiveness captures the quality of government policy formulation and implementation, and the credibility of government's commitment to such policies. It reflects the quality of public institutions and the extent to which they are independent from political pressures, which help create and maintain sound business environment to motivate managers and entrepreneurs to maximise firm's operational efficiency and return on investment (see La Porta et al. 1998 and Bekaert et al. 2007). It does so by ensuring corporations conform to investors' interest and expectations by reducing abuse of power, moral hazard and self-serving behaviour of corporate insiders. Specifically, *Gov_Eff* manifests institutional effectiveness and the quality of bureaucracy in protecting both domestic and foreign investors. Institutional effectiveness enables the establishment of management's behaviour monitoring tools, warranting accountability and provision of cost effective protection of minority investors. As such, institutional effectiveness facilitates and stimulates the performance of corporations. Excessive bureaucracy and red tape, hinders business activities, and discourages creativity and innovations in the business environment. Less bureaucracy leads to prompt decisions which effectively allow investors and corporations to easily go about their business.

[43] Most governance literature, for instance, treat corruption measures as a continuous variable which therefore makes it appropriate to use the OLS estimation method (See Brunetti and Weder, 2003).

Gov_Eff is rated on a scale of 0 – 100, with countries scoring low (minimum zero) against this measure, reflects weak institutional quality. Similarly, countries scoring high (maximum 100), indicates bureaucratic strength and expertise to govern without drastic changes in policies or interruptions in the provision of services offered by government.

4.4.2 Control of corruption

Control of corruption *(Con_Cor)* reflects the perception of the extent to which public power employed for private benefit is controlled. Wei (2000) notes corruption[44] reduces the inflow of foreign investment, as it has the same effect as tax. Similarly, Mauro (1995) reports negative association between level of corruption and rates of investment. The prevalence of corruption threatens foreign investments by distorting the economic and financial environment, and lowering the efficiency of government and business activities. Furthermore, as corruption creates an unfavourable business environment, it increases cost of capital for businesses and investors.

WGI measures corruption using variables such as; widespread corruption among government officials, the level of public trust in politicians, corruption between governments and foreign companies, prosecution of public abuse, and the frequency to which companies make extra payments in connection with taxes, customs duty and the judiciary for favour. The WGI measure of control of corruption, ranges from 0 (low control of corruption) to 100 (high control of corruption).[45] Higher values correspond to better governance or investor protection standards.

4.4.3 Regulatory quality

Regulatory quality *(Reg_Qual)* captures the perceptions of governments' ability in formulating and implementing sound policies and regulations that facilitate and promote private sector development. Few of the key factors used in the construction of the measure includes investment and trade freedom, effectiveness of anti-trust policies and the extent to which the country's legislation is compatible with, and respected by other countries' legal

[44] The definition of corruption ranges widely from routine tips and quick money to complicated schemes of favour between businessmen and civil servants. Most apparent common form of corruption includes demand for special payments and bribes with regards to import and export licenses, exchange controls, tax assessments, or loans. Corruption is also linked to excessive patronage, nepotism, job reservations, and favour-for-favour, secret party funding, and suspicious close ties between politicians and businesses (see Kaufmann et al. 2010).

[45] Existing studies modelling the causes of corruption are: (Treisman, 2000; La Porta et al. 1999; Fisman and Gatti, 2002; Brunetti and Weder; 2003 and Persson et al. 2003).

system. The prevalence of trade barriers, discriminatory taxes, competition legislation that prevent fair competition and access barriers to the capital markets, exhibit poor regulatory quality. The variable also captures the extent labour and trade regulations affect the growth of business. *Reg_Qual* is constructed on a scale of 0 to 100, with a higher score reflecting better quality of regulatory environment in which private businesses and investments, including foreign investments, compete in a free and fair atmosphere.

The careful construction of regulatory quality by WGI consists of an investment profile data compiled by the Political Risk Services Group (PRS) which are determined by PRS on the assessment of three sub-components of political risk: contract viability or risk of expropriation, payment delays, and repatriation of profits (see Bekaert et al. 2007).

4.4.4 Rule of law

Rule of law *(Rule_Law)* captures the perception of the extent to which agents' exhibit confidence and abide by the police and courts, particularly quality of contract enforcement, property rights, protection of financial assets and intellectual property. *Rule_Law* also captures the independence of the judiciary and fair administration of justice. In case of foreign investors, an impartial judiciary and, enforceability of contracts and court orders should assist them in pursuit of judicial recourse when their interest is unlawfully affected. WGI employ data from several sources to construct the rule of law measure including factors such as timeliness of the judicial decisions, efficiency of legal framework for challenging regulations and equal treatment of foreign investors before the law as compared to domestic investors. The *Rule_Law* variable ranges from 0 - 100 with lower score reflecting poor and higher score better rule of law.

4.4.5 Control variables

Following the extant literature, we use several control variables that we expect to drive investor protection standards and also have possible impact on home and foreign bias. Table 8-2, columns (2)-(14) show the average values of 13 country level control variables: (1) market capitalization (*MKTCap)*, (2) past year return (*Retn_1*), (3) turnover ratio (*Turn*), (4) market capitalisation to GDP (*MGDP*), (5) inflation (*Infl*), (6) log stock market integration (*LSMI*), (7) Tobinq, (8) legal origin (*Legal_O*), (9) press freedom (*Press*), (10) political stability (*PolStab*), (11) conflict (*Confl*), (12) education (*Educ*), (13) gross domestic product

per capita (*GDPPC*) for variations in economic development. We provide a brief justification for their inclusion.

First, we employ logarithmic market capitalisation (*MKTCap*) in USD millions to control for size and information effect on investor protection. Countries that have a larger stock market will have the financial resources to demand better investor protection. La Porta et al. (1998) argue that countries that have better laws that protect investors tend to have larger and deeper capital markets. Greater participation in the stock market, suggests that investors are satisfied with the level of investor protection provided to investors, which leads to deeper stock markets. Following Kang and Stulz (1997), we expect *MKTCap* to be positively related to investor protection.

It is conceivable that better past performance or a prosperous stock market will make financial resources available to investors to demand improved institutions and governance. To provide robustness to our analysis, we include the previous year's stock performance (*Retn_1*) to capture the momentum effect, which makes extra financial resources available to investors. For instance, Jegadeesh and Titman (1993) show that firms and countries that experience better returns are associated with good governance systems that protect investors. Giannetti and Koskinen (2010) suggest that stocks have lower expected returns when investor protection is weak.

Next, we use Turnover ratio *(TURN)* and market capitalisation to GDP *(MGDP)* to capture stock market development impact on investor protection. Countries that have well developed stock markets have good institutions. Lau et al. (2010) suggest that countries with better governance tend to have larger stock market capitalisation scaled by GDP. *TURN*, captures market liquidity effects on investor protection. Variations in cross-country investor protection can be explained by stock market liquidity, which captures stock market development. Bekaert and Harvey (2000), and Bekaert et al. (2007) show that stock market liquidity, captures cross-sectional variations in market micro structure.

We control for inflation (*Infl*) to ensure that our analysis is not driven by variations in macroeconomic reforms which may further drive regulatory reforms. Neumayer (2002) suggests that low inflation rate reflects sound economic policies, which have positive effect on good governance. Busse and Groening (2009) argue that inflation captures distortions in

macroeconomic fundamentals, lack policy credibility and poor governance. High inflation rates will make companies and government officials engage in corrupt practices. Low inflation captures improvement in governance and we expect inflation to be negatively associated with investor protection.

The IMF (2005) demonstrates that trade openness relates positively to good governance. Additionally, Rajan and Zingales (2003) provide both theoretical and empirical links between trade openness and institutional development.[46] We, therefore, use the log of stock market integration (*LSMI*) to capture the level of trade openness on investor protection.

We employ *Tobinq* to capture the valuation effect on investor protection. Higher *Tobinq* implies better firm performance and more financial resources to investors to demand good governance. La Porta et al. (2002) provide empirical evidence that higher valuations of firms are associated with countries that have strong investor protection. Studies by Rajan and Zingales (1998), Baker and Wurgler (2000), and La Porta et al. (2000) demonstrate that higher financial resources improve investment protection standards. We employ Tobinq to capture the valuation effect on investor protection.

Coffee (2000) and Johnson et al. (2000b) offer explanations as to why common law countries provide better investor protection than civil law countries. We use legal origin (*Legal_O*) to address the type of a country's legal system or legal origin effect on investor protection. La Porta et al. (2000), Straub (2000), and Chong and Zanforlin (2000) are among those who suggest that common law countries provide better investor protection than civil law countries. Following La Porta et al. (1997), legal origin variable takes a value of 1 if a common law country, otherwise 0.

We use political stability (*PolStab*) and absence of violence (*Confl*) to capture stable countries. Apparently, countries that are politically stable and free from internal/external conflicts, are expected to have quality institutions to enhance good governance and better investor protection. For instance, Busse and Groening (2009) argue that internal and external conflicts have a negative impact on governance and investor protection as stable governments are more accountable. We use political stability (*PolStab*) and absence of violence (*Confl*) to

[46] See Wei (2000), Lafffont and N'Guessan (1999) for the impact of trade openness on corruption.

capture the effect of a stable government on investor protection. We obtained the rating index (0-100) on political stability from WGI with higher values reflecting higher level of stability. For the conflict factor, we use the aggregated index (0-12) of internal and external sub-component ICRG's political risk index, with higher values signifying lower risk of conflicts.

We employ press freedom (*Press*) to capture the effects of free media and free access to information on investor protection. The IMF (2005) shows that countries that allow adequate press freedom have better investor protection and less corruption. Adequate press freedom will allow journalists to report corrupt practices prevailing in a country. Politicians, business leaders, and the judiciary, will be aware of being exposed by the press and will, therefore, act appropriately. Press freedom serves as accountability of politicians in a country, and greater accountability of politicians relates to policies and institutional reforms that are beneficial for the wider economy. Djankov et al. (2001) show a free media and access to information, permits investors to provide checks and balances on each other's activities and government activities. Press freedom takes a value of 100 (high degree of press freedom), 0 (low degree of press freedom). We expect a high measure of press freedom to be associated with better investor protection. We obtain data from WGI and use the subcomponents of voice and accountability.

We use education (*Educ*) to capture human capital and the concept that, a better educated population will have better effective participation in wider processes of decision making and will demand better governance. Alesina and Perotti (1996) demonstrate the positive effect of education on institutional quality. The education effect on investor protection is examined in the works of Glaeser and Saks (2006), and Rauch and Evans (2000). Following La Porta et al. (1999a) and Haider (2009), we measure education as the total number of new entrants in the last grade of primary education, regardless of age, and expressed as a percentage of the total population of the official primary entrance age. We source the data from WDI.

Finally, we use GDP per capita GDP (*GDPPC*) to capture the effect of wealth and economic development on investor protection standards. We expect countries that have a high income level to have sufficient financial resources to establish strong institutions and to hold government accountable to provide better investor protection. Busse and Groening (2009) use real growth per capita GDP to capture the effects of financial resources in enhancing good governance. Bonaglia et al. (2001) suggest that the level of a country's economic

development influences the cultural attitudes towards investor protection and the resources that may be devoted to monitor public officials. Empirical studies by Gelos and Wei (2005) show that better investor protection is associated with a high level of economic development. Bris and Cabolis (2004) also note that better investor protection exists in countries that experience high economic development. La Porta et al. (1998) establish that gross domestic product per capita determines investor protection. We expect income level to have positive effect on investor protection standards. We obtain the data from WDI.

4.5 Summary of data

Table 4-1: Data description and sources

First Empirical Study: International Portfolio Investment on Cost of Capital: Dependent Variables

Abbreviations	Variables	Description	Source
HRRm	Historical realised return of the market	The historical average of excess country equity market return over the risk free rate. The yearly average stock market returns are computed using the monthly US dollars country stock market indices.	Obtained from Morgan Stanley Capital International (MSCI)
CERP	Country equity risk premium	Country equity risk premium	Constructed and maintained by Damodaran (2012)
rCred	Sovereign credit rating	Natural log of Sovereign bond risk rating, denominated in foreign currency, as the proxy of implied cost of capital. We convert the qualitative credit ratings into numerical values based on a scale of 1-22.	We obtain country credit-risk ratings of 10-year local currency denominated sovereign bonds from Damodaran's website
DY	Dividend yield	Dividend yield calculated as the total amount of dividend yield for a country as a percentage of a country's stock market capitalisation.	We obtain DY measures for all countries from Thompson Reuters and World Federation of Exchanges
Second Empirical Study: International Portfolio Investment on Stock Market Development: Dependent Variables			
MGDP	Market capitalisation as a percentage of GDP	Constructed as the log ratio of market capitalisation as a percentage of GDP to capture the breadth of the market as well as the importance of the stock market in the economy.	World Bank's World Development Indicator
TRGDP	Stock value traded as a percentage of GDP	Stock value traded as a percentage of GDP to complement the market capitalisation ratio and the trading activities of firm's shares.	World Bank's World Development Indicator
TURN	Turnover ratio	Turnover ratio as the value of stock traded as a percentage of stock market capitalisation.	World Bank's World Development Indicator

TRCOST	Transaction cost	A composite measure of market level transaction costs (in basis points) incorporating three different sub-components of costs related to equity trading: commission, fees, and market impact.	Maintained by Elkins/McSherry and reported in the yearly Standard and Poor Global Stock Markets Factbook.

Third Empirical Study: International Portfolio Investment on Corporate Governance: Dependent Variables

Gov_Eff	Government effectiveness	Government effectiveness composite measure, captures institutional effectiveness and the quality of bureaucracy in protecting both domestic and foreign investors. WGI award 0 (low score) to countries with weak government effectiveness and 100 (high score) to countries that have government effectiveness.	Maintained by World Bank Governance Indicator - World Bank
Con_Cor	Control of corruption	Control of corruption captures the perception of the extent to which public power is employed for private benefit, which includes petty and large scale corruption. The WGI measure of control of corruption ranges from 0 (low control of corruption) to 100 (high control of corruption).	Maintained by World Bank Governance Indicator - World Bank
Reg_Qual	Regulatory quality	Regulatory quality captures the perceptions of how governments formulate and implement sound policies that promote private sector development and aid foreign investors to control in domestic countries. WGI use data from several sources to construct the regulatory quality measure, which ranges from 0 (low) to 100 (high).	Maintained by World Bank Governance Indicator - World Bank
Rule_Law	Rule of law	Rule of law captures the perception of the extent to which investors have confidence in a country's judicial system. Impartiality of the judiciary, enforceability of contracts and court orders. The rule of law variable, ranges from 0 (low score) to 100 (high score).	Maintained by World Bank Governance Indicator - World Bank

All Three Empirical Chapters: Key Independent Variables

CPIS_HB	Home bias	Equity home bias (CPIS_*HB*) captures the degree to which local investors in country *l* over-allocate their local equity market relative to the theoretical suggestion of ICAPM benchmark. It is	Co-ordinated Portfolio Investment Survey of International Monetary Fund and Standard and Poor Global Stock Markets Factbook

		constructed as $EHB_{lt} = \log\left(\frac{W_{llt}}{W_{lt}^{*}}\right)$ where W_{llt} represents domestic investors' allocations in the domestic equity market of country l for the period *t*, W_{lt}^{*} is the ICAPM suggested benchmark allocation for country *l* for time period *t.*	
CPIS_FB	Foreign bias	Equity foreign bias *(CPIS_FB)* implies the disproportionate allocation of investors domiciled in country *k* into the foreign securities of countries *l.* We calculate the equity foreign bias as $EFB_{klt} = \log\left(\frac{W_{klt}}{W_{klt}^{*}}\right)$, where w_{klt} is the allocation of investors in country *k's* in equities issued by firms in country *l* for the period *t*, W_{klt}^{*} is the ICAPM suggested benchmark allocation for country *l* for period *t.*	Co-ordinated Portfolio Investment Survey of International Monetary Fund and Standard and Poor Global Stock Markets Factbook
GF_FB	Global fund foreign bias	Foreign biases based on EPFR Global Funds' data are denoted as GF_FB. We take the average equity foreign bias (AFB_{jt}) exhibited by all source country investors (*k=1…..n*) for the country l for each period t as $AEFB_{lt} = \frac{\sum_{k=1}^{n} EFB}{n}$ $k \neq l$, excluding the country for which foreign bias is measured, $k \neq l$.	Unique fund level country allocation data from Emerging Portfolio Fund Research (*EPFR)* to create the global fund's foreign bias (*GF_FB*) measure

Control Variable for the three empirical studies

MKTCap	Market capitalization	The natural logarithm of market capitalisation (MKTCap) of listed companies in USD millions.	Standard and Poor Global Stock Markets Factbook; and World Bank's World Development Indicator
Beta	Beta	Beta is the covariance of the MSCI country's world index return over the past five years divided by the MSCI world index return variance.	Morgan Stanley Capital International (MSCI)
BM	Book to market	BM is the natural logarithm country level ratio of book-to-market; Retn_1 is the average MSCI monthly index return over the past year.	Morgan Stanley Capital International (MSCI)
Retn_1	Return	The average MSCI monthly index returns over the past year.	Morgan Stanley Capital International (MSCI)
Exch	Exchange rate	Three year moving average covariance of the monthly stock market index return with the monthly change of the domestic	Sourced from Thompson Reuters

		currency with respect to the dollar.	
Infl	Inflation	The one year lagged rate of annual inflation based on the consumer price index.	World Bank's World Development Indicator
Turn	Turnover	The ratio of the total traded volume of stock in a year divided by market capitalisation.	World Bank's World Development Indicator
LSMI	Log stock market integration	The log stock market integration measured as the ratio of a country's annual exports plus imports divided by GDP.	World Bank's World Development Indicator
Law	Law and order	Law represents the law and order rating index of a country.	Political Risk Services Group's ICRG
RGDPG	Real GDP growth	Real gross domestic product growth.	World Bank's World Development Indicator
PolRisk	Political risk	Political risk rating index of a country.	Political Risk Services Group's ICRG
EconRisk	Economic risk	The economic risk rating index of a country.	Political Risk Services Group's ICRG
FinRisk	Financial risk	The financial risk rating index of a country.	Political Risk Services Group's ICRG
Flow	Flow	The log of net foreign direct investment scale by GDP.	World Bank's World Development Indicator
Sav	Savings	The natural logarithm of a country level gross domestic savings.	World Bank's World Development Indicator
PCred	Private credit	Private credit is the log value of domestic credit to the private financial intermediary denominated in USD.	World Bank's World Development Indicator
Int	interest rate	Real interest rate adjusted for inflation as measured by GDP deflator.	World Bank's World Development Indicator
Legal_O	Legal origin	Dummy variable that takes a value of 1 if a common law country or 0 if otherwise.	La Porta (1998)
Cor	Corruption	Index of corruption prevailing in a country. The prevalence and persistence of corruption will reduce investors' participation in the domestic stock market.	Political Risk Services Group's ICRG
GDPPC	GDP per capita	GDPPC is the GDP Per Capita.	World Bank's World Development Indicator
Tobin's Q	Tobin's Q	*Tobin's Q* is measured as the log market value of equity plus the	Morgan Stanley Capital International and Thompson Reuters

		book value of total assets minus the book value of equity and divided by the book value of total assets of country i.	
PolStab	Political stability	Political instability.	Political Risk Services Group's ICRG
Confl	Conflict	Free from internal conflicts.	Political Risk Services Group's ICRG
Press	Press freedom	Press freedom to capture the effects of free media and free access to information on investor protection. Press freedom takes a value of 100 (high degree of press freedom), 0 (low degree of press freedom).	Maintained by World Bank Governance Indicator - World Bank
Educ	Education	It is measured as the total number of new entrants in the last grade of primary education, regardless of age, and expressed as a percentage of the total population of the official primary entrance age.	World Bank's World Development Indicator

Chapter 5: Methodology

The previous chapter provides the data sources, description of the variables and how they were constructed. This chapter offers the research method and the statistical techniques used in the three empirical analyses. In the research empirical analysis, the study presents a summary analysis of the variables; correlation coefficients, econometric issues, and regression analysis base on pool ordinary least squares (OLS) with a panel modelling.

5.1 Summary analysis

We begin the empirical analysis (in Chapters 6, 7, and 8) with the summary mean statistics of our sample (i.e. the dependent and the key independent variables) constructed on the mean of each country. Equation 5-1 defines how we calculate the mean.

$$\bar{y} = \frac{1}{w}\sum_{j=1}^{n} w_j y_i \qquad 5\text{-}1$$

Whereby $\bar{y}$ is the mean of the variable we are trying to compute, and y_i is the individual observation on y, where $j = 1, \ldots . n$ and n is the sample size, w_j denotes the weight.

We further categorise the sample countries into developed and emerging markets, based on MSCI definition. Finally, we analyse the variables in terms of the top 10 countries exhibiting high levels of home and foreign bias, and the bottom 10 countries with less prevalence of home and foreign bias.

5.2 Correlation analysis

In the main analysis in the empirical chapters, we provide bi-variant Spearman's correlation coefficient to show the relationship between the variables used in the study. Through Spearman's correlation coefficient, we are able to provide an early indication to show whether home and foreign bias have a negative or positive relationship with the dependent variables. The correlation coefficient is given by:

$$\rho_{xy} = \frac{Cov(r_x, r_y)}{\sigma_x \sigma_y} \quad 5\text{-}2$$

5.3 Pooled OLS

Selecting the suitable statistical approach using panel data is important in empirical research to ensure consistent and efficient estimation of the parameters.[47] In this study, we use pooled OLS regression due to the nature of our data, and the use of several time invariant variables that hardly change over time. OLS is the best linear unbiased estimator for the coefficients. The following equation shows the standard linear equation model.

$$y_{it} = a + \beta x_{it} + \varepsilon_{it} \quad 5\text{-}3$$

Where x_{it} denotes K-dimensional vector of the independent variables. The model imposes that the intercept a and the slope coefficients in β are identical for all individuals and time periods. The error term in equation 5-3 varies over individuals and time, which captures all unobservable factors that affect the dependent variable y_{it}. Using pooled OLS to estimate the model requires efficiency and unbiasedness. The following condition must be fulfilled.

$$E\{\varepsilon_{it}\} = 0 \quad 5\text{-}4$$

$$E\{x_{it}\varepsilon_{it}\} = 0 \quad 5\text{-}5$$

Ever since pooled OLS have multiple observations for the same units (countries), it is reasonable to assume that the error terms from different periods will be correlated. For instance, econometric literature shows that, a person's wage will be influenced by unobservable characteristics that vary over time. This will make pooled OLS standard errors calculated, based on the assumption of independently and identically distributed (IID) error terms misleading. Furthermore, pooled OLS is more likely to be efficient, compared to an estimator that exploits the correlation over time in ε_{it}.

[47] Baltagi (2001) suggests three basic approaches (i.e. pooled OLS, random and fixed effects) in examining the relationship within or between each cross section. These approaches can be employ to allow for individual heterogeneity.

In a simple regression model in the empirical corporate finance literature, OLS requires the following important assumptions to produce consistent estimates of the parameters. Gujarati (2003) recommends that, the following important assumptions must be fulfilled when using OLS.

1. Sample observations are randomly on $Y(and\ X_1 \ldots, X_k)$.
   This assumption requires normality, whereby the sample size must be drawn from normal distributed population.
2. Mean zero error term$(i.e., E(u) = 0)$.
   The assumption of independence of error terms suggests that error terms are independent from one another and non-existence of serial correlation.
3. The explanatory variables have no linear relationship (i.e., no perfect collinearity so the rank$(XX) = K, where\ X = (1, X_1, \ldots., X_k)$.
4. There is no correlation between the explanatory variable$(i.e., cov(x, u) = 0\ for\ j = 1, \ldots., K)$. For unbiased estimates of the parameter, there should be an error term with zero mean, conditional on the explanatory variable$(i.e., E(u/x) = 0)$. There is a problem of inference if the error term correlates with each explanatory variable. It is extremely difficult to empirically test whether the explanatory variable correlates with the error term in the regression, as the error terms are unobservable.

Panel data assume $\varepsilon_{it} = a_i + u_{it}$. Whereby it is assumed that u_{it} is homoscedasticity and does not correlate over time. Additionally, the a_i element is time invariant and homoscedasticity across the individual units.

The assumption $E\{x_{it}, \varepsilon_{it}\} = 0$, implies that the observable regressors in x_{it} are uncorrelated with the unobservable characteristics in both a_i and u_{it}, suggesting that the independent variables are exogenous. In many instances, there is reason to believe that $E\{x_{it}a_i\} = 0$, and the assumption is deemed to be very restrictive. We can have the unobserved heterogeneity in a_i to correlate with one or more of the independent variables. For instance, in a wage equation, a person's unobserved ability perhaps could influence wages (y_{it}), but also a person's education level (included in x_{it}). In a firm-level investment equation, unobserved firm characteristics may affect investment decision (y_{it}) as well as characteristics in x_{it} (e.g., cost of capital).

Consistency of OLS requires the error term $(a_i - a + \varepsilon_{it})$ be uncorrelated with x_{it}. Regressing y_{it} on x_{it} in a pooled OLS will yield a consistent estimate of β if the composite error u_{it} in the pooled OLS model $(y_{it} = a + x_{it}\beta + u_{it})$ is uncorrelated with x_{it}. A violation of the OLS assumptions may result in econometric problems such as inefficient, and biasedness in the estimation of the coefficients, caused by autocorrelation, heteroskedasticity, multicollinearity and endogeneity.

Each country has its own individual characteristics that may or may not influence the predictor variables.[48] For example, the political system of a country could have some effect on home and foreign bias. In a pooled OLS context, we use several country explicit, rarely changing variables, such as ICRG's, political, economic and financial risk ratings, to allow for country-specific heterogeneity.

In the next section, we discuss autocorrelation and heteroskedasticity problems associated with pooled OLS, which could compromise the consistency of the coefficient estimation. We further provide detailed discussions on how we test and address these consistency and efficiency issues.

5.4 Autocorrelation and heteroskedasticity standard error correction

We show, in this section, econometric issues that affect the efficiency of OLS in estimating the coefficients. We further perform a series of diagnostic tests to check whether or not our model is appropriately specified. Autocorrelation and heteroskedasticity are efficiency problems that are encountered in panel data as a result of the combination of time series and cross-section data. The occurrence of autocorrelation and heteroskedasticity suggest that the error term in the model is no longer independently and identically distributed. By identically distributed, we imply that the residuals are homoskedastic, indicating that they have been obtained from the same population and have a uniform variance. Similarly, by independently distributed, we mean that they are not clustered or serially correlated. The occurrence of autocorrelation and heteroskedasticity make OLS still unbiased, but OLS is no longer efficient, and therefore yield incorrect standard errors and t-statistics.

[48] The standard econometric technique used in panel data is to control for random and fixed effects. Random effect has the assumption that the individual constant is a group specific disturbance which is similar to the error term, except for each group, whilst the fixed effect assumes that individual constant is a group specific constant term in the regression model (Green, 2007).

$$E\{\varepsilon/x\} = E\{\varepsilon\} = 0 \quad (5\text{-}6)$$

$$V\{\varepsilon/x\} = V\{\varepsilon\} = \sigma^2 \quad (5\text{-}7)$$

The above equations imply that the conditional distribution of the errors, given the matrix of the explanatory variables has zero means, constant variances and zero covariance. It indicates that each error has the same variance and two different error terms are uncorrelated. The assumption indicates $E\{\varepsilon_i/x_i\} = 0$. So the model corresponds to the conditional expectations of y_i given x_i.

When estimating such a model, preferably, we will want the error term to be a pure white noise with $E(\varepsilon_{it}, x_{it}) = 0$. Supposing we have controlled for all the time variant variables, the coefficients are unbiased if the $E(a_i, X_{it}) = 0$ for all i. In such a case, we assume that the intercepts are different for different individuals but they are random drawings from a distribution with mean μ and σ_a^2.

5.4.1 Autocorrelation

Panel data includes repeated observation of the same unit (time series); we can therefore expect a violation of $E\{\varepsilon/x\} = E\{\varepsilon\} = 0$, and experience a situation where there is a correlation of time series with its own past and future values. For instance, the likelihood of tomorrow being rainy, is greater if today is rainy than if today is a dry day.

Autocorrelation occurs when the covariance between several error terms is not equal to zero. This implies that two or more consecutive error terms are correlated. The presence of autocorrelation renders OLS unbiased, but OLS becomes inefficient and the standard errors are estimated incorrectly. Error term captures unobserved factors affecting the dependent variable that the model has not accounted for. The persistence of unobserved errors correlating with each other will result in serial correlation. Our panel data contain multiple observations (i.e. time series data) on countries. Therefore, we can expect different error terms of an individual observation to be correlated. Given the model:

$$Y_{it} = b_0 +_1 x_{it} + u_{it} \quad (5\text{-}8)$$

Autocorrelation indicates a systematic relationship between error terms or the residuals measured at different points in time and results in $Cov(\mu_t \mu_{t-1}) \neq 0$. The systematic relationship will be $\mu_t = \rho\mu_{t-1} + e_t \; -1 <= \rho <= 1$.

This suggests that the current value of the residual is related to the last period's value, together with a current period random component e_t. First-order autoregressive process (AR) is the most popular form of autocorrelation, where the error term in $Y_{it} = X_{it}\beta + \varepsilon_{it}$ and is assumed to depend upon on its predecessor as follows $\varepsilon_t = \rho\varepsilon_{t-1} + V_t$ where V_t is an error term with a mean of zero and constant variance σ^2 that exhibits no serial correlation. This indicates that the value of the error term in any observation, is equal to ρ times its value in the previous observation, plus a fresh component V_t which is independent over time.

Autocorrelation is usually seen as a sign of misspecification and inference based on the OLS estimator will be misleading as the standard errors will be based on an incorrect model specification.

We test for the presence of autocorrelation in our model specification by running the Durbin-Watson (1950) test which is the common test for first-order autocorrelation, especially for small sample distribution. The Durbin-Watson test is given by:

$$dw = \frac{\varepsilon_{t=2}^{T}(e_{t-}e_{-1})^2}{\varepsilon_{t=1}^{T} e_t^2} \qquad 5\text{-}9$$

Where e_t is the OLS is residual (notice the different indices for summations). Straight forward algebra shows that

$$dw \sim_{\sim} 2 - 2p \qquad 5\text{-}10$$

Consequently, a value of dw close to 2, indicates that the first-order autocorrelation coefficient ρ is close to zero. If dw is much smaller than 2, this suggests a positive autocorrelation ($\rho > 0$); if dw is much larger than 2, the ($\rho < 0$). Even under H_0: $\rho = 0$, the distribution of dw depends not only upon the sample size T and the number of variables K in X_t but also upon the actual values of the X_t. It is possible to compute upper and lower limits

for the critical values of dw that depend only upon sample size T and number of variables K in X_t. These values, d_l and d_u, were tabulated by Durbin and Watson (1950)

5.4.2 Heteroskedascity

Linear OLS model is given by[49]

$$y_{it} = \beta_0 + \beta_1 x_{it} + \cdots + \beta_k x_{it} + u_{it}, \quad 5\text{-}11$$

The assumption is that $Var\ (u_i/x_i) = \sigma_i^2$ implying that the variance of the error term is constant.

$$Var(u_i/x_i) = \sigma^2 h(x_i) \quad 5\text{-}12$$

Heteroscedasticity occurs when equation 5-12 is violated i.e. when the variance of unobserved error u_{it}, conditional on independent variables, is not constant. The variance of the error may be a function of independent variables. Where $Var\{u_{it}/x_{it}\}$ is diagonal, but not equal to σ^2 times the identity matrix. It implies that the error terms are mutually uncorrelated, whilst the variance of u_{it} may vary over the cross section observations. Heteroskedasticity means different error terms do not have identical variances, so the diagonal elements of the covariance matrix are not the same. This implies that the error terms in the model are no longer independently and identically distributed.

Verbeek (2012) illustrates a situation where y_i denotes expenditure on food and x_i consists of a constant and disposable income dpi_{it}. An Engel curve for food needs to be upward sloping, thus on average, higher income corresponds to higher expenditure on food. Nevertheless, we can expect the variation in food expenditures among high income households is much larger than the variations among low income households. This occurs when the variance of u_{it} increases with income. The consequences of heteroskedasticity mean that;

1. The OLS estimators remain unbiased and consistent as a result of the fact that none of the explanatory variables correlate with the error term. Therefore, a correctly specified equation will produce coefficient estimates similar to the real parameters.

[49] Wooldridge (2009) provide technical details of the consequences of heteroskedasticity and how Breusch-Pagan test can be run to check the presence of heteroskedasticity.

2. Heteroskedasticity affects the distribution of the coefficient estimates by increasing the variances of the distribution, which thereby makes the OLS estimates inefficient.
3. Heteroskedasticity underestimates the variances of the estimators, which subsequently result in higher values of t and F statistics.

We use a Breusch-Pagan test for heteroskedasticity which is intended to detect any linear form of heteroskedasticity. This identifies the problem of errors that are not IID. The model tests the null hypothesis that the variances of error terms are equal, versus the alternative, that error term variances are multiplicative functions of one or more variables. The alternative hypothesis states that the error variance increases as the predicted values of Y increase, e.g. the bigger the predicted value of Y the bigger the error variance. The null hypothesis of homoskedasticity is given by:

$$H_0: \delta_1 = \delta_2 = \cdots = \delta_k = 0. \qquad 5\text{-}13$$

The basic approach is to adopt a linear function. The Breusch-Pagan test for heteroskedasticity first uses OLS equation 5-14 to estimate the model to obtain the squared OLS residuals (u^2) for each observation in equation 5.15.

$$y = \beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k + u, \qquad 5\text{-}14$$

At the second stage, the model runs the following auxiliary regression and keeps the R-squared from the regression, $R^2_{\hat{u}^2}$.

$$\hat{u}_t^2 = \delta_0 + \delta_1 x_1 + \delta_2 x_2 + \cdots + \delta_k x_k + v, \qquad 5\text{-}15$$

Where v is an error term with mean zero given the x_j, the dependent variable is the square of the error in equation 5-15 i.e. the OLS model.

Finally, the Breusch-Pagan tests the F statistic and calculates the p-value. If the p-value is sufficiently small, that is, below the chosen significance level, then we reject the null hypothesis of homoscedasticity and conclude there is significant evidence of heteroskedasticity.

5.4.3 Multicollinearity

Multicollinearity occurs when two or more independent variables are highly and positively correlated, implying that the coefficient estimates will tend to be highly and negatively correlated. Greater presence of multicollinearity will result in unreliable estimates with large standard errors and unexpected sign or magnitude, suggesting that one, or more, parameter of interest is estimated highly inaccurately. Essentially, it implies that our sample provides insufficient information about the parameters and will, thereby, render confidence intervals for coefficients to be wide and small t-statistics. The coefficients will have to be larger to be statistically significant.

The study uses variance inflation factors (VIF) to test for the presence of multicollinearity amongst the independent variables. Gujarati (2003) suggests that a VIF value of less than 10 is acceptable. However, Hair et al. (1998) and Kennedy (2008) recommend that a VIF exceeding 10 indicates the presence of harmful multicollinearity. The problem of multicollinearity could be resolved by omitting one or more explanatory variables that are highly correlated. Stata automatically removes one or more of the multicollinearity variables.

5.4.4 Newey-West autocorrelation and heteroskedasticity standard error

We perform a linear regression with Newey-West (1987) standard errors that are robust to both autocorrelation and heteroskedasticity. Green (2012) provides technical details on how the correction is made. Standard OLS regression is given by the following:

$$Y_{it} = X_{it}\beta + U_{it} \qquad 5\text{-}16$$

Where in equation 5-12, the variance of (U_{it}) = 0 (Omega). If U_{it} are heteroskedastic and / or auto-correlated, then the correct formula for the Variance ($\hat{\beta}_{OLS}$) is

$$\hat{V}_{ar}\left(\hat{\beta}_{OLS}\right) = (X'X)^{-1}X'\hat{\Omega}X(X'X)^{-1} \qquad 5\text{-}17$$

We use linear OLS regression to estimate the coefficients. A lag (0) suggests the absence of autocorrelation. The Newey-West standard errors are computed, conditional on a choice of maximum lag, whilst the variance estimates are computed using the White robust standard error. They are computed from a distributed lag of the OLS residuals, and specify the longest

lag at which auto-covariances are to be calculated. The Newey-West formula involves an expression in squares of the residuals, which is similar to White's robust standard error formula (as well as a second term in the cross-products of the residuals), these robust estimates subsume White's standard error correction.

For lag $(m), m > 0$, in equation 5-18, the Newey-West is similar to the White formula. However, in equation 5-18 Newey-West add autocorrelation correction to the White formula to compute the variance estimates.

$$X'\hat{\Omega}X_{Newey-West} = X'\hat{\Omega}X_{White} \quad 5\text{-}18$$

$$X'\hat{\Omega}X = X'\hat{\Omega}_0X + \frac{n}{n-k}\sum_{l=1}^{m}(1-\frac{1}{m+1})\sum_{t=l+l}^{n}\hat{e}_t\hat{e}_{t-l}\,(x'_t x_{t-l} + x'_{t-l}x_t) \quad 5\text{-}19$$

Where x_t is the row of the X matrix observed at time t. k is number of predictors in the model, l is time lag, and m is maximum time lag. n is the number of observations.

5.5 Specifications issues

Several econometric issues could result in biased estimates of the coefficients. First, omitted variable bias, whereby the omitted variable in the error term correlates with the explanatory variables. Additionally, a reverse causality can occur where the dependent variable influences the key independent variable of interest. Selection bias is caused by the non-randomness of the sample data. There are others such as measurement error, common-method variance, inconsistent inference, and model misspecification that can bias the coefficients. Nevertheless, we do not experience them in this study. In the following sections, we provide these specification issues and how we addressed them.

5.5.1 Omitted variable bias

More broadly, most international finance variables are based on both public and non-public information, suggesting that a number of variables relevant for international finance are not observable. The inability to observe some variables to appear among the explanatory variables, X, these omitted variables appear in the $\mathcal{U}$. If the omitted variable correlates with

the explanatory variables, then there is an endogeneity problem that causes inference to break down.

The failure of $E(u/x_i, \ldots, x_k) = 0$ renders bias in the OLS estimators; correlation between u and any of $x_i, X_2 \ldots\ldots x_k$ will basically cause the OLS estimators to be inconsistent. If the error is correlated with any of the independent variables, then OLS is biased and inconsistent.

Ordinary least squares can be represented in a regression equation as

$$y_{it} = a_i + \beta x_{it} + \varepsilon_{it} \qquad 5\text{-}20$$

Where y_{it} denotes dependent variable, α_i denotes a constant, βx_{it} denotes the independent variable, and ε_{it} denotes the error term or the unobserved variable, whereby $\varepsilon_{it} = \alpha_i + U_{it}$ .The constant error term includes both observable and unobservable. In several studies, fixed effect or least square dummy variable (LSDV) is used to address unobserved unit (country) effects. In this study, we use several country specific rarely changing variables such as ICRG's, political, economic and financial risk ratings to allow for country-specific. OLS make the assumption that the error term in the basic OLS regression, indicates the independent variables should vary randomly in the prediction of the dependent variable. The prediction will not be random if the error term correlates with an independent variable. It will thereby, render the estimated coefficients biased and consistent. Other causes of omitted bias are caused by omitted fixed effects, and random effects without checking if variables correlate with fixed or constant effects. Economically, unobserved heterogeneity exists if $E(\eta_1/X_{it}, \mathrm{Z_{it}}) \neq 0$. Econometrically, unobservable heterogeneity is a source of endogeneity if the unobservable factors affect either the dependent or the independent variables or both. Failing to include important control variables which correlate with the key independent variables, will make the estimated coefficients biased and inconsistent. We include several control variables to address potential omitted variable bias. For instance, in corporate governance literature, the effects of managerial ability, which is generally difficult to quantify, much less observe, definitely affect performance. Therefore, an OLS regression of performance on board structure, that ignores the unobservable heterogeneity, may find a negative relationship between board independence and performance.

We employ the Ramsey reset to test if our model suffers from omitted variable bias. The Ramsey test generates new variables based on the predicted values, and thereby uses the new variables to test the statistical significance of the variables. The Ramsey test examines whether our model is correctly specified and all important variables are included. In the next, section we test whether our model suffers from reverse causality.

5.5.2 Endogeneity (reverse causality)

Endogeneity as a result of reverse causality is, arguably, an essential and pervasive problem that is encountered in empirical finance research. Reverse causality occurs when the key independent variable is determined simultaneously, along with the dependent variable y. For example, if y_{it} is the cost of capital and x_{it} is home bias, the simultaneity problem arises when home bias is partially determined by cost of capital. Simultaneity bias can be illustrated as follows.

$$y_{it} = x_{it}\beta + \varepsilon_{it} \qquad 5\text{-}21$$

The model has only explanatory variable x_{it}, which is also determined by y_{it} as follows.

$$x_{it} = \lambda y_{it} + \varepsilon_{it} \qquad 5\text{-}22$$

When the assumptions of OLS are violated, the estimated coefficients will be compromised and the results will be uninformative and cannot be causally interpreted. The presence of endogeneity as a result of reverse causality will make OLS generate biased and inconsistent parameter estimates, which makes it virtually impossible to generate reliable inference. Endogeneity is not only pervasive but prevalent across international finance. Failing to acknowledge the presence of endogeneity could be perilous and may have serious implications for inference. Particularly, it may render the coefficient estimates highly biased generating wrong results and erroneous conclusions about the integrity and truthfulness of theory. Additionally, the hypotheses test can be seriously misleading.

Endogeneity comes about from several sources, for instance, omitted variables which produce a correlation between the explanatory variables, simultaneity and selection bias where randomisation is infeasible in the sample selection.

We are concerned that our key independent variables of interest (home and foreign bias) are endogenously determined. Roberts and Whited (2011) show a review article that provides guidance on how to address the endogeneity issue. The methods used to address endogeneity include lagged independent variables and the Heckman selection model to address reverse causality and selection bias respectively. Our attempt to explain the impact of home and foreign bias on cost of capital, stock market development, and investor protection will be biased if there is an issue of endogeneity. For instance, a country with a lower cost of capital, will attract more foreign investors. Similarly, it is conceivable that countries with better stock market development will attract a large percentage of foreign investors. Chan et al. (2005) show countries that have better investor protection, will attract foreign investors. We use Newey-West (1987) to address autocorrelation and heteroskedasticity problems, lagged values to address reverse causality issues, and the Heckman selection model to address selection bias.

5.5.3 Lagged values

Studies suggest that by using panel data, an internal instrument can be generated when there is an endogenous variable. Verbeek, (2012) argues that in dynamic panel data, the endogenous independent variable can be lagged as an instrument to become exogenous. Following several studies that have used lagged values to resolve the endogeneity problem caused by reverse causality (see Yang, 2003: Gelos and Wei, 2005), we use lagged values of the endogenous variables (home and foreign bias) as instrumental variables to address the problem of reverse causality.

$$y_{it} = a_0 + x_{it_{-1}} + z_{it} + \varepsilon_{it} \qquad 5\text{-}23$$

Where; y_{it} is the dependent variable, a_0 is the intercept, $x_{it_{-1}}$ is the lagged value of the endogenous variable, z_{it} are the explanatory or control variables, ε_{it} are the error terms. When x_{it} is a predetermine variable but not strictly exogenous, only lagged values of x_{it} is a valid instrument. If x_{it} is strictly exogenous, then current and lagged value of x_{it} is a valid instrument.

The lagged values transform to become exogenous or instrumental variables that strongly correlate with the potentially endogenous variables (home and foreign bias) to influence the

independent variables; however, it is seemingly unlikely to affect the dependent variables except through their effect on the independent variables. Lagged values have the advantage of being very simple to implement, additional data requirements are limited and it is intuitively appealing. Lagged values provide rigour and transparency to the model specification.

5.5.4 Heckman selection model

There is a possibility of the model suffering from selection bias as a result of the non-randomness of the selection of the countries. Due to unavailability of data for some countries, the study omits several emerging countries and could thereby make our result encounter selection bias. Without correcting for non-randomly selected sample may lead to incorrect conclusion. We, however, use the Heckman selection model to address the selection bias.

The Heckman model offers statistical procedures that address the problem of selection bias and contribute to the programme of resolving selection bias in the following: (i) the model provides a theoretical framework that highlights the importance of modelling the dummy endogenous variable; (ii) The Heckman model was the first attempt that use the probability (i.e. the propensity score) of a participant being in one of the two conditions indicated by endogenous dummy variable, and then use the estimated propensity score model to estimate coefficients of the regression model; (iii) Heckman treats the unobservable selection factors as a problem of specification error or a problem of omitted variables, and correct for bias in the estimation of the outcome equation, by explicitly using information gained from the model of the sample selection; (iv) and he developed a creative two-step procedure by using the simple least squares algorithm.

Heckman (1979) argues that selection bias is a form of omitted variable bias, and his selection model conjectures the following fundamental regression relationship.

$$Y_j = X_j\beta + U_{1j} \qquad 5\text{-}24$$

In equation 5-24, the dependent variable is not always observed. However, the dependent variable for observation j is observed when

$$Z_j\Upsilon + U_{2j} > 0 \qquad 5\text{-}25$$

Where

$$U_1 \sim N(0, \sigma)$$

$$U_2 \sim N(0, 1)$$

$$Corr \sim (U_1, U_2) = \rho$$

When $\rho \neq 0$, standard regression methods employed in equation 5-24 will produce biased estimates. Nonetheless, the Heckman model will offer a consistent, asymptotically efficient estimate for all the parameters in the model.

Heckman's selection model is based on the following models:

$$Y_1 = \beta' X + U_1 \quad 5\text{-}26$$

$$Y_2 = \Upsilon' Z + U_2 \quad 5\text{-}27$$

Where X is a k −vector of regressors, Z is and m −vector of regressors. The error terms U_1 and U_2 are mutually normally distributed, individually of X and Z, with zero expectations. We are interested in the first model. Y_1 is observed when $Y_2 > 0$. Therefore, the dependent variable is $Y = Y_1$ if $Y_2 > 0$, Y is omitted value if $Y_2 \leq 0$.

When we disregard the sample selection bias and regress Y on X adopting the observed $Y's$ only, it will render the OLS estimator β biased as a result of the fact that

$$E[Y_1/Y_2 > 0, X, Z] = \beta' X + \rho\sigma f(\Upsilon' Z)/F(\Upsilon' Z), \quad 5\text{-}28$$

F denotes the cumulative distribution function of the standard normal distribution, f represents the corresponding density, σ^2 is the variance of U_1, whilst ρ is the correlation between U_1 and U_2. Therefore

$$E[Y_1/Y_2 > 0, X] = \beta' X + \rho\sigma E[f(\Upsilon' Z)/X] \quad 5\text{-}29$$

Puhani (2000) shows how Heckman's two-step proposal is used to estimate the inverse Mills ratio

$$\lambda(X'_{2i}\beta_2/\sigma_2) = \frac{\phi(-(X'_{2i}\beta_2/\sigma_2))}{1-\Phi(-(X'_{2i}\beta_2/\sigma_2))} \quad 5\text{-}30$$

by way of a probit model and estimate the following equation

$$y_{1i} = X'_{1i}\beta_1 + \frac{\sigma_{12}}{\sigma_2}\lambda(X'_{2i}\beta_2/\sigma_2) + \varepsilon_1 \quad 5\text{-}31$$

in the second stage. Heckman treated sample selection bias as a special case of omitted variable problem with λ being the omitted variable of OLS, we use on the subsample for which $y_1^* > 0$, as long as μ_2 has a normal distribution and ε_1 is independent of λ, Heckman's two step estimator is consistent. However, it is not efficient as ε_1 is heteroskedastic. As the variance of ε_1 is given by

$$Var(\varepsilon_{1i}) = \sigma_1^2 - \frac{\sigma_{12}^2}{\sigma_2^2}\left[\frac{X'_{21}\beta}{\sigma_2}\lambda\left(\frac{X'_{2i}\beta}{\sigma_2}\right) + \lambda\left(\frac{X'_{2i}\beta}{\sigma_2}\right)^2\right] \quad 5\text{-}32$$

Clearly, $Var(\varepsilon_{1i})$ is not constant, but varies over i, as it varies with X_{2i}, in order to obtain a simple and consistent estimate of the asymptotic variance-covariance matrix.

When the endogeneity problem is not accounted for in the estimation process, the OLS will produce biased parameter estimates. Heckman (1976, 1979) offered a two-stage estimation procedure using the inversed-Mills' ratio to take account of the endogeneity bias.[50]

We performed an endogeneity correction for the treatment effects in our empirical chapters. In the first step, a regression to observe a positive outcome of the dependent variable is modelled with a probit model. The estimated parameters are used to calculate the inverse Mills' ratio, which is then included as an additional explanatory variable in the OLS estimation (Green, 1993). Using Heckman's two-stage estimation, we correct the specification for endogeneity and examine whether sub-optimal portfolio allocation has impact on cost of capital, stock market development, and investor protection standards.

[50] See Chapters 6.6.3, 7.5.2, and 8.5.2.

Chapter 6 First empirical study: Sub-optimal portfolio allocation and cost of capital

Studies show the prevalence of home and foreign bias in international portfolio investment. Studies provide theoretical argument, suggesting that home and foreign bias affect cost of capital. For instance, Stulz (1999) and Errunza (2001) argue that countries that have high prevalence of home bias will experience high cost of capital, due to the lack of international risk sharing between domestic and foreign investors. In light of this evidence, we are motivated to undertake this study as a result of the importance of cost of capital in project evaluation (see Chapter 2.3.1). A lower cost of capital will create more projects, to have positive NPV, which will lead to more investment and economic growth, and create more jobs in the country.

6.1 Empirical analysis

We present the empirical analysis based on the research method in Chapter 5. Current studies, for instance, Stulz (1999) and Errunza (2001) offer theoretical models suggesting that cost of capital reduces when a country attracts sufficient foreign equity investment. Similarly, over-investment in the domestic market by local investors, increases cost of capital. Chan et al. (2009), show that home bias reduces firm valuation as result of high cost of capital being associated with home bias. In this empirical study, our objective is to advance the current literature by providing empirical evidence to answer the research question: "The impact of sub-optimal international portfolio allocation on cost of capital". We test the following hypotheses:

H_1 Countries that exhibit higher home bias are associated with higher cost of capital.

H_2 Countries with higher foreign bias relate to lower cost of capital.

H_3 Pervasiveness with higher global fund foreign bias allocation, is associated with lower cost of capital.

We begin our empirical analysis by presenting the summary statistics of the different cost of capital proxies, CPIS based equity home bias (*CPIS_HB*) and foreign biases (*CPIS_FB*), and the EPFR based global fund foreign bias (*GF_FB*). Subsequently, we report the simple

correlation figures between the dependent variables, i.e., cost of capital proxies and the key independent variables (*CPIS_HB*, *CPIS_FB* and *GF_FB*), econometric issues followed by robust regression analysis. Based on the MSCI definition, our sample country comprises 23 developed countries and 21 emerging countries from 2001 to 2010.[51]

6.2 Summary analysis

In Table 6-1, we partition the sample countries into developed and emerging countries. We report the average statistics (mean figures) of the various proxies of the cost of capital (columns 2-5).The sub-optimal international portfolio bias measures are reported in columns 6-8. The same summary figures in panel B are grouped according to level of development, i.e. between emerging and developed markets. Finally, panel C reports the figures for the top 10 and bottom 10, sorted on the basis of *CPIS_HB* measures.

…….....Insert Table 6-1 about here.....

Consistent with expectations, the figures in panels A and B show that developed countries exhibit a lower cost of capital, relative to their emerging market counterparts. The lowest cost of capital in terms of historical risk premium is observed for Ireland, followed by the United States, Japan, the United Kingdom, the Netherlands, Switzerland, Belgium, Russia, France, and Italy, as the ten countries with the lowest cost of capital. Similarly, the countries ranking with the highest cost of capital are the Czech Republic, Brazil, Bulgaria, Peru, Thailand, Egypt, Poland, Finland, and the Philippines. With the exception of Finland, they are mainly emerging markets. Focusing on the other three proxies of the cost of capital, a similar pattern can also generally be observed in terms of their ranking, implying that compared to their developing counterparts, investors in developed markets bear a lower cost of capital.

In terms of the three measures of sub-optimal portfolio allocations (i.e. *CPIS_HB, CPIS_FB* and *GF_FB)* panels A and B reveal that the top ten countries ranking lowest in terms of home bias measure, i.e. *CPIS_HB,* are mostly developed countries (except China), with the lowest being the United States followed by the United Kingdom, Japan, the Netherlands, Germany, France, Ireland, Canada, and Italy. On the other spectrum, countries ranking highest on the measure of home bias, i.e., investors preferring their home countries' securities rather than

[51] See appendix 2 for the list of countries.

foreign securities, are mainly emerging markets with the highest home bias observed for Bulgaria followed by Romania, Hungary, Peru, the Czech Republic, the Philippines, Egypt, Argentina, Poland, and Indonesia. In terms of *CPIS_FB*, it is unsurprising that European countries predominantly occupy the top ten lists, attributable to being in the same economic union. Nonetheless, we still observe that most developed countries rank higher in terms of foreign bias (positive bias), i.e., countries mostly preferred by international investors, compared to the emerging markets. Correspondingly, observations are almost identical for the *GF_FB* measure.

The above analysis of the summary statistics based on individual countries clearly indicates that countries with the lowest cost of capital seem to be associated with lower home bias by their home investors and higher foreign bias by international investors. Panel C further supports this conjecture, whereby we notice that the lowest home bias figure for the top ten countries is 2.7 (*CPIS_FB = 1.12* and *GF_FB = 0.32*), compared to the home bias measure of the bottom ten countries of 7.04 (*CPIS_FB* = -4.72 and *GF_FB = -2.15*). When we compare this with the cost of capital measures, we see that the top ten countries' average historical risk premium is 6.10% (*rCred* = 2.00 and *CERP* = 5%), compared to the bottom ten historical premium of 24.50% (*rCred* = 13.78 and *CERP* = 10.10%). Clearly, the analysis strongly suggests that countries with a lower home bias (higher foreign bias) tend to be associated with a lower cost of capital. We address this conjecture in the following section using correlation analysis and robust regression estimations.

We report the summary statistics of the control variables in Table 6-2. *MKTCap, Beta, BM, PolRisk, Retn_1* show substantial cross country variations. *MKTCap* is the lowest in Bulgaria (6.62 USD billions) but the highest in the United States (15600 USD billions). *Beta* varies vastly between 0.51 in Switzerland to 1.87 in Brazil. *BM* ranges from 0.22 (Spain) to 1.54 (Mexico). Retn_1 varies widely between 1% (France, Netherland, Belgium, Denmark, Japan, and Hong Kong) and 18% (Brazil). *PolRisk* ranges from 55 in Indonesia to 91.6 in Finland. We provide detailed descriptions of the variables in Chapter 4 Section 2.5.

…….....Insert Table 6-2 about here.....

6.3 Correlation analysis

Table 6-3 presents the cross-correlation coefficient matrix between all the variables we use in our analysis.

…….....Insert Table 6-3 about here.....

In line with expectations, *CPIS_HB* is positively and statistically significantly correlated with all the cost of capital measures. This indicates that countries with a greater home bias potentially suffer from a higher cost of capital. Such conjecture is again consistent, in line with our summary analysis. Similarly, the *CPIS_FB* measure is negatively correlated with the cost of capital proxies, suggesting that countries which are favoured by foreign investors are associated with a lower cost of capital. Furthermore, the *GF_FB* measure also shows negative and statistically significant correlation coefficients, again providing support to the previous conjecture. Most of the other correlation coefficients display expected signs in terms of their correlation coefficients.

6.4 Econometric issues

Based on section 5.4 and 5.5 of the research methodology, we conduct the following diagnostic test to ensure all econometric problems are detected and accordingly resolved.

6.4.1 Autocorrelation

We test for the presence of autocorrelation by using the Durbin-Watson test and run the regression in STATA: We obtained *DW* values of 1.779912 which suggests the presence of autocorrelation.

6.4.2 Heteroskedasticity

We use the Breusch-Pagan to test for heteroskedasticity. We obtain a chi-square of 14.06 which indicates the presence of heteroskedascity. We therefore use the Newey-West autocorrelation and heteroskedasticity correction model to address the problem.

Breusch-Pagan test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of *HRRm*
chi2(1) = 14.06
Prob > chi2 = 0.0002

6.4.3 Multicollinearity

We employ variance inflation factors (VIF) to test for multicollinearity. The mean of VIF for our model is 1.50 which implies that multicollinearity seems not to be a problem in our model.

VIF Test Results

Variable	VIF	1/VIF
PolRisk	3.06	0.327117
Law	2.73	0.365871
Retn_1	1.45	0.691456
MKTCap	1.36	0.724725
Turn	1.35	0.740455
Infl	1.32	0.771087
Exch	1.28	0.783569
BM	1.25	0.799293
Beta	1.19	0.839133
RGDPG	1.17	0.853348
LSMI	1.17	0.856465
EconRisk	1.14	0.878838
FinRisk	1.05	0.949647
Mean VIF	1.50	

6.4.4 Omitted variable bias

We use the Ramsey reset to test for omitted variable bias. The F values are all above 5% which suggests that we have included all relevant explanatory variables and our model does not suffer from omitted variable bias. Ramsey reset test of omitted variables for *CPIS_HB*, *CPIS_FB*, and *GF_FB*. Test of important variables omitted

Ramsey reset test using powers of the fitted values
Ho: model has no omitted variables
Cost of Capital

CPIS_HB	F(3, 422)=1.78	Pro>F=0.15
CPIS_FB	F(3, 422)=1.74	Pro>F=0.16
GF_FB	F(3, 422)=2.64	Pro>F=0.07

6.5 Regression results

This section examines whether the cross-sectional and temporal variations in home biases of domestic investors and foreign biases of foreign investors across the world, explain the varying degrees of international differences in the cost of capital. This study uses panel regressions and employs all possible control variables that could potentially be correlated with the different cost of capital measures. Because of the presence of autocorrelation and

heteroskedasticity as outlined in section 6.4.1 and 6.4.2 respectively, all the regression estimations use the Newey-West correction of the standard errors, which are robust to arbitrary autocorrelation and heteroskedasticity. In the following sections, we first discuss the empirical findings between the sub-optimal portfolio allocation measures and cost of capital, reserving the discussion of controls until the end.

6.5.1 Cost of capital and equity home bias

We begin our estimation by assessing the impact of sub-optimal domestic allocation, i.e., home bias (*CPIS_HB*) on the cost of capital. In Table 6-4, we present the regression results showing the relationship between equity home bias and four costs of capital proxies. The t-statistics are reported in parentheses. The coefficients of *CPIS_HB* in Table 6-4 are positive and statistically significant, even at the 1% significance level in models 2 to 4, and 5% significance level in Model 1. Consistent with robust international risk sharing theory, the results provide compelling evidence that higher home bias is associated with high cost of capital. The coefficients of 0.696 (t-statistic=2.38), 0.150 (t-statistic=7.21), 0.288 (t-statistic=3.84), and 0.216 (t-statistic=3.20) for *HRRm*, *rCred*, *CERP*, and *DY* respectively, suggest that an increase in home allocations should also increase the cost of capital. Erb et al. (1996) find that an increase of one unit in the log of a country's credit ratings is associated with the reduction of 10.47% in cost of equity capital. As we use the same measure of country credit rating (i.e. 1-22) and from an economic significance point of view, the statistically significant coefficient of 0.150 in Model 2 indicates that a 10 unit increase in the log of *CPIS_HB* (i.e. 1%), is related to a rise in the cost of capital by approximately 0.15*10=1.50 basis points.

…….....Insert Table 6-4 about here.....

6.5.2 Cost of capital and equity foreign bias

Table 6-5 reports the results of the relationship between cost of capital and *CPIS_FB* measure, including all the country-specific control variables and year effect. Consistent with expectations, the results in Table 6-5 show that the *CPIS_FB* measure is statistically significant at 1% statistical significance level in Models 1 to 3, and 5% statistical significant level in Model 4. The coefficient of -0.812 (t-statistic = -2.19) of Model 1 suggests that the historical risk premium is lower for countries with a higher foreign bias. Model 2

demonstrates a negative coefficient of -0.151 (t-statistic = -8.44) consistent with the view that favourable country allocation by foreign investors is related to favourable country ratings, indicating a lower cost of capital. Similarly, the coefficient of -0.424 (t-statistic = -7.38) also supports the conjecture that countries which attract higher foreign equity portfolio investments are associated with lower country risk premiums. The results in Model 4, further support the theory consistent with the claim, that higher foreign bias is associated with lower cost of capital.

Model 2 indicates that a 10 unit increase in equity foreign bias is related to a fall in cost of capital by approximately by 1.51 basis points (-0.151*10) per year. This is significant because country credit ratings do not move much, in comparison to country stock returns. The coefficient of -0.155 (t-statistic = -1.92) also confirms that countries attracting higher allocations are related to lower dividend yield, suggesting a lower cost of capital.

…….....Insert Table 6-5 about here.....

6.5.3 Cost of capital and fund level foreign bias measure

In this section we replicate the regression of Table 6-4 using global fund level data to measure equity foreign bias (*GF_FB*). As seen from the results in Table 6-5, the signs of the coefficients are negative and statistically significant across all the proxies of cost of capital measures in Models 1-4. The different *GF_FB* coefficients of -0.983 (t-statistic=-2.29), -0.459 (t-statistic=-6.66), 0.277 (t-statistic=-2.38), and -0.155(t-statistic=-2.22) for *HRRm*, *rCred*, *CERP*, and *DY* respectively, reinforce the findings discussed under Section 3.1. This suggests that higher degrees of foreign bias are inversely associated with differences in the cost of capital across developed and developing countries. The results imply that the risk sharing benefits of international investments, seem to increase, as foreign investors tilt their allocations more towards the implied ICAPM suggestion. This is consistent with the optimal global risk-sharing conjectures of Stulz (1999) and Errunza (2001).

…….....Insert Table 6-6 about here.....

6.5.4 Control variables

In terms of the control variables, most of them largely bear expected signs and are statistically significant as reported in Table 6-4. *MKTCap* plays a significant role in

explaining cost of capital. It has statistical and negative effect on cost of capital throughout the models. *Infl* has a negative effect on cost of capital. With the exception of Model 4, it is statistically significant throughout the models. *Turn* has a negative impact on cost of capital, but still maintains a correct negative sign and relatively statistically significant when cost of capital is proxy by *rCred* and *CERP*. *LMSI* is negatively related to cost of capital but turns out to be mainly statistically insignificant. The sign is correctly negative. That is, if a country integrates its stock market with the rest of the world, cost of capital falls, due to increase in risk sharing. Its insignificance might indicate that countries have not integrated their stock market sufficiently as financial theory suggests. *RGDPG* appears not to influence cost of capital, as the coefficients are mainly negative. *Law* is mainly statistically significant in Models 1 and 2, but it maintains a negative sign in all the models. Such a finding is consistent with existing studies (see Hail and Leuz, 2006). *Beta* is positively related to the cost of capital and statistically significant. Similarly, *BM* and *Exch* are positively associated with the cost of capital but their statistical significance levels are sensitive to different specifications. Such inconsistent behaviour of the control variables is also reported by existing studies (see Lau et al., 2010). *PolRisk* maintains correct positive sign in Models 1 and 2, and statistically significant at the 1% level.

Other controls such as *PolRisk*, *EconRisk* and *FinRisk* are generally inconsistent with respect to signs and statistical significance to different specifications as a result of the weaknesses of each cost of capital proxy. These control variables have inconsistent sign and statistical significance as a result of fact that; there is a shorter history of stock return data for emerging countries yielding a higher degree of standard error. Further, dividend yield may reflect differences in the countries growth opportunities which may be sensitive to *BM*, *Exch*, *PolRisk* and *FinRisk* and cause them to have inconsistent signs and statistical significance.

6.6 Robustness test

All our above-mentioned empirical results provide strong evidence of the influence of sub-optimal international allocations (i.e. home and foreign biases) on the cost of capital, which is consistent with the theory. In this section we run a battery of robustness tests to further test the empirical sensitivity of our results. First, we use *Tobin's Q* as an additional alternative measure of cost of capital. Second, we address the concern of possible endogeneity issues (reverse causality and selection bias) by using two different approaches: first, we deal with reverse causality by employing the pre-determined (exogenous) one year lagged values of

home and foreign biases; second, we further use the Heckman selection method to address the sample selection bias. We discuss them in detail in the following sub-sections.

6.6.1 Additional measure of cost of capital: *Tobin's Q*

As extensively discussed above, we test the impact of *CPIS_HB*, *CPIS_FB* and *GF_FB* on the cost of capital using $HRRm$, $CERP$, $rCred$, and DY where we establish that the prevalence of home bias (foreign bias) increases (decreases) the cost of capital. In this section we additionally test whether variations in cross-country aggregate firms' valuations can be explained by differences in home and foreign biases. In order to test the valuation effect and follow the existing literature (Chan et al. 2009), we employ an alternative measure of cost of capital, i.e., *Tobin's Q*. The country level *Tobin's Q* is measured as the log market value of equity plus the book value of total assets minus the book value of equity and divided by the book value of total assets of country i. Since there is an inverse relationship between the cost of capital and equity market valuation or firm performance, we expect *CPIS_HB (CPIS_FB* and *GF_FB)* to be negatively (positively) associated with Tobin's Q. The results are reported in Table 6-7.

…….....Insert Table 6-7 about here.....

We show, in Model 1 of Table 6-7, that the cross-sectional and temporal differences in market valuations are inversely related to *CPIS_HB* as demonstrated by the coefficient of -0.415 (t-statistic = -7.49). This demonstrates that domestic investors' home bias reduces firms' valuations, which in turn implies an increase in the cost of capital. The result is consistent with the conjectures of Errunza and Losq (1985) and Stulz (1999). Home bias reduces firm value because local investors bear a large proportion of risk, as there is inadequate international risk sharing.

In Models 2 and 3 of Table 6-7, the results show that both the measures of foreign bias (*CPIS_FB* and *GF_FB)* are positively associated with higher levels of the *Tobin's Q* measure. The estimated coefficients of *CPIS_FB* and *GF_FB* of 0.171 (t-statistic = 3.47) in Model 2 and 0.294 (t-statistic = 3.94) in Model 3, respectively, implies that as foreign investors increase their allocations towards the suggested ICAPM weight, firms' values increase as a result of the reduction of cost of capital. As such, using the *Tobin's Q* measure, we further

reinforce our previous findings by demonstrating that higher levels of *CPIS_HB* reduce the stock valuations, whereas greater degrees of *CPIS_FB* and *GF_FB* increase the equity valuations.

6.6.2 Reverse causality: Lagged pre-determined variables

Changes in cost of capital may themselves induce foreign investors to invest more, leading to reduced home bias and increased foreign bias. If this is the case, then our estimates may suffer from endogeneity issues arising from reverse causality. We address the potential endogeneity problem using one year lagged values of home and foreign bias, as pre-determined exogenous variables. We discuss the results in this section.

To address our concern of endogeneity, we employ lagged *CPIS_HB, CPIS_FB* and *GF_FB* in Tables 6-8, 6-9 and 6-10 respectively. Consistent with our expectations, the four coefficients on *CPIS_HB* in Table 6-8 are in line with expected signs and are statistically significant at the 1% level for all the four measures of cost of capital. This confirms and provides robust support to the results reported in Table 6-6 that higher equity home bias is associated with the higher cost of capital, even after addressing the endogeneity problem arising from potential reverse causality.

…….....Insert Table 6-8 about here.....

The coefficient estimates of the lagged values of *CPIS_FB* reported in Table 6-9 remain negative and statistically significant across all the proxies of the cost of capital. With the exception of *DY* which has a coefficient of -0.262 (t-statistic = -2.34), the remaining cost of capital measures are statistically significant even at the 1% significance level. These results further support our findings that higher equity foreign biases are associated with lower cost of capital, even after controlling for any potential reverse causality issues.

…….....Insert Table 6-9 about here.....

In Table 6-10 we address the possible reverse causality issue using lagged foreign bias measures constructed using the global funds. In line with expectation, all four coefficients of the lagged *GF_FB* are negative and statistically significant for all four measures of the cost of capital. The statistical significance of *GF_FB* estimates is consistent with those reported in

Table 6-6. Such results further support the conclusion that with increased levels of foreign investors' allocations, the cost of capital falls.

…….....Insert Table 6-10 about here.....

6.6.3 Heckman selection bias

The 44 countries we are able to use are from the 45 all-country index of MSCI and, hence, capture 98 per cent of the highly investable markets. Although we would ideally like to use as many countries as possible, owing to unavailability of data, particularly for smaller emerging and frontier markets, we end up selecting 44 countries. In this section, we use the standard Heckman selection bias method to address the concern of selection biases which may compromise the validity of the results. The results, in general, closely mirror the main result based on OLS.

There is a slight increase in the coefficients and the statistical significance compared to Table 6-4. The results in Models 1-4 of Table 6-11 have a sign similar to our main analysis of Models 1-4 in Table 6-4.This demonstrates that our results are generally not affected by the non-random selection of the countries.

……...Insert Table 6-11 about here….....

The coefficients of *CPIS_FB,* reported in Models 1-4 of Table 6-12 are statistically significant, suggesting a negative and statistically significant effect across all the proxies of cost of capital. The magnitude and degree of statistical significance levels of *CPIS_FB* coefficient estimates are higher, compared with their counterparts from the baseline models of Table 6-5.

……...Insert Table 6-12 about here….....

The results are reported in Models 1-4 of Tables 6-13 of *GF_FB*. The coefficients and statistical significance of all the regressions improves relative to those reported in previous regressions based on OLS in Table 6-6.

……...Insert Table 6-13 about here….....

Clearly, our extensive sensitivity analysis demonstrates that our findings are indeed robust to different specifications, and use of different estimation methods. The overall results of the empirical analysis provide strong evidence that a higher degree of home bias is related to a higher cost of capital. Correspondingly, foreign investors, increasing their portfolio weight towards the global optimum allocations, reduce the host country's cost of capital.

6.7 Chapter summary

Existing studies provide compelling evidence on the prevalence of home and foreign bias in international portfolio allocations. However, the implications of such biases have not been extensively investigated. The theory notes that relative to the ICAPM, as the magnitude of domestic bias in the equity portfolio allocations decreases, it facilitates the benefits of global risk sharing between foreign and domestic investors. Similarly, following the same ICAPM prescription, the increase in foreign bias towards a particular host country by foreign investors should also positively influence global risk sharing.

We use global macro and fund level micro data on 44 cross-country (developed and emerging) portfolio allocations to construct the home and foreign bias measures. Similarly, following the existing literature, we employ five different proxies of the cost of capital. Applying robust econometric techniques and extensive specifications, our study finds that consistent with the theory, the results reveal that a higher degree of home bias is associated with a higher level of cost of capital. Similarly, a higher degree of foreign bias exhibited by foreign investors in their equity allocations is related to a lower cost of capital for the host countries.

The study has important implications for policy makers, especially, governments in emerging countries. Home and foreign bias matter for cost of capital. Therefore, policy makers in countries such as Bulgaria, Romania, and Indonesia need to encourage domestic investors to diversify their investments internationally. Similarly, policy makers in emerging countries can improve governance and investor protection standards to attract foreign investors.

Table 6-1: Summary statistics of dependent and key independent variables

Panel A: Developed Countries								**Emerging Countries**							
Country	HRRm (%)	rCred (1-22)	CERP (%)	DY (% of price)	CPIS_HB	CPIS_FB	GF_FB	Country	HRRm (%)	rCred (1-22)	CERP (%)	DY (% of price	CPIS_HB	CPIS_FB	GF_FB
Australia	14	2.4	5	3.88	3.78	-0.37	-0.54	Argentina	19	17.10	14	3.22	6.25	-0.65	-1.64
Austria	12	2.0	5	2.17	4.75	1.13	-0.53	Brazil	28	13.70	10	3.70	4.44	-3.40	-0.51
Belgium	7	2.8	6	3.48	3.62	1.14	-0.54	Bulgaria	27	13.30	9	1.63	9.25	-3.47	-1.87
Canada	13	2.2	5	2.39	3.16	0.12	-0.81	Chile	19	6.60	6	3.09	5.56	-0.34	-2.27
Denmark	15	2.0	5	1.75	4.83	0.74	-0.11	China	11	7.10	6	2.47	3.30	-4.88	-0.26
Finland	12	2.0	5	3.66	4.96	0.28	0.32	Czech Rep	32	6.60	6	4.87	6.97	-0.35	-1.46
France	9	2.0	5	3.39	2.90	0.04	0.07	Egypt	23	10.80	7	4.58	6.58	-2.95	-2.15
Germany	17	2.0	5	2.51	2.88	0.59	0.11	Hungary	18	7.20	6	2.65	7.30	-1.12	-1.26
Greece	13	6.0	6	3.14	5.81	-1.15	-1.11	India	19	12.80	9	1.45	4.39	-6.77	-1.82
Hong Kong	10	5.4	6	2.94	3.56	0.21	0.01	Indonesia	24	15.60	12	2.96	6.13	-5.04	-1.17
Ireland	3	2.2	5	2.57	3.05	2.91	0.60	Korea	12	8.20	6	1.64	4.33	-2.15	0.01
Israel	11	6.8	6	3.66	5.78	-1.33	-0.41	Malaysia	16	8.40	7	3.04	5.30	-2.61	-1.79
Italy	9	3.6	6	4.02	3.30	0.89	-0.19	Mexico	18	9.40	7	1.76	5.23	-3.81	-0.24
Japan	4	5.7	6	1.39	2.35	-0.92	-0.12	Peru	24	11.60	8	3.91	7.04	-3.65	-1.39
Netherlands	7	2.0	5	3.86	2.84	1.08	0.54	Philippines	20	13.30	10	2.16	6.66	-5.06	-1.75
New Zealand	7	2.4	5	4.10	6.05	0.73	0.62	Poland	22	7.40	6	2.61	6.21	-2.32	-3.46
Norway	15	2.0	5	3.10	4.41	1.26	-0.05	Romania	18	13.20	9	2.70	7.98	-3.45	-2.03
Portugal	9	4.3	6	4.27	5.96	0.18	-0.73	Russia	8	12.20	8	2.01	4.61	-5.33	-2.36
Spain	13	2.2	5	3.19	3.70	-0.84	-0.58	South Africa	16	7.80	6	3.08	4.33	-0.52	-1.59
Sweden	12	2.2	5	2.81	3.97	0.73	0.01	Thailand	24	9.40	7	3.24	5.92	-3.43	-0.79
Switzerland	7	2.0	5	1.99	3.37	0.40	0.50	Turkey	19	15.00	12	1.94	5.86	-5.74	-2.01
UK	5	2.0	5	3.15	2.32	0.20	0.40								
US	4	2.0	5	1.85	0.79	-0.79	-0.09								

Panel B: Averages of the developed and emerging countries.

Country	HRRm (%)	rCred (1-22)	CERP (%)	DY (% of price)	CPIS_HB	CPIS_FB	GF_FB
Developed	10.30	3.0	5.30	3.00	3.38	0.31	-0.11
Emerging	19.86	10.8	8.14	2.80	5.88	-3.19	-1.51

Panel C: Averages of the top and bottom 10 countries.

Country	HRRm (%)	rCred (1-22)	CERP (%)	DY (% of price)	CPIS_HB	CPIS_FB	GF_FB
Top10	6.10	2.0	5.00	1.71	2.70	1.12	0.32
Bottom10	24.50	13.8	10.10	4.10	7.04	-4.72	-2.15

Note: The variables in columns 2-5 are the cost of capital measures. $HRRm$ is the historical realised market return measured as the historical average of excess country equity market return over risk free rate. $rCred$ is the natural log of numerical values based on Moody's country credit ratings. The qualitative credit ratings are converted into numerical values based on a scale of 1-22. We assigned a value of 1 to *AAA=1, AA+=2, AA=3*….all the way to *D=22*. $CERP$ is the country equity risk premium based on adding the sovereign default risk premium (scaled by the relative volatility of equity to bond market) to the equity risk premium of a base country (The United States). *DY* is the dividend yield measured as the total amount of stock dividend of a country as a percentage of the market capitalisation of the country. The variables listed in columns 6-8 are the sub-optimal international portfolio allocation bias measures. *CPIS_HB* is the IMF-CPIS based equity home bias and is calculated as the log value of the share of domestic investors in their own country's stock market capitalisation (*l*) relative to the country's world market capitalisation weight. *CPIS_FB* is the IMF-CPIS based equity foreign bias measure computed as the average of the log value of the ratio of foreign allocations from foreign investors domiciled in country *k* investing in equities of country *l* to the benchmark allocation for country *l* ($k \neq l$). *GF_FB* is also an equity foreign bias measure but constructed using EPFR's global micro fund level data.

Table 6-2: Summary statistics of control variables

Panel A: Developed Countries

Country	MKTCap (in USD billions)	Beta	BM (Ratio)	Retn_1 (%)	Exch (Cov. of % in decimals)	Infl (%)	Turn (% of MKCap)	LSMI (% of GDP)	RGDPG (%)	Law (0-6)	PolRisk (0-100)	EconRisk (0-50)	FinRisk (0-50)
Australia	800	0.97	0.56	4	1.4	3	84.23	40.80	3.07	5.81	87.3	29.1	36.09
Austria	93.6	0.9	0.63	2	0.3	2	44.70	101.49	1.45	5.85	85.1	33.65	38.43
Belgium	251	0.98	0.55	1	0.4	3	44.74	153.17	1.60	4.70	82.1	42.97	27.78
Canada	1430	1.08	0.33	3	1.4	2	75.43	70.33	2.11	5.85	85.6	41.84	29.50
Denmark	168	0.95	0.78	1	1.2	2	81.36	124.87	1.12	5.68	85.2	43.53	41.92
Finland	189	1.62	0.66	6	1.3	2	119.26	55.01	2.05	5.85	91.6	45.22	37.21
France	1740	1.12	0.37	1	1.2	2	101.20	78.37	1.14	4.62	76.0	34.92	30.69
Germany	1280	1.33	0.39	2	5.3	2	141.75	53.34	1.09	4.55	82.3	36.07	26.22
Greece	122	1.07	0.70	9	2.1	7	49.06	78.38	2.40	3.55	75.3	34.77	32.76
Hong Kong	826	1.02	1.08	1	0.3	2	77.91	362.9	3.51	4.66	79.6	43.84	41.38
Ireland	92.7	0.95	0.53	6	1.3	2	52.34	161.14	2.75	5.85	85.7	41.85	35.59
Israel	135	1.03	1.07	5	1.2	3	61.53	76.03	3.43	5.15	65.8	36.16	31.27
Italy	647	0.97	0.51	3	0.4	2	130.19	52.70	0.34	3.79	78.3	35.05	31.70
Japan	3570	0.72	1.03	1	-1.2	0	111.68	26.94	1.14	4.85	81.2	36.28	43.47
Netherlands	581	1.11	0.51	1	0.3	2	147.38	132.82	1.25	5.9	87.5	41.93	29.08
New Zealand	41.5	0.87	0.62	10	1.4	2	46.31	59.34	2.27	5.45	84.8	27.89	26.50
Norway	181	1.29	1.39	4	1.4	2	114.81	71.45	2.21	5.55	84.9	44.60	44.74
Portugal	77.1	0.94	0.29	3	0.3	9	63.47	67.27	0.55	5.05	81.7	34.63	34.60
Spain	1010	1.09	0.22	5	1.3	3	164.33	56.87	1.96	4.66	77.8	38.29	36.77
Sweden	394	1.45	0.35	4	0.4	4	121.81	89.37	2.15	5.98	90.5	44.64	28.42
Switzerland	932	0.51	0.51	3	1.4	1	99.91	88.85	1.43	4.75	86.4	44.93	45.24
UK	2780	0.82	0.43	3	0.4	2	142.71	57.08	1.48	5.30	83.3	34.08	24.27
US	15600	0.88	0.52	2	0.3	2	212.34	25.46	2.00	4.83	76.1	27.80	30.56

Panel B: Emerging Countries

Country	MKTCap (in USD billions)	Beta	BM (Ratio)	Retn_1 (%)	Exch (Cov. of % in decimals)	Infl (%)	Turn (% of MKTCap)	LSMI (% of GDP)	RGDPG (%)	Law (0-6)	PolRisk (0-100)	EconRisk (0-50)	FinRisk (0-50)
Argentina	77.4	1.26	0.58	7	2.2	10	10.40	40.41	4.47	3.21	70.2	32.43	31.15
Brazil	673	1.87	1.25	18	1.2	7	48.15	25.81	3.16	2.33	66.5	34.98	32.63
Bulgaria	6.62	1.29	1.31	9	4.3	5	18.62	116.48	3.86	3.89	74.6	31.08	32.30
Chile	151	0.94	0.83	13	1.3	4	15.37	69.21	3.66	4.85	76.5	40.14	25.74
China	2430	1.18	0.76	9	1.4	3	122.53	58.66	9.27	3.93	65.4	37.37	46.50
Czech Rep	37	0.90	1.31	10	2.3	2	60.96	58.66	3.06	5.15	80.7	36.91	31.03
Egypt	68.7	0.75	1.17	13	1.4	9	36.26	93.56	4.75	3.92	65.0	34.50	33.46
Hungary	26	1.29	0.55	7	1.2	5	77.24	146.36	2.03	4.30	80.9	34.87	35.64
India	754	1.01	0.81	11	1.3	7	115.82	39.90	7.66	3.70	57.9	33.53	37.38
Indonesia	125	1.23	1.20	8	1.4	8	53.16	56.92	4.99	2.92	55.0	36.83	29.54
Korea	633	1.52	0.28	3	1.2	3	222.26	82.12	4.52	4.76	76.1	41.64	34.19
Malaysia	220	1.18	0.62	9	1.3	4	31.36	191.51	4.43	3.27	74.5	35.78	36.95
Mexico	254	1.22	1.54	4	1.3	4	27.84	54.33	1.74	3.42	73.2	38.38	38.97
Peru	48.7	0.91	1.01	6	2.3	2	12.97	43.06	5.59	2.75	63.6	39.06	31.58
Philippines	63.4	1.10	0.94	8	1.4	5	18.51	89.85	4.75	2.70	67.2	29.84	35.77
Poland	103	0.71	0.82	4	0.4	3	37.55	75.52	4.15	4.45	79.6	36.48	36.19
Romania	20.5	0.67	0.59	7	1.4	11	12.97	75.08	3.88	3.75	66.7	31.71	35.21
Russia	607	1.50	0.56	6	2.3	10	58.94	55.18	4.74	4.29	68.9	37.73	43.92
South Africa	499	0.97	0.96	13	1.4	5	69.52	59.34	3.01	2.70	71.5	35.07	25.91
Thailand	130	1.16	0.90	9	2.3	12	94.00	135.01	4.17	3.17	64.7	34.20	33.74
Turkey	151	1.33	0.51	14	1.4	9	152.80	49.15	4.96	4.50	65.9	32.59	32.02

MKTCap is the country market capitalisation; Beta is the covariance of *MSCI* country's' world index return over past five years divided by *MSCI* world index return variance; *BM* is the log country level ratio of book-to-market; *Retn_1* is the average *MSCI* monthly index return over the past year; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the following year's percentage change in the consumer price index; Turn is the ratio of the total traded volume of stock in a year divided by market capitalisation; *LSMI* is the stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; RGDPG* is the real growth rate in the domestic product; Law represents the rule of law index of a country; *PolRisk* is the political risk index of a country; *EconRisk* represents the economic risk index of a country; *FinRisk* is the financial risk of a country.

Table 6- 3: Pearson's pairwise correlation coefficient between the dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRRm (1)	1																			
rCred (2)	0.47*	1																		
CERP (3)	0.48*	0.61	1																	
DY (4)	0.13*	0.21	0.08	1																
CPIS_HB (5)	0.14*	0.52	0.46*	0.10*	1															
CPIS_FB (6)	-0.21	-0.60	-0.57	-0.13	-0.39	1														
GF_FB (7)	-0.1	-0.43	-0.37	-0.08	-0.46	0.46*	1													
MKTCap (8)	-0.37*	-0.03	-0.02	-0.22	-0.25	-0.12	0.03	1												
Beta (9)	0.30*	0.26	0.26*	0.04	0.05	-0.21	0.02	0.06	1											
BM (10)	0.16*	0.27	0.24*	0.03	0.34*	-0.25	-0.12	0.04	0.02	1										
Retn_1 (11)	0.04	0.28	0.28*	0.09	0.24*	-0.26	-0.17	-0.03	0.28	0.19	1									
Exch (12)	0.15*	0.06	0.07	0.09	0.03	-0.10	-0.13	0.04	0.02	-0.10	-0.32	1								
Infl (13)	-0.25*	-0.41	-0.35*	-0.02	0.26*	-0.29	-0.29	-0.04	0.15	0.02	0.20	0.19*	1							
Turn (14)	-0.20	-0.48*	-0.45	-0.11	-0.60	0.16*	0.40*	0.30*	0.18	-0.28	0.03	-0.05	-0.18	1						
LSMI (15)	-0.11	-0.20*	-0.25	-0.08	0.15*	0.28*	0.06	-0.17	-0.10	0.02	-0.02	-0.03	-0.07	-0.03	1					
RGDPG (16)	-0.10*	-0.27	-0.28*	-0.12	0.17*	-0.46	-0.24	-0.03	0.07	-0.03	-0.05	0.25*	0.13*	-0.03	-0.02	1				
Law (17)	-0.35	-0.61*	-0.50	-0.04	-0.33	0.56*	0.35*	-0.04	-0.10	-0.31	-0.21	-0.02	-0.27	0.37*	0.19*	-0.19	1			
PolRisk (18)	-0.25	0.67*	-0.54	-0.03	-0.33	0.71*	0.39*	-0.09	-0.13	-0.30	-0.30	-0.05	-0.37	0.26*	0.26*	-0.25	0.77*	1		
EconRisk (19)	0.02	0.28*	-0.25	-0.05	-0.16	0.21*	0.19*	0.09	0.04	-0.01	-0.07	0.02	-0.14	0.15*	0.26*	-0.03	0.18*	0.23*	1	
FinRisk (20)	-0.10	0.05	-0.07	-0.17	-0.05	-0.09	0.06	-0.03	-0.10	0.10	-0.08	0.03	-0.09	0.03	0.04	0.09	0.07	0.08	0.06	1

Note: The variables labelled 1- 4 are the cost of capital measures and 5-7 are the sub-optimal international portfolio allocation bias measures. They are described in Table 6-1. The other variables include *MKTCap* as the log country market capitalisation; *Beta* is the covariance of *MSCI* all country's world index return over the past five years divided by the *MSCI* world index return variance; *BM* is the log country level ratio of book-to-market; Retn_1 is the average *MSCI* monthly index return over the past year; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly change of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Turn* is the ratio of the total traded volume of stock in a year divided by market capitalisation; *LSMI* is a measure of market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; RGDPG* is the real growth rate in the domestic product; *Law* represents the rule of law rating index of a country; *PolRisk* is the political risk rating index of a country; *EconRisk* represents the economic risk rating index of a country; *FinRisk* is the financial risk rating index of a country. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6- 4: The relation between equity home bias and four cost of capital proxies

This table shows regression results of the following model:

$$CoC_{lt} = \alpha + \beta_1 \text{CPIS\_HB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
CPIS_HB	0.696**	0.150***	0.288***	0.216***
	(2.38)	(7.21)	(3.84)	(3.20)
MKTCap	-0.739***	-0.596***	-0.882**	-0.121***
	(-7.02)	(-5.44)	(-2.41)	(-4.92)
Beta	0.655***	0.194***	0.138***	0.846
	(4.64)	(2.99)	(4.24)	(0.42)
BM	0.180*	0.471	-0.129	-0.136
	(1.94)	(0.78)	(-0.56)	(-0.07)
Retn_1	0.264	2.978	0.143	28.24***
	(0.78)	(0.92)	(1.16)	(2.64)
Exch	0.238	0.738	0.399	3.438
	(0.23)	(1.31)	(1.31)	(1.31)
Infl	-0.116**	-0.738***	-0.462**	-2.577*
	(-2.01)	(-3.96)	(-2.04)	(-1.87)
Turn	-0.278***	0.110***	-0.645***	0.393
	(-6.65)	(8.30)	(-3.05)	(0.30)
LSMI	-0.606	-0.488***	-0.710***	-0.110
	(-0.11)	(-2.85)	(-3.59)	(-0.76)
RGDPG	-0.107	-0.726**	-0.174***	-0.541**
	(-1.02)	(-2.22)	(-3.93)	(-2.16)
Law	-0.153***	-0.334***	-0.166	0.534
	(-4.02)	(-2.85)	(-1.07)	(0.51)
PolRisk	0.148***	0.122***	-0.372*	-0.948
	(3.04)	(8.36)	(-1.92)	(-0.65)
EconRisk	-0.246	0.201*	-0.268*	0.709
	(-0.68)	(1.69)	(-1.78)	(0.71)
FinRisk	-0.702	0.631***	-0.166	-0.222***
	(-0.24)	(2.99)	(-0.22)	(-3.26)
Constant	-0.927**	1.637***	0.125***	5.511***
	(-2.17)	(6.92)	(7.72)	(4.05)
Number of Observations	390	424	440	424
Adj. R-squared	0.449	0.737	0.521	0.251
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital (CoC_{lt}) measures of country i at time t (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is *CPIS_HB* also described in Table 6-1 above. The controls include *MKTCap*, the log country market capitalisation; *Beta* is the covariance of the *MSCI* country's world index return over the past five years divided by the *MSCI* world index return variance; *BM* is the log country level ratio of book-to-market; *Retn_1* is the average *MSCI* monthly index return over the past year; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly change of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Turn* is the ratio of the total traded volume of stock in a year divided by market capitalisation; *LSMI* is a measure of market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; RGDPG* is the real growth rate in the domestic product; *Law* represents the rule of law rating index of a country; *PolRisk* is the political risk rating index of a country; *EconRisk* represents the economic risk rating index of a country; *FinRisk* is the financial risk rating index of a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6- 5: The relation between equity foreign bias and four cost of capital proxies
This table shows regression results of the following model:

$$CoC_{lt} = \alpha + \beta_1 \text{CPIS\_FB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
CPIS_FB	-0.812***	-0.151***	-0.424***	-0.221**
	(-2.19)	(-8.44)	(-7.38)	(-2.05)
MKTCap	-0.372**	-0.948***	-0.374**	-0.541***
	(-2.35)	(-2.69)	(-2.01)	(-5.37)
Beta	0.705	0.97***	0.500***	0.373
	(1.22)	(6.85)	(3.54)	(1.45)
BM	0.0478	0.116	0.182	-0.412
	(0.08)	(0.44)	(1.41)	(-1.61)
Retn_1	-0.296	-1.801	-0.159**	-24.01**
	(-1.35)	(-1.24)	(-2.21)	(-2.59)
Exch	0.280	0.308	0.555***	1.382
	(0.54)	(0.83)	(2.97)	(0.66)
Infl	-0.661**	-0.807***	-0.239**	-1.645
	(-2.04)	(-3.82)	(-2.50)	(-1.16)
Turn	-0.875	-0.146***	-0.430***	0.103
	(-0.23)	(-11.01)	(-6.56)	(0.63)
LSMI	-0.603	-0.398	-0.526	0.942
	(-0.40)	(-0.20)	(-0.56)	(1.52)
RGDPG	-0.165**	-0.479	-0.449**	-0.770***
	(-2.19)	(-1.10)	(-2.01)	(-2.96)
Law	-0.117***	0.203	-0.469	0.255
	(-3.12)	(1.44)	(-0.69)	(1.53)
PolRisk	0.122***	0.103***	-0.101	-0.394**
	(2.67)	(5.33)	(-1.05)	(-1.97)
EconRisk	-0.165	0.462***	-0.946	0.184*
	(-0.74)	(3.35)	(-1.41)	(1.80)
FinRisk	-0.369*	-0.183	-0.135**	0.068
	(-1.93)	(-0.16)	(-2.55)	(0.80)
Constant	0.142**	1.513***	0.825***	6.879***
	(2.28)	(9.35)	(10.27)	(2.60)
Number of Observations	440	440	364	417
Adj. R-squared	0.888	0.660	0.669	0.346
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital (CoC_{lt}) measures of country i at time t (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is *CPIS_FB* also described in Table 6-1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6- 6: The relation between equity foreign bias using global fund and four different cost of capital proxies

This table shows regression results of the following model:

$$CoC_{lt} = \alpha + \beta_1 \text{GF\_FB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
GF_FB	-0.983***	- 0.459***	-0.277**	-0.155**
	(-2.29)	(-6.66)	(-2.38)	(-2.22)
MKTCap	-0.627***	-0.197***	-0.256***	-1.049***
	(-4.93)	(-2.65)	(-4.29)	(-4.96)
Beta	0.700***	0.197***	0.156***	0.762
	(6.47)	(2.65)	(5.87)	(0.32)
BM	0.380***	0.238***	-0.927	0.685
	(4.31)	(3.31)	(-0.41)	(0.21)
Retn_1	-0.268	-1.348	-0.176	-5.881
	(-0.59)	(-0.61)	(-1.30)	(-0.72)
Exch	0.130	0.235	0.543	6.713***
	(1.10)	(0.53)	(1.36)	(3.25)
Infl	-0.259***	-1.148*	-0.447**	0.576
	(-4.03)	(-1.83)	(-2.35)	(0.31)
Turn	-0.436***	-0.247***	-0.112***	-0.153
	(-11.12)	(-8.37)	-(8.35)	(-1.06)
LSMI	-0.305	0.506	-0.590***	-0.946*
	(-0.52)	(0.22)	(-3.42)	(-1.66)
RGDPG	-0.899	-0.635	-0.196***	-0.219
	(-0.75)	(-1.36)	(-5.57)	(-0.73)
Law	-0.302***	-0.546***	0.358	-0.304
	(-5.08)	(-3.20)	(0.22)	(-0.20)
PolRisk	0.248***	0.119***	-0.454***	-0.205
	(4.60)	(5.74)	(-2.87)	(-1.19)
EconRisk	-0.330	0.496***	-0.241*	0.565
	(-0.78)	(3.04)	(-1.93)	(0.68)
FinRisk	-0.446	-0.959	0.285	0.346
	(-0.13)	(-0.73)	(0.03)	(0.49)
Constant	-0.217***	2.654***	0.136***	23.30***
	(-3.46)	(6.01)	(8.77)	(5.91)
Number of Observations	380	410	380	400
Adj. R-squared	0.463	0.559	0.535	0.579
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital (CoC_{lt}) measures of country i at time t (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is *GF_FB* also described in Table 6-1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-7: Relation between foreign bias, home bias, country bias and Tobin's Q

	Model (1) Tobin's Q	Model (2) Tobin's Q	Model (3) Tobin's Q
CPIS_HB	-0.415***		
	(-7.49)		
CPIS_FB		0.717***	
		(3.47)	
GF_FB			0.294***
			(3.94)
MKTCap	-0.449***	-0.419***	-0.491***
	(-19.10)	(-16.66)	(-18.68)
Beta	-0.202	-0.160	-0.0137
	(-1.08)	(-0.80)	(-0.07)
BM	-0.172	-0.501***	-0.725***
	(-0.95)	(-2.67)	(-3.95)
Retn_1	16.11	5.845	2.690
	(1.63)	(0.60)	(0.26)
Exch	3.245	4.895**	3.021
	(1.32)	(2.11)	(1.13)
Infl	-1.294	-0.307	-1.965
	(-0.91)	(-0.21)	(-1.31)
Turn	-0.105	0.346***	0.145
	(-1.01)	(3.70)	(1.25)
LSMI	-0.663***	-0.923***	-1.014***
	(-4.84)	(-6.52)	(-7.34)
RGDPG	-0.424	-0.510	-0.231
	(-1.62)	(-0.20)	(-0.78)
Law	0.172*	0.202**	0.0913
	(1.83)	(2.02)	(0.95)
PolRisk	0.601***	0.412***	0.448***
	(5.15)	(3.03)	(3.49)
EconRisk	-0.207**	-0.121	-0.106
	(-2.24)	(-1.24)	(-1.10)
FinRisk	-0.123*	-0.447	0.368
	(-1.68)	(-0.56)	(0.48)
Constant	12.90***	11.63***	12.86***
	(12.19)	(10.23)	(11.67)
Number of Observations	440	440	410
Adj. R-squared	0.565	0.502	0.567
Country effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes

Note: The dependent variable *Tobin's Q* is measured as the log market value of equity plus the book value of total assets minus the book value of equity and divided by the book value of total assets of country *i*. The key independent variables are *CPIS_HB, CPIS_FB* and *GF_FB*, also described in Table 6-1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-8: Using one-year lag CPIS_HB

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
CPIS_HB_1	0.829***	0.305***	0.336***	0.196***
	(3.41)	(3.82)	(4.67)	(3.38)
MKTCap	-0.808***	-0.160***	-0.101***	-0.105***
	(-7.69)	(-4.89)	(-3.31)	(-4.39)
Beta	0.721***	0.214***	0.143***	0.662
	(8.57)	(7.97)	(5.73)	(0.34)
BM	0.194**	0.408	-0.131	-0.0277
	(2.50)	(1.62)	(-0.55)	(-0.15)
Retn_1	-0.603	-1.065	0.275**	-30.36***
	(-1.38)	(-0.73)	(2.02)	(-2.87)
Exch	0.577	0.263	0.753**	2.217
	(0.57)	(0.77)	(2.33)	(0.90)
Infl	0.0761	0.731***	0.263	2.486*
	(1.36)	(3.84)	(1.45)	(1.77)
Turn	-0.268***	-0.119***	-0.555***	0.700
	(-6.14)	(-8.09)	(-4.05)	(0.65)
LSMI	0.292	0.429**	-0.642***	-0.317
	(0.52)	(2.27)	(-3.57)	(-0.23)
RGDPG	0.107	-0.728**	-0.177***	-0.374
	(0.99)	(-2.04)	(-5.21)	(-1.44)
Law	-0.160***	0.344***	-0.265**	-0.183
	(-4.04)	(2.65)	(-2.13)	(-0.19)
PolRisk	0.128**	0.121***	-0.317**	0.154
	(2.55)	(7.48)	(-2.05)	(0.13)
EconRisk	-0.232	0.221*	-0.265**	0.346
	(-0.61)	(1.68)	(-2.15)	(0.36)
FinRisk	-0.701	-0.161	0.371	-0.242***
	(-0.24)	(-1.61)	(0.39)	(-3.33)
Constant	-0.111**	1.632***	0.112***	4.178***
	(-2.52)	(11.17)	(8.06)	(3.94)
Number of Observations	354	383	396	382
Adj. R-squared	0.472	0.720	0.539	0.248
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is one year lagged *CPIS_HB,* also described in Table 1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-9: Using one-year lag CPIS_FB

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
CPIS_FB_1	-0.931***	-0.286***	-0.428***	-0.262**
	(-3.69)	(-3.43)	(-9.29)	(-2.34)
MKTCap	- 0.922**	-0.986***	-0.329*	-0.993***
	(-2.00)	(-2.59)	(-1.80)	(-6.70)
Beta	0.610	0.206***	0.529***	0.402
	(0.92)	(6.86)	(3.51)	(1.40)
BM	-0.524	0.170	0.181	0.825***
	(-0.01)	(0.06)	(1.34)	(2.70)
Retn_1	-0.505**	-0.635	-0.880	-22.19**
	(-1.98)	(-0.39)	(-1.08)	(-2.06)
Exch	0.116	0.456	0.706***	1.720
	(0.20)	(1.13)	(3.42)	(0.71)
Infl	-0.354	-0.590**	-0.200*	-0.162
	(-0.97)	(-2.50)	(-1.87)	(-0.10)
Turn	-0.482	-0.144***	-0.422***	-0.556***
	(-0.99)	(-9.85)	(-5.93)	(-2.70)
LSMI	-0.183	-0.268	0.451	-1.390**
	(-1.09)	(-0.13)	(0.45)	(-2.00)
RGDPG	-0.166*	-0.592	-0.444*	-0.102***
	(-1.97)	(-1.28)	(-1.84)	(-3.64)
Law	-0.107**	0.172	-0.220	-0.352*
	(-2.52)	(1.15)	(-0.30)	(-1.94)
PolRisk	0.116**	0.961***	-0.142	-0.211
	(2.04)	(4.43)	(-1.34)	(-0.90)
EconRisk	-0.133	0.503***	-0.502	0.205*
	(-0.05)	(3.38)	(-0.68)	(1.86)
FinRisk	-0.397*	0.762	-0.135**	0.130
	(-1.92)	(0.06)	(-2.45)	(1.45)
Constant	0.709	1.593***	0.838***	7.559**
	(0.94)	(8.90)	(9.48)	(2.52)
Number of Observations	396	396	331	376
Adj-squared	0.884	0.659	0.665	0.362
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is one year lagged *CPIS_FB*, also described in Table 1 above. All the controls are the same as described in Table 6-3 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-10: Using one-year lag GF_FB

	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
GF_FB_1	-0.147***	-0.567***	-0.324***	-0.216***
	(-4.09)	(-5.50)	(-2.86)	(-2.88)
MKTCap	-0.749***	-0.372	-0.154***	-0.971***
	(-6.94)	(-0.98)	(-4.34)	(-9.60)
Beta	0.684***	0.166***	0.164***	0.297
	(7.50)	(5.17)	(5.79)	(1.24)
BM	0.415***	-0.482	-0.137	0.158
	(4.90)	(-1.63)	(-0.05)	(0.70)
Retn_1	-0.396	-0.136	-0.341**	-6.301
	(-0.08)	(-0.08)	(-2.25)	(-0.68)
Exch	0.291	0.212	0.682*	6.311***
	(0.24)	(0.51)	(1.85)	(2.97)
Infl	-0.189***	-0.989***	-0.406**	-0.556
	(-2.93)	(-4.35)	(-2.07)	(-0.34)
LSMI	-0.453	-0.0175	-0.480***	-0.882
	(-0.75)	(-0.80)	(-2.62)	(-1.37)
RGDPG	-0.643	-0.354	-0.191***	-0.184
	(-0.52)	(-0.80)	(-5.08)	(-0.55)
Law	-0.291***	-0.598***	-0.419	-0.566
	(-6.72)	(-3.92)	(-0.30)	(-0.36)
PolRisk	0.224***	0.124***	-0.404**	-0.271
	(3.99)	(6.35)	(-2.38)	(-1.48)
EconRisk	-0.218	0.219	-0.245*	0.517
	(-0.49)	(1.40)	(-1.81)	(0.57)
FinRisk	-0.480	-0.534	0.596	-0.189
	(-0.14)	(-0.44)	(0.55)	(-0.26)
Constant	-0.232***	1.786***	0.124***	22.54***
	(-4.93)	(10.47)	(8.59)	(7.84)
Number of Observations	342	369	342	360
Adj. R-squared	0.474	0.622	0.548	0.587
Country effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes

Note: The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is one year lagged *GF_FB*, also described in Table 6-1 above. All the controls are the same as described in Table 6-3 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-11: CPIS_HB regression based on the Heckman two stage treatment model

Heckman two-stage model	Model (1) HRRm	Model (3) rCred	Model (2) CERP	Model (4) DY
CPIS_HB	0.775***	0.332***	0.288***	0.134**
	(3.34)	(8.14)	(4.28)	(3.43)
MKTCap	-0.796***	-0.619***	-0.824***	-0.108***
	(-8.06)	(-5.51)	(-3.09)	(-4.62)
Beta	0.525***	-0.214***	0.149***	-0.681
	(6.01)	(-7.39)	(6.05)	(-0.54)
BM	0.167	0.387	0.174	0.162
	(1.45)	(1.10)	(0.59)	(0.82)
Retn_1	-0.371**	-0.934	0.128	-0.265***
	(-2.57)	(-0.65)	(1.20)	(-2.89)
Exch	0.345	0.637	0.402	0.279
	(0.30)	(0.67)	(1.34)	(1.14)
Infl	-0.241***	-0.708***	-0.487**	-0.703
	(-4.21)	(-3.45)	(-2.10)	(-0.50)
Turn	- 0.325***	-0.116***	-0.671***	0.337
	(-4.32)	(-7.78)	(-5.15)	(0.33)
LSMI	-0.642	-0.356*	-0.698***	-0.116
	(-0.37)	(-1.80)	(-4.28)	(-0.85)
RGDPG	-0.124	-0.810**	-0.153***	-0.640***
	(-0.14)	(-2.40)	(-5.47)	(-2.84)
Law	-0.238***	-0.240*	-0.183	0.605
	(-5.13)	(-1.77)	(-1.45)	(0.65)
PolRisk	0.177***	0.134***	0.317***	0.867
	(3.03)	(7.20)	(2.62)	(1.30)
EconRisk	0.279	0.238***	0.272**	0.819
	(1.11)	(3.29)	(2.40)	(1.00)
FinRisk	0.787	0.613	0.174	0.217***
	(1.11)	(1.08)	(0.19)	(2.99)
Lambda (inverse Mills' ratio)	-0.534***	-0.614***	-0.487***	-0.527***
	(-16.24)	(-14.57)	(-12.36)	(-12.48)
Wald Chi-square	308.85	376.35	299.74	227.61
Constant	0.607***	1.541***	0.125***	6.276***
	(4.27)	(10.08)	(9.74)	(5.96)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent variable is *CPIS_HB*, also described in Table 6-1 above. All the controls are the same as described in Table 6-3 above. All t-statistics reported are in parentheses. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-12: CPIS_FB regression based on the Heckman two stage treatment model

Heckman two-stage model	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
CPIS_FB	-0.682***	-0.220***	-0.456***	-0.279**
	(-3.31)	(-8.18)	(-4.22)	(-2.10)
MKTCap	-0.430**	-0.861***	-0.340**	-0.673***
	(-2.34)	(-2.76)	(-2.24)	(-7.33)
Beta	0.739	0.197***	0.131***	0.450*
	(1.35)	(7.14)	(5.73)	(1.86)
BM	0.137	0.107	0.204	0.393
	(0.26)	(0.45)	(0.05)	(1.43)
Retn_1	-0.248	-1.755	-0.204*	-23.41***
	(-1.62)	(-1.28)	(-1.74)	(-2.67)
Exch	0.361	0.324	0.497*	1.280
	(0.75)	(0.85)	(1.65)	(0.66)
Infl	-0.724**	-0.782***	-0.348***	-1.231
	(-2.19)	(-3.93)	(-2.62)	(-0.93)
Turn	-0.844	-0.177***	-0.508***	-0.146
	(-0.41)	(-11.32)	(-8.38)	(-0.57)
LSMI	0.617	0.358	-0.412**	0.784
	(0.83)	(0.20)	(-2.53)	(1.23)
RGDPG	-0.160**	-0.398	-0.422***	-0.699**
	(-2.27)	(-1.13)	(-3.46)	(-2.50)
Law	-0.193***	-0.153	-0.430	-0.249
	(-2.78)	(-1.48)	(-1.14)	(-1.56)
PolRisk	0.111**	0.114***	-0.146	0.308***
	(2.56)	(5.48)	(-0.94)	(2.78)
EconRisk	0.153	0.521***	0.880**	0.203**
	(0.73)	(3.45)	(2.51)	(2.14)
FinRisk	0.484**	0.177	0.127	0.097
	(2.10)	(0.17)	(1.29)	(0.89)
Lambda (inverse Mills' ratio)	0.347***	0.394***	0.489***	0.513***
	(21.45)	(18.67)	(15.33)	(17.25)
Wald Chi-square	491.55	438.77	523.78	434.28
Constant	0.130**	1.513***	0.122***	10.24***
	(2.21)	(9.61)	(9.34)	(4.24)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent variable is *CPIS_FB*, also described in Table 6-1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are in parentheses. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 6-13: GF_FB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) HRRm	Model (2) rCred	Model (3) CERP	Model (4) DY
GF_FB	-0.531***	-0.659***	-0.327***	-0.123***
	(-4.62)	(-11.20)	(-6.32)	(-5.11)
MKTCap	-0.770***	- 0.266***	-0.424**	-0.910***
	(-7.23)	(-7.74)	(-2.56)	(-4.64)
Beta	0.563***	0.190***	0.146***	0.816
	(6.37)	(3.96)	(6.29)	(0.44)
BM	0.243***	0.581	0.629	-0.792
	(2.87)	(1.26)	(0.29)	(-0.44)
Retn_1	-0.300**	-2.943	0.253**	-20.29**
	(-1.98)	(-1.16)	(2.10)	(-2.08)
Exch	0.216	0.458	0.466	3.475
	(0.70)	(1.04)	(1.20)	(1.40)
Infl	0.334***	0.497	0.434**	-0.188
	(4.61)	(1.37)	(2.48)	(-0.13)
Turn	-0.345***	-0.125***	-0.559***	-0.632
	(-5.38)	(-2.71)	(-7.59)	(-1.39)
LSMI	-0.410	-0.471	-0.529***	-0.792***
	(-0.07)	(-1.34)	(-3.24)	(-3.22)
RGDPG	-0.759	-0.543***	-0.183***	-0.423**
	(-0.59)	(-8.10)	(-5.61)	(-2.36)
Law	-0.283***	-0.431***	-0.241	-0.297
	(-5.99)	(-5.45)	(-1.22)	(-0.74)
PolRisk	0.177***	0.222***	0.419***	0.186
	(3.00)	(7.42)	(2.90)	(1.59)
EconRisk	0.315	0.249	0.313***	0.532
	(0.71)	(1.05)	(2.75)	(0.61)
FinRisk	0.525	0.584***	0.330	0.226***
	(1.47)	(3.13)	(1.02)	(3.10)
Lambda (inverse Mills' ratio)	0.613***	0.486***	0.493***	0.628***
	(19.32)	(17.55)	(21.03)	(16.23)
Wald Chi-square	562.37	523.74	496.25	477.49
Constant	-0.150**	2.715***	0.143***	7.499***
	(2.03)	(7.38)	(6.34)	(5.14)

Note: The dependent variables are cost of capital measures (*HRRm, rCred, CERP* and *DY*) as described in Table 6-1 above. The key independent is *GF_FB*, also described in Table 6-1 above. All the controls are the same as described in Table 6-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Chapter 7 Second empirical study: International portfolio investment and stock market development

Stock markets are increasingly seen as an important source of financial resources for investment in both developed and emerging countries (see Chapter 2 Section 4.1). Current studies have provided compelling evidence of the prevalence of home and foreign bias across both developed and emerging markets. Studies provide theoretical argument that domestic and foreign investors over or underinvestment will have implications on stock market development. For instance, Errunza (2001) provides theoretical suggestions that sub-optimal portfolio allocations could have varying effects on stock market development. Countries that experience significant home bias will have high illiquid stock market, which will inhibit stock market development. In light of this theoretical argument and the importance of stock market development to financial capital accumulation, technological innovation, economic growth and development, we are motivated to undertake this study to examine whether sub-optimal portfolio allocation (home and foreign bias) have implications for stock market development. We use four measures of stock market development to test the following hypothesis:

H_4 Countries with a prevalence of higher home bias experience poor stock market development.

H_5 Countries with a higher foreign bias experience better stock market development.

H_6 Countries with a higher global fund foreign bias enjoy better stock market development.

7.1 Summary analysis

We start our empirical analysis by providing summary statistics of several measures of stock market development.[52] Consistent with the definition provided by MSCI, the sample countries used in our study include 23 developed countries and 21 emerging countries from 2001 to 2010. We subdivided our sample into developed and emerging countries and present the summary figures of the four stock market development measures at country level in Table

[52] See Table 6.1 for the average statistics of *CPIS_HB*, *CPIS_FB*, and *GF_FB*.

7-1. In panel B, we group the same summary figures into developed and emerging markets. Subsequently, we present in panel C, the figures for both the top 10 and the bottom 10 countries arranged in line, with sub-optimal portfolio allocation. Successively, we report the correlation matrix between the four stock market development proxies and the three key independent variables (*CPIS_HB*, *CPIS_FB* and *GF_FB)*, then proceed with our robust regression analysis.

…….....Insert Table 7-1 about here.....

As reported in Table 7-1, we partition our sample countries in developed and emerging countries. Developed countries tend to experience well developed stock markets as compared to emerging markets. Most of the countries that rank in the top ten against the measure of stock market capitalisation as a percentage of GDP (*MGDP)*, are developed markets (Hong Kong, Switzerland, South Africa, Malaysia, United Kingdom, United States, Australia, Canada, Chile, and Sweden). On the other hand, the bottom ten countries classified as least developed in terms of stock market development are mostly emerging markets, except Austria and New Zealand (Romania, Bulgaria, Hungary, Czech Republic, Mexico, Poland, Turkey, and Indonesia). A similar picture emerges when we compare the top and bottom ten rankings against the *TRGDP* and *TURN* factors, whereby the majority of markets occupying the top positions are developed with the bottom ten being emerging markets.[53] When we compare the markets on the basis of lowest to highest transaction cost (*TRCOST*), the top ten countries with the least transaction costs are all developed markets (Japan, United States, France, Germany, Switzerland, Belgium, Netherlands, Italy, Sweden and Norway). Similarly countries with the highest transaction costs are all emerging markets (Indonesia, Argentina, Egypt, South Africa, Peru, Romania, Philippines, Russia, Chile, and Poland). Clearly, the ranking based on all the four stock market development measures, convincingly supports the view that compared to the smaller emerging markets, developed markets are bigger in size, more highly diversified, exhibit higher level of liquidity, and reflect lower transaction costs.

To further substantiate the initial country-wise analysis, we present the same summary figures in Panel B of Table 7-1 but group the countries on basis of developed and emerging

[53] The top ten countries against the measure of *TRGDP* are Hong Kong, United States, Switzerland, United Kingdom, South Korea, Netherlands, Spain, Finland and South Africa. Similarly the bottom ten are Czech Republic, Indonesia, Austria, Poland, Philippines, Mexico, Bulgaria, Argentina, Peru and Romania.

markets. The average stock market development figures of the developed markets *(MGDP = 97.05, TRGDP = 99.67, TURN = 99.47 and TRCOST = 31.51)* reflect a much higher level of stock market development, relative to the figures for emerging markets *(MGDP = 58.97, TRGDP = 33.62, TURN = 60.70 and TRCOST = 54.68).*

We observe that the top 10 countries average figures *(MGDP = 170.00, TRGDP = 177.68, TURN = 156.31 and TRCOST = 30.70)* again reflect much higher level of stock market development, compared to the bottom ten figures for emerging markets *(MGDP = 24.49, TRGDP = 8.08, TURN =21.59 and TRCOST = 76.01)*

To summarise, the extensive analysis of the summary statistics on stock market development and sub-optimal portfolio investments impart strong indications that countries that exhibit lower home bias and are favoured more by foreign investors have more developed stock markets. This suggests that markets where domestic (foreign) investors' exhibit lower (higher) levels of home bias (foreign bias) have more developed stock markets. We further substantiate such signals, using correlation and more robust regression analysis in the following sections.

We present a summary statistics of the control variables in Table 7-2.[54] *Flow*, *Int*, *FinRisk*, and *Cor* show substantial cross country variations. *Flow* ranges from 0.191 (Belgium) to 0.002 (Japan). *Int* varies between 40.5 (Brazil) and 1.12 (United States). China has the highest financial risk (*FinRisk=46.5*) and lowest is United Kingdom (*FinRisk=24.27*). *Cor* is between 5.55 (Finland) and 1.72 (Russia). Detailed description of the control variables are presented in Section 4.3.5.

…….....Insert Table 7-2 about here.....

7.2 Correlation coefficients

Table 7-3 reports the cross-correlation coefficient matrix between all variables under scrutiny. Not surprisingly, Table 7-3 shows positive correlations among the first three measures of stock market development *(i.e. MGDP, TRGDP* and *TURN)*. Further, in line with expectation, *TRCOST* is negatively correlated with the other three proxies of market

[54] To avoid a repetition of summary statistics of control variables used in the previous empirical chapter, see Table 6.2 for a summary statistics of control variables such as *Exch, Infl, Retn_1, LSMI, MKTCap*, and *R_Law*.

development. These estimates show that markets which are bigger and more diversified are also more liquid and price efficient. In analysing the measures of stock market development against the measures of sub-optimal portfolio allocations (*CPIS_HB, CPIS_FB* and *GF_FB*), consistent with our theoretical expectations, we find that the home bias *(CPIS_HB)* carries statistically significant negative correlation coefficients with the first three stock market development indicators i.e. *MGDP, TRGDP, TURN* and positive with *TRCOST*. This provides further support to the conjecture that the tendency of investors to overweight their domestic stocks in their portfolio has a negative impact on the development of domestic stock markets. The measures of foreign bias (i.e., *CPIS_FB* and *GF_FB*) bear statistically significant and positive correlation coefficients with the three measures of stock market development *(MGDP, TRGDP* and *TURN)* and negative with *TRCOST*. Again, the estimates suggest a positive association between foreign equity portfolio allocation and the level of stock market development. The coefficients of correlations of most other variables have expected signs.

…….....Insert Table 7-3 about here.....

7.3 Econometric issues

As reported in Section 5.4 of the research method, we perform diagnostic tests to find if our models have economic issues, and accordingly resolved them.

7.3.1 Autocorrelation

We use the Durbin-Watson test to check for the presence of autocorrelation by running the following regression in STATA. We obtained *DW* values of 1.183272 which indicates the presence of autocorrelation.

7.3.2 Heteroskedasticity

We use Breusch-Pagan to test for heteroskedasticity. A small chi-square value of 2.80 implies there is no heteroskedasticity problem and the variances of the error terms are equal.

Breusch-Pagan test for heteroskedasticity

Ho: Constant variance
Variables: fitted values of MGDP
chi2(1) = 2.80
Prob > chi2 = 0.0943

7.3.3 Multicollinearity

We use variance inflation factors (VIF) to test for multicollinearity. The mean of VIF for our model is 1.71 which suggests that our model has no multicollinearity problem.

VIF Test Result

Variable	VIF	1/VIF
MKTCap	1.82	0.54824
R_Law	1.62	0.61878
Retn_1	1.51	0.66198
PCred	1.49	0.67186
Cor	1.48	0.67349
Legal_O	1.33	0.75094
Exch	1.30	0.77216
LSMI	1.21	0.82736
Infl	1.21	0.82846
GDPPC	1.15	0.86953
Int	1.12	0.89126
Flow	1.09	0.91624
FinRisk	1.08	0.92534
Sav	1.03	0.97215
Mean VIF	1.71	

7.3.4 Omitted variable bias

We employ Ramsey reset to test for omitted variable bias. The F values are all above 5% and therefore indicate that we have included all relevant explanatory variables and our model does not suffer from omitted variable bias.

Ramsey reset test of omitted variables for CPIS_HB, CPIS_FB, and GF_FB. Test of important variables omitted. Ramsey reset test using powers of the fitted values

Ho: model has no omitted variables

Cost of Capital

CPIS_HB	F(3, 422)=1.78	Pro>F=0.15
CPIS_FB	F(3, 422)=1.74	Pro>F=0.16
GF_FB	F(3, 422)=2.64	Pro>F=0.06

7.4 Regression results

This section documents further evidence on whether the cross-sectional and temporal differences in home and foreign biases of equity portfolio investors, can explain the variations in the levels of stock market development. In all pooled OLS regressions, the

standard errors are corrected for arbitrary autocorrelation and heteroskedasticity using the Newey-West method. We also deal with the potential issue of estimation biases using alternative specifications. In subsequent sections, we initially discuss the empirical results between the home and foreign bias measures and stock market development. We preserve the discussion of the control variables at the end.

7.4.1 Stock market development and equity home bias

We explore, in this section, does home bias affect the level of stock market development? We address this question by presenting the results of four regressions (models 1-4) as reported in Table 7-4.[55] In all the specifications (models 1-4) the key explanatory variable of interest, is home bias (*CPIS_HB)*, with *MGDP*, *TRGDP*, *TURN* and *TRCOST* as dependent variables respectively. All the specifications include the controls, country and year fixed effects.

Models 1-3 (columns 2-4) show that the coefficients of equity home bias (*CPIS_HB)* measure, bears the expected negative signs against *MGDP(-0.276), TRGDP(-0.662)* and *TURN(-0.380)* variables. Similarly, the *CPIS_HB* coefficient in Model 4 (column 5) records a significant positive sign against *TRCOST (0.145*). All the coefficients are statistically significant at 1% significance level. These figures suggest, that on average, a one percentage decrease in home bias, increases the size and diversity of the stock market by nearly 0.3% of GDP (*MGDP* = -0.276). Similar increase in home bias, negatively affects the liquidity of the market by 0.7% (*TRGDP* = -0.662), 0.4% (*TURN* = -0.380), and 0.1% (*TRCOST* = 0.145) against the proxies reflecting the degree of market liquidity. Even though, as in any empirical work, we have to exercise caution in quantitatively interpreting the results from a sample. Our study provides a qualitative and statistically strong indication of the adverse connotations of over-weighting home markets on the development level of local stock market.

…….....Insert Table 7-4 about here.....

7.4.2 Stock market development and equity foreign bias

In Table 7-5, we examine the effect of foreign bias (*CPIS_FB)* on the four stock market development proxies by running four regressions (Models 1-4) which also include control variables and year fixed effects. In line with economic basis, the positive and statistically

[55] The *t-statistics* are reported in parentheses.

significant coefficients on the stock market development measures of Models 1-3 provide convincing evidence that the higher the foreign bias (*CPIS_FB*), the more developed are the stock markets. The coefficient estimates of 0.093, 0.205, and 0.096 for *MGDP, TRGDP*, and *TURN* respectively suggest that markets which are able to attract a higher level of foreign investors' fund (i.e. higher foreign bias) benefit from developing the depth and breadth of their local stock market. Similarly, the coefficient estimates in Model 4 of -0.087, implies that foreign investors' favourable bias towards a country, helps render the market more competitive in terms of reducing transaction costs.

…….....Insert Table 7-5 about here.....

7.4.3 Stock market development and fund level foreign bias measures

We further investigate whether equity foreign bias (*GF_FB*), measured by cross-country allocations of global funds, have a similar influence on the prospects of stock market development. As reported in Table 7-6, with the exception of Model 1, where the coefficient estimates are statistically significant at the 10% level, the remaining coefficients reported in Models 2-4 are statistically significant at the 1% level. The reported coefficients of 0.063, 0.394, 0.323 and -0.112 for *MGDP*, *TRGDP*, *TURN*, and *TRCOST* respectively lend strong support to our earlier results. This clearly suggests that market competition, size and diversity contributions of foreign portfolio investors, are imperative to develop the local stock markets.

…….....Insert Table 7-6 about here.....

7.4.4 Control variables

Our findings are robust to control variables where most exhibit the expected signs. Among the control variables, the theoretically consistent and statistically significant variables include, flow of foreign direct investment (*Flow)*, growth of private sector credit (*PCred),* recent stock market returns (*Retn_1*), market capitalisation (*MKTCap*), law and order in the country *(R_Law*) and legal origin (*Legal_O*). As expected, a higher level of inward foreign direct investment flows, have a significant positive influence on the development of the depth and breadth of local stock markets. Similarly, the growth in private sector credit (*PCred*) lends support to the development of equity markets. The estimates also show that the development of the stock market is positively associated with the recent stock returns (*Retn_1*). As the stock markets (*MKTCap*) grow bigger, they further drive the competition,

diversity and liquidity of the markets. Finally, both the investor protection measures (rule of law and legal origin), carry expected signs and show that quality of legal institutions are imperative to the development of the stock markets, and countries with common law based legal traditions, are associated with higher stock market development.

Interest rate (*Int*) has a significant negative effect on stock market development. Other control variables show less statistically significant impact on stock market development. *Sav, Exch, Infl* and *FinRisk* measures have the expected sign but play virtually no role in explaining stock market development. Stock market integration largely has a statistically significant positive impact on stock market development. Finally, *Cor* negatively related to stock market development, and is mainly significant. This suggests that countries that experience a high level of corruption will experience poor stock market development.

7.5 Robustness tests

Our main analysis provided in the previous section, offers compelling evidence that is consistent with financial literature and theory; thus home and foreign bias have a varying impact on stock market development. In this section, we extend our analysis of the relationship between sub-optimal international equity allocations (i.e. home and foreign bias) and stock market development, by running a battery of robustness tests to provide support to our main analysis. First, we use lagged values to address the concern of endogeneity, caused by reverse causality. Second, we employ the Heckman selection model to address the endogeneity problem as a result of selection bias. We will discuss them in detail in the following sub-sections.

7.5.1 Reverse causality: Lagged pre-determined variables

It is arguable that the relation between the biases and stock market development are driven by some unobserved country characteristics which could influence the biases (i.e. home and foreign bias) and stock market development; for instance, investors and mutual funds, preferring to hold stocks of countries with developed stock market. We, thereby, conduct a series of robustness tests to examine whether our main result is sensitive to endogeneity problems, by including lagged pre-determined values of home and foreign bias as instrumental variables. It is quite conceivable that the level of a country's stock market development could influence foreign investors to increase their equity allocation. This will subsequently lead to a higher foreign bias. The result of this will render our main coefficient

estimates to suffer from endogeneity problems as a result of reverse causality. Under the international capital asset pricing model risk sharing hypothesis, we expect an improvement in stock market development when a country attracts sufficient foreign investment. We use lagged values to address our concern of reverse causality.

In Table 7-7, we replicate our main regression in Table 7-4 by using lagged value (*CPIS_HB_1*) to provide robustness. The coefficients reported in Table 7-7 are -0.250 (t-statistics=-10.55), -0.545 (t-statistics=-16.43), -0.275 (t-statistics=-9.17), and 0.110 (t-statistics=6.77) for *MGDP*, *TRGDP*, *TURN*, and *TRCOST* respectively. This suggests that regardless of using lagged values, our main result is similar to those reported in Table 7-4.

…….....Insert Table 7-7 about here.....

As reported in Table 7-8, introducing lagged values does not materially affect our results reported in Table 7-5. *CPIS_FB_1* exhibits significantly positive association with three stock market development measures. As expected, *CPIS_FB_1* increases *TRCOST*. As reported in Model 4, the significance level of *CPIS_FB* marginally improves in Table 7-8 as compared with Model 4 of Table 7-5. This provides strong support that our main result does not suffer from reverse causality.

…….....Insert Table 7-8 about here.....

The coefficient estimates of lagged values of *GF_FB_1* reported in Table 7-9, as in line with our expectations, are positively related to stock market development. The coefficient estimate of *GF_FB_1* is negative and the statistical significance is marginally better than those reported in Model 4 of Table 7-6. The result provides compelling support to our main analysis. This suggests that countries favoured by foreign investors, experience improved stock market development, after we have addressed the concern of reverse causality using lagged values.

…….....Insert Table 7-9 about here.....

7.5.2 Heckman selection bias

In this section, we re-estimate Tables 7-4 to 7-6 using the Heckman two-stage selection model, as we consider the possibility of our main result being influenced by selection bias. One might argue that the coefficient estimates in our main analysis are driven by endogeneity cause by selection bias. Ideally, we would have preferred to use more countries, but due to unavailability of data, especially for emerging and frontier markets, we limited our sample to 44 countries. This may give rise to an endogeneity problem caused by selection bias, and thereby, may invalidate the statistical inferences.

The overall findings in Table 7-10 confirm our main analysis of *CPIS_HB* on stock market development. Even after addressing endogeneity using Heckman selection, the magnitude and degree of statistical significance marginally improves. The results reported in Table 7-10, further show no material change in inferences of our main findings. This implies that strong preferences for domestic equities are exhibited by investors in international markets, despite the well-documented gains from international diversification inhibiting stock market development.

…….....Insert Table 7-10 about here.....

Table 7-11 replicates the report in the main analysis in Table 7-5. The coefficient and the statistical significance of *CPIS_FB* improve as compared to Table 7-5. They are statistical significant at the 1% level.

…….....Insert Table 7-11 about here.....

In Table 7-12, the statistical significance of *GF_FB* is marginally higher, compared to the main analysis in Table 7-6. There is an increase in the coefficient estimates compared to the main estimates using OLS in Table 6-6. This further corroborates our main evidence that foreign investors, by tilting their investment towards a country, improve stock market development.

…….....Insert Table 7-12 about here.....

7.6 Chapter summary

This chapter reports the results of the empirical findings on the impact of sub-optimal portfolio allocation on stock market development. There is a body of research that shows the importance of stock market development towards economic growth and development. Finance theory demonstrates that financial liberalisation, via foreign investors, will improve stock market development. A review of the existing literature indicates that there are limited studies examining factors that determine stock market development.

In this study, we calculate home and foreign bias by employing two sets of a comprehensive data from 44 countries from 2001 to 2010, to evaluate their implication on stock market development. We report two main findings. First, we show that countries where home bias is more pronounced, experience less stock market development as a result of international under-diversification by domestic investors and a reduction of risk sharing between domestic and foreign investors. Further explanation for the result is that home bias suggests that domestic institutional investors will engage in buy-and-hold activities which will adversely affect stock market liquidity and development. Second, we show that foreign bias improves stock market development. This is explained by the fact that the country will be integrated with the global stock market, which will enhance global risk sharing between domestic and foreign investors, and therefore, reduce cost of capital and increase stock market valuation. Additionally, foreign investors will demand improved governance in the host country, which will boost the participation of domestic investors in the stock market.

The study offers several policy implications for policy makers in emerging countries. First, the negative effect of home bias on stock market development, suggests that policy makers and governments from countries such as Bulgaria, Romania, Hungary, Peru, Czech Republic, Philippines, Egypt, Argentina, Poland, and Indonesia where home bias is not only prevalent, but also persistent, could provide incentives to the domestic investors to diversify internationally to reduce risk. Second, our empirical results also show that foreign bias or countries that are favoured by foreign investors, experience an enhanced stock market. The policy implication of this study is that, countries, particularly emerging markets contemplating to develop the depth and breadth of their local stock markets, should initiate effective policy measures by encouraging international diversification of their domestic investors. For instance, policy makers should implement policies that can attract foreign

investors by improving good governance and macroeconomic fundamentals to attract foreign investors.

Table 7-1: Summary statistics of the dependent variables

Developed Countries					Emerging Countries				
Country	MGDP (% of GDP)	TRGDP (% of GDP)	TURN (% of MKTCap)	TRCOST (Basis points)	Country	MGDP (% of GDP)	TRGDP (% of GDP)	TURN (% of MKTCap	TRCOST (Basis points)
Australia	119.16	94.35	84.22	31.31	Argentina	38.67	3.16	10.41	67.98
Austria	28.95	13.56	44.70	30.47	Brazil	54.96	25.61	48.16	43.06
Belgium	65.83	28.98	44.75	28.16	Bulgaria	17.52	3.17	18.61	60.21
Canada	114.47	82.78	75.42	30.28	Chile	107.1	15.69	15.36	NA
Denmark	63.31	50.19	81.36	32.04	China	69.07	86.97	122.53	46.50
Finland	98.60	124.71	119.26	37.72	Czech Rep	25.33	15.13	60.97	56.37
France	80.67	81.52	101.21	24.74	Egypt	55.67	21.88	36.26	68.15
Germany	45.71	65.40	141.75	25.60	Hungary	24.53	18.61	77.26	51.00
Greece	51.91	24.77	49.06	54.34	India	68.12	62.30	115.82	59.06
Hong Kong	421.17	349.97	77.92	39.22	Indonesia	30.03	14.52	53.16	65.30
Ireland	46.77	25.00	52.33	31.24	Korea	73.81	145.02	227.27	55.05
Israel	84.72	47.91	61.53	37.36	Malaysia	137.03	40.62	31.37	51.21
Italy	37.54	50.46	130.20	29.15	Mexico	28.33	7.46	27.84	35.71
Japan	77.97	89.44	111.68	19.38	Peru	47.15	2.95	6.97	71.24
Netherland	91.33	139.12	147.37	28.45	Philippines	48.26	8.42	18.51	88.02
New Zealand	36.38	15.63	45.63	34.58	Poland	28.56	10.55	37.55	NA
Norway	55.67	62.57	114.81	30.21	Romania	16.31	1.92	12.97	73.12
Portugal	39.39	25.67	63.45	31.83	Russia	61.59	33.32	58.94	NA
Spain	86.70	136.66	164.33	46.82	South Africa	215.23	97.61	48.01	68.54
Sweden	104.08	124.5	121.80	28.60	Thailand	62.06	50.92	94.00	53.14
Switzerland	229.24	225.24	99.90	27.10	Turkey	28.94	40.20	152.80	51.10
UK	128.47	178.77	142.71	50.02					
US	124.09	255.15	212.32	21.73					

Panel B: Averages of the developed and emerging countries.

Country group	MGDP (% of GDP)	TRGDP (% of GDP)	TURN (% of MKTCap)	TRCOST (Basis points)
Developed	97.05	99.67	99.47	31.51
Emerging	58.97	33.62	60.70	54.68

Panel C: Averages of the top and bottom 10 countries.

Country group	MGDP (% of GDP	TRGDP (% of GDP)	TURN (% of MKTCap	TRCOST (Basis points)
Top 10	170.00	177.68	156.31	30.70
Bottom 10	26.49	8.08	21.59	76.01

Note: The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalization; *TRCOST* is transaction cost and is an inverse of turnover ratio.[56]

[56] As in chapter 6, we use *CPIS_HB*, *CPIS_FB* and *GF_FB* as sub-optimal portfolio allocation. Summary analyses of these variables are provided in chapter 6.2.

Table 7-2: Summary statistics of control variables

Panel A: Developed Countries

Country	Flow (% of GDP)	Sav (log of USD millions)	PCred (log of USD millions)	Int (%)	GDPPC (in USD)	Legal_O (0-1)	RiskRisk (0-50)	Cor (0-6)
Australia	0.047	21.4	4.85	2.13	34705	1	36.09	4.667
Austria	0.028	25.4	4.87	2.74	37845	0	38.43	4.842
Belgium	0.191	23.4	4.72	2.67	36323	0	27.78	3.817
Canada	0.006	21.8	5.29	1.83	35335	1	29.50	4.854
Denmark	0.025	24.9	5.22	1.50	47736	0	41.92	5.267
Finland	0.033	23.8	4.42	2.13	38092	0	37.21	5.550
France	0.003	24.8	4.75	2.17	34014	0	30.69	3.238
Germany	0.020	22.0	4.91	1.51	34333	0	26.22	4.325
Greece	0.115	17.5	4.76	7.54	22032	0	32.76	2.775
Hong Kong	0.011	24.5	5.02	3.95	27859	1	41.38	3.817
Ireland	0.031	22.8	5.11	2.14	46103	1	35.59	3.288
Israel	0.102	25.8	4.43	5.34	21799	1	31.27	3.075
Italy	0.003	24.3	4.83	3.56	30279	0	31.70	2.467
Japan	0.002	24.9	5.75	3.31	35857	0	43.47	3.258
Netherland	0.046	21.4	5.22	1.32	39882	0	29.08	5.083
New Zealand	0.014	23.4	4.90	1.75	25219	1	26.50	5.233
Norway	0.047	17.8	4.39	1.74	66658	0	44.74	5.000
Portugal	0.033	26.4	5.11	5.42	18380	0	34.60	3.600
Spain	0.041	27.0	5.12	5.64	25992	0	36.77	3.858
Sweden	0.042	21.2	4.80	2.74	41035	0	28.42	5.192
Switzerland	0.038	17.0	5.17	2.15	54237	0	45.24	4.163
United Kingdom	0.061	27.9	5.20	1.99	35933	1	24.27	4.171
United States	0.016	29.9	5.41	1.12	42341	1	30.56	4.033

Panel B: Emerging Countries

Country	Flow (% of GDP)	Sav (of USD millions)	PCred (log of USD millions)	Int (%)	GDPPC (in USD)	Legal_O (0-1)	RiskRisk (0-50)	Cor (0-6)
Argentina	0.026	26.6	3.56	7.37	5918	0	31.15	2.608
Brazil	0.030	25.2	4.42	40.50	5834	0	32.63	2.313
Bulgaria	0.157	22.7	3.77	4.68	4273	0	32.30	2.500
Chile	0.084	19.5	4.34	4.20	8116	0	25.74	3.496
China	0.004	20.0	4.93	1.43	2299	0	46.50	1.854
Czech Rep	0.114	23.5	3.90	4.71	13843	0	31.03	3.146
Egypt	0.009	24.7	4.42	3.59	1639	0	33.46	2.246
Hungary	0.080	22.0	4.23	4.48	10655	0	35.64	3.467
India	0.004	21.6	4.13	4.83	830	1	37.38	2.021
Indonesia	0.059	25.3	3.76	5.60	1594	1	29.54	2.088
Korea	0.004	21.1	4.56	3.48	16657	1	34.19	2.471
Malaysia	0.041	21.8	4.86	2.80	6036	1	36.95	2.754
Mexico	0.028	22.2	3.61	4.24	7959	0	38.97	2.142
Peru	0.064	24.4	2.94	18.20	3319	0	31.58	2.517
Philippines	0.013	23.1	3.92	4.27	1428	1	35.77	2.033
Poland	0.046	22.5	3.91	8.31	8802	0	36.19	2.688
Romania	0.068	28.4	3.34	5.13	5306	0	35.21	2.238
Russia	0.047	18.7	3.38	5.27	6375	0	43.92	1.725
South Africa	0.012	25.1	5.19	4.20	4868	1	25.91	2.671
Thailand	0.043	20.9	4.87	3.30	3021	1	33.74	1.742
Turkey	0.027	23.9	4.01	6.31	6991	0	32.02	2.392

Flow is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *GDPPC* is the GDP Per Capita; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country.

Table 3: Pearson's pairwise correlation coefficients between the dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MGDP (1)	1																				
TRGDP (2)	0.76*	1																			
TURN (3)	0.33*	0.85*	1																		
TRCOST (4)	-0.24	-0.51*	-0.51*	1																	
CPIS_HB (5)	-0.61*	-0.77*	-0.61*	0.65*	1																
CPIS_FB (6)	0.24*	0.27*	0.17*	-0.55*	-0.39*	1															
GF_FB (7)	0.19*	0.40*	0.42*	-0.46*	-0.46*	0.46*	1														
Flow (8)	0.06*	0.11*	0.22*	-0.16*	-0.18*	0.06*	0.07*	1													
Sav (9)	0.09*	0.06*	0.03	-0.03	0.02	0.03*	0.03*	0.06	1												
PCred (10)	0.37*	0.40*	0.29*	0.05*	-0.43*	0.04*	0.12*	0.06	-0.07	1											
Int (11)	-0.07*	-0.18*	-0.19*	0.10*	0.12*	-0.16*	-0.05*	0.02	0.05*	-0.10*	1										
Exch (12)	-0.16*	-0.01	-0.06*	0.07*	0.02	-0.10*	-0.13*	-0.02	-0.03	-0.02	0.19*	1									
Infl (13)	-0.14*	-0.22*	-0.18*	0.23*	0.27*	-0.30*	-0.29*	-0.04*	0.04*	-0.14*	0.06*	0.19*	1								
Retn_1 (14)	0.27*	0.14*	0.04	-0.12*	0.24*	-0.26*	-0.17*	-0.04*	0.03	-0.08	0.15*	-0.32*	0.20*	1							
LSMI (15)	0.12*	0.06	0.02	-0.10*	0.15*	0.28*	0.05*	-0.18*	-0.10*	0.18*	-0.24*	-0.02	-0.08*	-0.02	1						
GDPPC (16)	0.05*	0.04*	0.06*	-0.44*	0.17*	-0.46*	-0.24*	-0.08*	-0.02	0.04*	-0.02	0.25*	0.13*	-0.05*	-0.02*	1					
MKTCap (17)	0.30*	0.35*	0.29*	-0.06*	-0.25*	-0.12*	0.02	0.07*	-0.02	0.44*	-0.02	0.04*	-0.03	-0.04	-0.17*	-0.02	1				
R_Law (18)	0.36*	0.52*	0.46*	-0.56*	-0.47*	0.78*	0.47*	0.12*	-0.03	0.1	-0.21*	-0.1	-0.36*	-0.25	0.25*	-0.37	0.02	1			
Legal_O (19)	0.35*	0.28*	0.13*	-0.24*	-0.18*	-0.07*	0.10*	-0.23*	0.05*	0.36*	-0.12*	0.02	-0.02	-0.07*	0.12*	0.12*	0.34*	0.25*	1		
FinRisk (20)	-0.06*	-0.03*	-0.02	0.10*	-0.05*	-0.09*	0.06*	-0.04*	-0.04*	0.02*	-0.08*	0.03	-0.09*	-0.08*	0.04*	0.09*	-0.02	-0.14*	-0.14*	1	
Cor (21)	-0.4	-0.26	-0.13	0.31	0.29	-0.29	-0.22	-0.03	-0.02	-0.13	0.11	-0.18	0.24	0.51	-0.09	-0.11	-0.05	0.16	-0.16	-0.09	1

Note: The variables labelled 1- 4 are the stock market development measures and 5-7 are the sub-optimal international portfolio allocation bias measures. They are described in Table 7-1. The other variables include *Flow* as the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index*; Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 7-4: The relation between equity home bias and four measures of stock market development

This table shows regression results of the following model:

$$SMD_{lt} = \alpha + \beta_1 \text{CPIS\_HB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_HB	-0.276***	-0.662***	-0.380***	0.145***
	(-11.11)	(-18.38)	(-10.58)	(7.58)
Flow	0.450**	0.171	0.675***	-0.098
	(2.48)	(0.66)	(2.88)	(-0.74)
Sav	0.634*	0.586	0.101	-0.156
	(1.88)	(1.29)	(0.24)	(-0.68)
PCred	0.787	0.649**	0.574**	-0.136
	(0.33)	(1.98)	(2.48)	(-0.98)
Int	-0.610***	-0.546	-0.128**	0.383*
	(-2.99)	(-1.06)	(-2.43)	(1.68)
Exch	-0.270***	-0.221	-0.105	0.126
	(-2.96)	(-1.57)	(-0.78)	(0.18)
Infl	-0.118	-0.843	-1.045	0.166
	(-0.23)	(-0.83)	(-0.89)	(0.30)
Retn_1	0.288	0.186***	0.232***	-0.402
	(0.79)	(2.89)	(3.26)	(-1.51)
LSMI	0.341***	0.599***	0.262**	-0.144
	(4.73)	(6.04)	(2.58)	(-0.24)
GDPPC	0.330*	0.478**	0.270	-0.324*
	(1.85)	(2.19)	(1.03)	(-1.70)
MKTCap	0.651***	0.108***	0.460**	-0.399
	(4.43)	(4.96)	(2.33)	(-0.31)
R_Law	0.430**	0.179***	0.133***	-0.523***
	(2.03)	(7.15)	(5.08)	(-4.10)
Legal_O	0.246***	0.194	0.051	-0.183***
	(2.71)	(1.64)	(0.51)	(-2.65)
FinRisk	-0.119	-0.281	-0.170	0.156
	(-0.35)	(-0.67)	(-0.37)	(0.70)
Cor	-0.150	-0.328	-0.331	0.220**
	(-1.07)	(-0.16)	(-0.15)	(1.98)
Constant	4.381***	3.565***	3.596***	2.412***
	(6.14)	(3.69)	(3.78)	(5.75)
Number of Observations	440	440	440	410
Adj. R-squared	0.61	0.71	0.48	0.61
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development (SMD_{lt}) measures of country l at time t. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_HB* is equity home bias and is calculated as the log share of domestic investors in their country's stock market capitalisation relative to the country's world market capitalisation weight; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-5: The relation between equity equity foreign bias and four measures of stock market development

This table shows regression results of the following model:

$$SMD_{lt} = \alpha + \beta_1 \text{CPIS\_FB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_FB	0.093***	0.205***	0.096***	-0.087***
	(3.96)	(4.63)	(2.85)	(-6.02)
Flow	0.136	0.092***	0.111***	-0.161
	(0.63)	(2.69)	(4.38)	(-1.07)
Sav	0.829**	0.102*	0.313	-0.729
	(2.17)	(1.65)	(0.66)	(-0.27)
PCred	0.745***	0.134***	0.578**	-0.228*
	(3.05)	(3.03)	(2.05)	(-1.95)
Int	-0.429	-0.176**	-0.204***	0.599**
	(-1.23)	(-2.07)	(-2.93)	(2.58)
Exch	-0.247**	-0.149	-0.446	0.579
	(-2.16)	(-0.65)	(-0.25)	(0.74)
Infl	-0.326	-0.199	-0.179	0.439
	(-0.53)	(-1.50)	(-1.38)	(0.85)
Retn_1	0.167	0.207*	0.235***	-0.351***
	(0.31)	(1.88)	(2.61)	(-2.76)
LSMI	0.350	0.285*	0.225**	-0.244***
	(0.33)	(1.74)	(2.22)	(-5.00)
GDPPC	0.372	0.507	0.208	-0.267
	(1.49)	(1.38)	(0.61)	(-1.49)
MKTCap	0.768***	0.135***	0.617**	-0.149
	(3.48)	(3.40)	(2.40)	(-0.13)
R_Law	0.114***	0.390***	0.284***	-0.611***
	(3.85)	(7.98)	(8.17)	(-4.95)
Legal_O	0.416***	0.595***	0.170	-0.368
	(4.45)	(3.54)	(1.26)	(-0.53)
FinRisk	-0.501	-0.113*	-0.583	0.500*
	(-1.28)	(-1.67)	(-0.99)	(1.87)
Cor	-0.296*	-0.401	-0.200	0.236**
	(-1.68)	(-1.41)	(-0.87)	(2.43)
Constant	2.069**	-2.027	0.330	3.523***
	(2.31)	(-1.49)	(0.34)	(7.85)
Number of Observations	440	440	440	410
Adj. R-squared	0.49	0.46	0.42	0.24
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development (SMD_{lt}) measures of country l at time t. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_FB* is equity foreign bias and is the log deviation of investors in country l in stockholdings for each host country k ($k \neq l$) from the rest of the world market capitalization weight of country l, calculated as the ratio of total market capitalisation of a country's domestic equity held by foreign investors divided by the country's total world market capitalisation weight. *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country;; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-6: The relation between equity country bias and four measures of stock market development

This table shows regression results of the following model:

$$SMD_{lt} = \alpha + \beta_1 GF\_FB + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
GF_FB	0.063*	0.394***	0.323***	-0.112***
	(1.84)	(6.44)	(6.08)	(-3.97)
Flow	0.166	0.075**	0.096***	-0.119
	(0.75)	(2.15)	(4.03)	(-0.71)
Sav	0.697*	0.858	0.305	-0.499
	(1.73)	(1.37)	(0.69)	(-0.19)
PCred	0.779***	0.133***	0.531**	-0.180
	(3.31)	(3.29)	(2.23)	(-1.28)
Int	-0.136	-0.238***	-0.233***	0.092***
	(-0.37)	(-2.93)	(-3.66)	(3.61)
Exch	-0.194*	-0.155	-0.114	0.158
	(-1.71)	(-0.77)	(-0.77)	(0.20)
Infl	-0.515	-1.565	-1.144	0.358
	(-0.82)	(-1.22)	(-1.02)	(0.57)
Retn_1	0.482	0.165*	0.230***	-0.524
	(0.93)	(1.77)	(3.17)	(-1.63)
LSMI	0.623	0.384	0.092	-0.156***
	(0.59)	(0.26)	(1.03)	(-2.64)
GDPPC	0.087	0.145	0.178	-0.390**
	(0.41)	(0.51)	(0.72)	(-2.26)
MKTCap	0.784***	0.150***	0.746***	-0.235
	(3.65)	(4.36)	(3.60)	(-0.19)
R_Law	0.135***	0.317***	0.179***	-0.714***
	(6.45)	(8.89)	(6.72)	(-6.33)
Legal_O	0.355***	0.367**	0.121	0.150**
	(3.65)	(2.33)	(0.11)	(2.19)
FinRisk	-0.101	-0.310	-0.116	0.486
	(-0.26)	(-0.06)	(-0.26)	(0.21)
Cor	-0.358**	-0.405	-0.131	0.327***
	(-2.01)	(-1.59)	(-0.67)	(3.23)
Constant	1.895**	-2.132	0.430	3.306***
	(2.07)	(-1.59)	(0.49)	(6.90)
Number of Observations	440	440	440	410
Adj. R-squared	0.43	0.46	0.36	0.54
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development (SMD_{lt}) measures of country l at time t. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *GF_FB* is equity country bias using global fund; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-7: Using one-year lag equity home bias

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_HB_1	-0.250***	-0.545***	-0.275***	0.110***
	(-10.55)	(-16.43)	(-9.17)	(6.77)
Flow	0.467**	0.171	0.665***	-0.724
	(2.51)	(0.66)	(2.84)	(-0.61)
Sav	0.654*	0.890*	0.328	-0.288
	(1.80)	(1.75)	(0.71)	(-1.25)
PCred	0.175	0.472**	0.299	-0.519
	(1.17)	(2.26)	(1.59)	(-0.51)
Int	-0.121***	-0.188	-0.969*	0.129
	(-2.85)	(-0.03)	(-1.81)	(0.51)
Exch	-0.320***	-0.461***	-0.257**	0.121
	(-3.13)	(-3.23)	(-1.99)	(0.19)
Infl	-0.238	-0.308	-0.192	0.086
	(-0.42)	(-0.39)	(-0.03)	(0.25)
Retn_1	0.130	0.197***	0.265***	-0.274
	(0.03)	(3.33)	(4.96)	(-0.92)
LSMI	0.271***	0.342***	0.0691	0.0739
	(3.99)	(3.60)	(0.81)	(1.45)
GDPPC	0.481***	0.932***	0.457***	0.200***
	(4.03)	(5.60)	(3.04)	(2.70)
MKTCap	0.425***	0.879***	0.525***	0.573
	(3.87)	(5.74)	(3.79)	(0.76)
R_law	0.414**	0.180***	0.125***	-0.523***
	(2.41)	(7.52)	(5.75)	(-5.30)
Legal_O	0.227***	0.261***	0.997	-0.165***
	(3.18)	(2.62)	(1.11)	(-3.77)
FinRisk	-0.158	-0.713*	-0.608	0.352*
	(-0.52)	(-1.68)	(-1.58)	(1.95)
Cor	-0.330***	-0.562	-0.207	0.158*
	(-2.62)	(-0.56)	(-1.31)	(1.86)
Constant	4.649***	2.075**	1.960**	3.001***
	(7.48)	(2.39)	(2.50)	(7.68)
Number of Observations	396	396	396	369
Adj. R-squared	0.59	0.69	0.45	0.61
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_HB_1* is one year lag equity home bias and is calculated as the log share of domestic investors in their country's stock market capitalisation relative to the country's world market capitalisation weight; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-8: Using one-year lag equity foreign bias

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_FB_1	0.085***	0.195***	0.091***	-0.082***
	(4.61)	(5.72)	(3.53)	(-6.78)
Flow	0.151	0.099***	0.113***	-0.171
	(0.74)	(2.63)	(3.96)	(-1.30)
Sav	0.086**	0.128*	0.493	-0.183
	(2.10)	(1.71)	(0.87)	(-0.71)
PCred	0.070***	0.129***	0.555***	-0.263**
	(4.67)	(4.68)	(2.66)	(-2.40)
Int	-0.535	-0.160*	-0.184***	0.554**
	(-1.14)	(-1.84)	(-2.81)	(1.99)
Exch	-0.251**	-0.277	-0.145	0.416
	(-2.20)	(-1.32)	(-0.91)	(0.58)
Infl	-0.298	-1.628	-1.291	0.524
	(-0.48)	(-1.42)	(-1.50)	(1.38)
Retn_1	0.265	0.233***	0.274***	-0.629**
	(0.55)	(2.64)	(4.06)	(-2.43)
LSMI	0.257	0.244**	0.193**	-0.236***
	(0.39)	(1.99)	(2.09)	(-4.89)
GDPPC	0.370***	0.345	0.488	-0.291***
	(2.70)	(1.37)	(0.03)	(-3.48)
MKTCap	0.762***	0.130***	0.631***	-0.482
	(5.59)	(5.15)	(3.33)	(-0.50)
R_law	0.244***	0.333***	0.108**	0.666***
	(6.52)	(4.82)	(2.06)	(3.18)
Legal_O	0.384***	0.596***	0.263**	-0.388
	(4.85)	(4.08)	(2.39)	(-0.78)
FinRisk	-0.291	-0.119*	-0.865*	0.554***
	(-0.84)	(-1.86)	(-1.80)	(2.66)
Cor	-0.512***	-0.617**	-0.283	0.262***
	(-3.73)	(-2.44)	(-1.48)	(2.75)
Constant	2.197***	-2.212*	0.127	3.697***
	(3.32)	(-1.82)	(0.14)	(8.38)
Number of Observations	396	396	396	369
Adj. R-squared	0.47	0.42	0.24	0.56
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_FB_1* is one year lag equity foreign bias and is the log deviation of investors in country *l* in stockholdings for each host country k ($k \neq l$)from the rest of the world market capitalisation weight of country *l* calculated as the ratio of total market capitalisation of a country's domestic equity held by foreign investors divided by the country's total world market capitalisation weight. *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-9: Using one-year lag equity country bias

	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
GF_FB_1	0.061**	0.366***	0.290***	-0.097***
	(2.03)	(6.97)	(7.61)	(-4.91)
Flow	0.178	0.084**	0.101***	-0.161
	(0.85)	(2.27)	(3.76)	(-1.17)
Sav	0.076*	0.131*	0.640	-0.175
	(1.82)	(1.79)	(1.20)	(-0.65)
PCred	0.072***	0.125***	0.483**	-0.178
	(4.71)	(4.62)	(2.46)	(-1.57)
Int	-0.344	-0.212**	-0.213***	0.779***
	(-0.72)	(-2.50)	(-3.46)	(2.70)
Exch	-0.202*	-0.184	-0.110	0.334
	(-1.74)	(-0.90)	(-0.75)	(0.45)
Infl	-0.562	-1.686	-1.032	0.728*
	(-0.89)	(-1.51)	(-1.27)	(1.85)
Retn_1	0.330	0.161*	0.240***	-0.392
	(0.15)	(1.89)	(3.88)	(-1.11)
LSMI	0.535	-0.506	0.097	0.163***
	(0.81)	(-0.43)	(1.15)	(3.25)
GDPPC	0.136	0.110	0.424	-0.394***
	(1.06)	(0.49)	(0.26)	(-4.71)
MKTCap	0.761***	0.141***	0.747***	-0.779
	(5.42)	(5.71)	(4.17)	(-0.08)
R_law	0.269***	0.406***	0.151***	-0.693***
	(7.03)	(6.03)	(3.09)	(-3.16)
Legal_O	0.337***	0.426***	0.151	-0.135***
	(4.15)	(2.97)	(1.46)	(-2.65)
FinRisk	-0.559	-0.198	-0.299	0.193
	(-0.16)	(-0.32)	(-0.67)	(0.91)
Cor	-0.581***	-0.543**	-0.127	0.338***
	(-4.12)	(-2.19)	(-0.71)	(3.46)
Constant	2.083***	-2.193*	0.282	3.470***
	(3.08)	(-1.84)	(0.33)	(7.57)
Number of Observations	396	396	396	369
Adj. R-squared	0.45	0.44	0.32	0.52
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *GF_FB_1* is one year lag of equity country bias measured using global fund; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-10: CPIS_HB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_HB	-0.355***	-0.721***	-0.432***	0.132***
	(-13.24)	(-21.56)	(-12.88)	(11.44)
Flow	0.427***	0.148	0.684***	-0.145
	(2.35)	(0.75)	(4.22)	(-0.72)
Sav	0.638**	0.487	0.292	-0.144
	(2.09)	(1.25)	(0.71)	(-0.37)
PCred	0.769	0.654***	0.677***	-0.269
	(0.63)	(3.72)	(3.66)	(-1.85)
Int	-0.231**	-0.541	-0.185***	0.387*
	(-2.34)	(-1.32)	(-3.73)	(1.97)
Exch	-0.286***	-0.257	-0.211**	0.143
	(-3.21)	(-1.40)	(-2.24)	(0.57)
Infl	-0.122	-0.830	-0.657	0.204
	(-0.18)	(-1.36)	(-0.72)	(0.64)
Retn_1	0.303	0.232***	0.321***	-0.546
	(0.91)	(3.28)	(4.79)	(-1.42)
LSMI	0.476***	0.648***	0.388***	-0.263
	(6.25)	(7.61)	(3.67)	(-0.42)
GDPPC	0.435***	0.487***	0.226	-0.411***
	(3.54)	(3.81)	(1.48)	(-4.72)
MKTCap	0.683***	0.233***	0.563***	-0.431
	(5.95)	(6.18)	(3.61)	(-0.78)
R_law	0.233***	0.309*	0.524	-0.194
	(4.61)	(1.97)	(1.24)	(-0.76)
Legal_O	0.256***	0.241***	0.490	-0.198***
	(3.67)	(3.45)	(0.81)	(-4.57)
FinRisk	-0.158	-0.322	-0.496	0.162
	(-0.64)	(-0.56)	(-1.25)	(0.93)
Cor	-0.186*	-0.427	-0.562	0.292***
	(-1.99)	(-0.64)	(-0.48)	(3.38)
Lambda (inverse Mills' ratio)	0.623***	0.644***	0.563***	-0.611***
	(26.12)	(23.88)	(18.57)	(-20.46)
Wald Chi-square	478.24	396.75	388.49	437.86
Constant	4.255***	4.33***	3.288***	3.862***
	(7.48)	(4.70)	(4.98)	(6.83)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_HB* is equity home bias and is calculated as the log share of domestic investors in their country's stock market capitalisation relative to the country's world market capitalisation weight; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is gross domestic product per capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are in parentheses. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-11: CPIS_FB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
CPIS_FB	0.734***	0.281***	0.183***	-0.120***
	(5.35)	(7.12)	(3.32)	(-8.56)
Flow	0.231	0.142***	0.274***	-0.242*
	(0.70)	(3.43)	(4.13)	(-1.98)
Sav	0.892**	0.133	0.467	-0.813
	(2.50)	(1.67)	(0.71)	(-0.84)
PCred	0.793***	0.281***	0.586***	-0.247***
	(5.18)	(5.27)	(3.61)	(-2.84)
Int	-0.522	-0.184***	-0.230***	0.647***
	(-0.97)	(-3.44)	(-2.64)	(2.90)
Exch	-0.332**	0.155	0.478	-0.611
	(2.27)	(0.93)	(1.22)	(-1.31)
Infl	-0.423	-0.256**	-0.224	0.534
	(-0.54)	(-2.12)	(-1.83)	(1.53)
Retn_1	0.170	0.248***	0.283***	-0.374***
	(0.39)	(2.31)	(4.68)	(-3.53)
LSMI	0.382	0.297**	0.245**	-0.366***
	(0.55)	(2.33)	(2.20)	(-5.83)
GDPPC	0.377***	0.624**	0.480	-0.253***
	(2.81)	(2.18)	(0.19)	(-3.84)
MKTCap	0.791***	0.562***	0.259***	-0.278
	(5.91)	(5.14)	(3.73)	(-0.81)
R_law	0.239***	0.418***	0.297**	-0.643***
	(7.05)	(10.84)	(11.35)	(-7.61)
Legal_O	0.427***	0.610***	0.188***	0.394
	(5.55)	(4.76)	(2.98)	(0.80)
FinRisk	-0.566	-0.172*	-0.617**	0.527***
	(-1.49)	(-1.88)	(-2.36)	(2.97)
Cor	-0.311**	-0.456*	-0.297	0.275***
	(-2.45)	(-1.86)	(-1.50)	(3.87)
Lambda (inverse Mills' ratio)	-0.348***	-0.453***	-0.387***	0.563***
	(-23.11)	(-18.16)	(-13.68)	(12.27)
Wald Chi-square	544.81	486.42	423.88	497.76
Constant	2.245***	-2.358*	0.140	3.637***
	(3.23)	(-1.61)	(0.26)	(9.31)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *CPIS_FB* is equity foreign bias and is the log deviation of investors in country l in stockholdings for each host country k ($k \neq l$) from the rest of the world market capitalisation weight of country l, calculated as the ratio of total market capitalisation of a country's domestic equity held by foreign investors divided by the country's total world market capitalisation weight. *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are in parentheses. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Table 7-12: GF_FB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) MGDP	Model (2) TRGDP	Model (3) TURN	Model (4) TRCOST
GF_FB	0.124***	0.402***	0.396***	-0.164***
	(3.64)	(8.31)	(7.97)	(-5.55)
Flow	0.178	0.128**	0.122***	-0.161
	(0.94)	(2.64)	(5.97)	(-0.86)
Sav	0.713**	0.926	0.474	-0.540
	(2.03)	(1.44)	(1.41)	(-0.33)
PCred	0.898***	0.157***	0.544**	-0.197*
	(5.56)	(5.82)	(2.44)	(-1.82)
Int	-0.187	-0.258***	-0.245***	0.124***
	(-0.47)	(-3.37)	(-3.72)	(3.60)
Exch	0.217*	0.166	0.143	0.179
	(1.97)	(1.12)	(1.20)	(0.62)
Infl	-0.563	-1.621	-1.411	0.406
	(-0.77)	(-1.64)	(-1.23)	(0.86)
Retn_1	0.467	0.135**	0.241***	-0.567*
	(1.26)	(2.47)	(4.63)	(-1.90)
LSMI	0.645	-0.395	-0.110	0.177***
	(0.84)	(-0.53)	(-1.47)	(3.74)
GDPPC	0.113	0.162	0.273	0.405***
	(0.67)	(0.86)	(0.91)	(3.77)
MKTCap	0.821***	0.162***	0.752***	-0.326
	(5.24)	(6.11)	(4.88)	(-0.63)
R_law	0.286***	0.375***	0.189***	-0.742***
	(7.19)	(9.37)	(7.64)	(-6.88)
Legal_O	0.351***	0.386***	0.177*	-0.193***
	(4.51)	(3.67)	(1.70)	(-3.67)
FinRisk	-0.152	-0.365	-0.142	0.502
	(-0.44)	(-0.17)	(-0.83)	(0.63)
Cor	-0.367***	-0.427*	-0.156	0.341***
	(-2.89)	(-1.90)	(-0.96)	(3.68)
Lambda (inverse Mills' ratio)	-0.611***	-0.467***	-0.296***	0.329***
	(-12.46)	(-8.24)	(-11.47)	(15.22)
Wald Chi-square	363.96	438.67	476.91	432.18
Constant	2.356***	-2.347*	0.286	3.247***
	(2.54)	(-1.97)	(0.56)	(8.56)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the stock market development measures. *MGDP* is market capitalisation as a percentage of GDP; *TRGDP* is stock value traded as a percentage of GDP; *TURN* is value of stock traded as a percentage of stock market capitalisation; *TRCOST* is transaction cost and is an inverse of turnover ratio; *GF_FB* is equity country bias using global fund; *Flow* is the log of net foreign direct investment scale by GDP; *Sav* is gross domestic savings as a percentage of GDP; *PCred* is the domestic credit to the private financial sector, scaled by GDP; *Int* is annual interest rate; *Exch* is the three year moving average covariance of the monthly stock market index return with the monthly depreciation of the domestic currency with respect to the dollar; *Infl* is the one year lagged rate of inflation based on the consumer price index; *Retn_1* is the average *MSCI* monthly index return over the past year; *LSMI* is the log stock market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; GDPPC* is the GDP Per Capita; *MKTCap* is the log of country market capitalisation; *R_Law* represents the law and order index of a country; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *FinRisk* is the financial risk of a country; *R_Law* represents the law and order index of a country; *Cor* is the corruption level prevailing in a country. All t-statistics reported are in parentheses. For tractable interpretation all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance level.

Chapter 8 Third empirical study: International portfolio investment and investor protection

Henry (2003) contends that financial globalisation may affect factor productivity of a country, by promoting better corporate governance and signalling higher quality of state governance.[57] In other words, financial globalisation, i.e. encouraging international portfolio diversification, which integrates the local with world capital markets, may have a lasting effect on the improvement of investor protection standards. However, the significant departure from the theoretical benchmarking in international equity portfolio diversification, referred to as home and foreign bias, is a ubiquitous phenomenon and is well documented in the finance literature.

A number of researchers and policy-makers have argued and provided compelling evidence that investor protection standards play a significant role in the reduction of cost of capital, stock market development, economic growth and development (see Chapter 2 Section 5.1). Studies argue that better investor protection standards lead to attracting foreign investors. Further, foreign investors avoid investing in countries with weak investor protection standards (Chan et al., 2005). Other studies provide strong argument that, countries that experience poor investor protection standards attract foreign investors from well governed countries as a result of high expected returns. Subsequently, these foreign investors from well governed countries, will export and demand better investor protection standards from the host countries. With knowledge of this argument and the existing studies that suggest sub-optimal portfolio allocation (home and foreign bias) could have a varying impact on investor protection (see Errunza, 2001). We are therefore motivated to embark on this study to investigate the implications of home and foreign bias on investor protection standards as improving investor protection standards is an important policy priority in many emerging countries.

In past years, there was unavailability of cross-border equity allocation data which has hindered research in these areas. We therefore make use of current available data of the Co-ordinated Portfolio Investment Survey of the IMF and EPFR data to embark on this study.

[57] In modern finance, it is axiomatic that investor protection regulations and practices are pivotal for the welfare of corporates and countries (La Porta et, al, 1997, 1998, 2000, 2002).

Consistent with our discussion in Chapter 3 (see Section 3.4), we employ four measures of investor protection, which we obtain from the World Governance Indicators. We test the following hypotheses in this chapter:

H_7 Higher home bias is related to a lower level of investor protection standards.

H_8 Higher foreign bias is associated with higher levels of investor protection standards.

H_9 A higher country global fund bias is related to higher investor protection standards.

8.1 Summary statistics

Before we start the analysis of the regression results, we provide summary statistics which offer an important overview and information of the relationship between sub-optimal portfolio allocation and investor protection. In line with the classification provided by MSCI, our sample country includes 23 developed countries and 21 emerging countries for the period 2001 to 2010. We partition our sample countries into developed and emerging countries and report the sample average statistics in panel A of Table 8-1 for the several measures of investor protection (columns 2 to 5).[58] Corresponding statistics are reported in panel B for developed as compared to emerging markets. Finally, panel C presents the sample mean for the top 10 and bottom 10 countries.

……..Insert Table 8-1 about here……..

In line with our anticipations, the figures reported in panels A and B indicate that developed countries display high investor protection in comparison to their emerging country equivalents, we detected the highest investor protection in terms of government effectiveness in Finland followed by Denmark, Sweden, Switzerland, Norway, Netherland, Canada, Australia, Austria and New Zealand (10 highest investor protection). Equally, the bottom investor protection ranking countries are Indonesia, Egypt, Russia, Peru, Argentina, Romania, Philippines, India, China and Brazil. A similar trend is observed in the other measures of investor protection.

[58] See columns 6-8 of Table 6-1 for the summary statistics of home and foreign bias measures i.e. *CPIS_HB*, *CPIS_FB*, and *GF_FB*.

Panel C of Table 8-1 demonstrates that the top 10 countries' average government effectiveness is 87.51 (*Con_Cor* = 85.68, *Reg_Qual* = 86.72, *Rule_Law* = 86.17) compared to the bottom 10 government effectiveness of 56.19 (*Con_Cor* = 50.13, *Reg_Qual* = 58.87, *Rule_Law* = 50.66). As such, the analysis is strongly indicates that countries with a lower home bias (higher foreign bias) tend to be associated with a higher investor protection standards or good governance.

Table 8-2 presents the summary statistics of the control variables.[59] *PolStab, Confl, Press,* and *Educ* demonstrate significant cross country variations. *PolStab* varies widely between 40.86 in Egypt to 99.62 in Denmark. *Press* is the lowest in China (6.96) but highest in Denmark (98.75). Detailed descriptions of the control variables are presented in Section 4.4.5.

……..Insert Table 8-2 about here……..

8.2 Correlation analysis

We report in Table 8-3, the correlation coefficient between all the variables we use in our analysis. Consistent with our expectations, *CPIS_HB* is negatively and significantly correlated with all the investor protection proxies. This suggests that, from a simple univariate perspective, countries with a greater home bias experience poor investor protection. This assumption is again consistent with our summary analysis. Correspondingly, the *CPIS_FB* measure has a positive correlation with the investor protection measures, indicating that countries that attract sufficient foreign investors are associated with better investor protection. Additionally, the *GF_FB* measure also shows positive and statistically significant correlation coefficients, offering further support to the previous assumption. Several of the control variables correlation coefficients display the expected signs.

……..Insert Table 8-3 about here……..

8.3 Econometric issues

We perform the following diagnostic test to resolve econometric problems.

[59] See Table 6-2 for the summary statistics of *MKTCap, Retn_1, Turn, Infl, LSMI*, and Table 7-2 for the summary statistics of *Legal_O*, and *GDPPC*.

8.3.1 Autocorrelation

We use the Durbin-Watson test to check for the presence of autocorrelation by running Durbin-Watson regression (Regdw) in STATA. We obtained *DW* values of 1.976017 which suggests the presence of autocorrelation.

8.3.2 Heteroskedasticity

We use Breusch-Pagan to test for heteroskedasticity. A large chi-square value of 200.50 indicates the presence of a heteroscedasticity problem. This suggests that the variance of the error terms is not equal. Breusch-Pagan tests of the null hypothesis that the error variances are equal, are rejected. In our main empirical analysis, we employ Newey-West autocorrelation and heteroskedasticity standard error correction which addresses autocorrelation and heteroskedasticity.

Breusch-Pagan test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Gov_Eff
chi2(1) = 200.50
Prob > chi2 = 0.0000

8.3.3 Multicollinearity

We adopt variance inflation factors (VIF) to test for multicollinearity. The mean of VIF for our model is 1.25 which implies that multicollinearity seems not to be a problem in our model.

VIF Test Result

Variable	VIF	1/VIF
MKTCap	1.61	0.622237
Legal_O	1.52	0.659116
Confl	1.31	0.760486
MGDP	1.30	0.768587
Turn	1.28	0.779293
Press	1.28	0.784259
Retn_1	1.19	0.839531

Infl	1.18	0.847324
Tobinq	1.16	0.860835
PolStab	1.15	0.867942
GDPPC	1.11	0.898337
LSMI	1.08	0.922136
Educ	1.08	0.924289
Mean VIF	1.25	

8.3.4 Omitted variable bias

We employ Ramsey reset to test for omitted variable bias. The F values are all below 5% which indicates that our model does suffer from omitted variable bias, and we therefore include several relevant explanatory variables; Ramsey reset test of omitted variables for *CPIS_HB*, *CPIS_FB*, and *GF_FB*. Test of important variables omitted. Ramsey reset test using powers of the fitted values.

Ho: model has no omitted variables

Investor protection:

CPIS_HB	F(3, 422)=9.57	Pro>F=0.000
CPIS_FB	F(3, 422)=8.51	Pro>F=0.001
GF_FB	F(3, 422)=7.58	Pro>F=0.001

8.4 Regression results

We examine, in this section, whether cross-sectional and temporal variations in home biases of domestic investors and foreign biases of foreign investors across the world explain the international differences in investor protection standards. To this end, we employ pooled OLS with panel dataset regressions, using several control variables that could potentially be correlated with the different investor protection measures, including country and year effects. All the regression estimations use robust Newey-West autocorrelation and heteroskedasticity standard error correction.

8.4.1 Investor protection and equity home bias

We start our analysis by examining the effect of non-optimal domestic allocation, i.e. home bias (*CPIS_HB*) on country level investor protection standards. In Table 8-4, we present the regression results, showing the association between equity home bias and four different investor protection measures. We present *t-statistics* in parentheses. Throughout the models,

the coefficient on *CPIS_HB* is negatively and statistically significant, even at the 1% level in Models 1 to 4. The results offer convincing evidence that domestic investors' over-investment in the local stock market, relate negatively to investor protection standards. This is consistent with the theoretical assumption by Errunza (2001) that home bias reduces country level good governance (investor protection). On average, one standard deviation increase in home bias reduces investor protection by Gov_Eff (0.26), Con_Cor (0.28), Reg_Qual (0.24), and (0.25). The R^2 reported in Table 8-4 ranges from 74% in Model 4 to 79% in Model 1. This confirms the relative importance of home bias in explaining investor protection.

……..Insert Table 8-4 about here……..

8.4.2 Investor protection and equity foreign bias

Table 8-5 presents the results of the association between investor protection and *CPIS_FB*. In line with our anticipations, the estimated coefficient on *CPIS_FB* is positively and statistically significant at a minimum of 1% level, in all the four models. The coefficient of 0.472 (t-statistic = 14.13) of Model 1, suggests that the government effectiveness improves for countries with a higher foreign bias. Model 2 exhibits a positive coefficient of 0.652 (t-statistic = 14.14) which is consistent with the view that favourable country allocation by foreign investors is associated with favourable effective control of corruption, indicating a better investor protection. Equally, the coefficient of 0.494 (t-statistic = 11.91) provides support to the conjecture that countries that attract higher foreign equity portfolio investments are associated with better regulatory quality. The coefficient of 0.627 (t-statistic=12.34) in Model 4, further supports the theory that higher foreign bias is associated with improved rule of law.

Model 2 shows that a one standard deviation increase in foreign bias is associated with 0.65% improvement in control of corruption and 0.49% enhancement in regulatory quality in Model 3. The R^2 ranges from 73% in Model 4 to 82% in Model 2.

……..Insert Table 8-5 about here……..

8.4.3 Investor protection and fund level foreign bias measures

Table 8-6 presents replicated panel regression estimates of Table 8-5 by employing global fund level data to proxy equity foreign bias (*GF_FB*). We show in Table 8-6 that the signs of the coefficients are positively and statistically significant across all the measures of investor protection. The different *GF_FB* coefficients estimates of 0.262 (t-statistic = 3.55), 0.371 (t-statistic = 3.76), 0.318 (t-statistic = 3.40), and 0.307 (t-statistic = 3.11) for *Gov_Eff, Con_Cor, Req_Qual,* and *Rule_Law* respectively, provide robustness to the findings discussed above. This indicates that foreign bias, whereby a country attracts sufficient foreign investment, relates positively to investor protection across developed and developing countries. The results are consistent with the theoretical assumption by Errunza (2001) that foreign investors from well governed countries will demand and export good governance to the host countries in which they invest.

……..Insert Table 8-6 about here……..

8.4.4 Control variables

In line with our expectations, several control variables mainly bear the expected signs and are statistically significant as presented in Tables 8-4 to 8-6. *Turn, MGDP, LMSI, Tobinq, Educ, and GDPPC* are positive and statistically significantly related to the investor protection standards. Such findings are consistent with existing studies (see Kang and Stulz, 1997; Lau et al. 2010; Rajan and Zingales, 2003; La Porta et al. 2002). *Retn_1* and *Infl* are inversely related to investor protection and are mainly statistically significant. Similarly, *MKTCap, Confl*, and *Press* are positively associated with investor protection, but their statistical significance levels are sensitive to different specifications. Such inconsistent behaviour of the control variables is also reported by existing studies (see Lau et al. 2010). Other controls such as *PolStab* and (*Legal_O)* have a positive and (negative) relation with investor protection measures, but are generally inconsistent with respect to statistical significance to different specifications.

8.5 Robustness tests

The evidence from univariate, correlations, as well as regression analyses, offer compelling empirically and theoretically consistent suggestion, that equity portfolio investors' fund

allocations play a significant role in investor protection standards. Further tests are undertaken in this section to ensure that the above findings are robust.

We run a series of sensitivity analyses in this section to further evaluate the robustness of our main empirical results. Initially, we address the concern of possible endogeneity issues (reverse causality and selection bias) by employing two alternative statistical techniques. First, we treat reverse causality by using the pre-determined (exogenous), one year lagged values, of home and foreign biases. Finally, we adopt the Heckman selection method to address the concern of sample selection bias.

8.5.1 Reverse causality: Lagged pre-determined variables

There is growing evidence that international equity portfolio investors avoid investing in companies or countries that display weak corporate governance. For example, foreign investors may be attracted to countries with better investor protection or good governance. For instance, employing US data Agarwal et al. (2005) show that US investors tend to allocate more funds to countries with better investor protection. Similarly, Chan et al. (2005) argue that foreign investors avoid investing in countries that have poor investor protection standards. The occurrence of this situation will render our estimates to suffer from endogeneity issues arising from reverse causality. We use lagged values statistical techniques to address the potential reverse causality concern. Following McKnight and Weir (2009), in Tables 8-7 to 8-9, we use one-year lagged values of home and foreign bias as instrumental variables or pre-determined exogenous variables.

To address our concern of endogeneity, we employ lagged *CPIS_HB*, *CPIS_FB* and *GF_FB* as instrumental variables in Table 8-7 to 8-9. Consistent with our expectations, the alternative coefficient estimates on *CPIS_HB* in Table 8-7 have the expected negative sign and are statistically significant at the 1% level in all cases. This provides robust support to the result presented in Table 8-4, that higher equity home bias is associated with poor investor protection standards, even after addressing the endogeneity problem arising from possible reverse causality.

……..Insert Table 8-7 about here……..

The coefficient estimates of the lagged values of *CPIS_FB* presented in Table 8-8 remain positive and statistically significant at the 1% significance level throughout all the measures of investor protection. These results further provide compelling robustness to our findings that higher equity foreign bias relates to better investor protection, even after controlling for any likely reverse causality issues. The result demonstrates that by employing different relevant statistical techniques show that the findings of the study are robust.

……..Insert Table 8-8 about here……..

In Table 8-9 we use lagged foreign bias measures constructed using the global funds to address the concern of a potential reverse causality problem. Consistent with our expectation, all four coefficients of the lagged *GF_FB* are positive and statistically significant at the 1% level for all four proxies of investor protection. The statistical significance of *GF_FB* estimates are similar to those presented in Table 8-6. Such results further provide robust support to the conclusion that country level investor protection standard improves with increased levels of foreign investor allocation.

……..Insert Table 8-9 about here……..

8.5.2 Heckman selection bias

We use data of 44 countries which are from the 45 all-country index of MSCI and hence, capture 98 per cent of the highly investable markets. Even though, we would preferably like to use as many countries as possible, due to unavailability of data, for the most part for smaller emerging and frontier markets, we result in selecting 44 countries. In this section, we employ the standard robust econometric methodology, i.e., Heckman two-stage selection bias model to resolve the concern of selection biases which may affect the validity of the results. In Tables 8-10 to 8-12, we use the Heckman two-stage selection model to address the issue of selection bias.

The results in Models 1-4 of Table 8-10 are slightly similar to our main analysis of Models 1-4 in Table 8-4. The signs and significance of the coefficients marginally improved. This suggests that endogeneity problems do not generally influence our results.

……..Insert Table 8-10 about here……..

The coefficients of *CPIS_FB,* reported in Models 1-4 of Table 8-11 are positive and statistically significant across all the proxies of investor protection. The magnitude and degree of statistical significance levels of *CPIS_FB* is higher compared to their counterparts from the baseline models of Table 8-5.

……..Insert Table 8-11 about here……..

The results of *GF_FB* are reported in Model 1-4 of Table 8-12 and are unaffected by using the Heckman selection model. The coefficients are positive and are quantitatively higher than those presented in the previous regressions in Table 8-6. There is a marginal increase in the statistical significance level as compared to Table 8-6.

……..Insert Table 8-12 about here……..

Essentially, our extensive sensitivity analyses demonstrate that our results are certainly robust to different specifications and to the use of alternative estimation methods. The entire analysis of the empirical result offers compelling evidence that a higher degree of home bias is associated with weak investor protection. Correspondingly, foreign investors increasing their portfolio allocation weight towards the global optimum allocations, lead to better investor protection standards.

8.5.3 Alternative investor protection measures

We provide further robustness to our results by using two alternative measures of investor protection. The first measure is International Country Risk Guide (ICRG) investor profile (*ICRG_InvFile*) which captures government attitudes towards inward investment.[60] The variable is provided by ICRG and has widely been used by academics. It is a sub-component of ICRG political risk rating which consists of (i) contract viability or risk of expropriation, (ii) payment delays, and (iii) repatriation of profits. The second proxy of investor protection is from firm level survey data provided by World Bank Doing Business (WBDB) investor

[60] See Bekaert et al. 2007.

protection (*WBDB_InvPro*). We use four components which capture investor protection (i) strength of investor protection, (ii) extent of disclosure index, (iii) ease of shareholder suit, and (iv) credit strength of legal rights index.

Table 8-13 provides the regression results for each of the investor protection measures. In all cases with the exception of *GF_FB*, the investor protection measures are statistically significant at the 5% level and have the expected sign. The regression result shows that when ICRG investor protection (*ICRG_InvFile*) measure is used, all three sub-optimal portfolio allocation measures are statistically significant at the 5% level and also bear the expected sign. Home bias (*CPIS_HB*) negatively relate to *ICRG_ InvFile*, whilst foreign bias (*CPIS_FB* and *GF_FB*) have a positive association with *ICRG_InvFile*. However, there is a mixed result when investor protection is proxy by data obtained from the WBDB. *CPIS_HB* and *CPIS_FB* have the expected sign and are statistically significant at the 5% and 10% level respectively. However, *GF_FB* is not significant when we employ the *WBDB_InvPro* and it bears an opposite sign. This is could be due to a small observation as the data covers only six years, since WBDB started collecting data from 2006. The evidence presented, suggests that the result is robust to alternative specification and is not sensitive to the choice of particular source of governance data.

……..Insert Table 8-13 about here……..

8.6 Chapter summary

Researchers argue that investor protection plays an important role towards economic growth and development. Therefore, this suggests that improving investor protection is an important policy priority, particularly in several emerging countries. As far as we are concerned, no study has empirically examined the implications of home and foreign bias phenomenon on investor protection. Current literatures mainly examine the impact of investor protection standards on economic growth. This study represents the first attempt to empirically examine the effects of home and foreign bias on investor protection. We hypothesise that; the predominance of home bias will segment the domestic market and will thereby impede the improvement in country-level investor protection standards. Similarly, when a country attracts sufficient international investment, foreign investors from well governed countries

will demand good governance and will positively contribute towards the improvement of investor protection standards.

Despite our understanding of what causes home and foreign biases in international equity portfolio diversifications, studies investigating their implications are highly limited. Economic conjecture advocates that financial globalisation that promotes greater international portfolio diversifications may improve factor productivity of a country by promoting better investor protection standards. In a financially open economy, domestic and foreign investors should hold the equities issued by corporates of the country following the ICAPM benchmark. However, defying the normative suggestions, equity investors exhibit different degrees of home and foreign bias in their cross-country diversifications. Lower home and higher foreign bias implies a higher degree of financial integration or globalisation, which further suggests greater presence of foreign investors in the domestic market. A higher presence of foreign investors, demands corporates to adopt a higher standard of governance practices. Similarly, in a financially more integrated market, it becomes difficult for the state itself to expropriate investors, as they risk losing the much needed foreign investments if they do not heed to the demands of foreign investors. The growing interest of foreign investors, thus, drives reform in the domestic investor protection regulations, and the state itself has to improve their own IPS.

Our study is the first attempt to empirically examine the following question: Do the phenomena of the widely observed home and foreign biases exhibited by equity portfolio investors have any implications for investor protection standards? Our study directly uses pooled OLS with panel modelling to examine how sub-optimal portfolio allocation via home and foreign bias, influence country level investor protection standards. We offer a distinct test of our hypothesis using CPIS and EFPR global fund data sample covering a cross-section of 23 developed and 21 developing countries worldwide for the period 2001 to 2010. Consistent with economic justifications, our empirical investigations show that encouraging international portfolio diversification plays an influential role in the development of IPS of a country.

The result provides compelling evidence that home and foreign bias have varying significant influence on investor protection. First, we find that markets where investors observe a higher degree of home bias are associated with poor quality of corporate and state investor

protection standards. The explanation for the negative impact is that, large domestic investors will develop close ties with managers and the state, which makes it easier to expropriate minority investors. Our result is consistent with the theoretical assumption by Errunza (2001) that home bias segments the market and leads to weak investor protection. Similarly, relative to more closed markets (lower foreign bias), countries that allow greater foreign portfolio investments (greater foreign bias) reflect higher levels of investor protection standards. Specifically, we find that closer the degree of domestic and foreign investors' international equity investments relative to the theory, higher is the quality of investor protection standards. This suggests that foreign institutional investors from well governed countries will export and demand better investor protection in the host country. Our findings support the notion that financial globalisation has a significant positive effect in the improvement of state and corporate governance.

We also find that most developed countries report stronger positive foreign bias, i.e. these countries are preferred by international investors, compared to the emerging markets. These findings are consistent with existing studies (see Bekaert and Wang, 2010 and Chan et al., 2005). We further add to this literature by providing new evidence on the observance of biases in the cross-country allocations by the sophisticated global fund managers, whose sole objective is to create a broad based optimal global diversification. We uncover that the manifestation of investment biases is not only reserved to the aggregate and macro data which may include country, regional or global funds, but such biases are also observed by the most sophisticated global fund managers.

The policy implications of this study are that policy makers should provide incentives to local investors to invest abroad and, similarly, embark on policies that can attract foreign investors by improving macroeconomic fundamentals. Literature advances sound economic arguments, as we explain that encouraging international equity portfolio diversification, particularly allowing inward foreign equity portfolio investments, should improve the quality of investor protection standards (see Smarzynsk and Wei, 2000 and Bonaglia et al. 2001). Consistent with this economic reasoning, our empirical results reveal that countries where investors span their equity portfolio in line with the theoretically optimal international benchmark, are associated with higher quality of investor protection standards. Such positive implications may arise through indirect or 'collateral' benefits of greater financial integration. Regarding

financially open economies, foreign equity portfolio investors play a catalytic role in improving the quality of investor protection standards.

Table 8-1: Summary statistics of dependent variables

Developed Countries					Emerging Countries				
Country	Gov_Eff (0-100)	Con_Cor (0-100)	Reg_Qual (0-100)	Rule_Law (0-100)	Country	Gov_Eff (0-100)	Con_Cor (0-100)	Reg_Qual (0-100)	Rule_Law (0-100)
Australia	94.82	94.9	95.3	95.1	Argentina	50.60	42.8	30.4	34.4
Austria	94.48	95.1	93.9	97.9	Brazil	56.87	55.8	57.8	43.8
Belgium	91.68	89.5	87.7	88.6	Bulgaria	58.18	55.0	67.1	51.9
Canada	95.74	95.1	93.6	95.2	Chile	86.69	90.2	92.3	87.9
Denmark	98.79	99.8	98.0	98.6	China	54.44	38.3	43.4	41.5
Finland	98.93	99.8	97.4	99.5	Czech Rep	77.73	68.3	82.5	76.2
France	90.47	90.1	84.8	90.0	Egypt	40.12	36.7	40.2	51.8
Germany	91.63	93.5	92.6	93.2	Hungary	78.86	73.4	84.0	77.7
Greece	75.38	70.5	76.6	74.2	India	54.36	44.2	43.6	56.9
Hong Kong	90.98	91.4	99.1	87.9	Indonesia	39.38	21.5	36.9	25.9
Ireland	91.34	91.8	96.6	93.2	Korea	79.47	68.8	72.6	77.0
Israel	82.23	81.6	81.0	78.5	Malaysia	80.74	66.2	66.0	64.3
Italy	73.59	69.1	78.6	67.6	Mexico	60.95	49.0	64.3	39.7
Japan	86.44	86.2	80.3	88.4	Peru	43.22	47.3	61.2	30.0
Netherland	96.72	96.9	98.1	95.5	Philippines	52.71	35.5	53.4	39.6
New Zealand	93.80	98.9	97.2	97.2	Poland	70.38	68.6	73.0	67.0
Norway	96.86	96.1	89.0	99.1	Romania	50.77	50.9	60.0	52.1
Portugal	84.03	83.9	84.0	85.3	Russia	42.83	19.6	36.7	20.4
Spain	86.71	86.1	87.4	85.9	South Africa	72.66	65.6	66.6	55.8
Sweden	97.82	98.2	93.7	97.7	Thailand	62.64	50.3	61.1	57.2
Switzerland	97.68	96.6	95.3	97.8	Turkey	59.62	51.5	59.2	54.1
United Kingdom	93.66	94.3	97.1	93.7					
United States	90.95	90.6	93.6	91.8					

Note: The dependent variables are investor protection measures. *Gov_Eff* is government effectiveness; *Con_Cor* is control of corruption; *Reg_Qual* is regulatory quality; *Rule_Law* is rule of law.

Panel B: Averages of the developed and emerging countries.

Country group	Gov_Eff (0-100)	Con_Cor (0-100)	Reg_Qual (0-100)	Rule_Law (0-100)
Developed	96.56	97.14	96.80	97.36
Emerging	48.53	38.52	46.16	37.90

Panel C: Averages of the top and bottom 10 countries.

Country group	Gov_Eff (0-100)	Con_Cor (0-100)	Reg_Qual (0-100)	Rule_Law (0-100)
Top10	87.51	85.68	86.72	86.17
Bottom10	56.19	50.13	58.87	50.66

Note: The dependent variables are the investor protection measures. *Gov_Eff* is government effectiveness; *Con_Cor* is control of corruption; *Reg_Qual* is regulatory quality; *Rule_Law* is rule of law.

Table 8-2: Summary statistics of control variables

Developed Countries							Emerging Countries						
Country	MGDP (% of GDP)	Tobinq	PolStab (1-100)	Confl (1-12)	Press (0-100)	Educ (0-100)	Country	MGDP (%of GDP)	Tobinq	PolStab (1-100)	Confl (1-12)	Press (0-100)	Educ (0-100)
Australia	119.16	5.83	94.93	11.26	94.29	NA	Argentina	38.67	5.76	52.70	9.50	56.75	102.18
Austria	28.95	5.35	95.47	11.79	92.51	100.32	Brazil	54.96	5.01	55.90	9.90	59.34	109.13
Belgium	65.83	5.09	93.37	11.43	93.04	90.06	Bulgaria	17.52	5.25	58.07	10.74	64.43	98.72
Canada	114.47	5.67	96.49	11.37	96.02	95.75	Chile	107.1	0.21	85.34	10.63	78.11	97.33
Denmark	63.31	3.72	99.62	10.90	98.75	100.82	China	69.07	4.18	57.24	10.52	6.96	NA
Finland	98.60	6.71	99.30	11.32	98.32	99.63	Czech Rep	25.33	3.33	79.84	10.86	78.44	97.99
France	80.67	5.59	90.89	9.53	88.24	NA	Egypt	55.67	5.39	40.86	9.17	18.63	95.19
Germany	45.71	5.42	91.42	11.05	93.61	101.65	Hungary	24.53	0.92	77.38	11.22	84.89	97.31
Greece	51.91	5.77	73.44	10.77	79.03	100.87	India	68.12	2.70	54.28	7.62	59.43	83.92
Hong Kong	421.17	3.69	93.90	10.83	58.75	97.65	Indonesia	30.03	-1.81	44.54	7.82	39.16	98.77
Ireland	46.77	6.13	90.86	11.51	93.04	95.24	Korea	73.81	-0.72	82.04	9.83	68.89	100.31
Israel	84.72	4.47	81.95	6.60	67.74	103.67	Malaysia	137.03	4.98	83.08	10.41	37.26	95.12
Italy	37.54	5.22	70.69	10.14	80.89	101.81	Mexico	28.33	4.11	61.19	9.28	53.14	101.32
Japan	77.97	1.29	88.30	11.04	77.96	102.18	Peru	47.15	5.17	40.95	7.50	47.33	100.13
Netherland	91.33	6.12	96.07	10.55	98.32	100.02	Philippines	48.26	2.66	53.21	7.44	49.79	94.36
New Zealand	36.38	6.22	94.54	11.41	98.08	NA	Poland	28.56	4.93	69.21	9.90	78.73	96.86
Norway	55.67	4.41	96.50	11.34	98.13	100.39	Romania	16.31	3.49	49.77	10.15	60.20	96.40
Portugal	39.39	5.02	82.15	10.18	90.93	NA	Russia	61.59	2.66	41.83	8.57	28.67	94.36
Spain	86.70	6.00	84.61	9.52	87.09	101.02	South Africa	215.23	4.84	71.08	8.95	69.42	95.28
Sweden	104.08	3.48	97.84	11.37	97.98	99.29	Thailand	62.06	2.96	63.68	8.71	47.16	NA
Switzerland	229.24	5.21	97.95	11.99	96.83	96.00	Turkey	28.94	5.26	61.92	8.73	41.72	97.57
UK	128.47	6.04	92.84	10.45	91.74	NA							
US	124.09	6.50	90.47	10.88	88.50	100.85							

MGDP is market capitalisation scaled by GDP; *Tobin's q* is measured as the log market value of equity plus the book value of total assets minus the book value of equity and divided by the book value of total assets of country i.; *Pop* is population; *PolStab* is political stability; *Confl* is threat of conflict; *Press* is press freedom; *Educ* is education per capita.

Table 8-3: Pearson's pairwise correlation coefficients between the dependent and independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Gov_Eff (1)	1																			
Con_Cor (2)	0.96*	1																		
Reg_Qual (3)	0.92*	0.94*	1																	
Rule_Law (4)	0.95*	0.96*	0.92*	1																
CPIS_HB (5)	-0.52*	-0.47*	-0.42*	-0.47*	1															
CPIS_FB (6)	0.79*	0.82*	0.77*	0.78*	-0.39*	1														
GF_FB (7)	0.50*	0.49*	0.47*	0.47*	-0.46*	0.46*	1													
MKTCap (8)	0.13	0.12	0.09	0.06	-0.25*	-0.12*	0.03	1												
Retn_1 (9)	-0.29*	-0.27*	-0.21*	-0.25*	0.24*	-0.26*	-0.17*	-0.04	1											
Turn (10)	0.44*	0.35*	0.34*	0.43*	-0.60*	0.16*	0.40*	0.30*	0.05*	1										
MGDP (11)	0.43*	0.38*	0.35*	0.36*	-0.61*	0.24*	0.19*	0.30*	-0.27*	0.34*	1									
Infl (12)	-0.39*	-0.40*	-0.37*	-0.36*	0.27*	-0.29*	-0.29*	-0.03	0.20*	-0.18*	-0.14*	1								
LSMI (13)	0.28*	0.22*	0.31*	0.25*	0.15*	0.28*	0.05*	-0.17*	-0.02	-0.02	0.12*	-0.08*	1							
Tobinq (14)	0.28*	0.35*	0.30*	0.27*	-0.25*	0.33*	0.17*	-0.58*	-0.13*	0.03	0.20*	-0.08*	-0.06*	1						
Legal_O (15)	-0.07*	-0.03	-0.03*	-0.04*	-0.18*	-0.07*	0.10*	0.33*	-0.07*	0.16*	0.35*	-0.03	0.12*	-0.11*	1					
PolStab (16)	0.07*	0.07*	0.13*	0.03	-0.07*	0.04*	-0.12*	0.16*	0.04*	0.05*	0.06*	0.17*	-0.12*	-0.08*	-0.20*	1				
Confl (17)	0.24*	0.24*	0.20*	0.23*	-0.05*	0.24*	0.13*	-0.20*	-0.14*	-0.04*	0.05*	-0.17*	0.07*	0.14*	-0.31*	0.04*	1			
Press (18)	0.09*	0.10*	0.15*	0.05*	0.06*	-0.15*	0.05*	-0.16*	0.07*	0.14	-0.22*	0.12*	-0.14*	-0.16*	-0.17*	0.03*	-0.21*	1		
Educ (19)	0.19*	0.20*	0.18*	0.13*	-0.09*	0.24*	0.19*	0.03	-0.11*	-0.03	0.04	-0.14*	-0.09*	0.12*	-0.07*	-0.02	0.16*	-0.09*	1	
GDPPC (20)	0.20*	0.23*	0.24*	0.23*	0.04	0.27*	0.16*	0.05*	-0.13*	-0.04*	-0.11*	-0.03	-0.08*	0.09*	-0.02	-0.08*	0.13*	0.09*	0.13*	1

Note: The variables labelled 1- 4 are the investor protection measures as defined in Table 8-1 and 5-7 are the sub-optimal international portfolio allocation bias measures as described in Table 6-1. The other control variables[61] include *MKTCap* as the country market capitalisation; *Retn_1* is the average *MSCI* monthly index return over the past year; *Turn* is turnover ratio*; MGDP* is market capitalisation scaled by GDP; *Infl* is the one year lagged rate of inflation based on the consumer price index; *LSMI* is a measure of market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; Tobinq q* is measured as the log market value of equity plus the book value of total assets minus the book value of equity and divided by the book value of total assets of country i; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *Pop* is population; *PolStab* is political stability; *Confl* is threat of conflict; *Press* is press freedom; *Educ* is education; *GDPPC* is gross domestic product per capita. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance.

[61] Several control variables are correlated. However, following the existing literature, we need to control for their impact of these variables on investor protection standards. This has resulted in most of the control variables exhibiting insignificant t-statistics in Tables 8.4-8.12.

Table 8-4: The relation between equity home bias and four investor protection proxies
This table shows regression results of the following model:

$$IP_{lt} = \alpha + \beta_1 \text{CPIS\_HB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_HB	-0.260***	-0.278***	-0.236***	-0.254***
	(-3.86)	(-3.10)	(-3.34)	(-2.96)
MKTCap	0.668	0.942	0.119*	0.835
	(1.21)	(1.18)	(1.93)	(1.07)
Retn_1	-0.323***	-0.312***	-0.175	-0.371***
	(-3.97)	(-3.02)	(-1.63)	(-3.27)
Turn	0.539***	0.468***	0.423***	0.775***
	(4.82)	(3.13)	(3.13)	(5.25)
MGDP	0.295*	0.377*	0.203	0.188
	(1.91)	(1.83)	(1.24)	(0.89)
Infl	-0.510***	-0.786***	-0.566***	-0.656***
	(-2.85)	(-3.10)	(-2.65)	(-2.81)
LSMI	0.133***	0.140***	0.157***	0.152***
	(8.40)	(7.36)	(8.94)	(7.49)
Tobinq	0.202***	0.334***	0.288***	0.271***
	(2.77)	(3.12)	(3.33)	(2.65)
Legal_O	-0.396**	-0.701***	-0.683***	-0.450
	(-1.99)	(-2.62)	(-2.90)	(-1.64)
PolStab	0.114	0.123	0.278**	0.072
	(1.02)	(0.83)	(2.05)	(0.04)
Confl	0.190*	0.165	0.456	0.255
	(1.70)	(1.03)	(0.36)	(1.59)
Press	0.415	0.235	0.614	0.506
	(0.58)	(0.23)	(0.73)	(0.52)
Educ	0.433***	0.521***	0.417**	0.246
	(3.49)	(3.13)	(2.56)	(1.46)
GDPPC	0.616***	0.870***	0.777***	0.882***
	(4.51)	(4.60)	(4.62)	(4.65)
Constant	-2.280***	-2.789***	-2.041***	-1.817**
	(-3.98)	(-3.55)	(-2.67)	(-2.26)
Number of Observations	440	440	440	440
Adj. R-squared	0.79	0.81	0.75	0.74
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection (IP_{lt}) measures of country l at time t (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law*) as described in Table 8-1 above. The key independent variable is *CPIS_HB* also described in Table 6-1. The other independent variables include *MKTCap* as the log country market capitalisation; *Retn_1* is the average MSCI monthly index return over the past year; *Turn* is turnover ratio; *MGDP* is market capitalisation scaled by GDP; *Infl* is the one year lagged rate of inflation based on the consumer price index; *LSMI* is a measure of market integration measured as the ratio of a country's annual exports plus imports divided by *GDP; Tobinq q* is measured as the log market value of equity plus the book value of total assets minus the book value of equity and divided by the book value of total assets of country i; *Legal_O* is a dummy variable that takes a value of 1 if a common law country or 0 if otherwise; *PolStab* is political stability; *Confl* is threat of internal conflict*; Press* is press freedom; *Educ* is education; *GDPPC* is gross domestic product per capita. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance.

Table 8-5: The relation between equity foreign bias and four investor protection proxies
This table shows regression results of the following model:

$$IP_{lt} = \alpha + \beta_1 \text{CPIS\_FB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_FB	0.472***	0.652***	0.494***	0.627***
	(14.13)	(14.44)	(11.91)	(12.34)
MKTCap	0.597*	0.818*	0.110***	0.712
	(1.74)	(1.67)	(2.66)	(1.42)
Retn_1	-0.153**	-0.497	-0.147	-1.135
	(-2.42)	(-0.66)	(-0.16)	(-1.32)
Turn	0.535***	0.396***	0.388***	0.694***
	(6.46)	(3.66)	(3.20)	(6.17)
MGDP	0.395***	0.439***	0.273**	0.235
	(3.69)	(3.08)	(2.10)	(1.57)
Infl	-0.302***	-0.470***	-0.335**	-0.347**
	(-2.87)	(-3.44)	(-2.54)	(-2.54)
LSMI	0.463***	0.243*	0.679***	0.414**
	(3.62)	(1.67)	(4.34)	(2.38)
Tobinq	0.095**	0.175**	0.171***	0.116*
	(1.99)	(2.51)	(2.82)	(1.67)
Legal_O	-0.242	-0.182	-0.292*	-0.500
	(-0.18)	(-1.02)	(-1.66)	(-0.26)
PolStab	0.147*	0.171	0.313**	0.393
	(1.72)	(1.58)	(2.41)	(0.33)
Confl	0.176**	0.145	0.311	0.236**
	(2.29)	(1.36)	(0.34)	(2.21)
Press	0.105**	0.110*	0.445	0.134**
	(2.24)	(1.73)	(0.08)	(2.14)
Educ	0.875	0.380	0.528	-0.220
	(0.85)	(0.30)	(0.42)	(-1.48)
GDPPC	0.126	0.199	0.267*	0.238
	(1.21)	(1.41)	(1.82)	(1.55)
Constant	-0.327	0.231	0.545	0.909
	(-0.67)	(0.04)	(0.09)	(1.25)
Number of Observations	440	440	440	440
Adj. R-squared	0.78	0.82	0.75	0.73
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection (IP_{lt}) measures of country l at time t (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law*) as described in Table 8-1 above. The key independent variable is *CPIS_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-6: The relation between equity foreign bias using global fund and four different investor protection proxies

This table shows regression results of the following model:

$$IP_{lt} = \alpha + \beta_1 \text{GF\_FB} + \beta_2 \text{Controls} + \text{Country and Year effects} + \varepsilon_{it}$$

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
GF_FB	0.262***	0.371***	0.318***	0.307***
	(3.55)	(3.76)	(3.40)	(3.11)
MKTCap	0.816	0.112	0.134**	0.993
	(1.49)	(1.43)	(2.23)	(1.29)
Retn_1	-0.359***	-0.333***	-0.192*	-0.396***
	(-4.50)	(-3.30)	(-1.81)	(-3.56)
Turn	0.611***	0.496***	0.444***	0.818***
	(5.57)	(3.70)	(3.25)	(5.75)
MGDP	0.530***	0.624***	0.413**	0.415**
	(3.51)	(3.06)	(2.47)	(2.02)
Infl	-0.518***	-0.766***	-0.548**	-0.648***
	(-2.84)	(-3.05)	(-2.57)	(-2.76)
LSMI	0.115***	0.119***	0.139***	0.133***
	(7.16)	(6.09)	(7.93)	(6.36)
Tobinq	0.225***	0.355***	0.305***	0.291***
	(3.15)	(3.42)	(3.60)	(2.91)
Legal_O	-0.462**	-0.789***	-0.758***	-0.525**
	(-2.44)	(-3.11)	(-3.42)	(-1.97)
PolStab	0.768	0.732	0.235*	0.489
	(0.69)	(0.51)	(1.77)	(0.31)
Confl	0.166	0.130	0.152	0.226
	(1.55)	(0.87)	(0.13)	(1.47)
Press	0.294	0.543	-0.770	0.358
	(0.42)	(0.05)	(-0.96)	(0.38)
Educ	0.350***	0.397**	0.310*	0.146
	(2.66)	(2.31)	(1.94)	(0.82)
GDPPC	0.534***	0.761***	0.684***	0.791***
	(3.92)	(4.07)	(3.97)	(4.13)
Constant	-2.070***	-2.367***	-1.674**	-1.501*
	(-3.35)	(-2.91)	(-2.23)	(-1.76)
Number of Observations	440	440	440	440
Adj. R-squared	0.76	0.80	0.74	0.71
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection (IP_{lt}) measures of country l at time t (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law*) as described in Table 8-1 above. The key independent variable is *GF_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-7: Using one-year lag CPIS_HB

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_HB_1	-0.294***	-0.322***	-0.248***	-0.291***
	(-5.16)	(-4.12)	(-3.63)	(-3.64)
MKTCap	0.616	0.100*	0.114**	0.828
	(1.63)	(1.94)	(2.52)	(1.57)
Retn_1	-0.292***	-0.313***	-0.165	-0.357***
	(-3.35)	(-2.63)	(-1.58)	(-2.93)
Turn	0.536***	0.441***	0.469***	0.771***
	(5.71)	(3.43)	(4.18)	(5.88)
MGDP	0.260**	0.342**	0.171	0.169
	(2.17)	(2.09)	(1.20)	(1.01)
Infl	-0.532***	-0.763***	-0.643***	-0.670***
	(-4.30)	(-4.50)	(-4.35)	(-3.87)
LSMI	0.139***	0.146***	0.160***	0.158***
	(10.53)	(8.12)	(10.18)	(8.60)
Tobinq	0.187***	0.335***	0.274***	0.267***
	(3.74)	(4.88)	(4.57)	(3.82)
Legal_O	-0.333**	-0.730***	-0.673***	-0.464**
	(-2.12)	(-3.40)	(-3.59)	(-2.12)
PolStab	0.748	0.114	0.255**	0.226
	(0.89)	(0.99)	(2.54)	(0.19)
Confl	0.201**	0.165	0.544	0.254**
	(2.22)	(1.33)	(0.50)	(2.00)
Press	0.328	0.733	-0.786	0.406
	(0.56)	(0.09)	(-1.13)	(0.50)
Educ	0.438***	0.546***	0.400**	0.298
	(3.16)	(2.87)	(2.41)	(1.53)
GDPPC	0.632***	0.895***	0.779***	0.879***
	(5.75)	(5.94)	(5.92)	(5.71)
Constant	-2.320***	-2.906***	-1.993**	-2.067**
	(-3.55)	(-3.25)	(-2.55)	(-2.26)
Number of Observations	396	396	396	396
Adj. R-squared	0.80	0.81	0.76	0.74
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law*) as described in Table 8-1 above. The key independent variable is *CPIS_HB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-8: Using one-year lag CPIS_FB

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_FB_1	0.471***	0.656***	0.492***	0.628***
	(17.78)	(18.79)	(14.56)	(16.86)
MKTCap	0.608**	0.975**	0.112***	0.801**
	(2.11)	(2.57)	(3.05)	(1.98)
Retn_1	-0.470	-0.107	-0.598	-0.607
	(-1.46)	(-0.12)	(-0.70)	(-0.65)
Turn	0.554***	0.390***	0.437***	0.707***
	(8.87)	(4.74)	(5.48)	(8.05)
MDGP	0.353***	0.390***	0.213**	0.198*
	(4.31)	(3.61)	(2.03)	(1.71)
Infl	-0.349***	-0.474***	-0.429***	-0.386***
	(-3.70)	(-3.82)	(-3.57)	(-2.91)
LSMI	0.521***	0.311**	0.734***	0.490***
	(5.01)	(2.27)	(5.53)	(3.34)
Tobinq	0.900**	0.189***	0.165***	0.125**
	(2.34)	(3.73)	(3.36)	(2.31)
Legal_O	-0.536	-0.183	-0.263*	-0.623
	(-0.44)	(-1.14)	(-1.69)	(-0.36)
PolStab	0.822	0.129	0.266***	0.769
	(1.28)	(1.52)	(3.25)	(0.09)
Confl	0.183***	0.143	0.376	0.233**
	(2.66)	(1.57)	(0.43)	(2.40)
Press	0.103**	0.106*	-0.479	0.135**
	(2.30)	(1.80)	(-0.08)	(2.16)
Educ	0.981	0.592	0.361	-0.172
	(0.91)	(0.42)	(0.26)	(-1.13)
GDPPC	0.139	0.211*	0.265**	0.223*
	(1.58)	(1.82)	(2.36)	(1.80)
Constant	-0.447	-0.150	0.0637	0.605
	(-0.88)	(-0.22)	(0.10)	(0.84)
Number of Observations	396	396	396	396
Adj. R-squared	0.77	0.81	0.75	0.72
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law)* as described in Table 8-1 above. The key independent variable is *CPIS_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-9: Using one-year lag GF_FB

	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
GF_FB_1	0.266***	0.402***	0.337***	0.346***
	(4.50)	(5.08)	(4.89)	(4.26)
MKTCap	0.688*	0.109**	0.121***	0.907*
	(1.81)	(2.13)	(2.71)	(1.73)
Retn_1	-0.343***	-0.347***	-0.186*	-0.391***
	(-3.99)	(-3.01)	(-1.85)	(-3.30)
Turn	0.651***	0.509***	0.507***	0.842***
	(7.54)	(4.39)	(5.02)	(7.07)
MGDP	0.520***	0.620***	0.383***	0.421***
	(4.82)	(4.28)	(3.04)	(2.83)
Infl	-0.577***	-0.784***	-0.653***	-0.694***
	(-4.67)	(-4.72)	(-4.52)	(-4.07)
LSMI	0.116***	0.119***	0.139***	0.134***
	(9.02)	(6.91)	(9.24)	(7.58)
Tobinq	0.206***	0.350***	0.283***	0.281***
	(4.12)	(5.19)	(4.84)	(4.07)
Legal_O	-0.389**	-0.803***	-0.731***	-0.528**
	(-2.46)	(-3.78)	(-3.95)	(-2.42)
PolStab	0.276	0.485	0.201**	0.796
	(0.32)	(0.42)	(2.02)	(0.68)
Confl	0.168*	0.118	0.161	0.213*
	(1.84)	(0.96)	(0.15)	(1.69)
Press	0.139	0.195	0.101	0.174
	(0.24)	(0.25)	(1.46)	(0.21)
Educ	0.371***	0.425**	0.296*	0.196
	(2.61)	(2.23)	(1.78)	(1.00)
GDPPC	0.555***	0.782***	0.684***	0.781***
	(4.96)	(5.20)	(5.23)	(5.06)
Constant	-2.189***	-2.501***	-1.616**	-1.742*
	(-3.29)	(-2.80)	(-2.07)	(-1.90)
Number of Observations	396	396	396	396
Adj. R-squared	0.75	0.80	0.75	0.70
Country effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Note: The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law)* as described in Table 8-1 above. The key independent variable is *GF_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are based on Newey-West autocorrelation and heteroskedasticity-corrected standard errors. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-10: CPIS_HB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_HB	-0.310***	-0.325***	-0.277***	-0.308***
	(-4.14)	(-3.61)	(-4.48)	(-3.74)
MKTCap	0.762*	0.968**	0.133***	0.921*
	(1.63)	(2.11)	(2.80)	(1.66)
Retn_1	-0.329***	-0.334***	-0.245***	-0.425***
	(-4.14)	(-3.76)	(-3.96)	(-3.88)
Turn	0.557***	0.564***	0.521***	0.823***
	(6.07)	(4.24)	(4.26)	(6.88)
MGDP	0.342***	0.487***	0.348**	0.231
	(3.61)	(3.49)	(3.45)	(1.47)
Infl	-0.579***	-0.811***	-0.667***	-0.694***
	(-3.11)	(-4.62)	(-5.49)	(-4.77)
LSMI	0.279***	0.154***	0.249***	0.174***
	(10.28)	(8.63)	(10.08)	(9.44)
Tobinq	0.384***	0.472***	0.342***	0.375***
	(4.42)	(5.36)	(5.26)	(4.23)
Legal_O	-0.434***	-0.825***	-0.774***	-0.483**
	(-2.78)	(-3.52)	(-3.71)	(-3.34)
PolStab	0.248	0.282	0.322***	0.147
	(1.45)	(1.08)	(4.27)	(0.48)
Confl	0.312***	0.288	0.547	0.474***
	(2.98)	(1.61)	(0.69)	(3.67)
Press	0.576	0.269	0.737	0.578
	(0.62)	(0.68)	(1.06)	(0.56)
Educ	0.547***	0.633***	0.584***	0.438
	(3.88)	(3.67)	(3.69)	(1.77)
GDPPC	0.732***	0.948***	0.881***	0.934***
	(6.40)	(5.84)	(5.66)	(6.95)
Lambda (inverse Mills' ratio)	0.543***	0.479***	0.751***	0.623***
	(12.55)	(17.08)	(14.87)	(15.33)
Wald Chi-square	548.03	845.79	681.53	790.35
Constant	-2.352***	-4.675***	-4.355***	-2.564***
	(-3.88)	(-4.59)	(-3.46)	(-3.67)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law)* as described in Table 8-1 above. The key independent variable is *CPIS_HB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are in parentheses. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-11: CPIS_FB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
CPIS_FB	0.532***	0.537***	0.527***	0.764***
	(17.33)	(17.56)	(14.45)	(15.52)
MKTCap	0.656***	0.833**	0.364***	0.818**
	(3.28)	(2.45)	(3.60)	(1.51)
Retn_1	-0.325***	-0.408	-0.344	-0.402
	(-3.22)	(-0.76)	(-0.87)	(-1.83)
Turn	0.621***	0.486***	0.424***	0.734***
	(9.77)	(4.52)	(6.25)	(8.47)
MGDP	0.421***	0.658***	0.492***	0.433***
	(5.34)	(3.96)	(3.46)	(2.92)
Infl	-0.352***	-0.578***	-0.377***	-0.395***
	(-3.28)	(-6.23)	(-3.67)	(-3.72)
LSMI	0.624***	0.455**	0.756***	0.624***
	(4.21)	(2.35)	(5.28)	(3.84)
Tobinq	0.132***	0.244***	0.203***	0.271**
	(2.87)	(3.73)	(3.81)	(2.29)
Legal_O	-0.361	-0.251	-0.382***	-0.587
	(-0.87)	(-1.65)	(-3.87)	(-0.64)
PolStab	0.255***	0.263***	0.488***	0.462
	(3.64)	(3.31)	(4.27)	(0.87)
Confl	0.234***	0.250*	0.439	0.372***
	(3.64)	(1.97)	(0.64)	(3.44)
Press	0.277***	0.247***	0.545	0.262***
	(3.76)	(2.73)	(0.18)	(3.98)
Educ	0.884	0.466	0.633	0.324*
	(1.43)	(0.68)	(0.64)	(1.95)
GDPPC	0.268***	0.209*	0.283***	0.347**
	(2.90)	(1.99)	(2.83)	(2.73)
Lambda (inverse Mills' ratio)	-0.345***	-0.641***	-0.482***	-0.632***
	(-19.46)	(-11.48)	(-13.28)	(-14.73)
Wald Chi-square	762.29	587.66	652.59	546.39
Constant	-0.483	0.354	0.563	0.783
	(-0.77)	(0.28)	(0.63)	(1.67)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law)* as described in Table 8-1 above. The key independent variable is *CPIS_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are in parentheses. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-12: GF_FB regression based on the Heckman two-stage treatment effect model

Heckman two-stage model	Model (1) Gov_Eff	Model (2) Con_Cor	Model (3) Req_Qual	Model (4) Rule_Law
GF_FB	0.308***	0.394***	0.432***	0.467***
	(5.12)	(5.25)	(4.97)	(4.63)
MKTCap	0.836***	0.186***	0.227***	1.132***
	(3.27)	(3.62)	(3.78)	(3.86)
Retn_1	-0.454***	-0.367***	-0.274***	-0.487***
	(-4.88)	(-3.89)	(-3.78)	(-3.77)
Turn	0.674***	0.586***	0.487***	0.895***
	(7.07)	(5.33)	(4.97)	(7.11)
MGDP	0.542***	0.685***	0.532***	0.424***
	(4.32)	(4.21)	(4.87)	(3.68)
Infl	-0.554***	-0.836***	-0.562***	-0.769***
	(-3.97)	(-5.88)	(-4.34)	(-4.83)
LSMI	0.237***	0.254***	0.367***	0.188***
	(8.74)	(7.68)	(9.35)	(7.63)
Tobinq	0.366***	0.383***	0.446***	0.314***
	(4.37)	(6.76)	(5.78)	(4.03)
Legal_O	-0.539***	-0.823***	-0.811***	-0.578***
	(-3.11)	(-4.94)	(-5.36)	(-3.45)
PolStab	0.792	0.766	0.368***	0.535
	(1.27)	(0.96)	(3.76)	(1.24)
Confl	0.241***	0.228***	0.297	0.276*
	(2.86)	(2.87)	(0.77)	(1.88)
Press	0.313	0.573	-0.784*	0.488
	(0.76)	(0.14)	(-1.97)	(0.68)
Educ	0.413***	0.433**	0.427**	0.286
	(3.56)	(2.04)	(2.62)	(1.21)
GDPPC	0.681***	0.863***	0.694***	0.807***
	(6.74)	(4.62)	(4.28)	(5.76)
Lambda (inverse Mills' ratio)	-0.677***	-0.543***	-0.368***	-0.462***
	(-17.24)	(-16.25)	(-11.72)	(-14.93)
Wald Chi-square	765.72	615.04	578.67	558.82
Constant	-2.421***	-3.856***	-2.322**	-2.635***
	(-4.28)	(-3.69)	(-2.77)	(-2.94)

Note: This table presents the coefficients of the estimates from Heckman two-stage treatment effects models. In the first stage, we run the probit model. We include Lambda (inverse Mills' ratio) in the second stage with control variables. The dependent variables are the investor protection measures (*Gov_Eff, Con_Cor, Req_Qual, Rule_Law)* as described in Table 8-1 above. The key independent variable is *GF_FB* also described in Table 6-1. All the controls are the same as described in Table 8-4 above. All t-statistics reported are in parentheses. For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels.

Table 8-13: Using alternative investor protection measures

	ICRG_InvFile	ICRG_InvFile	ICRG_InvFile	WBDB_InvPro	WBDB_InvPro	WBDB_ InvPro
CPIS_HB	-0.097***			-1.156***		
	(-9.17)			(-2.82)		
CPIS_FB		0.140***			0.712**	
		25.85			2.21	
GF_FB			0.154***			-0.24
			10.24			(-1.33)

Note: *ICRG_InvFile* is investor profile measure provided by International Country Risk Guide (ICRG); *WBDB_InvPro* is investor protection measure provided by World Bank Doing Business (WBDB).

Chapter 9 Summary, conclusions and limitations

9.1 Introduction

This chapter summarises the thesis and key findings. The study consists of three research questions (R.Q).

R.Q 1: What is the impact of sub-optimal international portfolio allocation on cost of capital?

R.Q 2: What is the role of international portfolio investment on stock market development?

R.Q 3: What is the effect of international portfolio investment on investor protection?

9.2 Restatement of the research questions

Countries, through financial liberalisation, have removed the explicit barriers to international capital inflows and outflows. Furthermore, despite the widely apparent, recognised diversification benefits from international investment through risk sharing (see Grubel, 1968; Solnik, 1974; Errunza, 1998; DeSantis and Gerard, 1997) evidence demonstrates that due to the phenomenon of home and foreign bias, domestic investors still allocate disproportionately more investment in the domestic market and are not holding internationally diversified portfolios as recommended by ICAPM. Similarly, foreign investors are not investing adequately in the domestic market. Reasons for the home and foreign bias phenomenon include deviation from purchasing power parity, information asymmetries, poor accounting standards, hedging motives and behavioural biases. Studies suggest that home bias segments the domestic market, whilst when foreign investors allocate investment towards the implied weight recommended by ICAPM, it integrates the market.

Therefore, if the prevalence of home and foreign bias segments and integrates the market, then these biases will have important implications. For instance, Errunza (2001) argues that the inflow of foreign equity investment will have impact on cost of capital, stock market development, and investor protection. Our study aims to answer three important research questions which include: What is the impact of home and foreign bias on cost of capital? What is the impact of home and foreign bias on stock market development? Does home and foreign bias have any influence or determine country level investor protection standards?

9.3 Hypothesis, data and methodology

Generally, we derived the following nine hypotheses. We use the first three hypotheses to answer the first research question: What is the impact of sub-optimal portfolio allocations on the cost of capital?

H_1 Countries that exhibit higher home bias are associated with higher cost of capital.

H_2 Countries with higher foreign bias relate to lower cost of capital.

H_3 Pervasiveness with higher global fund foreign bias allocation is associated with lower cost of capital.

We developed the following three hypotheses to answer our second research question: What is the role of international portfolio investment on stock market development?

H_4 Countries with a prevalence for higher home bias, experience poor stock market development.

H_5 Countries with a higher foreign bias, experience better stock market development.

H_6 Countries with a higher global fund foreign bias, enjoy better stock market development.

We use the last three hypotheses to answer the third research question. What is the effect of international portfolio investment on investor protection?

H_7 Higher home bias is related to a lower level of investor protection standards.

H_8 Higher foreign bias is associated with higher levels of investor protection standards.

H_9 A higher country global fund bias is related to higher investor protection standards.

Our study employs three different datasets to calculate our measures of home and foreign bias. First, following Chan et al. (2005) we use recently available, cross-country bilateral

equity data, for a period of 10 years (2001-2010) which we obtained from Coordinated Portfolio Investment Survey (CPIS) to construct home and foreign bias. Second, we employ a distinctive fund level country allocation dataset, provided by Emerging Portfolio Fund Research (EPFR) to construct the global fund foreign bias measure. Finally, we use country level market capitalisation sourced from World Development Indicator (WDI) to construct ICAPM benchmark allocation. In our empirical studies, we use five proxies of cost of capital, four measures of stock market development, and four investor protection measures which have widely been used in several academic literatures.

Consistent with previous studies, in the first empirical study, we use historical realised return of the market (see Lau et al. 2010), sovereign credit rating (Reeb et al. 2001), country equity risk premium (Damodaran, 2012), and dividend yield (Bekaert and Harvey, 2005) to proxy for cost of capital. We further use *Tobin's Q* to capture valuation effect or firm performance. Following existing studies, in the second empirical study, we use four measures of stock market development. Particularly, we use market capitalisation as a percentage of GDP (Levine and Zervos, 1996), stock value traded as a percentage of GDP (Bencivenga et al. 1995), turnover ratio (Boehmer et al. 2005), and transaction cost (Chan et al. 2005) to proxy for stock market development. Finally, in the third empirical study, drawing on existing literature, we use four investor protection measures, sourced from World Governance Indicators, which has largely been employed by several academics (see Neumayer, 2002; Anders, 2006; Jung, 2006).

Generally, we test those hypotheses using pooled OLS, with panel setup and Newey-West autocorrelation and heteroskedasticity corrected standard errors. We performed several diagnostic tests and addressed our concern of endogeneity issues using lagged values, and the Heckman selection model.

9.4 Research findings

The first empirical study examines the impact of sub-optimal (home and foreign bias) international portfolio allocation on cost of capital. The study uses historical realised market risk premium, sovereign credit risk rating, country equity risk premium, and dividend yield as proxies of cost of capital. The results in Chapter 6 demonstrate that home bias increases cost of capital, whilst foreign bias reduces cost of capital as a result of increased risk sharing between domestic and foreign investors. We provide robustness to our main result by

examining the impact of home and foreign bias on firm valuation via *Tobin's Q*. We find that home and foreign bias reduces and increases firm performance respectively. The result further shows that home and foreign bias reduces and increases cost of capital respectively. This is as a result of the inverse relation between cost of capital and firm valuation. Additionally, we perform sensitivity analysis by using lagged values, and the Heckman selection model to address our concern of endogeneity. The result provides compelling evidence that our main result is robust.

The second empirical study investigates the impact of home bias (domestic investors over-weighting the domestic markets) and foreign bias (under- or over-weighting the foreign markets) allocation on stock market development. Existing studies largely examine the importance of stock market development. We use four measures (market capitalisation as a percentage of GDP, stock value traded as a percentage of GDP, turnover ratio, and transaction cost) as proxies of stock market development. The research findings show the effects of home bias with the exception of transaction cost, reduces market capitalisation as a percentage of GDP, stock value traded as a percentage of GDP, and turnover ratio. The explanation is that the prevalence of home bias, segments stock markets, and therefore, reduces risk sharing and liquidity.

However, the results further show that foreign bias increases the stock market development measures, apart from transaction cost, which we expect to have a negative relation with foreign bias. The coefficients of the stock market development measures are all positive and statistically significant at the one percentage level. This is explained by the fact that foreign investors provide capital, expertise, and competition, which could spur financial deepening of the local market, particularly in countries with weaker financial development. Furthermore, foreign investors not only infuse the much needed capital for investment and growth but also promote competition, raise the bar of corporate governance and transparency, and promote the domestic firms to the international financial markets. We use lagged values, and the Heckman selection model to address the concern of endogeneity. The sensitivity analysis provides support that our main result is robust.

The third empirical study examines the impact of home and foreign bias on investor protection standards. We use four measures of investor protection (government effectiveness, control of corruption, regulatory quality, and rule of law) which we source from the World

Governance Indicators. The investor protection measures capture the rights given to minority investors, how these rights are enforced at the courts, and the sound business and institutional environment in which corporations operate to create value for shareholders. The results suggest that, even after controlling for variables that affect investor protection, home bias leads to weak investor protection standards. This corroborates with the theory that domestic institutional investors that become controlling shareholders in companies, will engage in activities that will lead to poor governance. Similarly, the results also show that foreign bias improves investor protection standards. This, in part, is due to foreign investors from well governed countries exporting and demanding good governance from the host country that has weak investor protection.

We perform several sensitivity analyses. First, we use alternative measures of investor protection from two governance sources to check the robustness of our result. The results largely provide support to our main analysis that home bias leads to weak investor protection, whilst foreign bias improves country level investor protection. We recognise that foreign investors may allocate investment in countries with better investor protection, which will create reverse causality issues. We, therefore, use lagged values and the Heckman selection model to address the endogeneity problem. The result provides robust evidence to support our main analysis that home and foreign bias have a negative and positive impact on country-level investor protection.

9.5 Key contributions

We provide a brief summary of our main research contributions as we have shown the detail contributions in Chapters 1 and 3. Evidence provided in the existing literature of the prevalence of home and foreign bias in equity investment allocation, motivates us to carry out this study. We make use of recent available cross-country portfolio allocation provided by CPIS and EPFR to make important contributions to how sub-optimal portfolio (i.e. equity home and foreign bias) allocation impacts on cost of capital, stock market development, and investor protection.

In the first empirical analysis, we contribute to the current literature by showing that home bias exhibited by domestic investors increases cost of capital due to inadequate risk sharing. Conversely, we also show that foreign bias reduces cost of capital as a result of increased risk sharing between domestic and foreign investors.

Second, there are limited direct empirical studies that have examined factors that influence or determine stock market development. This study makes contributions to the stock market development literature, by examining the impact of home and foreign bias on stock market development. We show that home bias impedes on stock market development, whilst foreign bias enhances stock development.

Strands of literatures have investigated the importance of investor protection standards. As far as we are concerned, scant studies have examined factors that influence or determine investor protection. We, therefore, make contributions to the governance literature by providing empirical evidence on how home and foreign bias impact on investor protection. Our result shows that home bias leads to poor investor protection standards, whilst higher foreign bias, enhances investor protection standards.

9.6 Potential limitations of the research and avenues for future research

We made substantial efforts to answer the research questions to achieve our research objectives. Nonetheless, there are some potential limitations to this study and we, therefore, advice readers to exercise caution when interpreting the findings of the research. The findings of this study are limited to 44 countries, due to unavailability of data on all other countries. Also, we use predetermined criteria to select the 44 countries. The non-random sample of the countries will subject our study to sample selection bias which affects the validity of our research findings. However, we reduce the limitations by using the Heckman selection model to provide robustness to the main result.

There is unavailability of data on several emerging and frontier markets. Analysis of the research, based on developed and emerging countries would have provided more insight into the study if there were data on emerging markets. Future research can examine the impact of home and foreign bias on emerging countries' cost of capital, stock market development, and investor protection when emerging countries' data become available.

Countries are attracting multinational companies, which imply that domestic investors can have international diversification, based on the multinational companies in the domestic market. This may have ramifications on the suggestion by ICAPM. Therefore, future research can examine the extent that multinational companies affect the home and foreign bias

phenomenon. Additionally, future research can examine if domestic investors are able to diversify risk domestically, through multinational companies in the domestic countries.

A further limitation of the study is that, domestic and foreign investors may avoid countries with high cost of capital, less developed stock markets, and weak investor protection. This creates reverse causality which may affect the validity of the study. However, the potential reverse causality is addressed empirically by using lagged values.

The Emerging Portfolio Fund Research (EPFR) data are global funds domiciled in nine countries focusing on specific regions or markets. Due to the objectives of the fund, they do not allocate investment in their home countries. As a result, we are unable to use EPFR data to construct a home bias measure. Future research can use mutual funds' data to extensively investigate the impact of home bias on stock market development and investor protection. The study can be extended in the future by examining the impact of home and foreign bias on cash flow.

9.7 Policy implications of the research

Apparently, evidence provided in the study, suggests that stock market liberalisation has failed to encourage investors engage in optimal portfolio allocation, leading to home and foreign bias. We show that cross-country variations in home and foreign bias matters for cost of capital, stock market development, and investor protection, and therefore, have several important policy implications. For instance, existing studies show that reduction in cost of capital is important for project evaluation and investment, whilst improvement in stock market development and better investor protection matters for economic growth and development. The policy implications of the study are that, policy makers in countries that experience high degrees of home bias, need to encourage domestic investors to diversify investment abroad. Similarly, policy makers can embark on strategies to attract foreign investors to participate in the domestic stock market.

9.8 Concluding remarks

This chapter summarises and concludes the research. The chapter first presents a restatement of the research questions. It then proceeds to highlight a summary of the research hypothesis, data, and methodology and findings. The key contributions of the research are presented prior

to highlighting the potential limitations of the research. The chapter provides the policy implications of the research and avenues for future study.

Consistent with economic justification, the research findings show that home bias increases cost of capital, inhibit stock market development and leads to weak investor protection standards and practices. Similarly, the study finds overwhelming evidence that foreign bias reduces cost of capital improves stock market development and enhances investor protection standards. The evidence presented in the study demonstrates that foreign equity investment, increases liquidity and risk sharing between domestic and foreign investors. It also shows that the participation of foreign investors from well governed countries also demand good governance from the host countries.

The study might interest academics, researchers, corporate managers, market participants and governments in emerging countries. The research primary, contributes to the existing literature by providing direct empirical evidence of the role that home and foreign bias play on cost of capital, stock market development, and investor protection. The findings of the study will help policy-makers understand the need to encourage domestic investors to diversify investment abroad. Furthermore, policy-makers should develop programmes to attract foreign investors. Particularly, governments in emerging countries need to improve macroeconomic fundamentals and good governance to attract and retain foreign investors.

Appendix

Appendix 1

Emerging Portfolio Fund Research Global fund data

Fund management team country	Main country of parent company	Fund manager	Fund focus	ETE	Fund size (USD million)	Percentage of the total funds
United States	United States	Franklin Templeton Investment Management	Unassigned	Y	21,012	0.175498
United States	United States	Franklin Templeton Investment Management	Unassigned	Y	611	0.005103
United States	United States	Franklin Templeton Investment Management	Unassigned	Y	7,336	0.061272
United States/Canada	United States	Franklin Templeton Investment Management	Unassigned	Y	998	0.008336
United Kingdom	United Kingdom	Henderson Global Investors	Unassigned	Y	12	0.0001
United Kingdom	United States	JPMorgan Asset Management	Unassigned	Y	174	0.001453
United Kingdom	United States	JPMorgan Asset Management	Unassigned	Y	133	0.001111
France	United Kingdom	Halbis Capital Management	Unassigned	Y	119	0.000994
United Kingdom	United Kingdom	Black Rock Investment Management	Unassigned	Y	54	0.000451
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	114	0.000952
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	Y	85	0.00071
United Kingdom	United States	JPMorgan Asset Management	Long Funds	Y	49	0.000409
United Kingdom	United States	JPMorgan Asset Management	Unassigned	Y	200	0.00167
United States	United Kingdom	Morgan Stanley Investment Management	Unassigned	Y	357	0.002982
United States	United Kingdom	Invesco Asset Management	Unassigned	Y	392	0.003274

United States	United States	Morgan Stanley Investment Management	Unassigned	Y	78	0.000651
United States	United States	Black Rock Investment Management	Unassigned	Y	118	0.000986
United Kingdom/Canada	United States	Franklin Templeton Investment Management	Unassigned	Y	3,151	0.026318
United Kingdom	United States	Thread needle Investment Management	Unassigned	Y	461	0.00385
United States	Netherlands	Trade winds NWQ Global Investors	Unassigned	Y	212	0.001771
United States	United States	Putnam Investment Management	Unassigned	Y	952	0.007951
United States	United States	Putnam Investment Management	Unassigned	Y	2,197	0.01835
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	Y	409	0.003416
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	83	0.000693
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	19	0.000159
Canada	United Kingdom	Invesco Asset Management	Unassigned	Y	118	0.000986
United Kingdom	United States	JPMorgan Asset Management	Unassigned	Y	397	0.003316
United Kingdom	United States	JPMorgan Asset Management	Unassigned	Y	1,454	0.012144
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	2,242	0.018726
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	152	0.00127
United Kingdom	United Kingdom	Invesco Asset Management	Unassigned	Y	141	0.001178
United Kingdom	United Kingdom	Deutsche Asset Management	Unassigned	Y	375	0.003132
Germany	Germany	WestLB Asset Management	Unassigned	Y	28	0.000234
France	France	Amundi Investment Solutions	Unassigned	Y	148	0.001236
United States	United States	Pine Bridge Investments LLC	Unassigned	Y	430	0.003591
United States	France	BNP Paribas Investment Partners	Unassigned	Y	310	0.002589
United States	United Kingdom	Invesco Asset Management	Unassigned	Y	97	0.00081

United States	United States	Pine Bridge Investments LLC	Large Cap	Y	101	0.000844
United Kingdom	Germany	Allianz Dresdner Asset Management	Unassigned	Y	21	0.000175
United Kingdom	Germany	RCM Capital Management	Unassigned	Y	71	0.000593
France	France	Comgest S.A.	Unassigned	Y	71	0.000593
Germany	Germany	Deutsche Asset Management	Unassigned	Y	44	0.000367
United States	Germany	Allianz Global Investors	Unassigned	Y	41	0.000342
Switzerland	United States	Capital Research & Management	Unassigned	Y	1,367	0.011418
United States	United States	Black Rock Investment Management	Unassigned	N	879	0.007342
United States	United States	Alliance Bernstein Capital Management	Unassigned	N	1,489	0.012437
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	N	36	0.000301
United Kingdom	United Kingdom	Gartmore Investment Limited	Unassigned	N	22	0.000184
Denmark	Denmark	Jyske Invest	Unassigned	N	28	0.000234
United Kingdom	United Kingdom	Gartmore Investment Limited	Unassigned	N	42	0.000351
France	France	Comgest S.A.	Unassigned	N	14	0.000117
United States	United States	Marathon Asset Management	Unassigned	N	3,887	0.032465
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	N	909	0.007592
United States	United States	Fayez Sarofim & Co.	Unassigned	N	438	0.003658
United Kingdom	Australia	First State Investments	Unassigned	N	59	0.000493
United Kingdom	Australia	First State Investments	Unassigned	N	8	6.68E-05
United Kingdom	United Kingdom	Aviva Investors	Unassigned	N	52	0.000434
Canada	United Kingdom	HSBC Asset Management	Unassigned	N	99	0.000827
United Kingdom	United Kingdom	Baillie Gifford	Unassigned	N	198	0.001654

United Kingdom	United Kingdom	Gartmore Investment Limited	Unassigned	N	148	0.001236
United Kingdom	United Kingdom	Gartmore Investment Limited	Unassigned	N	306	0.002556
United Kingdom	United Kingdom	Henderson Global Investors	Unassigned	N	239	0.001996
United States	United States	Batterymarch Financial Management	Unassigned	N	69	0.000576
United Kingdom	United Kingdom	Schroder Investment Management	Unassigned	N	421	0.003516
United Kingdom	United Kingdom	Schroder Investment Management	Unassigned	N	535	0.004468
United Kingdom	United Kingdom	Schroder Investment Management	Unassigned	N	60	0.000501
United Kingdom	United Kingdom	Henderson Global Investors	Unassigned	N	337	0.002815
United Kingdom	United Kingdom	Martin Currie Investment Management	Unassigned	N	81	0.000677
Germany	Germany	Deutsche Asset Management	Unassigned	N	948	0.007918
Germany	Germany	Deutsche Asset Management	Unassigned	N	4,101	0.034253
Germany	Germany	Deutsche Asset Management	Unassigned	N	1,909	0.015944
Germany	Germany	Deutsche Asset Management	Unassigned	N	7,514	0.062759
Germany	Germany	Allianz Global Investors	Unassigned	N	124	0.001036
United Kingdom	United Kingdom	M&G Investment Management	Unassigned	N	5,791	0.048368
United States	United States	First Eagle Investment Management, LLC	Unassigned	N	15,232	0.127222
United States	France	BNP Paribas Investment Partners	Unassigned	N	51	0.000426
Netherlands	France	BNP Paribas Investment Partners	Unassigned	N	940	0.007851
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	N	32	0.000267
United Kingdom	Switzerland	Credit Suisse Asset Management	Unassigned	N	1,569	0.013105
United Kingdom	United States	Black Rock Investment Management	Unassigned	N	290	0.002422
United Kingdom	Switzerland	Pictet Asset Management	Unassigned	N	86	0.000718

Switzerland	Switzerland	Pictet Asset Management	Unassigned	N	322	0.002689
United Kingdom	United Kingdom	Schroder Investment Management	Unassigned	N	180	0.001503
United Kingdom	United States	JPMorgan Asset Management	Large Cap	N	351	0.002932
United Kingdom	United States	JPMorgan Asset Management	Large Cap	N	10	8.35E-05
United Kingdom	United States	JPMorgan Asset Management	Large Cap	N	1,378	0.011509
Luxemburg	Denmark	Linde Partners Asset Management	Unassigned	N	355	0.002965
Finland	Finland	Glitnir Asset Management	Unassigned	N	105	0.000877
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	N	235	0.001963
Luxemburg	Germany	Union Investment GmbH	Unassigned	N	230	0.001921
Germany	United States	Black Rock Investment Management	Large Cap Blend	N	67	0.00056
United States	United States	Batterymarch Financial Management	Unassigned	N	142	0.001186
United States	United States	William Blair & Co.	Unassigned	N	38	0.000317
United States	United States	Artisan Partners	Unassigned	N	27	0.000226
Singapore	Singapore	Fullerton Fund Management	Unassigned	N	417	0.003483
United States	United States	Black Rock Investment Management	Unassigned	N	938	0.007834
United Kingdom	United Kingdom	Martin Currie Investment Management	Unassigned	N	97	0.00081
United States	United States	Global Currents Investment Management	Unassigned	N	1	8.35E-06
United Kingdom	United States	Newton Investment Management	Unassigned	N	4	3.34E-05
France	United States	State Street Global Advisors	Unassigned	N	559	0.004669
United States	United States	Institutional Capital LLC	Unassigned	N	48	0.000401
United Kingdom	United Kingdom & France	AXA Framlington Investment Management	Unassigned	N	340	0.00284

United Kingdom	United Kingdom	M&G Investment Management	Unassigned	N	91	0.00076
Canada	Canada	Goodman & Company, Investment Counsel	Unassigned	N	613	0.00512
Canada	Canada	Goodman & Company, Investment Counsel	Unassigned	N	739	0.006172
United States	United States	The Boston Company Asset Management	Unassigned	N	29	0.000242
United Kingdom	United Kingdom	Baillie Gifford	Unassigned	N	172	0.001437
United Kingdom	United States	Walter Scott & Partners	Unassigned	N	84	0.000702
Netherlands	France	BNP Paribas Investment Partners	Unassigned	N	38	0.000317
United Kingdom	Switzerland	Global Asset Management	Unassigned	N	815	0.006807
United Kingdom	United States	Assenagon Asset Management	Unassigned	N	87	0.000727
United Kingdom	United Kingdom	M&G Investment Management	Unassigned	N	3,554	0.029684
United Kingdom	United Kingdom	Aberdeen Asset Management	Unassigned	N	77	0.000643
United Kingdom	United Kingdom	Baillie Gifford	Unassigned	N	2,909	0.024297
United Kingdom	United Kingdom	Baillie Gifford	Unassigned	N	1,487	0.01242
United States	United States	John Hancock Asset Management	Unassigned	N	832	0.006949
United States	United States	AQR Capital Management	Unassigned	N	405	0.003383
Norway	Norway	DnB NOR Asset Management	Large Cap Blend	N	165	0.001378
United States	United States/Australia	Trilogy Global Advisors	Unassigned	N	28	0.000234
AUnited Statestria	Austria	Kepler-Fonds KAGm.b.H.	Large Cap Value	N	65	0.000543
Norway	Norway	SKAGEN AS	Large Cap Value	N	5,595	0.046731
Norway	Norway	DnB NOR Asset Management	Large Cap Blend	N	222	0.001854

ETF is exchange-traded fund

Appendix 2

Developed and Emerging Markets based on MSCI definition

Developed	*Emerging*
Australia	Argentina
Austria	Brazil
Belgium	Bulgaria
Canada	Chile
Denmark	China
Finland	Czech Republic
France	Egypt
Germany	Hungary
Greece	India
Hong Kong	Indonesia
Ireland	Korea
Israel	Malaysia
Italy	Mexico
Japan	Peru
Netherlands	Philippines
New Zealand	Poland
Norway	Romania
Portugal	Russia
Spain	South Africa
Sweden	Thailand
Switzerland	Turkey
United Kingdom	
United States	

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