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# Empirical Analyses on International Investments

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‘This thesis is the result of the author’s original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.’



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# Empirical Analyses on International Investments

## Abstract

This thesis draws motivation from the stylized fact that investors do not diversify their investments well enough to reap the benefits of international diversification. Hence, it empirically examines and provides new insights into three different aspects related to suboptimal international investments: determinants of suboptimal foreign allocation, the impact of such suboptimal allocation on the cost of debt, and a possible avenue to enhance the level of foreign investment.

The first empirical chapter identifies that though both economic and non-economic factors are important in driving foreign bias in bond investments, it is the non-economic factors that are more important in influencing the bias. This chapter further shows that the importance of non-economic factors gets augmented during periods of debt crisis whereas that of economic factors remain unchanged.

The second empirical chapter demonstrates that foreign bond bias has a positive impact on the cost of debt: higher level of foreign bias in a market leads to a lower cost of debt in that market.

The third empirical chapter provides evidence that enforcement of existing corporate governance regulations in firms leads to higher foreign ownership in firms.

The findings presented in this thesis are robust to various checks and are of interest to policymakers, academics, and firm owners. Being aware of the costs associated with suboptimal foreign investment and being cognizant of the various

economic and non-economic factors that can influence foreign allocation can help formulate appropriate policies to enhance foreign investments closer towards the prescribed optimal level. The findings that better corporate governance is associated with higher level of foreign investment is of particular interest to firm owners, especially in emerging markets. This thesis also provides avenues for further research and this can be beneficial to academics.

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*To my immediate family members,*

*With lots of love*

## Table of Contents

## 1. Introduction

This PhD thesis is primarily motivated by the observed reluctance on the part of investors to diversify their investments internationally (see French and Poterba, 1991; Stulz, 2005), despite the clear theoretical benefits that could be achieved by such diversification; studies have shown that holding well-diversified investment portfolio helps lower the risks for the investors (Grubel, 1968; Lessard, 1973; Levy and Sarnat, 1970; Sharpe, 1964; Solnik, 1974). Additional benefits of such diversification include reduction in the cost of capital, as demonstrated by existing studies (Lau et al., 2010; Stulz, 1999). It has further been documented that despite the process of globalization or lowering of barriers in the past few decades, investors across the world still exhibit keenness to invest in domestic assets and are reluctant to hold an internationally diversified portfolio well enough to reap the maximum benefits of international diversification (Cooper and Kaplanis, 1994; French and Poterba, 1991; Levy and Lerman, 1988; Tesar and Werner, 1995). This poses a natural question as to what is stopping investors from holding an ideally diversified portfolio. Related questions include what impact such under-diversification has on the welfare of the investors and economy at large; and what can be done to incentivise investors to invest more abroad. These three related questions form the cornerstones of this thesis and are explored in three empirical chapters. For concreteness, the key questions explored in this thesis are as follows:

i) What are the determinants of foreign bias? How do economic variables compare with non-economic variables? And do their importance stay constant during normal and turbulent times?

ii) What are the implications of foreign bias? Specifically, does foreign bias have an impact on the cost of capital?

iii) What can be done to attract higher level of foreign investment? Specifically, would enforcement of corporate governance lead to higher proportion of foreign investment?

This thesis builds on the existing literature and presents novel findings in these regards. First, the findings show that though economic and non-economic factors both are important in determining foreign bias, it is the latter (non-economic factors) that are more important than the former. Second, the empirical findings herein also exhibit that higher level of foreign bias can lead to lower cost of capital. Finally, firm-level empirical analysis presented in this thesis demonstrates that enforcement of corporate governance can lead to higher proportion of foreign ownership; this has clear implications for international risk-sharing and foreign bias position of a country.

The findings presented later in this paper are of particular importance to investors, firms, and governments that may be seeking to lower their cost of capital by attracting more investors and by higher level of risk sharing with the world markets. The findings are also of interest to policymakers in that the insights provided herein, related to patterns of international investment positions over normal and turbulent times, can help policymakers formulate policies aimed at attracting higher level of foreign capital. Additionally, policymakers can also benefit from the findings regarding how different social traits towards foreign investment differ among different countries. The findings of this paper are also of interest to students

and researchers keen on gaining understanding of determinants and implications of suboptimal international investments.

The rest of this chapter proceeds as follows: Sections 1.1, 1.2, and 1.3 provide concise discussions on the three empirical chapters contained in this thesis. These sections also briefly discuss the motivation behind the studies and key findings for each empirical study. Deeper discussions on each empirical study follow later in their dedicated chapters. Section 1.4 outlines the structure and organization of the remainder of this thesis.

## *1.1. First empirical chapter*

The first empirical chapter of this thesis explores the determinants of foreign bias in bond investment by classifying the possible determinants in two broad categories of economic and non-economic factors. It also examines if the importance of the determinants change during crisis periods.

### *1.1.1. Overview and motivation*

Building on the framework first developed by Markowitz (1952), a small number of researchers including Sharpe (1964) derived the capital asset pricing model (CAPM), which is one of the most important models in portfolio diversification and investment.[1] The CAPM has been extended to accommodate international setting in which case it is also referred to as International Capital Asset Pricing Model (ICAPM). Assuming that all investors are mean-variance optimizers - i.e. seeking to optimize their returns on investment for a given level of volatility -

[1] Markowitz and Sharpe were jointly awarded Nobel prize in economics in 1990 for their work. See Bekaert and Hodrick (2012, p-446) for a brief overview on CAPM.

ICAPM prescribes that all investors should hold the market portfolio, i.e. similar portfolio (with similar proportion of assets from different markets).

Despite the possible benefits of such international diversification (see Solnik, 1974), it is well documented that investors choose to allocate relatively higher portion of their wealth in domestic portfolio (see Burger and Warnock, 2003; Cooper and Kaplanis, 1994; French and Poterba, 1991) which obviously results in such investors making suboptimal level of investments in foreign portfolios. For example, consider two foreign countries F (France) and G (Germany) occupying similar weight of five percent of the world market. In an equilibrium setting, ICAMP prescribes that an investor allocate five percent of her wealth to F and G each, but the investor would most certainly allocate less than five percent of her portfolio in countries F and G. Further, while underweighting both the countries, she can still favour one country over other by allocating three percent of her portfolio in F and only two percent in G. This relative preference for one country over other, even while underweighting foreign markets as a whole, is known as foreign bias in the finance literature (see Anderson et al., 2011; Beugelsdijk and Frijns, 2010; Chan et al., 2005). Existing literature on the issue of foreign bias has received limited attention so far and has mainly focussed on equity investments. This provides the motivation in this thesis to build on this paucity of research and explore the determinants of such foreign bias exhibited by investors in a different asset class: bond. I focus particularly on the impact of broad economic factors (such as market development, exchange rate volatility, capital openness, etc.) and non-economic factors (such as geographic distance, competitiveness, etc.); and examine if the

importance of these two broad factors remain the same during normal times and crisis periods.

A fundamental question may arise at this stage as to whether ICAPM is the appropriate benchmark for bonds. If investments are limited to traded financial instruments, along with all the other assumptions (see Bekaert and Hodrick, 2012; pp-446), ICAPM can indeed be used in the context of bonds just like it has been used in the literature in the context of equities. To illustrate, consider a rational investor investing in bonds of 100 different countries all of which have a political risk of 0.75 already factored in the bond prices. Assume that half of the countries' political risk scores improve to a score of 0.7 over time while the scores of other half countries worsen to 0.8. To a large extent, this fluctuation in political risk is a diversifiable risk for which a rational investor would not seek extra compensation. This argument can be extended to include other risks like default risk, exchange risk etc. that may be embedded in bond prices.

### *1.1.2. Measure of foreign bias*

There is no one best measure of foreign bias. Measures of suboptimal domestic and international allocation can be categorized into two broad classes: positive and normative (Cooper et al., 2012). Positive approach, which is more common in the literature, is based on ICAPM prescription that all investors hold identical world market portfolio. Under this approach, portfolio weight assigned to each asset is the asset's actual share on the world market capitalization. Even within this broad positive approach, different transformations have been used in the existing

literature (e.g. Bekaert and Wang, 2009; Chan et al., 2005). The normative approach, on the other hand, is based on the mean-variance optimization, and assumes that the averages and the co-variances of returns are known. Both of these approaches have their relative weaknesses, as discussed in more detail in the relevant empirical chapter.

In this empirical chapter, foreign bias measure is calculated based on the positive approach. This first empirical study (and the second empirical paper in this thesis) uses the variant of foreign bias in line with Chan et al. (2009) and takes the difference between the actual weight assigned to a particular country, taken in its natural log form, and the optimal ICAPM country weight, taken in its natural log form.

### *1.1.3. Related literature and contribution*

This study is most closely related to the work of Anderson et al. (2011), Beugelsdijk and Frijns (2010), Burger and Warnock (2003), Chan et al. (2005), and De Moor and Vanpée (2013). Anderson et al. examine the specific role of national cultures in suboptimal international diversification and find that the economic importance of cultural factors is high in international equity investment. Beugelsdijk and Frijns demonstrate the importance of culture in foreign bias and show that cultural distance between two markets can have significant impact on foreign allocation between such markets. Burger and Warnock examine foreign bond bias solely of US investors and focus only on macroeconomic fundamentals of host markets. Chan et al. provide an exploratory analysis of the determinants of suboptimal international equity investments and demonstrate the importance of economic factors as well as familiarity factors in influencing such international

equity diversification. De Moor and Vanpée focus on identifying the differences in the way a given set of variables impact equity and bond biases, and find that certain variables are important for bond bias only (e.g. sovereign credit rating).

This empirical study builds on these above studies and differs in few important ways. First, it complements these studies by providing a comparative impact of economic and non-economic factors on foreign bias. Non-economic factors in this study are a combination of familiarity factors (i.e. distance, language, and bilateral trade, as used by Chan et al.) and cultural factors that defines a society's perception towards competition and ambiguous situations (as used by Anderson et al. and Beugelsdijk and Frijns). Inclusion of these cultural traits is important because investors are known to make decisions based on their personal or societal traits (see Chui and Kwok, 2008; Graham et al., 2009; Kaplanski et al., 2015; Kirkman et al., 2006; Kwok and Tadesse, 2006). Perhaps this is one of the reasons why investment biases are still considered puzzling. This empirical analysis not only offers a greater set of non-economic factors (compared to the previous studies) but also provides relative importance of economic versus non-economic factors, which can be of importance to policymakers.

Second, this study examines if foreign bias changes during crisis periods; and if so, whether the importance of economic and non-economic factors alter during such crises. In other words, it also examines how economic factors and non-economic factors interact with crisis periods to influence foreign bias. Data used in this study covers the period of global financial crisis (2007-2009) as well as Eurozone debt crisis (2009-2011), providing an ideal setup to carry out this examination. Third, unlike previous studies that focus on equities, this study focuses

specifically on debt investment. This is important because price of bonds and equities can move in different directions (see Campbell and Taksler, 2003) implying that different factors might influence investors' preference for bonds and equities differently. Examination of bond also deserves a study in its own right, especially in the context of "original sin", as suggested by Eichengreen and Hausmann (1999), and the self-fulfilling crisis that it can precipitate (Krugman, 1999).[2] Further, study of global debt market warrants a study in its own right due to its sheer size: global debt market size stands roughly twice the size of world equity market capitalization (see McKinsey Global Institute, 2011).

### *1.1.4. Research methods and findings*

The theoretical model to examine the determinants of foreign bias is borrowed from Cooper and Kaplanis (1986) who provide a framework on how investors' domestic and foreign allocation is dependent on various deadweight costs that could arise while investing. Hence, this study tries to incorporate a variety of factors that can be expected to impact deadweight costs of investing abroad and follows the established literature in the selection of key economic and non-economic variables that could impact foreign bias.

The key economic variables in the empirical analyses include real returns on bond investment, foreign exchange risk, bond market development, investor protection measure, capital control and remaining macroeconomic factors. Similarly, non-economic variables in the study include geographic distance, common language,

[2] Original sin refers to a country's inability to issue external debts in domestic currency. Most of the countries not issuing major currencies (like USD, Euro, etc.) suffer from this phenomenon and choose to issue debts in major foreign currencies. This can lead to currency or maturity mismatch and such borrowing countries will be unable to hedge such mismatches (see Eichengreen and Hausmann, 1999).

bilateral trade, - which are all bilateral in nature - uncertainty avoidance, and keenness for achievement.

The main empirical analysis in this chapter employs regression analysis with host country fixed effects.[3] Analyses of panel data on cross-border bond allocations for 54 developed and emerging countries, for years 2001 to 2012, show that non-economic factors are the stronger drivers of foreign bond bias compared to economic fundamentals. This is a novel addition to the existing body of literature. In particular, the results show that geographical distance between two countries followed by uncertainty avoidance are the two stronger drivers of foreign bias. The findings hold even after addressing concerns related to endogeneity and exclusion of major financial centres. These results suggest that policymakers should aim towards making their markets more familiar to foreign investors if they are to register higher foreign bias.

This study also finds that investors reallocated their bond investment during Eurozone debt crisis but not so much during the global financial crisis. Specifically, foreign bias during the debt crisis was lowered and this decline in foreign bias during crisis was due to non-economic factors. In other words, the empirical results show that the importance of non-economic factors were enhanced during the Eurozone debt crisis while that of the economic factors remained statistically unchanged. This is another novel addition to the existing body of knowledge.

The other general findings of this study are consistent with existing studies. For instance, the direction of impact for economic fundamentals are consistent with

[3] For an in-depth analysis of panel data regression and fixed effects, see Baltagi (2005), Hsiao (2014), Wooldridge (2010) among others.

current literature (e.g. Chan et al., 2005; Fidora et al., 2007). The findings related to non-economic factors are also consistent with existing studies: geographic distance continues to be an important determinant of foreign investment. Regarding non-economic factors, this study supports the existing notion that geographical distance is a very important determinant of foreign investment (e.g. Grinblatt and Keloharju, 2001; Huberman, 2001); the findings related to cultural attitudes are also consistent with existing studies (e.g. Anderson et al., 2011; Graham et al., 2009; Kwok and Tadesse, 2006)

This empirical study makes several contributions to the existing literature. First, it builds on the rather limited literature on foreign bias specifically on bond portfolio. Second, it adds to the body of knowledge that links the role of cultural attitudes and foreign investment decisions. Finally, it builds on the literature linking investment decisions and crisis periods.

### *1.2. Second empirical chapter*

The second empirical work in this thesis evaluates the implications of foreign bias.[4] Specifically, it examines if cost of debt is impacted by foreign bias: a higher foreign bias in a host country should result in a lower cost of debt, as suggested by ICAPM.

#### *1.2.1. Overview and motivation*

Consistent with the predictions of ICAPM, existing studies note that improved international risk-sharing can help lower cost of capital (Bekaert and Harvey, 2000; Stulz, 1999). Assume that a rational investor invests in bonds of two

[4] See earlier section for foreign bias [ Section 1.1.2]

different countries, and that both the countries carry political risk measures of 0.7 which is embedded in the bond prices of the bonds. Also assume that the political risk of one of the countries improves to 0.6 while that of the other worsens to 0.8 over a given period of time. The lowering of risk in the former would enhance the bond price while the increase of risk in the latter would lower the price. This rational investor would not be seeking extra compensation for this fluctuation in political risk (and bond prices) because it is a risk that he has already diversified. However, despite the benefits that could be achieved by way of international diversification (see Solnik, 1974), investors do not diversify well enough internationally and choose to invest disproportionately higher in domestic assets (see Chan et al., 2005). An obvious implication of this is that most countries end up with sub-optimal level of global risk-sharing which can theoretically have a negative impact on cost of capital. Specifically, this study examines how foreign bond bias could affect the cost of debt for such host countries. The sparse empirical evidence on this along with the increasing importance of debt in today's financial world provides motivation to pursue this specific area of research.

### *1.2.2. Measure of cost of debt*

Since bonds have complex characteristics[5], comparability of cost of debt across different countries becomes challenging. Bekaert and Hodrick (2012, p-385) note in a related context that "… *it is important to compare "oranges with oranges.*" Hence, in an attempt to compare similar bonds in this empirical chapter, yield to maturity (YTM) of long-term US dollar-denominated bonds form the basis for the

[5] Bonds differ mainly in terms of their maturity, currency of denomination, nature of interest payments, tradability, and international character (see Bekaert and Hodrick, 2012, p-356).

calculation of cost of debt. Specifically, YTM in excess of US Treasuries of comparable maturity is taken as the dependent variable in this study. Such excess basis point spreads are sourced from JP Morgan's Emerging Market Bond Indices (EMBI) series and are available for sovereign bonds of emerging markets only. This dataset from the same source has been used in studies by Bekaert et al. (2014), Cruces and Trebesch (2013), Mauro et al. (2002), among others. The limitation of this data is that it allows for an analysis of emerging markets only. Hence, in order to extend the empirical analysis to developed markets in this thesis, additional tests are carried out by using YTM of Euro-denominated sovereign bonds in excess of German Bund having similar maturity (see Afonso et al., 2015).

### *1.2.3. Related literature and motivation*

This empirical chapter builds on the existing literature and examines the impact of suboptimal foreign allocation on cost of capital (and cost of debt) of host countries. This study is most closely related to that of Lau et al. (2010) who examine the impact of home bias on cost of equity capital. This chapter differs in few important ways. First, it investigates how foreign investors' suboptimal allocations in host markets (i.e. foreign bias) is associated with cost of capital of the host markets. This choice of foreign bias, rather than home bias, theoretically offers a better measure of international risk sharing of host countries. To illustrate this point, consider country pair B (Britain) and F (France) having similar market weights (say 6%) vis-à-vis the world market; also assume that both these countries are exhibiting optimal allocation at home and the remainder of the allocation in the paired country with little or no investment in the rest of the world; this might look like optimal investment at home, but it is not an optimal foreign allocation. Focusing on home

bias in this situation would render an examination meaningless because the domestic allocation is optimal. Since rest of the countries in the world are making little or no investment in this country pair, the foreign bias measure of the many countries for this country pair would be low; and since the investors from this country pair ( B and F) have not diversified well enough internationally, they would be seeking compensation for the diversifiable risk as well, thus leading to higher cost of capital in the country pair. Second, this chapter introduces econometric and methodological improvements by employing country fixed effects, vector autoregression, instrumental variable and by making use of a quasi-natural experiment. This is important given that Lau et al. use pooled OLS and Fama-Macbeth approach for their panel dataset of 38 countries. Ignoring country-level heterogeneity can lead to biased estimates (see Baltagi, 2005) and use of Fama-Macbeth approach can lead to biased standard errors of coefficients especially in the presence of heteroscedasticity at country level (see Petersen, 2009). Third, this study focuses on cost of debt, which is different to equity not just in terms of asset class but also in terms of their relative attractiveness to issuers and investors (see Myers and Majluf, 1984). Additionally, the sheer economic significance of global debt market (as mentioned earlier in section 1.1.1), provides further motivation to focus on this specific asset class.

Other related studies include that of Bekaert et al. (2014), Cruces and Trebesch (2013), and Longstaff et al. (2011), among others. Longstaff et al. examine whether it is the country-specific factors or the global factors that exert higher influence on sovereign credit risk. Cruces and Trebesch explore the price impact on sovereign bonds owing to magnitude of preceding sovereign default. Bekaert et al. disentangle forward-looking political risk component out of the

sovereign bond yield spreads. This study diverges significantly from all of these studies by floating the notion that the sub-optimal foreign bond allocations (i.e. foreign bias) is also related to cost of sovereign debt. There are a number of current studies (e.g. Andritzky, 2012; Arslanalp and Poghosyan, 2014; Jaramillo and Zhang, 2013; Peiris, 2010) that examine the impact of foreign bond investment on bond spreads. As these studies focus on the absolute value of bond investment rather than the phenomenon of foreign bias, these studies are conceptually different to this one.

### *1.2.4. Research methods and findings*

Using quarterly panel data at fund-level from 2002 to 2014 for approximately 60 emerging markets and employing regression analysis with host country fixed effects[6], this study provides evidence that higher level of foreign bias is strongly associated with lower cost of debt. The results are robust to various tests of endogeneity and bond market liquidity. The results are also similar when the fund-level data on bond allocation is replaced by cross-country bond allocation data from International Monetary Fund (IMF). The key findings of the examination remain essentially the same when the test is extended to developed markets with different sets of data altogether. The results are further corroborated when a quasi-natural experiment is conducted using an exogenous shock in the form of Eurozone debt crisis. Overall, the results in this chapter consistently support the notion that higher foreign bias has the potential to lower the cost of debt.

This study contributes to two related strands of the finance literature. First, it adds to the limited literature examining suboptimal international allocations (e.g.

[6] For econometric analysis of panel data, see Baltagi (2005), Hsiao (2014), Wooldridge (2010).

Chan et al., 2005; Cooper and Kaplanis, 1986; French and Poterba, 1991), and the implications of such suboptimal allocations (e.g. Lau et al., 2010). This chapter also complements the rich literature examining the determinants of cost of debt (e.g. Edwards, 1984; Longstaff et al., 2011; Mauro et al., 2002). The novelty of this study is the finding that higher level of foreign bias in a given host country helps in lowering the cost of debt in that country; i.e. lower foreign bias can lead to higher cost of debt. A question to ponder further is if foreign bias is low in a given country, who is investing disproportionately high in these countries? It must be the home investors. This idea is in alignment with the idea that foreign bias is an indirect measure of home bias (see Ahearne et al., 2004). In this respect, this chapter also complements the findings of (Lau et al., 2010) who find that higher level of home bias is associated with higher cost of capital. This has important implications especially for governments and policy makers. With many countries having a public debt to GDP ratio of more than 75 percent[7], reduction in the cost of debt by even a few basis points can help lower the overall cost of borrowing for the government; this in turn can lower the required cost of capital in equity as well. This provides an incentive for the policymakers to implement policies aimed at attracting higher level of foreign bias.

[7] See Dembiermont et al. (2015) for data on general government debt of select developed and emerging countries.

### *1.3. Third empirical chapter*

The first two empirical chapters of this thesis essentially relate to country level examinations (related to determinants and implications of foreign bias). As such, the findings presented so far in this thesis are of interest mainly to policymakers and governments; and this might wrongly suggest that firms have very little role to play in determination of foreign bias at country level. It has to be appreciated that the overall foreign investment (and foreign bias) is determined by the collective amount of investments received by constituent firms of a country.[8] Intuitively, if firms of a country could attract higher proportion of foreign investment (than existing levels), it would improve the overall foreign bias position of that country. Hence, the third empirical examination in this thesis explores the impact of firm-level actions on foreign investments: it explores whether improving corporate governance at firm-level - by imposing harsh regulatory penalties - can impact the proportion of foreign equity ownership. This chapter specifically focuses on enforcement of corporate governance laws, rather than mere existence of such laws, as the enforcement of relevant laws is an important element of protecting shareholders' rights.

#### *1.3.1. Overview and motivation*

Finance literature related to shareholder protection, corporate governance and transparency provides the motivation for this empirical chapter.

[8] For bond foreign bias, investments received by governments also need to be accounted for because government debts can form a major part of the overall debt of a country; but for foreign equity bias, by its very definition, foreign investments/debts received by governments is not important as governments generally rely on debt (rather than equity) to finance their deficits.

In the literature related to corporate governance, La Porta et al. (2000, pp-15) note that: "*For both shareholders and creditors, protection includes not only the rights written into the laws and regulations but also the effectiveness of their enforcement.*" In certain cases, having no law is better indeed than having a law that is not enforced (Bhattacharya and Daouk, 2009). This has important implications for foreign investors seeking to invest in emerging markets. Though the level of existing investor protection laws do not differ significantly between rich and poor countries, the enforcement of such laws is particularly weak in poorer countries (La Porta et al., 2000). Intuitively, this suggests that foreign investors would be loath to investing in emerging markets because of ineffective implementation of investor protection rules.

Foreign investors are also known to avoid investing in emerging markets for a separate reason: they are known to avoid investing in markets that offer poor transparency as this can increase the monitoring costs of the foreign investors (see Akerlof, 1970; Gelos and Wei, 2005; Leuz et al., 2010). This problem for foreign investors is further compounded by the findings that domestic investors enjoy a higher level of information of domestic firms compared to their foreign counterparts (Brennan and Cao, 1997). This suggests that an emerging market could attract higher level of foreign ownership if it could enhance its corporate governance mechanisms.

These ideas taken together provide the motivation to examine whether or not the enforcement of existing corporate governance regulations in an emerging market helps to attract higher foreign ownership of firms. This study shows that the enforcement of existing regulation in an emerging market indeed leads to significant increase in foreign equity investment in firms.

### *1.3.2. Measure of foreign equity ownership*

For the purpose of computing the proportion of (foreign) portfolio holdings in a firm, taking into account the total number of equity shares can lead to misleading figures because the shares held by insiders are not generally available for trading (Dahlquist et al., 2003). Hence it is normal in the finance literature to consider only that portion of equity shares which is available to investors – and not held by insiders – while computing share ownership of outsiders or foreigners (e.g. Chan et al., 2005; Leuz et al., 2010). Accordingly, this empirical study utilizes foreign ownership measure that is constructed by using the shares held by non-insiders only.

The existing literature exhibits a tendency to calculate the market float – the amount of shares available for trading – by considering, among other things, block shareholding of five percent or more as insiders' holding. This is based on the assumption that insiders hold stakes of at least five percent or more of the total equity if they want to control the firms. This assumption has various shortcomings as conceded by Dahlquist et al. (2003). For example, all investors holding more than five percent of shares may not be insiders; a group of insiders may hold less than five percent each so that they hold a controlling stake in the firm collectively; controlling shares may be held by insiders not directly but through various third parties that are very difficult to distinguish (La Porta et al., 1999). Additional shortcomings of this approach relate to the source of the data: such ownership data is available only for a small number of firms; and such data is available generally for largest firms while insider ownership seems to be more severe in smaller firms (Dahlquist et al., 2003). By and large, the existing practice of calculating market float has severe shortcomings mainly owing to the availability of good quality data.

In this respect, this study deviates from the existing practice by utilizing a dataset that distinguishes insiders from non-insiders. All promoters' shares, as defined by the relevant laws, are considered to be held by insiders (regardless of the fact that some of the promoters' shares may be held by foreigners). For the purpose of computing foreign equity ownership, only the non-insider portion of equity shares of a firm is taken as the market float for that firm. Specifically, foreign equity ownership, in this study, is defined as non-promoters' foreign ownership of equity shares scaled by total number of non-promoters equity shares.

It is to be noted that shares held by foreign promoters are not considered to be general foreign ownership in the context of this chapter because they are insiders (albeit foreign) and the motivation behind this chapter is in determining how foreigners – who have higher monitoring costs than domestic investors – shy away from investing in foreign firms. Treating the (foreign) insiders as foreign investors would defeat the purpose of this chapter.

### *1.3.3. Related literature and contribution*

There exists a rich body of literature examining the relationship between foreign investment and corporate governance. Notable related literature include that of Aggarwal et al. (2005), Ammer et al. (2012), Bhattacharya et al. (2003), Gelos and Wei (2005), Giannetti and Simonov (2006), Leuz et al. (2010), Miletkov et al. (2014), among others. Aggarwal et al. conduct a study in investment allocation preferences in emerging markets for US institutional investors. Ammer et al. investigate the determinants of international investment for American investors and find cross-listing to be a very important factor. Bhattacharya et al. examine the cost of capital associated with opaque earnings disclosure. Gelos and Wei examine the

importance of transparent financial disclosures on attracting foreign investment. Giannetti and Simonov examine if domestic and foreign investors take into account quality of corporate governance while investing in firms, in the context of a developed market (Sweden). Leuz et al. examine foreign investment preferences of American (US) investors in the context of corporate governance. And Miletkov et al. examine the influence of corporate board independence on firms' ability to attract foreign capital.

This chapter makes incremental contributions to this existing literature in a number of ways. First, it addresses a tension in the literature related to direction of relation between foreign investment and corporate governance. Does higher level of corporate governance attract more foreign investment or do foreign investors, after investing, demand better corporate governance? Or are these two factors determined simultaneously? There is no clear answer to this as yet since previous studies have used a cross-sectional data (e.g. Aggarwal et al., 2005; Leuz et al., 2010). Among other things, including control variables like financial leverage, cross-listing etc., which are related to ownership and governance structures of firms, leads to endogeneity concerns (see Carrieri et al., 2013; Doidge et al., 2004; Harvey et al., 2004, amongst others). It is also plausible that foreign equity owners start demanding better transparency and minority protection and better trading regulations thus necessitating enhanced corporate governance (Errunza, 2001). Use of panel data would be more suitable to study the relationship between these factors by checking within-firm or within-industry variation over time (see Baltagi, 2005). Also, since traditional empirical research is being criticized for concerns related to endogeneity, focus should now be towards natural experiments including regulatory shocks

(Gillan, 2006). The use of panel data and the inclusion of exogenous shock in the form of enforcement of regulatory reform – to be discussed shortly – adds to the robustness of the results of this study.

Second, previous studies have examined the foreign investment patterns of US investors (Aggarwal et al., 2005; Ammer et al., 2012; Leuz et al., 2010). While US investors are important to international investments, they still do not reflect the complete picture as they represent less than one-third of all international equity investments. Coordinated Portfolio Investment Survey (CPIS), conducted by IMF, exhibits total international equity investment amounting to United States Dollar (USD) 22.1 trillion as of December 2014; and international equity investment by US investors account for 30.3 % (USD 6.7 trillion) of this total. This shows that focusing on just US investors could ignore the remaining two-third of foreign investors and could lead to incomplete results. Hence, this study uses a rich dataset to examine the foreign investment of all foreign investors thus allowing a glimpse of the fuller picture.

Third, finding float - or the investable proportion of asset, after taking into account insider ownership - has been difficult mainly because of lack of clear information regarding ownership structure (see Claessens et al., 2000; Dahlquist and Robertsson, 2001; Faccio and Lang, 2002; Foley and Greenwood, 2010; Kim, 2012, among others). The data in this study makes it possible to construct a relatively simple measure of float, as discussed later in the empirical chapter.

Fourth, many previous studies use a comprehensive survey data of United States (US) investors provided by US authorities; this data tends to belong to a

certain point in time [e.g December 1997 in the case of Leuz et al. (2010)][9]; and related data from different countries may not be available for the same point in time (for example, see Leuz et al.). This has the potential to lead to distorted results. The use of single country data in this study, due to its very nature, corrects for this noise.

Fifth, most studies rely on proxies related to ownership structure to get measures of corporate governance: Giannetti and Simonov use ratio of control to cash flows; Leuz et al. use insider ownership as proxy for corporate governance. A fundamental assumption with these studies is that most or all large shareholders will try to expropriate more than their rightful share of the cash flows or try to burden the firm with their vested interests, which might not necessarily be the case. On the other hand, owners with smaller holdings, which would be effectively ignored in these studies, could collude to collectively wield control over the firms. Further doubts can be raised regarding the validity of these proxies. For example, Giannetti and Simonov (2006) show a significant variation in their corporate governance proxy across firms in Sweden. Since Sweden is already a developed market with strong rule of law and judicial efficiency (La Porta et al., 1998), it can be argued that such variance in corporate governance mechanisms across Swedish firms is capturing something else besides corporate governance. This study, in addition to using such standard numerical proxies as control variable, relies on exogenous legal shock that can be expected to enforce corporate governance regulations (rather than relying solely on such numerical proxies).

[9] See http://ticdata.treasury.gov/Publish/flts.pdf for details. This data is also used by Ammer et al. (2012) and Dahlquist et al. (2003).

Finally, this study focuses on an emerging country: India. Many previous studies look at a cross-section of countries that differ significantly in important aspects like legal origin, language, distance, financial development, market liquidity, market integration, capital openness, accounting standards, transparency, culture, etc. Arguably, there is no best single proxy to capture these macroeconomic variables at country level. Although there is some consensus in the literature regarding the impact of global macroeconomic variables on explaining capital flows to emerging markets (e.g. Milesi-Ferretti and Tille, 2011), our understanding as to how such global factors have different level of impact across emerging markets is limited (Cerutti et al., 2015). The use of sole country in this analysis, coupled with the use of panel data, assists in controlling these country-specific variables much more effectively.

### *1.3.4. Research method and findings*

Using panel data set for more than 800 publicly-listed firms in India during 2001 to 2007, and using an exogenous systemic shock to conduct a natural experiment[10], this study finds that enforcement of corporate governance leads to higher level of foreign equity ownership. This exogenous shock relates to a legislation enacted in 2000 that required listed firms - meeting certain threshold related to paid up capital or net worth - to make their disclosures more transparent, to make their board more independent, and to make their internal audit committee more powerful.[11] Since this new regulation and its enforcement is not applicable to all listed firms, it marks a clear demarcation between firms that are subject to the enforcement (treatment firms) and firms that are not (control firms). The clear

[10] See Meyer (1995) for advantages of using natural experiments.
[11] This legislation is called Clause 49 of the Listing Agreement. For details and more recent revisions, see http://www.sebi.gov.in/circulars/2004/cfdcir0104.pdf

delineation between these two groups of firms allows for the use of Difference-in-Difference[12] regression technique.

The results show that the impact of enforcement of corporate governance at country level has a positive influence on foreign equity ownership and the impact is economically and statistically significant. The findings are robust to various additional tests. A possible concern in the empirical setting relates to the disparity in the types of industries the control and treatment firms belong to; and significant variances in firm-specific characteristics of control and treatment firms. These issues are addressed by selecting a narrower band of firms that are more comparable and closer to the threshold of applicability (of enforcement). The main results still hold. Further robustness checks including false experiment –which is explained in detail in Chapter 5 – provide compelling evidence that enforcement of corporate governance laws leads to higher foreign ownership in firms.

This chapter contributes mainly to three strands of literature. First, it adds to the literature related to the influence of legal factors on external finance, initiated by La Porta et al. (1998, 1997) and built upon by (Beck et al., 2005). These studies examine the relationship among legal origins, investor protection, and capital markets. Second, this chapter also adds to the literature examining the determinants of foreign investment and how foreign investors are influenced by country and firm characteristics (e.g. Aggarwal et al., 2005; Gelos and Wei, 2005; Leuz et al., 2010). Unlike these existing papers, this study identifies the positive link between enforcement of existing corporate governance laws and foreign ownership at firm

[12] For more on difference-in-difference technique, see Wooldridge, (2013, p-455)

level by using a natural experiment involving an exogenous legal shock. Finally, this study builds on the literature related to foreign bias, and supports the notion that imposing stricter penalties for non-compliance of corporate governance can lead to higher proportion of foreign equity investment, thus enhancing international risk-sharing and foreign bias position of that country.

### *1.4. Structure of the remainder of this thesis*

The rest of the thesis is structured as follows. Chapter 2 reviews the related literature for all the three empirical chapters of this thesis. Chapter 3, 4, and 5 contain the empirical exercises: Chapter 3 is dedicated to the empirical examination of the impact of economic and non-economic factors on foreign bias; and how the importance of such determinants alter during crisis periods. Chapter 4 is devoted to exploration of the impact of foreign bias on cost of debt. Chapter 5 provides a detailed examination of how enforcement of corporate governance regulations can lead to higher foreign ownership. Chapter 6 contains a summary of the preceding chapters and provides concluding remarks.

Relevant tables, figures, and appendices of chapters are shown at the end of each chapters. All the chapters in this thesis have subsections which are clearly outlined in the Table of Contents page. A list of the literature cited throughout this thesis is shown towards the last few pages of this thesis.

## 2. Literature Review and Motivation

This chapter reviews the existing literature on international investment and thereafter discusses the existing literature and motivation for the three empirical chapters included in this thesis.

Section 2.1 provides a discussion on the body of literature related to benefits of international investments. Section 2.2 discusses the concept of home and foreign bias in international investment and describes various measures of home bias and foreign bias used in the existing literature. Section 2.3 provides literature review on what determines home and foreign bias and forms the basis of the first empirical chapter (Chapter 3) in this thesis. Section 2.4 discusses the nascent literature related to implications of home and foreign bias and forms the basis for the second empirical chapter (Chapter 4) of this thesis. Section 2.5 explores the rich literature on corporate governance and its impact on foreign investments. This section also provides a foundation for the third empirical chapter (Chapter 5) of this thesis. Section 2.6 presents the summary of this chapter.

### *2.1. Benefits of international diversification*

Following the mean-variance framework of Markowitz (1959, 1952), the key benefit of foreign portfolio investment is international risk diversification. Foreign portfolio investments lead to risk diversification as it would be extremely rare for all the different markets across the globe to go up or down at the same time and with the same magnitude. Levy and Sarnat, (1970) find the international diversification to be more beneficial to investors when the correlations across markets are low. The key factor, hence, is the level of correlation between the returns on the securities issued

in different countries which exhibit cross sectional and time varying level of economic structures and business cycles. A low correlation between two markets would open up more opportunities, all else being equal, whereas a high correlation would lessen such benefits (McLeavy and Solnik, 2014).

Building on the works of Markowitz, Evans and Archer (1968) provide empirical evidence that international diversification has the potential to lower portfolio risks. Grubel (1968) furthers this model by including long term and foreign-currency assets in the empirical analyses and demonstrating that investors can lower their portfolio risks by diversifying internationally. Lessard (1973) provide evidence, in the context of Latin American countries, that international diversification has the potential to lower risk on a consistent basis. Other notable early literature along similar vein includes that of Bekaert and Urias (1996), De Roon et al. (2001), and Huberman and Kandel (1987). On a slightly different note Errunza et al. (1999) note that the importance of international diversification may be overstated; they provide evidence that benefits of international diversification can be achieved by trading in domestically-traded securities and without actually trading in foreign tradable assets.

Although an overwhelming body of literature points towards clear benefits of international diversification, an important question remains as to the optimal level of allocation across countries. A number of theoretical and empirical studies (see Bekaert and Wang, 2009; Chan et al., 2005; Cooper and Kaplanis, 1986; amongst others) note that the International Capital Asset Pricing Model (ICAPM) provides the prescriptive theoretical benchmark for optimum cross-country allocation. Each investor in each country should allocate his wealth relative to share of each country's

wealth in the world capital market. However, despite the benefits of international risk diversifications and prescriptive benchmark, a vast literature, particularly focusing on equity investments, note that portfolio investors exhibit significant biases in their cross-country allocations leading to what are popularly known as home and foreign bias puzzles. A more detailed explanation of home and foreign bias is provided in the following paragraph.

### *2.2. Measures of home bias and foreign bias*

Following the existing literature (see Chan et al., 2009; Cooper and Kaplanis, 1986), the concept of home and foreign bias is explained below. Home bias refers to the degree to which domestic investors underweight their home market relative to the ICAPM prescription. Foreign bias represents the degree to which investors under or over allocate foreign markets in their foreign portfolio investments. For illustration purpose, an example of equity portfolio investments is discussed although the same principle applies to other tradable asset classes. Suppose in a hypothetical world of only three countries (A, B and C), each share a third of world market capitalization. Suppose investors in country A invest 40 million (40%) of their USD 100 million portfolio in equities of country A and the remaining 60 million (60%) equally between countries B and C. Investors in country A display a home bias (40% against 33%) but no foreign bias in terms of their allocations for countries B and C i.e. the rest of investment (60 million) should be allocated equally because for country A their foreign allocations (weighting of foreign investments) should be equal between countries B and C as both have equal share in world market capitalization. In other words, for each country the benchmark should be 50% each for the two foreign countries in terms of their foreign allocations because the benchmark does not

include country A as investments are only made in foreign countries. Now, suppose similar group of investors in country B with same USD 100 million assets invest 50 million (50%) in their domestic assets and the remaining 50 million is allocated as 40 million for country A's assets and 10 million for country C's assets i.e. it allocates 80% of its foreign investments to country A and 20% to country C. In this case, country B also exhibit home bias (50% against 33%) but now it over allocates for foreign country A (80% against 50%) and under allocates for country C (20% against 50%). Hence, in simple percentage terms, country B displays positive foreign bias for country A (30% = 80% - 50%) and negative foreign bias (-30% = 20%-50%) for country C.

In the above case and in terms of foreign investments, the benchmark excludes home markets. A number of studies also include home market in the construction of benchmark and hence have different version of foreign biases. Again, an illustrative example is provided as above. Suppose in a hypothetical world of only three countries (A, B and C), each share a third of world market capitalization. Suppose investors in country A invest 40 million (40%) of their USD 100 million portfolio in domestic assets and the remaining 60 million (60%) equally between countries B and C. Investors in country A display a home bias (40% against 33%) but equal foreign bias in terms of their allocations for countries B and C (i.e. 30% against 33%). Now, suppose similar group of investors in country B with same USD 100 million assets invests 50 million (50%) in their domestic assets and the rest of 50 million is allocated as 40 million (40%) for country A's assets and 10 million (10%) towards country C's assets. In this case, country B also exhibit home bias (50% against 33%) but now it over allocates for foreign country A (40% against 33%) and

under allocates for country C (10% against 33%). Hence, in simple percentage terms, country B displays positive foreign bias for country A (7% = 40% - 33%) and negative foreign bias (-23% = 10%-33%) for country C.

Clearly, there are different ways of computing home bias and foreign bias measures (see Cooper et al., 2012). However, regardless of the chosen method, the primary objective is to explain the cross sectional and temporal variations observed in home and foreign biases. The following subsection briefly discusses other approaches of measuring home and foreign biases.

### *2.2.1. Other approaches measuring home and foreign biases.*

Investors using Bayesian portfolio techniques under uncertain model and parameter conditions will choose country benchmarks that are very different to global market portfolio weights (Baele et al., 2007; Garlappi et al., 2007). Further, ICAPM benchmark on market capitalizations may not always be the optimal benchmark for investors since they may choose to hedge against various additional forms of risks like inflation risk (see Cooper and Kaplanis, 1994) and human capital risk (see Baxter and Jermann, 1997). Use of country benchmarks other than the one prescribed by ICAPM is beyond the scope of this thesis.

## *2.3. Determinants of home and foreign bias*

The section provides an analysis of the factors that have been identified and used to explain the differences in home and foreign biases.

Sercu and Vanpee (2008) provide a good review of existing literature to outline the determinants of biases in international investments. This subsection

brings up discussions from the existing literature to present the possible determinants of home and foreign biases in international portfolio investments.

### *2.3.1. Hedging domestic risk*

Due to uncertainty arising out of future inflation rates, investors from different countries are tempted to invest in portfolios that differ by a component designed to hedge inflation risk (Adler and Dumas, 1983). It would not be possible to hedge against inflation risk by investing in domestic stocks if inflation rates and domestic stock returns are not positively correlated. Empirical evidences (e.g. Adler and Dumas, 1983; Cooper and Kaplanis, 1994) point towards weak correlation between domestic inflation and stock returns. Hence, domestic home bias cannot be symptomatic of hedging against future inflation. Theoretical papers predict an association between bilateral trade flows and international investment with the rationale that bilateral financial assets holdings may act as a hedge against trade shocks in partner countries (see Fidora et al., 2007; Lane and Milesi-Ferretti, 2008). However, empirical evidence on impact of bilateral trade flows and capital flows is not conclusive (see Ahearne et al., 2004; Lane and Milesi-Ferretti, 2008; Obstfeld and Rogoff, 2000).

Fidora et al. (2007) find that a significant portion of domestic bias in bond can be explained by real exchange rate volatility and such influence would be smaller for equities; but De Moor and Vanpée, 2013 do not find such difference in the two asset classes. Burger and Warnock (2003) note that ex post gains to international diversification depend very much on whether such positions are hedged against currency risk.

As regards to the argument about investors buying domestic stocks to hedge non-financial income risks, Massa and Simonov (2006) find that hedging the risk of non-financial income does not explain the home equity bias whereas Baxter and Jermann (1997) find a positive link between the returns on human capital and domestic equities implying that holdings in domestic equities should be reduced by investors in order to hedge their human capital risks. On the contrary, Julliard (2003) finds a negative correlation between human capital returns and domestic equities.

Hence, none of the aforementioned studies provide a conclusive evidence as to why investors could invest disproportionately more in domestic equity for hedging.

### *2.3.2. Capital market development and transaction costs*

Chan et al. (2005) argue that ceteris paribus effect of more developed stock market translates into higher liquidity and lower transaction costs for investors thus making it more attractive for investment. Vanpee and Moor (2013) suggest that a large market size in a country attracts equity but not bond from abroad and find that level of financial development at home would encourage domestic investors to invest more in domestic assets but this effect is more pronounced for bond than for equity. Burger and Warnock (2003) argue that countries that have strong institutions and stable policies have a large local currency bond market and suggest that developing countries should, by controlling inflation and developing strong institutions, develop local bond market to attract foreign bond investment. Portes and Rey (2005) find that size of host countries' stock markets, along with proxies for informational asymmetries, significantly influence international equity flows. But Bekaert and

Wang (2009) do not find financial market development to be a significant determinant for home bias.

Recently, models on global imbalances have focused on the incentive for less developed markets with limited investment opportunities to invest abroad: Caballero et al. (2008) suggest that high-growth economies experience demand for savings instruments and buy US instruments due to limited availability of such instruments domestically; Ju and Wei (2014) develop a model where poor countries have less efficient financial sectors but high returns to investment resulting in large outflows of financial capital but inflows of foreign direct investment; and Mendoza et al. (2007) find that countries having less developed financial markets accumulate foreign assets in countries where financial markets are more advanced. Other papers, however, argue otherwise. For example, Lane and Milesi-Ferretti (2008) find evidence that countries that have more developed stock markets tend to have larger foreign equity investments. Martin and Rey (2004) argue that larger countries will have deeper domestic stock markets and hold more foreign assets.

De Santis (2010) finds that portfolio asset flows are influenced positively by the size of the recipient countries' financial markets and that the predictions of International CAPM (Solnik, 1974) are only partially met. Burger and Warnock (2003) show that US investors avoid local bond markets with worse credit ratings and higher volatility. More recently, Vanpee and Moor (2013) show that having a poor credit rating will have bigger impact for bond than for equity portfolio mainly because bond returns are more susceptible to sovereign ratings relative to equity returns.

Costs such as different tax rates and transaction costs related to international investments may also be able to explain the different level of home and foreign biases across markets (Black, 1974; Cooper and Kaplanis, 1986). Transaction costs for international investments can be higher than those for domestic ones and this can be seen as barrier to international investment but still, in general, commissions on bonds tend to be quite low in all markets (McLeavy and Solnik, 2014, p.359). Martin and Rey (2004) develop a two-country model with incomplete asset markets in which demand for foreign assets decreases with transaction costs – which can include banking commissions and variable fees, exchange rate transaction costs and information gathering costs - in a non-linear way. Faruqee et al. (2004) and Thapa and Poshakwale (2012) also find transaction costs to be one of the key determinants of foreign portfolio allocations. This would lead to expectation of smaller amount of transactions in foreign equities than in domestic stocks. However, Tesar and Werner (1995) find that turnover rate on foreign equity is much higher than in domestic ones whereas Warnock (2002) finds that foreign turnover rates are similar to domestic turnover rates. Thus, direct transaction costs do not offer a complete picture to explain home bias in equities.

### *2.3.3. Information asymmetries*

Information asymmetry and information costs are some of the more popular explanations for home bias (see Ahearne et al., 2004; Brennan and Cao, 1997). Merton (1987) shows that investors typically invest in assets that are familiar to them so as to avoid costs associated with information gathering and processing. A distinct strand of literature examines the link between information asymmetries and international portfolio choices by regressing actual portfolio holdings directly on

variables that proxy for information asymmetries such as regional and cultural factors (e.g. Berkel, 2007; Chan et al., 2005; Faruqee et al., 2004). One prediction of information-asymmetry theory is that if domestic investors are at an information advantage relative to foreign investors, it should yield higher returns for the domestic investors. However, empirical evidence on this is mixed. For example, Grinblatt and Keloharju (2000) find that foreign investors get higher profits than domestic investors while Choe et al. (2005) find that domestic investors outperform foreign investors. Although a general consensus cannot be found on whether domestic investors outperform foreign investors, empirical evidence is more convincing for domestic investors' superior performance (see Sercu and Vanpée, 2007).

### *2.3.4. Corporate governance and transparency*

Evidence exists in literature suggesting that countries with stronger corporate governance receive higher level of investment (see Aggarwal et al., 2005; Leuz et al., 2010). A number of studies have examined the relationship between home bias and corporate governance and transparency issues including La Porta et al. (1999) who find that ownership of company in countries with good legal protection of minority is more internationally dispersed. In a similar vein, Gelos and Wei (2005) find a positive relationship between government plus corporate transparency and international portfolio investments while Giannetti and Simonov (2006) show that the standard of a company's corporate governance impacts not only the stocks held in investors' portfolio but also the possibility of new investors investing in that firm. Stulz (2005) finds that share ownership is more concentrated in economies where investor protection is poor and the risk of state expropriation is high. Vanpee and Moor (2013) find that good government practices, both at corporate and country

level, help to attract bond investment from abroad while such governance in domestic market does little to attract investment from domestic bond investors. La Porta et al. (2000, 1999, 1998) find that countries with better guarantee of investors' rights have better developed financial markets. Chan et al. (2005) also provide strong evidence that foreign bias is smaller for countries that have better protection of investors' rights and that such protection is more important for foreign investors than domestic ones. Dahlquist et al. (2003) argue that poor corporate governance lead to higher home bias while Bekaert and Wang (2009) do not find a consistent relationship between corporate governance and foreign investment bias.

Overall, available evidences suggest that enhancing transparency and improving standard of governance, both at firm and government level, encourages foreign participation in domestic stocks.

### *2.3.5. Capital control*

Capital control is potentially a first-order determinant for investment biases and more financial openness should generally lead to smaller foreign investment biases (see Bekaert and Wang, 2009). Forbes (2010), while examining why foreigner invest in US, finds that countries with higher capital controls invest lower proportion of their holding in US equities. Tax can also deter investment particularly in those countries who deduct withholding tax from dividends paid to non-resident investors (see Bekaert and Wang, 2009). Chan et al. (2005) also find that withholding tax has significant effect on foreign bias whereas French and Poterba (1991) do not find such influence of taxes on foreign investment and capital flow. Though capital controls have been progressively relaxed over the past few decades (see McLeavy and Solnik, 2014), they still remain in some countries in one form or the other. Intuitively,

restrictions imposed by domestic authority to invest abroad should increase home bias while restrictions on capital inflows would reduce foreign investment in the domestic assets. Empirical evidence can indeed be found for this argument (e.g. Chan et al., 2005). Faruqee et al. (2004) also find equity home bias to be positively related to capital controls.

### *2.3.6. Behavioural Biases*

A different approach has also been taken by researchers to accommodate the idea that investors may not necessarily act rationally when it comes to allocating their investment[13]. Solnik (2008) uses regret theory to explain international underinvestment while Morse and Shive (2011) argue that it is due to patriotism that investors tend to focus their investment in domestic assets. Karlsson and Norden (2007) find that men have a tendency to be relatively more home-biased than women while Anderson et al. (2011) find higher level of masculinity in a given country to be associated with lower home bias. Even a perceived information advantage, as opposed to an actual one, can induce a home bias in investors and overconfident individuals are known to misjudge potential returns of familiar assets and over-invest in such familiar assets (Barber and Odean, 2001). Dorn and Huberman (2005), however, do not find convincing evidence for such overconfidence leading to diversification decisions.

Using language, culture and geographic distance as behavioural proxies have been suggested in studies (e.g. Coval and Moskowitz, 1999; Faruqee et al., 2004; Grinblatt and Keloharju, 2001; Ke et al., 2010). Regional pacts like the creation of

[13] Grinblatt and Kiloharju (2001) note that familiarity bias could in fact be rational: investors could gather useful information from nearby companies and from company statements in a language they understand. They do not put this to test, however.

EMU may also have had an impact on cross-border investment (e.g. De Santis and Gerard, 2009; Lane, 2005). Chan et al. (2005) find that familiarity between home and host countries increases the amount of equity held by one country in another and thus decrease the foreign bias while Bekaert and Wang (2009) do not find familiarity factors like language and distance to be important for investment biases.

Evidence also exists relating to investors' preference to hold assets in countries that are closer, not just geographically but otherwise as well (see Bertaut and Kole, 2004; Coval and Moskowitz, 2001; Portes et al., 2001, among others) while others do not find a significant role for such proximity (see Lane and Milesi-Ferretti, 2008). Berkel (2007) report ‘friendship bias’ and finds that it is reciprocal for country pairs (eg Germany & Austria) which is persistent as well.

Cooper and Kaplanis (2000) argue that explaining the home bias by observable costs of holding foreign assets is possible only if investors have very low levels of risk aversion. Beugelsdijk and Frijns (2010) find that nations having higher tendency to avoid uncertainty allocate less money abroad and that this variable plays a greater role in emerging markets. They note that though cultural differences are mentioned as one of the familiarity variables affecting foreign bias, human understanding regarding theoretical and empirical aspects on the role of culture remains incomplete. Although multiple approaches towards culture are used in cross-cultural studies (see Adler, 1983), comparative empirical studies in economics and international business have been dominated by a seminal study of Hofstede (1980) where he distinguishes among a number of cultural characteristics that are assumed to capture cross-cultural differences (see Sivakumar and Nakata, 2001). Among the cultural variables distinguished by Hofstede, Kirkman et al. (2006) find two

characteristics - namely *uncertainty avoidance* and *individuality* - particularly related to economic phenomena though the other variables propounded by Hofsted are also known to influence foreign asset allocation. Anderson et al. (2011) draw similar conclusions finding that the impact of cultural influences on international investment biases to be as strong as that of geographic distance. Degree of a country's *individualism* is also found to have a positive effect on foreign investment (Beugelsdijk and Frijns, 2010) and investors from country with high level of *long term orientation* index display less home bias (Anderson et al., 2011).

### *2.3.7. Diversification potential*

The prediction that domestic investors should be able to reap the benefits of diversification by investing in countries that have low correlation against their domestic market has received mixed support in empirical literature (Burger and Warnock, 2003; Lane and Milesi-Ferretti, 2008). Chan et al. (2005) do not find evidence of correlation having the anticipated impact on home or foreign bias; in fact they observe an opposite impact than predicted. De Santis and Gerard (2009) find that marginal diversification benefits and initial degree of underweight are the strongest drivers of bilateral changes in portfolio country weights in both equity and bonds. Vanpee and Moor (2013) find foreign bias to be lower between countries that have higher correlation in bond returns. Times of high volatility and crises may lead correlations to be temporarily high without being related to long-term diversification potential (Bekaert et al., 2005).

### *2.3.8. Momentum or herd trading*

McLeavy and Solnik (2014; p-305) explain that difference in real yields of bonds may to some extent explain investment decisions of managers. Other things held constant, one would expect investors to invest in markets providing higher real yields; but a higher yield in one currency is often cancelled out, ex post, by depreciation in that currency. Although the tendency of investors to chase returns, by increasing holdings in well-performing assets and/or reducing holdings in underperforming ones, has been widely documented (e.g. Bohn and Tesar, 1996; Froot et al., 1992; Sirri and Tufano, 1998), this evidence has been challenged more recently (see Curcuru et al., 2011; Hau and Rey, 2008). Chan et al. (2005) and Faruqee et al. (2004) also find evidence of return-chasing behaviour while Vanpee and Moor (2013) do not find such evidence of return-chasing in bond home bias.

### *2.3.9. Gap in the literature and motivation*

The above discussions show that a number of studies have been devoted towards exploring the determinants of home bias and foreign bias, mainly in equity investments. However, there remains plenty of room for improvement in research to enhance our understanding of home and foreign bias phenomenon. For example, Chan et al. (2005) examine the determinants of home and foreign bias in equity investment; but they do not use panel data and opt for cross sectional data in their analysis. This leads to concerns related to endogeneity (see Baltagi, 2005). De Moor and Vanpée (2013) also conduct a study comparing how a given set of variables impact equity and bond biases. Most of these studies do not include cultural attitudes in their analysis. I consider this to be an important omission as cultural attitudes have been found to be different among countries (Hofstede, 1980) and these differences

have the potential to influence financial decisions (see Barber and Odean, 2001; Beugelsdijk and Frijns, 2010; Chui and Kwok, 2008; Graham et al., 2009; Kwok and Tadesse, 2006). There are indeed studies that examine the impact of cultural attitudes but they are limited to equity investments and take into account tranquil periods only (see Anderson et al., 2011; Beugelsdijk and Frijns, 2010). Arguable, the importance of such determinants could change during crisis periods and it is important from policy viewpoint to understand how crisis periods can influence investors' financial decisions. This is especially important given the scourge of two recent financial crises in the form of global financial crisis and Eurozone debt crisis. Further, bonds being of different asset class could arguably be influenced differently than equity (see Burger and Warnock, 2003; Campbell and Taksler, 2003; Elton, 1999); and investors and firms have different levels of appetite for bonds and equities (Myers and Majluf, 1984). Additionally, none of the existing papers make a comparative study to examine the relative importance of economic versus non-economic factors. A comparative study would allow policymakers to formulate better strategies to attract higher level of foreign bias. These outstanding issues provide motivation to examine the importance of economic and non-economic factors in foreign bias of bonds in normal as well as in crisis periods. These issues are explored in Chapter 3 of this thesis.

### *2.4. Implications of suboptimal international allocations*

After reviewing the literature on the determinants of home and foreign bias in Section 2.3, this section discusses current literature on the implications of suboptimal international allocations, identifies the gap in the existing literature, and provides the motivation for the second empirical chapter of this thesis.

### *2.4.1. Implications of suboptimal allocation*

Though the home bias and foreign bias phenomena have been documented for quite some time now (e.g. Chan et al., 2005; French and Poterba, 1991) with attention being paid mainly to determinants of such biases (e.g. Beugelsdijk and Frijns, 2010; Cooper and Kaplanis, 1986; Covrig et al., 2007; Dahlquist et al., 2003; Fidora et al., 2007), the literature related to implications of such suboptimal allocation is surprisingly scarce. Among a very limited number of studies examining the impact of home bias, Lau et al., (2010) argue that countries can lower their cost of equity capital substantially by decreasing their level of home bias. They proxy cost of equity capital using three measures – implied cost of capital, average realized return, and expected dividend yield – and provide compelling evidence that lowering the degree of home bias could lead to reduction in such costs of equity capital. In another study, Chan et al. (2009) examine the impact the home bias (of local investors) and foreign bias (of foreign investors) on firm valuation; consistent with the hypothesis that global risk-sharing should lower cost of capital and hence increase firm value, they find that lower level of home bias is related to higher stock market valuation.

### *2.4.2. Gap in the literature and motivation*

The literature on implications of home and foreign bias is rather nascent and leaves a fertile ground for new research. A very narrow strand of literature examines the impact of home bias on firm value (see Chan et al., 2009) and on the cost of equity capital (see Lau et al., 2010). Considering the economic importance of bonds and consistent with the theme of this thesis, an important question in this area relates to the impact of foreign bias on the cost of debt. This question is explored in detail in Chapter 4 of this thesis.

## *2.5. Corporate governance and foreign ownership*

This section discusses the literature review on corporate governance, identifies the gap in the literature and outlines the motivation for the third empirical chapter of this thesis.

### *2.5.1. Corporate governance*

The relationship between investors and managers of firms have long been viewed, rather cynically, as an agency relationship (see Coase, 1937; Fama and Jensen, 1983; Jensen and Meckling, 1976). This is a relationship defined by the nature of conflict that can arise between owners – who make available the money needed for investment – and managers who are involved in the daily functioning of the firm (Shleifer and Vishny, 1997). Though potential conflicts between owners and managers could theoretically be avoided by laying out clearly-defined rights and responsibilities, precise contractual agreement to cover all eventualities cannot be executed due to, among other things, unforeseen nature of future events and lack of expertise on the part of investors (see Grossman and Hart, 1986; Williamson, 1979). This can lead to a situation where 'residual control rights' is effectively handed over to the managers by investors; or this could also lead to situations where major investors themselves take part in day to day running of the firms at the expense of minority shareholders and other stakeholders. These in turn can lead to agency costs between the investors and the managers. Regulatory framework of a given market can be an important determinant of level of such agency costs (see Jensen and Meckling, 1976).

Though existing body of literature does not indicate the existence of one best definition of corporate governance, it is not surprising that different but complementary definitions of corporate governance exist. For example, Shleifer and Vishny (1997) consider corporate governance to be the ways in which investors safeguard their return on investment. A broader view of corporate governance takes into account not just the firms but also the environment in which the firms operate along with the political and regulatory environment of the market they operate in (see Jensen, 2001). Despite varying definitions, there seems to be a consensus in that corporate governance is viewed as a mechanism to lower the conflict between firm managers and other stakeholders. There exists a very rich literature on various aspects of corporate governance and a deeper review of the huge body of literature is obviously beyond the scope of this chapter. Hence, the following section will discuss existing literature from the perspective of understanding the interaction between corporate governance and foreign investment. For a deeper review on other important issues related to corporate governance, interested readers are directed to the works of Gillan, (2006), La Porta et al. (2000), and Shleifer and Vishny (1997), among others.

### *2.5.2. Gap in the literature and motivation*

Corporate government problem is a major concern particularly in emerging markets (Shleifer and Vishny, 1997) as these markets generally tend to offer poor level of protection to investors; this is because regulatory framework are either lacking or difficult to enforce in emerging markets. Additionally, domestic investors benefit from higher flow of information as compared to foreign investors (see Brennan and Cao, 1997). These discrepancies render firms in emerging markets less

attractive to foreign investors as the investors face the prospect of incurring additional costs to monitor and gather information from opaque financial statements of poorly governed firms (Akerlof, 1970; Gelos and Wei, 2005; Leuz et al., 2010). Stulz (2005) notes in a similar vein that investors are unable to extract full benefits of international diversification due to 'twin agency problem'[14]. An obvious implication of this discrepancy is twofold: investors in developed markets cannot extract full benefits of international diversification; and cost of capital in emerging markets remain high (see Stulz, 1999).

This provides an interesting question to ponder: if mechanisms of corporate governance could be improved in emerging markets, would it help attract more foreign investment? Exploring this question to get an answer can be tricky not least because mere existence of governance mechanisms does not guarantee the enforcement of such mechanisms in the emerging markets. As La Porta et al. (1998) note, rich and poor countries do not so much differ in the investor protection laws they have but rather on the enforcement of such laws; law enforcement has been particularly weak in poorer countries. And for investors, the importance of laws and regulations lie not merely on their existence but on their effective implementation as well (La Porta et al., 2000). In certain cases, having no law can be better than having a law that is not enforced (Bhattacharya and Daouk, 2009). These issues provide the motivation for examining the impact of enforcement of – rather than mere existence of – corporate governance on foreign ownership in emerging markets. This examination is conducted in more detail in Chapter 5 of this thesis.

[14] Twin agency problem relates to the risks to outside investors from the corporate insiders and also from the government.

### *2.6. Chapter summary*

Despite the clear benefits of international diversification, investors still do not diversify internationally at an optimal level; the consequence is that such investors are not able to extract the full benefits of well-diversified international portfolio as suggested by finance theory.

Though a number of studies have attempted to identify the reasons behind investors' suboptimal allocations, there remain noteworthy gaps in the literature warranting further research to enhance our understanding of such sub-optimal investment decisions of investors. First, as debt is an important source of finance for firms and governments, a study attempting to identify the determinants of suboptimal allocation in bonds is important. Second, given the importance of non-economic factors (including behavioural attitudes) in investment decisions, the inclusion of additional behavioural variables in an empirical enquiry is imperative. Third, it is of interest to policymakers to be cognizant of relative importance of economic versus non-economic factors in determining the level of foreign bias assigned by foreign investors. Finally, considering the recent market crises that have affected investors, it is important from policy-making viewpoint to examine whether the influence of economic and non-economic factors (on international bond allocation) remain the same during normal times and crisis periods.

The implications of foreign bias is another important but under-researched area. There are very limited number of studies examining the implications of suboptimal foreign allocation and most of these studies are focused towards equity investments. Considering the overall importance of the cost of capital and the

theoretical possibility that it could be influenced by foreign bias, the examination on the impact of foreign bond bias on the cost of debt is important.

Attracting a higher level of foreign investment is one way of increasing the foreign investment allocation that is currently observed to be suboptimal across markets. One possible mechanism of attracting higher level of foreign investment - especially in the context of an emerging market - could be by enforcing existing regulations. This is due to the fact that poor countries generally offer weak law enforcement and hence poorer level of investor protection despite having similar investor protection laws as rich countries (La Porta et al., 1998). This provides a motivation to examine if enforcement - not just mere existence - of existing corporate governance laws leads to higher level of foreign investment.

## 3. Determinants of Foreign Bias

This is the first empirical chapter of this thesis. It examines the determinants of foreign bias in bonds. The host of variables are segregated into two groups: economic and non-economic. This chapter also examines if the importance of such variables remains the same or alter during crisis periods.

### *3.1. Introduction*

Although contrary to finance theory, it is well-established that portfolio investors overinvest in their domestic markets and underinvest in foreign markets, leading to investment biases. Most of the existing studies explaining these biases focus on equity investments, particularly explaining the cross-country differences in overweighting of domestic equities, referred to as equity home bias (Cooper and Kaplanis, 1994; Grinblatt and Keloharju, 2001). The issue of underweighting of foreign markets, referred to as foreign bias, has received much less attention, focused mainly on equity investments (Beugelsdijk and Frijns, 2010; Chan et al., 2005); and there is disagreement on the possible causes. Some studies (e.g. De Moor and Vanpée, 2013) explore the determinants of biases in bond investment as well but such studies generally do not examine the impact of societal/behavioural attitudes on international investments. Cultural attitudes tend to be different among countries (Hofstede, 1980) and these cultural differences have the potential to influence investment decisions of investors (see Barber and Odean, 2001; Beugelsdijk and Frijns, 2010; Chui and Kwok, 2008; Graham et al., 2009; Kwok and Tadesse, 2006). Further, the impact of the influencing factors (on investment biases) might themselves change during crisis times. Hence, to complement the existing body of

knowledge, I explore the potential determinants of biases in foreign bond investments, comparing relative importance of economic and non-economic factors, and examining if their influence change during the global financial and European debt crises.

A question may arise at this stage as to whether ICAPM is the appropriate benchmark for bonds. ICAPM can indeed be used in the context of bonds just like it has been used in the literature in the context of equities. For the purpose of illustration, consider a rational investor investing in bonds of 10 different countries all of which have a country risk of 0.70 already factored in the bond prices. If we assume that the country risk of these countries could fluctuate in either direction, up or down, then this fluctuation of country risk is a diversifiable risk for which the rational investor would not be asking for extra compensation. This argument can be extended to include other risks like default risk, exchange rate risk, political risk, etc. that may be embedded in bond prices.

In addition to filling the research gaps on foreign bias, particularly on bonds, this study on the international allocation of bonds is also motivated by the importance, characteristics and development of the bond market. The size of global bond markets is roughly twice the size of equity markets, and has witnessed steady growth in the past decade as debt has become an important source of finance for governments, financial institutions and corporates. Data from Bank for International Settlements (BIS) show that bond market size increased from USD 35.5 trillion in year 2001 to USD 97.5 trillion in 2012; during the corresponding period, cross-border holdings of long-term debt (excluding money market instruments) grew from USD 5.5 trillion to USD 19.8 trillion, as reported by International Monetary Fund

(IMF) in Coordinated Portfolio Investment Survey (CPIS). Despite such significant increases in the absolute dollar value of cross-border bond investments, the data reveals that bond investors are still not diversifying internationally to benefit from the optimal risk-return trade-off.

Also, bonds have unique features relative to equity as asset class, and therefore the underlying determinants of bond foreign biases could be different from that observed in equity investments. For example, compared to equity markets, bonds exhibit lower volatility returns with a higher element of relative safety. Studies show that government bond returns are not influenced by the factors that impact equity returns (Elton, 1999). Similarly, Campbell and Taksler (2003) report that the price of bonds can significantly diverge from that of equities, implying that different factors could drive the attractiveness of equities and bonds asymmetrically. Additionally, bonds and equities differ in terms of their preferences to borrowers and investors (Myers and Majluf, 1984) and bonds possess inflation-hedging properties unlike equities (Fama and Schwert, 1977). Further, studies in equities – while calculating the world market portfolio – either assume that all shares issued by firms can theoretically be held by foreigners or these studies adjust for proportion of shares held by insiders by using an approach that can lead to distorted figures (see Dahlquist et al., 2003); using a separate tradable asset in the form of bonds can mitigate this concern. These factors provide motivation to examine whether it is the economic fundamentals or non-economic factors that are more influential in international bond investment bias. Further, there is evidence that investors do not flee volatility in equity markets but do take flight from volatility in bond markets (see Burger and Warnock, 2003). Therefore, I investigate whether there were any significant

reallocations of bond investments from countries most affected by the recent Eurozone sovereign debt crisis. Additionally, the setting of debt crisis along with recent global financial crisis, allows me to test whether the sensitivity of economic and non-economic factors is different during periods of economic crisis relative to non-crisis periods.

In summary, this chapter examines three important issues related to foreign bond investments. First, it investigates whether it is the economic fundamentals and/or non-economic factors that are associated with biases in foreign bond allocations. Second, using the 2009-11 European sovereign debt and 2007-09 global financial crises as experimental set-ups, this chapter investigates whether investors reallocate/rebalance their bond portfolio during these turbulent economic periods. Third, it examines whether the crises periods interact with economic and non-economic factors to alter their importance during such crises.

Using an extensive dataset on cross-border bond allocations for 54 markets (developed and emerging) spanning 12 years, two important findings emerge from this study. First, though economic fundamentals and non-economic factors (including familiarity and behavioural factors) both are important drivers of foreign bias, I find that familiarity, which tends to lower information acquisition costs with foreign markets, is the predominant driver of foreign bias. Given the lower volatility of bond market, the premium attached by foreign investors for economic fundamentals (including institutional factors) seems to be of secondary importance relative to familiarity with foreign markets. Further, in addition to the bilateral familiarity factors, non-economic investor-specific behavioural attributes also offer interesting insights in the allocation decisions of cross-country bond investments. I find that

investors with higher levels of uncertainty avoidance consistently underweight foreign bond markets. In contrast, investors with higher levels of masculinity, a proxy for competitiveness, have greater allocation of funds invested in foreign bonds.

Second, during the 2007-09 global financial crisis I find no statistical evidence of lower foreign bond diversification from all foreign countries. This can be explained by the global systematic nature of the crisis, where foreign bond markets were not as severely affected globally (in comparison to other asset classes) and with respect to individual regions or countries. However, when I include the period spanning the European debt crisis and in particular focus on the markets most severely affected, i.e. Greece, Italy, Ireland, Portugal and Spain (GIIPS), it emerges that foreign investors divest their share of allocations from the markets suffering most from the European debt crisis. Further, I also find that the importance of non-economic factors in explaining foreign bias is even greater during the European debt crisis, even after controlling for economic factors.

This study contributes to the following three strands of the literature. First, it adds to the limited literature on international bond portfolio diversification. To the best of my knowledge, this is the first study to simultaneously investigate the relative importance of economic fundamentals versus behaviourally influenced non-economic factors in explaining foreign biases in international bond allocations. Second, I also supplement the literature which associates the role of cultural attitude with foreign investment decisions (see Graham et al., 2009; Grinblatt and Keloharju, 2001 amongst others). Specifically, I show how investor-specific cultural factors can influence foreign bond allocation decisions. Finally, I also contribute to the growing literature linking crisis periods and investor behaviour (e.g. Malmendier and Nagel,

2011). I consider both the period of global financial crisis (2007-09) and the European sovereign debt crisis (2009-11) to examine how these periods influence foreign bias in international bond investment. Additionally, I consider whether the sensitivities of economic and non-economic factors can alter during the economic crisis periods relative to non-crisis periods.

The rest of this chapter is structured as follows. The following section (Section 3.2) contains a brief discussion on the theoretical framework to support the empirical modelling. Section 3.3 discusses the possible determinants of foreign bias along with their economic explanations. Section 3.4 provides summary statistics to the data and variables and section 3.5 presents the empirical analyses. Section 3.6 discusses the limitations of this chapter and section 3.7 provides concluding remarks for this chapter.

### *3.2. Theoretical model*

The theoretical framework for this empirical chapter is drawn from Cooper and Kaplanis (1986). As shown in equation (3.1) below, μ is the objective function to be maximized:

$$\mu = Max(w_i'R - w_i'c_i), \tag{3.1}$$

subject to the two following constraints:

$$w_i'Vw_i = v$$

$$w_i'I = 1$$

where $w_i$ is a column vector having a $j$ th element of $w_{ij}$; $w_{ij}$ is the share of the investor $i$'s wealth allocated in risky securities of country $j$; $R$ is a column vector

of expected returns before tax; $c_i$ is a column vector having a $j$th element of $c_{ij}$; $c_{ij}$ is the deadweight cost for investor $i$ of holding securities in country $j$; $V$ is the variance/covariance matrix of the gross returns of the risky securities; $v$ is a constant and $I$ is a unity column vector. The Lagrangean function of the maximization problem is given by:

$$L = (w_i'R - w_i'c_i) - (h/2)(w_i'Vw_i - v) - k_i(w_i'I - 1) \quad (3.2)$$

where $h$ and $k$ are the Lagrange multipliers. Differentiating (3.2) with respect to $w_i$ and setting the value to zero, we get (3.3):

$$R - c_i - hVw_i - k_iI = 0 \quad (3.3)$$

Rearranging the above gives equation (3.4) for investor $i$'s optimal portfolio as:

$$w_i = (V^{-1}/h)(R - c_i - k_iI), \quad (3.4)$$

where

$$k_i = [I'V^{-1}R - I'V^{-1}c_i - h]/I'V^{-1}I.$$

This now allows to aggregate individual portfolio holdings to get world capital market equilibrium, the clearing condition for the model being equation (3.5):

$$\sum P_i w_i = M, \quad (3.5)$$

where $P_i$ is the proportion of world wealth owned by country $i$; $M$ is a column vector whose ith element is $M_i$ and $M_i$ is the share of global market capitalization in country $i$'s market.

Substituting equation (3.4) in equation (3.5) and subtracting the resultant equation from equation (3.3), we get equation (3.6):

$$hV(w_i - M) = (\sum P_i c_i - c_i) + I(\sum P_i k_i - k_i) \tag{3.6}$$

Representing minimum variance portfolio $(= \mathrm{V}^{-1}\mathrm{I}/\mathrm{I}'\mathrm{V}^{-1}\mathrm{I})$ by $z$, we obtain equation (3.7):

$$hV(w_i - M) = (\sum P_i c_i - c_i) - z'(\sum P_i c_i - c_i)I \tag{3.7}$$

If the deadweight costs are zero, the right-hand side of (3.7) is reduced to zero signifying that each investor holds the world market portfolio in the absence of barriers to international investment; i.e. there is no home bias or foreign bias. However, this is valid only if all investors have equal degree of risk aversion.

But if we consider a situation where the deadweight cost for only domestic investment is zero and such deadweight cost for all other investor-country pair is $c$; and where the covariance matrix, $V$, is diagonal with all variances equal to $s^2$, then investor $i$'s portfolio holdings in country $j$ is given by:

$$w_{ij} = M_j - (P_j c/hs^2), \qquad i \neq j$$

$$w_{ij} = M_j - (P_j c/hs^2) + (c/hs^2), \quad i = j \tag{3.8}$$

Equation (3.8) suggests that the larger the marginal deadweight costs, the greater is the deviation of portfolio holdings from the world market portfolio and such deviation is negative for foreign investment (and positive for domestic investment). If the deadweight cost is not uniform across country pairs, equation (3.6) is re-expressed and then simplified to the following equation (3.9):

$$hs^2(w_{ij} - M_j) = -c_{ij} + b_j + a_i - d, \quad i \neq j \tag{3.9}$$

where:

$$a_i = z'c_i$$

$$b_j = \sum M_k c_{kj}$$

$$d = z'\sum M_i c_i$$

$a_i$ is the weighted average marginal deadweight cost for investor $i$; $b_j$ is the weighted marginal deadweight cost for investors investing in country $j$; and $d$ is the world weighted average marginal cost.

This framework stipulates that investors, assuming that they intend to maximize their return for a given level of risk, hold the world market portfolio in the absence of deadweight costs, i.e. when all investors are not hindered by any form of barrier to invest in foreign markets. However, the presence of direct and indirect barriers to international investments, that generates marginal deadweight costs, translates into deviations from the world market portfolio. For a particular market,

the framework allows for the deadweight costs to be imposed on domestic investors investing abroad, and also on foreign investors investing locally. Each investor ($i$) is expected to be interested in maximizing his portfolio's returns (R) for a given level of variance (V) for the portfolio. These derivations posit that difference in the deadweight cost for an investor of a country $i$ ($c_{ij}$) and the weighted marginal deadweight cost for world investors ($b_j$) determine if investor $i$ overweights or underweights country j (if $c_{ij} > b_j$, then investor $i$ would underweight country $j$ in his portfolio, relative to the market). Investors would also invest less in that host market $j$ if their relative deadweight cost ($c_{ij}$) is higher than their weighted average marginal deadweight cost ($a_i$) of investing in such host markets. This suggests that investors make international portfolio choice decisions based on this marginal deadweight cost relative to weighted average marginal deadweight cost of other investors or of the country of investment.

### *3.3. Determinants of foreign bias*

Drawing on the theoretical framework, in this section I report the possible barriers to foreign investments that can generate potential deadweight costs. I segregate the factors driving bond investment biases into two categories. The first group is related to economic fundamentals and the second to non-economic factors. Economic fundamentals are linked to country-specific economic and institutional factors and non-economic factors are associated with information asymmetry and irrationality issues. I describe all the variables used in this empirical analysis in Table 3.1, explaining both economic and non-economic factors.

### *3.3.1. Measure of foreign bias*

The construction of a foreign bias measure needs market level crossborder bond portfolio holdings and bond market size data. Crossborder bond holdings data is obtained from CPIS[15] of IMF. I start with an aggregate dataset of crossborder long-term bond investment for more than 100 countries for the years 2001 to 2012. The average year-end cross-border holdings stand at $13.9 trillion (at a 12-year aggregate of $167 trillion). I take out the unspecified and confidential data (4.7 trillion) for which host countries are not specified and further amount of $4.4 trillion invested in international organizations. This leaves the data with all-year aggregate of $157.8 trillion of cross-border bond holdings where holder and host countries are identifiable. Negative values and missing values are also disregarded. Following the suggestion of Cooper et al. (2012), all absolute $0 investments are treated as $1 investments to avoid error in calculation of foreign bias and to ensure that complete underinvestment in host markets are not ignored. Owing to very limited availability of other relevant data, I further discard all non-MSCI (non- Developed, non-Emerging and non-Frontier) countries from the dataset. Additionally, countries for which bond market benchmark are not availale in BIS are also dropped. This leaves a dataset having a yearly average cross-border holdings of $10 trillion (12-yr aggregate of $120 trillion) from 54 of the MSCI-designated developed, emerging and frontier markets for the period of 2001-2012.[16] In terms of temporal range in the sample, the

[8] The CPIS database has been used by Bekaert and Wang (2009), Lau et al. (2010) amongst others. However, a few caveats need to be noted in using the CPIS data set. For example, investment from some countries, (notably China) are not reported; some investments are shown as negative values; a small sample is reported as unallocated; some data is reported as confidential and investments from 'international organizations' are also reported.

[16] The coverage of the sample period is dictated by the availability of data. For example, data on bond market development and capital openness is not yet available for the year 2013.

cross-border bond holdings increased from US$3.7 trillion in 2001 to US$14.3 trillion in 2012. Further, the total cross-border investments received in the sample countries comprises of 76% of the average total holdings (US$120 trillion for 2001-12 from a total of US$158 trillion) reported by CPIS. This strongly suggests that the sample is representative of the aggregate global bond market portfolio investments.

Following Fidora et al. (2007), bond market size is taken from Debt Securities Statistics of BIS Quarterly Review. Since the BIS data has its limitations, a combination of three different tables ( namely Table 14B, Table 16A, and Table 18) from the report are used to deduce bond market size for each country. Table 14B relates to all outstanding international bonds and notes, excluding money market instruments, issued by domestic issuers. Table 16A provides figures on outstanding domestic debt securities issued by domestic residents and Table 18 includes figures on total debt securities (domestic and international) issued by domestic residents. Ideally, a given country's total bond market reported in Table 18 should be the sum of its outstanding in Table 14B and 16A , (i.e. Table 14B + Table 16A = Table 18) but this is not always the case. For example, countries like Brazil, India and South Africa exhibit significant bond outstanding in Table 14 + Table 16 but show zero outstanding in Table 18. In these cases, I ignore the figure of Table 18 but take into account the figures from Table 14B and Table16A combined. On the other hand, France shows significant bond outstanding in Table 18 but relatively lower values are seen in the other two tables. In such situations, the higher amount of Table 18 is taken. For countries like Canada, China and Japan, the aggregate figures of Table 14B and Table 16A are very similar to that of Table 18 for recent years but these

figures may differ in earlier years. Is such instances, I take the table/s that give/gives the higher of the average bond outstanding over the years for the given country.

From the available data, I remove 367 observations of countries not belonging to MSCI Developed, Emerging or Frontier markets. This leaves 749 country observations over the 12 year period in the data, with an average yearly outstanding now slightly reduced to $63.8 trillion. I also drop those observations where total foreign bond holding is more than the total bonds issued by the country itself, as this is indicative of possible errors in the data. The minimum and maximum yearly bond market outstanding, after rooting out non-MSCI countries, stand at $35.5 trillion and $97.5 trillion for 2001 and 2012 respectively. For consistency, country benchmarks, crossborder investments and domestic holdings are calculated after all non-MSCI countries are dropped from the dataset.

To construct the foreign bias measures, I first compute the bilateral allocation made by investors from source country *i* into bond portfolio issued by host country *j* for the period *t* as shown in the equation (3.10) below:

$$w_{ijt} = BH_{ijt} \Big/ \sum_{j=1}^{54} BH_{ijt} \tag{3.10}$$

where $w_{ijt}$ is the share of host country ($j$ ) in bond holdings for investors of source country ($i$) and $BH_{ijt}$ is the market value of bond holdings of country $j$ in the portfolio of country $i$'s investors as reported by CPIS for period *t*. Next, the benchmark weight of country $j$ in the world market portfolio is calculated in equation (3.11) as follows:

$$w_{jt}^{*} = MV_{jt} \Big/ \sum_{j=1}^{54} MV_{jt} \tag{3.11}$$

where $w_{jt}^{*}$ is the share of country $j$ in world bond market and $MV_{jt}$ is the bond market outstanding of country $j$ for the period $t$ as obtained from BIS. I follow Chan et al (2005) to calculate foreign bias measure for each country pair. Foreign bias ($FBIAS_{ijt}$ ), as defined in equation (3.12) below, is the extent to which investors from source country ($i$) overweight or underweight foreign markets ($j$) in their bond holdings and is computed as the log ratio of $w_{ijt}$ to $w_{jt}^{*}$.

$$FBIAS_{ijt} = \ln\left(w_{ijt} \Big/ w_{jt}^{*}\right) \tag{3.12}$$

In this emprical chapter, higher foreign bias indicates more weight assigned to the host market (by foreign investors).

### *3.3.2. Economic factors*

To capture different dimensions of economic drivers of bond allocations, I use a wide range of economic fundamentals. These include returns on bond investments, foreign exchange risks, bond market development, investor protection standards, explicit barriers of formal capital control, and other macroeconomic factors.[17] Following the theoretical framework, I expect attractive features of foreign markets to reduce deadweight costs for investors thus leading to higher foreign bias. On the contrary, less attractive characteristics of a host market would lead to higher deadweight cost leading to lower foreign bias.

[17] See Bekaert and Wang (2009), Chan et al. (2005), Forbes (2010).

In terms of bond returns, the tendency of investors seeking higher returns by increasing holdings in well-performing assets has been widely examined (see Chan et al., 2005; Curcuru et al., 2011). Based on this argument it is expected that recent higher market returns would motivate investors to increase their bond holding in that market, leading to higher foreign bias. I use real annual yield (YLD), net of sovereign default risk premium and expected inflation, as a measure of bond returns. This is because country risk measures and foreign exchange volatility - which are to be used as additional variables – would capture the elements of sovereign default premium and expected inflation. The annual yield on ten-year government bond is computed as the preceding twelve months' average yield. The data is obtained primarily from International Financial Statistics (IFS) of IMF. For some countries where this data is not available in IFS, I pick this data from Economic Intelligence Unit.[18] Inflation figures, based on CPI index, are from World Development Indicators (WDI) of the World Bank and sovereign default risk spreads based on Moody's ratings are taken from Damodaran Online. [19] For five countries where local currency yields are not available from either source, I use yields from USD-denominated debt taken from JP Morgan's EMBI series net of country risk and US inflation.[20]

Exchange rate volatility can increase deadweight costs for international investors (if bonds are issued in an overseas currency). Fidora et al. (2007) find that investors are more likely to invest more in their domestic markets than investing

[18] http://www.eiu.com/.
[19] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html
[20] These five countries are Argentina, Egypt, Indonesia, Turkey and Ukraine. Excluding these five countries from our sample does not change the findings of this paper.

abroad when faced with higher foreign exchange volatility. It is anticipated that the higher exchange rate of a host market would make it less attractive for international bond investors, thus leading to lower foreign bias in that market. To capture exchange rate volatility (*EXCH*), I use the 61-country trade-weighted and inflation-adjusted broad monthly indices for real effective exchange rate from BIS with year 2010 as the base year. I calculate yearly volatility as percentage change in the indices per year based on the preceding 36 months' data. In all the regression analyses, I take the natural log of exchange rate volatility for a given country.

Differential levels of bond market development across the globe can also generate deadweight costs for investors. Forbes (2010) finds that a country's financial market development positively influences foreign investment, as a well-developed market offers enhanced liquidity and efficiency. This suggests that a well-developed foreign market can attract international bond investors resulting in higher foreign bias. To capture the overall bond market development, I use the sum of private domestic bonds and private international bonds taken as a share of GDP as a proxy for bond market development (*BDEV*) and use it in its logarithmic form in the empirical analysis.[21] The data is sourced from Global Financial Development Database developed by Čihák et al. (2013).[22]

With respect to investor protection, La Porta et al. (1997) demonstrate that countries offering a lower level of investor protection have less developed capital

[21] Burger and Warnock (2003) and Forbes (2010) use ratio of domestic bond market capitalization to GDP as a measure of overall bond market development. However, ignoring the international component of bond issuances ignores an important element of overall development of the bond market.

[22] This data is available only for the period 2000 to 2011. However, since the temporal variation over any two-year period is not materially different, I use the data from 2011 for the year 2012.

markets lacking the optimal breadth and depth. Similarly, Bae et al. (2006) find that foreigners invest more in bonds of those countries that safeguard investors' property rights. As a result, within the framework of this empirical exercise, the higher degree of investor protection standards in a host market generates lower degree of deadweight costs for international bond investors, thus leading to higher foreign bias. The measure of property rights (*PROP*) is from Table 2c of Economic Freedom Network (EFN)[23] compiled by Gwartney et al. (2014) and ranges from 1 to 10. Lower score implies that rights over financial and other assets are poorly defined and not properly protected by law whereas higher score represents clear definition and enhanced protection of such rights.

Although capital controls have been progressively relaxed over the past few decades (McLeavy and Solnik, 2014), the degree of openness still varies across countries. Higher levels of capital control impose limits on foreign investors on their investments in national markets (Ahearne et al., 2004). This implies that relaxing capital account restrictions and easing existing barriers to capital inflows would increase foreign investments in a given market (see Chan et al., 2005; Forbes, 2010). Therefore, a higher level of capital openness is expected to be associated with higher foreign bias. As a measure of capital controls, I use the openness index (*CAPOP*) from the Table 4Dii of EFN. This measure ranges from 0-10, and is constructed on the basis of 13 different types of international capital control measures reported in the various issues of *Annual Report on Exchange Arrangements and Exchange Restrictions* of IMF. A higher score reflects higher level of capital openness.

[23] http://www.freetheworld.com/datasets_efw.html.

Macroeconomic imbalances and, financial and political risks could also explain foreign biases as they are associated with generating higher deadweight costs to foreign investors.[24] For instance, Eurozone countries struggling to bring their budget deficits within agreed levels could be indicators of future shocks in their bond markets, making those host countries less attractive for bond investors. To control for a wide spectrum of such risks, not included in other variables, I add country credit ratings in our analysis. Higher country risk of a given host country is expected to discourage foreign investors leading to lower foreign bias. The measure for country risk (*CRISK*) is based on Moody's ratings and ranges from 0 to 1000 basis points with higher score representing higher risk. Following earlier studies (e.g. Cruces and Trebesch, 2013; Eichengreen and Mody, 2000), I do not use the absolute values of credit ratings, but regress such credit ratings against all the other economic fundamentals and use the residual in the regressions. This residual captures all the other country-specific time-varying factors that I have not included in the set of economic variables but are used by credit rating agencies to assess the riskiness of the country.

### *3.3.3. Non-economic factors*

It is suggested that higher familiarity of an asset/market leads to more investment in that asset/market (Huberman, 2001). However, there is no conclusive consensus as to whether the effect of such familiarity is rational or irrational. For example, Chan et al. (2005) equate higher familiarity to lower information costs, measuring the varying degree of information asymmetry between home and foreign

[24] See, for example, Afonso et al. (2015), and Bekaert et al. (2014).

investors, whereas Grinblatt and Keloharju (2001) associate familiarity bias with irrationality. Earlier studies (e.g. Heath and Tversky, 1991) also lend support to the non-economic and non-rational aspect of familiarity where investors are more optimistic about domestic asset returns as they feel less competent to evaluate foreign assets. Given the disagreement in segregating the familiarity and behavioural issues, in this study I use several country-pair and source country investor-specific factors capturing the different sources of familiarity and/or irrationality under the common heading of "non-economic factors".

The motivation to treat the bilateral pair country factors separately from economic fundamentals emanates due to two reasons. First, all the economic fundamentals are country-specific and the familiarity explanations are country-pair dependent. Second, all economic fundamentals are expected to impact investment biases directly on their own, but the bilateral links are expected to influence investment biases indirectly through familiarity with foreign markets. The first two non-economic factors I use are the geographic proximity between source and host countries and a dummy variable reflecting whether investors share a common language in the country-pair. In terms of distance, Chan et al. (2005) suggest that international investors are more reluctant to invest in countries that are relatively further away. Higher geographical distance creates larger deadweight costs arising from lower familiarity, which in turn leads to lower foreign bias (i.e. less favourable foreign allocations). Geographical proximity is measured by distance *(DIST)* in kilometres between capital cities of country pairs and is taken from http://privatewww.essex.ac.uk/~ksg/ and is used in its natural logarithmic form. A common language is also known to influence foreign investments, however the

impact is in the reverse direction, as sharing a common language with a foreign market helps in enhancing familiarity of host market thus motivating higher allocations (see Cuypers et al., 2015; Grinblatt and Keloharju, 2001). Therefore, bond investors are expected to favour foreign markets that share a common language. To account for common language *(COMLA),* dummy variable with a value of one is used if a country pair shares major language with another country, and this is taken from Wei and Subramaniyan (2007).http://users.nber.org/~wei/data.html[25]

The third factor known to capture time-varying degree of familiarity between country pairs is bilateral trade (Lane and Milesi-Ferretti, 2008). The flow of information through trade increases familiarity with partner countries and therefore would increase foreign bias. The measure of bilateral trade (*BILTR*) is the weight in international trade assigned to a given country by its partner countries. Figures on bilateral trade, including both exports and imports, are taken from IMF Direction of Trade Statistics.

I complement the bilateral familiarity factors with two source country-specific behavioural factors. The first is related to varying level of uncertainty avoidance among investors from different countries, and the second factor is associated with investors' drive for competitiveness and material rewards. Countries where investors have higher levels of uncertainty avoidance are known to have greater bank-dominated (less risky) financial markets, whereas countries with lower levels of uncertainty avoidance are known to be more market-dominated (more risky) (Kwok and Tadesse, 2006). Empirically, Anderson et al. (2011) find that countries

[25] http://users.nber.org/~wei/data.html, see 'Dataset 2'.

with higher levels of uncertainty aversion diversify less in foreign equities, but they do not find outsiders being influenced by such behavioural characteristics of host country investors. On a similar note, Beugelsdijk and Frijns (2010) show that more uncertainty avoiding countries invest lower amounts in foreign equities, which is more pronounced for emerging markets. In summary, existing empirical evidence suggests that investors from countries that have relatively higher levels of uncertainty-aversion would be less inclined to invest in unfamiliar assets abroad and therefore underweight foreign bonds. For measures of source country-specific uncertainty avoidance, I take country level scores for uncertainty avoidance (*UNTAV*) from Hofstede (1980).[26] It measures the extent to which individuals in the country feel uncomfortable with ambiguous and uncertain situations. This measure is based on a scale of 0-100 with higher score indicating higher level of tendency to avoid uncertain and ambiguous situations.[27]

The second investor-specific behavioural factor is associated with the general view that some societies tend to be more competitive, assertive and reward-seeking than others (Hofstede, 1980). Intuitively, investors from societies that place more preference to competition and material rewards should be more inclined to venture out of familiar territory in search of greater rewards. Empirical evidence also suggests that investors from such competitive and reward-seeking societies exhibit higher levels of foreign equity diversification, possibly because they perceive themselves to possess better information about foreign markets (Anderson et al.,

[26] Hofstede's studies, although not without criticism, are considered to be the most widely cited studies in measurement of cultures; see Kwok and Tadesse (2006) for a discussion.

[27] As additional robustness test, I also use similar data from Global Leadership and Organizational Behaviour Effectiveness (GLOBE) study of House et al. (2004). GLOBE provides two measures of uncertainty avoidance: one related to 'values' and the other related to 'practice'. I take the uncertainty avoidance measure related to values as it is positively correlated with Hofstede's measure.

2011). In a similar vein, Graham et al. (2009) show that investors who feel more competent invest a larger portion of their wealth in foreign assets. In line with this view, it can be argued that the tendency of a society to be more competitive, aggressive, and reward-seeking can drive investors to invest more in (foreign) markets they are less familiar with, and this might partially explain the biases observed in international bond diversification. To measure the degree of competitiveness and reward-seeking tendency prevalent in a society, I use the country score for masculinity (*MASC*), also from Hofstede (1980). Higher score on this dimension implies that the society has an affinity for more assertiveness, competition, achievement, and heroism (Hofstede, 1980). Lower score of masculinity would be closer to feminine values associated with social caring and cooperation. This measure ranges from 0-100, with higher values reflecting higher level of competitive social tendencies.

Given the discussion on the potential determinants of foreign biases in bond portfolio allocations, Table 3.2 presents a summary of the expectations on the relationship of foreign bias with the economic and non-economic factors described above.

### *3.4. Summary statistics*

The average yearly summary statistics of key variables are shown in Table 3.3 for all the 54 countries in the sample spanning a period of 2001 to 2012.[28] Average foreign bias (*FBIAS*) towards a host country ($j$) from all source countries

[28] Data for some countries is partially missing. There are four countries (Bahrain, Kazakhstan, Mauritius and Ukraine) which will not be included in any regression as they have missing values in both economic and non-economic categories. However, they are still reported as they are used to construct the foreign bias measure.

($i$) is higher for developed markets (-3.93) compared to emerging markets (-6.37). Notably, the top nine host countries with highest level of foreign bias are developed markets and nine out of the bottom ten are emerging markets.[29] Unsurprisingly the differences in average figures suggest that investors seem to prefer to invest in developed market relative to their emerging counterparts.

With respect to the fundamental variables, there are significant differences between the developed and emerging markets. The yearly average real yield (*YLD*) for developed markets and emerging markets is 1.75 percent and 1.24 percent respectively. It is evident that developed markets sovereign bonds are yielding higher real returns compared to their emerging markets' counterparts. This supports the conjecture that foreign investors are attracted by higher real returns. Such differences suggest a positive relation between foreign bias and real return. As expected, the exchange rate volatility (*EXCH*) for developed markets (4.16 percent) is lower than that of emerging markets (7.57 percent). Average bond market development (*BDEV*) for the entire sample is 62.8 percent of GDP with developed markets (95.9 percent) showing considerably higher level of development than emerging markets (16 percent). Similarly, and as expected, developed countries have higher scores in terms of protection of property rights (*PROP*) and capital openness (*CAPOP*) and they also register significantly lower country risk (*CRISK*).

In terms of the measures related to non-economic drivers, the common language (*COMLA*) average figure of 0.18 for developed markets implies that they

[29] The top nine countries with the highest foreign bias are (from high to low) Netherlands, United Kingdom, Germany, France, Ireland, United States, Austria, Finland, and Sweden. The bottom nine countries with the lowest foreign bias (from high to low) are Kuwait, Bahrain, Indonesia, Egypt, Israel, Thailand, Mauritius, Lebanon, and Pakistan.

share official language with more partner countries compared to the smaller figure of 0.14 for emerging markets. These figures are particularly driven by the proximity of European countries. With regards to trade, on average, countries in the sample conduct 4.2 percent of their overall bilateral trade (*BILTR*) with individual developed markets as compared to 1.3 percent with individual emerging markets. This further signifies that developed markets are economically more integrated with world markets relative to emerging markets. With respect to the source country-specific behavioural factors, though developed markets exhibit lower level of uncertainty avoidance (*UNTAV*) than the emerging markets, the scores for masculinity (*MASC*) are similar. The figure of 59 (on a scale of 0-100) for *UNTAV* [30] indicates that investors from developed markets are less likely to avoid uncertain situations relative to investors from emerging markets, as reflected by the measure of 71. Apart from *MASC*, differences between developed and emerging markets in all the variables are significant at 99 percent confidence level. The similar score for *MASC* for both the markets suggests that competitiveness and reward-seeking societal attitudes are not the exclusive preserves of either developed or emerging markets.

In summary, on average, countries with higher foreign bias are associated with higher recent return, lower exchange rate volatility, better developed markets, markets with higher level of property rights protection, more open capital markets, closer proximity with investor countries, higher share of common language and bilateral trading. In general, the summary statistics are consistent with the expectations. In the following section, I present the regression analysis on the

[30] GLOBE study (House et al 2004) exhibits similar pattern with developed markets having lower score for uncertainty avoidance (4.1 on a scale of 3.2 to 5.6) as compared to emerging markets (4.9).

association between foreign bias and the different measures of economic and non-economic factors.

### *3.5. Empirical analysis*

Drawing on the theoretical framework, the general regression specification for modelling foreign bias ($Fbias_{ijt}$) in international bond allocations is shown in equation (3.13):

$$Fbias_{ijt} = \beta_1 Fund_{jt} + \beta_2 Fam_{ijt} + \beta_3 Behav_i + \beta_4 INSB_{it} + \beta_5 \alpha_t + \beta_6 \alpha_j + \epsilon_{ijt} \quad (3.13)$$

where $Fund_{jt}$ is the vector of host country-specific (i.e. country *j*) economic fundamental variables, $Fam_{ijt}$ is a vector of bilateral familiarity variables between home and host countries, and $Behav_{it}$ is a vector of the two behavioural variables specific to source country investors. Following Chan et al. (2005), an additional variable, inverse of source country bias (*INSB = 1 – Domestic Bias*), is included to allow for the fact that a higher investment at home, i.e. source country *i*, relative to the theory would automatically lower foreign investments of investors in source countries. For instance, if a country invests 90% of its total bond holdings in domestic bonds, this obviously means that there is that lower proportion of funds available to invest abroad. Domestic bias ($DB_{it}$) is defined as log ratio of domestic

allocations of source investors to the world benchmark as shown below in equation (3.14) below:

$$DB_{it} = \ln\left({w_{it}}/{w_{it}^{*}}\right) \tag{3.14}$$

where $w_{it}$ is the domestic allocations of investors in source country *i* which is constructed as ratio of domestic holdings to total bond holdings. Domestic allocations are computed in as shown below in equation (3.15) :

$$w_{it} = \frac{domestic\ bond\ holdings\ by\ investors\ in\ country\ i}{total\ global\ bond\ holdings\ by\ investors\ in\ country\ i} \tag{3.15}$$

Domestic holdings by investors in country *i* are computed as the difference between total domestic bond market outstanding values, as reported by BIS, and total bond holdings of country *i* by foreign investors, as reflected in the data from CPIS. Total global bond holdings by investors in country *i* is the sum of total domestic and international bond holdings by investors in country $i$. The benchmark weight ($w_{it}^{*}$) of country $i$ in the world market portfolio is calculated as shown below in equation (3.16):

$$w_{it}^{*} = MV_{it} \Big/ \sum_{i=1}^{54} MV_{it} \tag{3.16}$$

where $w_{it}^{*}$ is the share of country $i$ in world bond market and $MV_{it}$ is the bond market value outstanding figure of country $i$ for the period *t* as obtained from BIS. Finally, $\alpha_t$, in equation (4) are year dummies and $\alpha_j$ are host country dummies. Except where stated specifically, the results are reported with standard errors

corrected for heteroskedasticity and autocorrelation using Newey-West estimator (see Newey and West, 1987).

Table 3.4 reports the results from different model specifications. In the second column, the expected signs for the coefficients are shown. Model I shows the estimates with only economic fundamentals in the regression. All fundamental factors enter the regression with expected signs and are significant at the 1% level.[31] The positive regression coefficient of *YLD* suggests that investors are more inclined to invest in markets experiencing recent higher real return providing support to investors seeking higher returns. [32] *EXCH* with a negative coefficient reflects the expected inverse association between exchange rate volatility and foreign bias. This relation implies that international bond investors tend to avoid markets with higher exchange rate volatility, consistent with the findings of Fidora et al. (2007). Similarly, from the positive sign of *BDEV* coefficients, it can be inferred that investors are motivated to invest more in markets with higher level of bond market development. Property rights (*PROP*) and capital openness (*CAPOP*) also show statistically significant relation in the expected direction. Any remaining country-specific macroeconomic, political and financial risks (*CRISK),* exhibit negative association with foreign bias, as expected.

Model II presents results for foreign bias regressed only against the five non-economic variables, i.e. three bilateral familiarity and two source country-specific behavioural variables. All the variables bear the expected signs and are significant at

[31] Although the regression coefficients are explained in their qualitative terms only, given the cross-country set-up of this investigation, the quantitative effects of the results should be interpreted with due caution.

[32] As an alternative measure of bond returns, I also take JP Morgan's EMBI global series for emerging markets and long-term government bond yields for developed markets from Datastream

the 1% level. The negative sign of *DIST* suggests that investors avoid markets which are further away from them geographically. Similarly, the positive coefficient associated with language indicates that common language (*COMLA*) with a host country is positively associated with foreign bias. For bilateral trade (*BILTR*), the positive coefficient reflects that higher trade conducted by a trading partner promotes foreign bias in the trading partner markets. With respect to source country-specific behavioural factors, the negative coefficient suggests that higher level of uncertainty avoidance (*UNTAV*) leads to lower foreign bias in foreign countries, which is in line with behavioural theory expectation.[33] On the other hand, a higher level of masculinity (*MASC*) is positively associated with more foreign bias. This positive association is also in line with our expectation and supports the findings of Graham et al. (2009) and Anderson et al. (2011). This provides support to the notion that more competitive, assertive and reward-seeking investors have the tendency to invest more in less familiar foreign assets.

Model III considers all economic and non-economic variables included simultaneously in the regression. The direction of association exhibited by all the variables remains essentially unchanged. Out of the eleven variables of interest, eight still exhibit statistical significance at the 1% level with the remaining explanatory variables significant at conventional levels.[34] I introduce control variables in Model IV in the form of inverse home bias of source country (*INSB*), and year fixed effects, and host country fixed effects. *INSB* exhibits a statistically significant positive

[33] As noted earlier, I replace Hofstede's measure with that of GLOBE. The coefficients are similar economically and statistically. To conserve space the results are note reported.

[34] Further, the adjusted R-squared figure of 0.24 is the numerical sum of the adjusted R-squared figures from model I and II. This suggests that the explanatory power of these two sets of variables do not overlap and are independent of each other.

coefficient supporting the view that countries with lower domestic bias exhibit more foreign bias in international bond markets. Even after controlling for host country specific time-invariant variables and allowing for temporal variation in the dependent variable, the coefficients of the key explanatory variables remain qualitatively the same. The introduction of the control variables enhances the explanatory power (adjusted R-squared of 0.34) and nine out of the eleven key variables remain significant at 1% level with the other two significant at conventional levels.

The overall results in Table 3.4 suggest that, among the economic fundamentals, high real yields, better developed bond markets, higher level of capital openness and better protection of property rights of host markets attract foreign investors, while higher exchange rate volatility is a deterrent for international bond investors. As regards to the non-economic factors, geographic distance acts as a natural barrier to foreign bias while common language and bilateral trade are conducive to foreign bias. Additionally, uncertainty-avoiding investors are reluctant to diversify their bond holdings internationally and investors from more assertive and competitive societies (proxied by masculinity) tend to exhibit higher level of foreign bias, even after controlling for economic fundamentals.

### *3.5.1. Horse race between economic and non-economic factors*

In this subsection, the relative importance between economic and non-economic factors is examined using three different metrics. First, I compare the R-squared of the regressions that include economic and non-economic variables. The second metric I use is the variance decomposition analysis; and finally, I use the standardized beta figures.

Results in Table 3.4 show that the incremental explanatory power (R squared) of non-economic variables is 0.21 compared to 0.03 for economic fundamentals (Model I and II). This provides a strong indication towards the higher explanatory power inherent in the non-economic variables, as compared to economic fundamentals, in explaining the variance in foreign bias.

To further examine the relative importance of each of the variables, I perform variance decomposition analysis following Bekaert and Wang (2009). For this purpose, I produce fitted values $\left(FB_{i,j,t}\right)$ of foreign bias from Model III (of Table 3.4) and calculate relative explanatory power (*VARD*) for each of the explanatory variables (*X)* using equation (3.17) below:

$$VARD_{(X)} \;=\; \beta_{(X)} \;\frac{\text{cov}\,(FB_{i,j,t}\;,\;\; X_{i/j,t}\,)}{\text{var}\,(FB_{i,j,t})} \qquad (3.17)$$

where $VARD_{(X)}$ is the relative explanatory power of explanatory variable *X*; $\beta_{(X)}$ is the beta coefficient for variable *X* as obtained from our regression (Model III); cov($FB_{i,j,t}\;,\;\; X_{i/j,t}\,$) is the covariance between the fitted values $\left(FB_{i,j,t}\right)$ and variable *X*. Finally, var ($FIB_{i,j,t}$) reflects the variance of the fitted values $\left(FB_{i,j,t}\right)$. From the above model, *VARD* for a given explanatory variable can be either negative or positive. The sign can be different from beta coefficient of the given variable because *VARD* measures unconditional variance contribution while beta coefficient in the regression measures partial correlation (Bekaert and Wang, 2009).

Table 3.4 shows that distance (*DIST*) and uncertainty avoidance (*UNTAV*) exhibit *VARD* measures of 55% and 28% respectively suggesting that more than three quarters of unconditional variance of foreign bias is explained by these two

variables combined.[35] This provides support to the notion that foreign bias is largely influenced by irrationality. Other variables, in the order of importance, are *BDEV*, *EXCH*, and *MASC* carrying *VARD* measures of 7.3, 2.7, and 2.3 percent respectively. Finally, and for further comparison, I also present the standardized regression coefficients[36] for the independent variables in the final column of Table 3.4. *DIST* and *UNTAV* still register the biggest impact on foreign bias with a change of one standard deviation in each of these two variables corresponding to reduced foreign bias by 37 and 26 percent respectively. In summary, the results provide consistent evidence towards the notion that non-economic factors, particularly related to *DIST* and *UNTAV*, explain more of foreign bias than economic fundamentals.

### *3.5.2. Endogeneity*

Errunza (2001) notes that higher level of foreign investment can lead to reforms in local capital markets. This could arguably cause some of the explanatory variables used in this study, particularly bond market development (*BDEV*), capital openness (*CAPOP*) and property rights measures (*PROP*), to be endogenous in the regression models.[37] Since bond yield (*YLD*) in the analysis is the average for the preceding 12 months and exchange rate volatility (*EXCH*) is the moving average over preceding 36 months, the issue of endogeneity is mitigated for these two variables. To address concerns of endogeneity for the remaining variables, I repeat all the variants of the basic regression model using one-year lag of the endogenous variables. Table 3.5 shows that the coefficients observed after using one-year-lagged

[35] The total of VARD measures add up to unity by construction.
[36] All independent variables are rescaled to have a standard deviation of one and I regress the dependent variable against just the key independent variables using OLS.
[37] This is less of a problem for familiarity variables as all of them, apart from bilateral trade, are constant over time.

values of endogenous variables remain qualitatively similar to the earlier results in Table 3.4. This additional test indicates that the empirical results so far do not suffer significantly from reverse causality.

### *3.5.3. Financial centres*

The possibility remains that institutional investors incorporated in financial centres could be investing on behalf of investors of many different countries. For instance, it is possible that institutional investors can be incorporated within certain jurisdiction purely for tax purposes, and investors from other countries could be investing in foreign bonds through such institutional investors. This creates a problem in the data by obscuring the actual source country of such foreign bond investments. To address this issue, I discard all investments originating from countries considered to be financial centres and re-run the four models in Table 3.4. Following Chan et al. (2005), United States, United Kingdom, Switzerland, Ireland, Japan, Hong Kong and Singapore are considered to be financial centres. I present the results in Table 3.6. The number of observations decreases to 11539, but the overall results remain essentially the same.

### *3.5.4. Global financial crisis and Eurozone debt crisis*

Investors often rebalance their portfolio during times of economic distress (Beber et al., 2009) in a phenomenon known as ‘flight-to-safety’ and/or ‘flight-to-liquidity’. Empirical evidence suggests that foreign investors avoid markets during crisis periods and especially in those countries where they do not get information transparently (Gelos and Wei, 2005) and that outside investors tend to exhibit

herding behaviour during crises (Kim and Wei, 2002). Intuitively, foreign bias can be expected to decrease during such crises as the investment environment is extremely uncertain. I segregate the time periods in the sample into two distinct periods; crisis and non-crisis (normal). Crisis years for this purpose include five years spanning the global financial crisis (2007-09) and Eurozone debt crisis (2009-11) and the remaining years are treated as normal times. I choose 2007 as the start of the global financial crisis in line with the chronology of global financial crisis provided by Federal Reserve Bank of St. Louis.[38] The choice of 2009 as the start of Eurozone debt crisis is motivated by the fact that the global financial crisis had already peaked and had started to be transformed into sovereign debt crisis in the Eurozone countries by mid-2009 (Afonso et al., 2015).

I conduct a simple mean difference paired t-test to evaluate any marked changes in foreign bias during these two different time periods. The results are presented in Table 3.7. A significant reduction in foreign bias measure is apparent during the crises years when foreign bias measure decreased from -4.867 to -5.289 (Panel A). In a comparison of the foreign bias figures for normal times with each crisis period, it can be seen that foreign bias measure did not decrease at all during the global financial crisis (Panel B). In fact, there has been a slight increase in foreign bias during 2007-08, though the difference is not statistically significant. However, the period of Eurozone debt crisis witnessed a marked decline in foreign bias measure with statistical significance as well (Panel C). A plausible explanation is that as the global financial crisis mainly impacted financial institutions, its impact

[38] See https://www.stlouisfed.org/financial-crisis/full-timeline. A number of other studies (including Grammatikos and Vermeulen, 2012; Kalemli-Ozcan et al., 2013) also take the year 2007 as the start of the global financial crisis.

on international bonds was subdued because of the relative safety of bonds (most of which are sovereign). However, the Eurozone debt crisis was an economically turbulent period with respect to uncertainty in bond investments.

This intuition is developed further by comparing the foreign bias figures for the five GIIPS countries that were most severely affected by the Eurozone crisis. The results reported in Panel D show that the foreign bias measure decreases by a greater extent in these countries. As a result, the preliminary analysis suggests that investors lower their foreign bond bias during international debt crises, especially in the most affected countries. However, given the global systematic and different nature of crisis, such divestment in bonds is not apparent during the global financial crisis. I conjecture that the prevalence of crisis in a host country serves to increase the marginal deadweight costs associated with investing in that country leading to under-weighting of the crisis countries by a greater extent. For illustration, the average yearly foreign bias (registered by all the other countries) in the GIIPS countries as compared to the average foreign bias in France and Germany is presented in Figure 3.1, which suggests that foreign bias in GIIPS countries have decreased significantly during 2009-11 period whereas foreign bias in Germany and France have remained steady during these years.

To ensure robustness of these findings, I use regression analysis to re-examine the possible changes in foreign bias during normal times and also during the two crises. For Eurozone debt crisis, I create a crisis year dummy (*ECrisis*) (equalling 1) for the years 2009 – 2011. Similarly, for global financial crisis, I create another crisis dummy *GCrisis* (equalling 1) for years 2007-08 and run a regression with the following specification as shown in equation (3.18):

$$Fbias_{ijt} = \beta_1 GCrisis + \beta_2 ECrisis + \beta_3 Fund_{jt} + \beta_4 Fam_{ijt} + \beta_5 Behav_i + \beta_6 INDHB_{it} + \beta_7 \alpha_j + \epsilon_{ijt} \quad (3.18)$$

The results are presented in Table 3.8 (Model I). Confirming the earlier findings that foreign bias decreased significantly during the Eurozone debt crisis, *ECrisis* bears a negative sign and is statistically significant at 1% level but *GCrisis* shows no significant impact.

In Model II, I add two more dummy variables to equation (3.18) in the form of *EZone* and *EuZCr*. *EZone* is a dummy variable of 1 for all Eurozone member countries (and zero otherwise) and *EuZCr* is a dummy variable of 1 for Eurozone member countries during Eurozone crisis years only. *EZone* has a positive and significant coefficient implying that Eurozone member countries, on average, have received higher foreign bias than other countries during normal times. However, the negative sign of *EuZCr* implies that foreign bias fell in the Eurozone countries as a whole during 2009-11. The association is not statistically significant possibly because, in the sample, Eurozone is heavily weighted by Germany and France whose bond markets have fared relatively better during Eurozone debt crisis (see Figure 3.1). If Germany and France are excluded, the *EuZCr* coefficient, as reported in Model III, is significant (with negative sign) suggesting that foreign bias in most of the Eurozone members decreased during the 2009-11 Eurozone debt crisis.

In Model IV, I introduce a dummy variable *GIIPS* (equalling 1 for GIIPS countries) to replace *EZone*. Similarly, *EuZCr* is replaced with *GIIPSCr,* the latter being a dummy for *GIIPS* countries during Eurozone crisis years only. *GIIPSCr* is negative as expected supporting the earlier finding that foreign bias further decreased

in *GIIPS* countries during Eurozone debt crisis even after allowing for the general decline in foreign bias during 2009-11. *GIIPS* does not exhibit significant coefficient implying that these countries did not command any higher preference over non-Eurozone members even during normal times (unlike other Eurozone countries).

Overall, the results in Table 3.8 provide evidence that foreign bias decreased significantly during Eurozone debt crisis and that the magnitude of reduction was greater in those countries that were most severely affected by the crisis.

It is relevant to examine further whether this change in foreign bond bias during Eurozone debt crisis was influenced more by economic fundamentals or by non-economic factors. For this purpose, I extract the first component of the six economic fundamentals using factor analysis and name it *FactorFund*.[39] Similarly I extract first component of the non-economic factors and name it *FactorFam*. To assess whether the importance of variables change during crises, I follow the approach of Gelos and Wei (2005). Accordingly, I interact each of the factor components *FactorFund* and *FactorFam* with Eurozone debt crisis dummy (*ECrisis*) to create interaction terms *CrFundW* (*FactorFund * ECrisis*) and *CrFamW* (*FactorFam * ECrisis*) and run the regression using equation (3.19) as shown below:

$$Fbias_{ijt} = \beta_1 CrFundW_{jt} + \beta_2 CrFamW_{ijt} + \beta_3 FactorFund_{jt} + \beta_4 FactorFam_{ijt} + \beta_5 INSB_{it} + \beta_6 \alpha_j + \epsilon_{jt} \quad (3.19)$$

The results are presented in Table 3.9. In Model I, *FactorFund* enters the regression with positive sign that is significant at the 1%level. It is important to note

[39] *CRISK* enters factor analysis in absolute values rather than the residuals.

the factor loadings (see Appendix 3.1) which show that *BDEV* and *PROP* carry the highest positive values and *EXCH* and *CRISK* carry significant negative values. As such, positive value for *FactorFund* implies more foreign bias towards countries with lower *CRISK*, lower *EXCH*, higher *PROP* and higher *BDEV* which is consistent with the earlier findings. *FactorFam* is negative and statistically significant at the 1% level. In the factor loadings for *FactorFam*, *DIST* and *UNTAV* have the two highest positive values while *COMLA* and *BITRD* have negative values. This suggests that the negative sign of *FactorFam* implies more foreign bias towards countries with common language, more trade, less distance, and from investors who have lower level of *UNTAV*. This is also consistent with the earlier findings. However, the key variable of interest in Model I is *CrFamW* which has the same negative sign as *FactorFam* implying that the importance of non-economic variables gained further importance during Eurozone crisis. No such inference can be made for economic fundamentals as *CrFundW*, despite bearing the same sign as *FactorFund*, is not statistically significant.

In Model II, the focus is mainly on Eurozone member countries to assess possible changes in the importance of fundamentals and familiarity variables. I replace *CrFundW* and *CrFamW* by *CrFundEu* and *CrFamEu* respectively. *CrFundEu* is an interaction term involving *FactorFund, ECrisis,* and *EZone* and *CrFamEu* involves interacting *FactorFam, ECrisis,* and *EZone.* The variable of interest *CrFamEu* is negative implying enhancement of importance of non-economic variables during the crisis. Interestingly, the coefficient of *CrFamEu* (-1.06) remains similar to that of *CrFundW* in Model I. This is explained by the influence of France and Germany, without which the *CrFamEu* would be further negative.

In Model III, I focus on the GIIPS countries only. Accordingly, I replace *CrFundEu* and *CrFamEu* by *CrFund5* and *CrFam5* respectively. *CrFund5* is an interaction term of *FactorFund, ECrisis,* and *GIIPS* and *CrFam5* involves interacting *FactorFam, ECrisis,* and *GIIPS. CrFam5* is negative at the 1% level (similar to *FactorFam*) and its coefficient is markedly more negative to the comparable interaction terms in the first two models. This implies that the importance of non-economic factors get even more pronounced when it comes to investing in crisis-affected countries.[40]

Overall, results in Table 3.9 suggest that though economic fundamentals and non-economic factors are both important in bond investment during normal times, the importance of non-economic factors become much more stronger and pronounced during a debt crisis, and especially so when investing in crisis affected countries. A plausible explanation is that as debt crisis unfolds, bond investors would be more inclined to withdraw from those affected markets, and particularly from distant and unfamiliar markets, regardless of economic fundamentals.

### *3.6. Limitations of this chapter and areas for future research*

A common shortcoming in the suboptimal diversification literature is that exhaustive list of tradeable assets is not used. In a very strict sense, the return on the market portfolio should be the value-weighted return on all investable assets which would consequently include equities, bonds, real estate and precious metals, among

[40] I also interact each of the key variables separately (with crisis year dummy and country dummy) to create 11 interaction terms on top of the explanatory variables in the regression analysis. Variance-inflation factor (VIF) (see Gujarati and Porter, 2009; p-328) score for some of the interaction terms shoot up to more than 10 resulting in some of the variables of interest showing up as statistically non-significant due to severe multicollinearity. Despite this, *DIST* and *UNTAV* continue to exhibit increased impact during the crisis. Results are not shown for brevity.

other things (Bekaert and Hodrick, 2012). In fact, most of the studies focus on single asset class thereby ignoring asset allocations in bonds, human capital, real estate, etc. The omission of these assets may or may not create a bias to optimal allocation, depending upon whether these supplementary assets can provide additional scope for diversification (Cooper et al., 2012).

Further, investors may have the tendency to hedge against various risks (e.g. inflation risks) and in such cases the model benchmark prescribed by ICAPM may not be the optimal benchmark (Cooper and Kaplanis, 1994). Additionally, in certain conditions, investors employing Bayesian portfolio techniques will choose allocation weights that are different to the global market weights (Baele et al., 2007). Though the foreign bias measure used in this research is in agreement with the current body of literature, these caveats remain in this study and the results should be interpreted within this context.

Recent literature highlights the tendency of domestic banks to increase their holdings of domestic debts due to moral suasion from the government, especially in countries under stress (Altavilla et al., 2016). Moral suasion from the government is arguably related to the independence of central bank and overall law and order situation of the country in question, and this should be inherent in the country risk measures used in this study.

Given the limitations mentioned above, an obvious direction for future research is to take into account wider range of investable assets and examine if the impacts of the various economic and non-economic factors remain the same. Further, a deeper examination specifically pertaining to the impact of cultural attitudes and geographical distance on foreign investment could yield more interesting results.

Examining the impact of government suasion on home/foreign bias can also be an interesting avenue for further research.

### *3.7. Conclusion*

This study investigates three important issues related to foreign bond investments. First, it examines whether economic fundamentals and/or non-economic factors are associated with cross-country biases, including how investor-specific behavioural features are related to foreign allocation in bonds. Second, using the 2007-09 global financial and 2009-11 European sovereign debt crisis as an experiment, it also investigates whether investors reallocate/rebalance their portfolio during these turbulent economic periods. Finally, this empirical chapter also explores whether the crisis periods interact with factors driving biases in international bond allocations.

Using country level data from 54 countries over 12 years, the presented results show that that economic fundamentals and non-economic factors (including familiarity and behavioural factors) are both important drivers of foreign bias, but bond foreign bias is influenced more by non-economic factors than economic fundamentals. I find geographical distance between countries and the uncertainty avoidance attitudes of investors to be more influential drivers of foreign bias compared to economic fundamentals. These results are robust to various tests including tests related to endogeneity and exclusion of the main financial centres.

The findings show that the deadweight costs of investing in bonds of countries experiencing debt crisis increase, which in turn lower foreign bias (i.e. lower allocation with respect to benchmark) in such affected countries. The analysis

of Eurozone debt crisis further indicates that such under-weightings of crisis countries is predominantly driven by the relation between non-economic factors and foreign bias during turbulent economic periods. However, when faced with financial/banking crisis (i.e. global financial crisis), the results do not show evidence of change in the patterns of foreign bond bias. The findings of the study suggest that government policies aimed at increasing information on domestic markets to foreign investors should attract higher foreign investments, as implied by the impact of familiarity and behavioural factors, particularly during volatile economic periods.

**Table 3.1: Key Variables and Definitions**

| Variable name | Measure | Definition |
|---|---|---|
| *FBIAS* | Foreign Bias | log (ratio of weight of allocation made by foreigners to host country's market weight in world bond market) |
| *YLD* | Real yield on bonds | annual yield on 10-year government bonds minus inflation minus sovereign risk; annual yield sourced from International Financial Statistics (%) and Economic Intelligence Unit; consumer price inflation is from WDI; sovereign risk measure based on Moody's ratings is from Damodaran Online. Alternative figures on long-term bond yields are taken from JP Morgan EMBI Global series (for developing markets) and 10-year sovereign bonds from Datastream (for developed markets). |
| *EXCH* | Exchange rate volatility | yearly volatility in indices for effective exchange rate; volatility for preceding 36 months from year-end is taken; raw data is from BIS. |
| *BDEV* | Bond market development | log ratio of private debt (both domestic and international) to GDP; data sourced from Global Financial Development Database available at: http://data.worldbank.org/data-catalog/global-financial-development. |
| *PROP* | Protection of property rights | sourced from table 2c of Economic Freedom of the World 2013 dataset; is within the scale of 1 to 10 and higher measure indicates clearer definition and higher protection of property rights. |
| *CAPOP* | Capital openness (capital control) | taken from table 4Dii of Economic Freedom Dataset 2013; within a scale of 0 to 10; higher measure indicates lower level of restrictions on investment and foreign ownership in that country. |
| *CRISK* | Country risk | Moody's country ratings; higher score indicates higher risk. |
| *UNTAV* | Uncertainty avoidance; reflects the extent to which members of a society feel uncomfortable with uncertainty and ambiguity. | Hofstede's measure of uncertainty avoidance (Hofstede 1980); alternative measure is from GLOBE study's (House et al 2004). |
| *MASC* | Masculinity; represents a preference in society for achievement, heroism, assertiveness and material rewards for success. | Hofstede's measure of masculinity (Hofstede 1980). |
| *DIST* | Log of distance in Kilometres between capital cities | http://privatewww.essex.ac.uk/~ksg/statelist.html. |
| *COMLA* | Common language | dummy variable of 1 if a country pair share a language; data from Wei and Subraminian (2007) sourced from http://users.nber.org/~wei/data.html which is derived from CIA Factbook. |
| *BILTR* | Bilateral trade weight assigned by partner countries | from IMF Direction of Trade Statistics (DOTS), it is the portion of total trade (imports and exports) conducted, from the perspective of source country, with a host country. |
| *INSB* | Control for foreign bond allocation of home country's investors | (1- domestic bias) of home country (*country i*). |
| *ECrisis* | Dummy for Eurozone debt crisis | Equal to 1 for years 2009-2011; otherwise 0. |

| | | |
|---|---|---|
| *GIIPS* | Dummy for countries most severely affected by Eurozone debt crisis | Equal to 1 for Greece, Ireland, Italy, Portugal, and Spain; otherwise 0. |
| *GCrisis* | Dummy for global financial crisis | Equal to 1 for years 2007-2008; otherwise 0. |

**Table 3.2: Expected Direction of Impact of Economic and Non-economic Factors on Foreign Bias**

| Variables | Expected sign | Foreign bias |
|---|---|---|
| YLD (%) | + | Cij < ai ; higher allocation |
| EXCH | - | Cij > ai ; lower allocation |
| BDEV (% GDP) | + | Cij < ai ; higher allocation |
| PROP (0-10) | + | Cij < ai ; higher allocation |
| CAPOP (0-10) | + | Ci < ai ; higher allocation |
| DIST (km) | - | Cij > ai ; Cij > bj; negative effect |
| COMLA (average) | + | Cij < ai ; Cij < bj; positive effect |
| BILTR (%) | + | Cij < ai ; Cij < bj; positive effect |
| UNTAV (0 – 100) | - | Local investors invest less in unfamiliar overseas assets |
| MASC (0 -100) | + | Competitive and reward-seeking investors invest more in unfamiliar overseas assets |

**Table 3.3: Summary Statistics of Key Variables**

*FBIAS* is a measure of bond foreign bias at country level. Foreign bias reflects deviation of country *j*'s share in bond holdings for each source country *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country j ($w^*_j$). Foreign bias computed as log ($w_{ij} / w^*_j$). This table presents overall average of foreign bias measure taking yearly average of source countries' bias in country *j* for each given year. Remaining variables include i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*), exchange rate volatility (EXCH), bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP)*, and country risk *(CRISK)*. Familiarity Factors include distance (in kilometers) between countries (*DIST*), common language (*COMLA*) dummy, average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country. All variables are sourced as reported in Table 1. Data is for years 2001 to 2012.

**Panel A: All Countries**

| Country | FBIAS | YLD (%) | EXCH (%) | BDEV (% GDP) | PROP (0-10) | CAPOP (0-10) | CRISK (0-10) | DIST (km) | COMLA (average) | BILTR (%) | UNTAV (1-100) | MASC (1-100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Argentina | -5.53 | 14.60 | 10.52 | 8.4 | 2.98 | 1.98 | 6.55 | 11,379 | 0.11 | 1.03 | 86 | 56 |
| Australia | -3.82 | 2.48 | 8.19 | 95.1 | 8.18 | 2.57 | 0.05 | 13,277 | 0.37 | 2.19 | 51 | 61 |
| Austria | -2.80 | 1.77 | 1.94 | 97.2 | 8.42 | 4.16 | 0.00 | 4,365 | 0.03 | 1.56 | 70 | 79 |
| Bahrain | -7.27 | n/a | n/a | 21.8 | 7.33 | 6.79 | 1.30 | 5,670 | 0.06 | 0.11 | n/a | n/a |
| Belgium | -3.91 | 1.41 | 2.37 | 104.2 | 7.60 | 5.86 | 0.48 | 4,352 | 0.17 | 3.46 | 94 | 54 |
| Brazil | -5.02 | 4.46 | 12.48 | 21.8 | 5.40 | 3.78 | 3.17 | 10,075 | 0.03 | 2.37 | 76 | 49 |
| Bulgaria | -5.44 | -0.04 | 3.35 | 1.9 | 3.70 | 6.10 | 2.76 | 3,998 | 0.00 | 0.50 | 85 | 40 |
| Canada | -4.41 | 2.30 | 5.93 | 54.4 | 8.23 | 7.39 | 0.05 | 8,176 | 0.41 | 1.75 | 48 | 52 |
| Chile | -5.76 | 2.67 | 7.59 | 21.4 | 6.49 | 5.58 | 0.83 | 11,778 | 0.10 | 0.77 | 86 | 28 |
| Colombia | -7.15 | 3.40 | 9.05 | 1.8 | 4.86 | 1.13 | 1.82 | 9,598 | 0.10 | 0.28 | 80 | 64 |
| Czech Republic | -5.33 | 0.57 | 6.16 | 15.6 | n/a | n/a | 0.90 | 3,816 | 0.00 | 1.21 | 74 | 57 |
| Denmark | -4.45 | 1.66 | 2.43 | 188.7 | 8.53 | 7.92 | 0.00 | 4,425 | 0.33 | 1.24 | 23 | 16 |
| Egypt | -7.60 | 0.26 | n/a | 1.2 | 5.00 | 5.16 | 2.76 | 5,053 | 0.41 | 0.54 | 80 | 45 |
| Estonia | -7.45 | 3.52 | 2.63 | 2.2 | 7.18 | 6.60 | 0.96 | 4,059 | 0.00 | 0.38 | 60 | 30 |
| Finland | -3.43 | 1.97 | 2.88 | 45.7 | 8.87 | 4.94 | 0.00 | 4,603 | 0.03 | 1.24 | 59 | 26 |
| France | -2.55 | 2.11 | 2.51 | 102.0 | 8.06 | 6.44 | 0.02 | 4,893 | 0.10 | 6.53 | 86 | 43 |
| Germany | -2.08 | 1.92 | 3.23 | 107.2 | 8.62 | 5.27 | 0.00 | 4,854 | 0.07 | 13.66 | 65 | 66 |
| Greece | -4.14 | 2.65 | 4.34 | 48.1 | 5.86 | 4.89 | 2.54 | 4,616 | 0.00 | 0.62 | 100 | 57 |
| Hong Kong | -6.24 | 0.86 | 4.48 | 39.5 | 8.21 | 7.87 | 0.59 | 8,458 | 0.36 | 2.06 | 29 | 57 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hungary | -4.58 | 1.40 | 7.49 | 11.5 | 5.79 | 5.05 | 1.44 | 3,962 | 0.00 | 1.14 | 82 | 88 |
| India | -6.45 | -3.86 | 5.63 | 3.3 | 6.12 | 0.00 | 2.64 | 6,686 | 0.36 | 3.13 | 40 | 56 |
| Indonesia | -7.53 | 0.87 | 10.17 | 4.7 | 4.50 | 1.41 | 4.18 | 9,623 | 0.00 | 1.54 | 48 | 46 |
| Ireland | -2.66 | 3.09 | 3.73 | 258.3 | 8.34 | 8.36 | 0.81 | 4,921 | 0.33 | 0.92 | 35 | 68 |
| Israel | -8.68 | -0.40 | 5.40 | 6.5 | 6.89 | 7.83 | 0.93 | 5,196 | 0.30 | 0.50 | 81 | 47 |
| Italy | -3.81 | 1.70 | 2.55 | 72.7 | 5.81 | 7.63 | 0.73 | 4,767 | 0.00 | 6.07 | 75 | 70 |
| Japan | -7.35 | 0.67 | 7.84 | 47.7 | 7.70 | 5.51 | 0.80 | 9,285 | 0.00 | 6.59 | 92 | 95 |
| Kazakhstan | -5.15 | -2.74 | n/a | 9.9 | 4.97 | 1.83 | 1.54 | 6,519 | 0.00 | 0.37 | n/a | n/a |
| Kuwait | -8.13 | n/a | n/a | n/a | 6.95 | 4.51 | 0.59 | 5,298 | 0.31 | 0.53 | 80 | 40 |
| Lebanon | -11.26 | n/a | n/a | 2.1 | 5.38 | 1.54 | 5.52 | 5,191 | n/a | 0.13 | 50 | 65 |
| Lithuania | -3.58 | 3.42 | 3.25 | n/a | 5.51 | 3.08 | 1.52 | 3,732 | 0.00 | 0.50 | 65 | 19 |
| Malaysia | -6.07 | 0.16 | 3.43 | 67.4 | 7.02 | 0.71 | 1.13 | 8,777 | 0.00 | 2.49 | 36 | 50 |
| Mauritius | -9.73 | 1.73 | n/a | n/a | 6.54 | 6.12 | 1.39 | 8,967 | 0.34 | 0.05 | n/a | n/a |
| Mexico | -4.52 | 2.30 | 7.94 | 19.7 | 5.03 | 1.60 | 1.38 | 10,123 | 0.11 | 1.51 | 82 | 69 |
| Netherlands | -1.89 | 1.76 | 3.12 | 196.7 | 8.45 | 9.15 | 0.00 | 4,894 | 0.03 | 5.08 | 53 | 14 |
| New Zealand | -5.40 | 2.60 | 7.87 | 7.9 | 8.06 | 7.62 | 0.06 | 15,002 | 0.35 | 0.30 | 49 | 58 |
| Norway | -3.74 | 2.00 | 5.31 | 29.8 | 8.18 | 5.37 | 0.00 | 4,654 | 0.00 | 1.11 | 50 | 8 |
| Pakistan | -11.20 | -6.73 | n/a | 0.4 | 4.03 | 0.77 | 5.98 | 6,523 | 0.34 | 0.32 | 70 | 50 |
| Philippines | -6.42 | 0.91 | 5.28 | 8.5 | 4.46 | 0.77 | 3.25 | 9,227 | 0.32 | 0.67 | 44 | 64 |
| Poland | -3.73 | 1.82 | 8.35 | 2.7 | 5.14 | 1.75 | 1.00 | 4,110 | 0.00 | 1.72 | 93 | 64 |
| Portugal | -4.87 | 2.31 | 1.99 | 106.7 | 6.69 | 5.78 | 1.13 | 5,184 | 0.03 | 0.67 | 99 | 31 |
| Romania | -5.69 | 0.19 | 5.71 | 0.8 | 4.49 | 6.68 | 2.87 | 4,136 | 0.00 | 0.83 | 90 | 42 |
| Russia | -4.16 | -2.69 | 6.32 | 6.3 | 3.27 | 4.64 | 1.46 | 4,815 | 0.00 | 5.72 | 95 | 36 |
| Singapore | -5.85 | 0.24 | 2.93 | 36.1 | 8.72 | 6.45 | 0.04 | 8,843 | 0.38 | 3.47 | 8 | 48 |
| Slovenia | -5.56 | 1.83 | 2.61 | 15.5 | 5.70 | 3.44 | 0.96 | 3,731 | 0.00 | 0.32 | 88 | 19 |
| South Africa | -6.03 | 2.01 | 12.05 | 25.6 | 7.39 | 0.77 | 1.13 | 8,872 | 0.35 | 0.93 | 49 | 63 |
| South Korea | -6.03 | 1.06 | 7.11 | 69.0 | 6.35 | 4.48 | 1.00 | 8,439 | 0.35 | 3.37 | 85 | 39 |
| Spain | -3.82 | 1.60 | 2.67 | 123.0 | 6.57 | 4.18 | 0.35 | 5,310 | 0.10 | 3.46 | 86 | 42 |
| Sweden | -3.28 | 2.18 | 4.94 | 105.9 | 8.58 | 3.64 | 0.05 | 4,708 | 0.03 | 2.28 | 29 | 5 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Switzerland | -3.63 | 1.76 | 4.56 | 104.5 | 8.90 | 5.20 | 0.00 | 4,724 | 0.18 | 2.44 | 58 | 70 |
| Thailand | -9.07 | 0.12 | 3.75 | 16.2 | 5.36 | 1.54 | 1.39 | 8,409 | 0.35 | 1.61 | 64 | 34 |
| Turkey | -5.05 | 1.20 | 12.85 | 1.5 | 4.95 | 2.20 | 4.04 | 4,574 | 0.00 | 1.63 | 85 | 45 |
| Ukraine | -5.02 | 1.92 | n/a | 3.5 | 2.93 | 0.52 | 5.07 | 4,202 | 0.00 | 0.83 | n/a | n/a |
| United Kingdom | -2.05 | 1.60 | 5.17 | 101.8 | 8.38 | 8.27 | 0.00 | 5,218 | 0.37 | 7.11 | 35 | 66 |
| United States | -2.66 | 1.50 | 4.33 | 141.0 | 7.74 | 5.54 | 0.00 | 8,913 | 0.37 | 17.62 | 46 | 62 |
| **Overall Average** | **-5.07** | **1.54** | **5.52** | **62.8** | **6.74** | **4.70** | **1.32** | **6,686** | **0.16** | **2.9** | **64.5** | **50.3** |

**Panel B: Developed versus Emerging Markets**

| | FBIAS | YLD (%) | EXCH (%) | BDEV (% GDP) | PROP (0-10) | CAPOP (0-10) | CRISK | DIST (km) | COMLA (average) | BILTR (%) | UNTAV (1-100) | MASC (1-100) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developed | -3.93 | 1.75 | 4.16 | 95.9 | 7.92 | 6.13 | 0.33 | 6,321 | 0.18 | 4.2 | 59.1 | 50.0 |
| Emerging | -6.37 | 1.24 | 7.57 | 16.0 | 5.31 | 2.97 | 2.45 | 7,104 | 0.14 | 1.3 | 71.5 | 50.7 |

**Table 3.4: Regression Analysis of Foreign Bias**

The dependent variable is foreign bias (*FBIAS*), the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. Two sets of regressors are included: i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*) net of inflation and sovereign risk, log (natural) of exchange rate volatility (EXCH), log of bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP),* and country risk *(CRISK)*. Familiarity Factors include log of kilometer distance between countries (*DIST*), common language (*COMLA*) dummy, average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country. *INSB* equals one minus home bias of source country *i* and controls for the obvious impact of country *i*'s domestic bias. All variables are constructed or sourced as reported in Table 1. All models report results with the standard errors corrected for heteroscedasticity and autocorrelation at panel level using Newey and West (1987) estimator. VARD shows relative importance of variables using variance decomposition analysis. Data is for years 2001 to 2012. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in parenthesis.

| | Expected Sign | Model I OLS | Model II OLS | Model III OLS | Model IV LSDV | VARD | Standardized Coefficients |
|---|---|---|---|---|---|---|---|
| YLD | + | 0.05*** | | 0.06*** | 0.06*** | 0.05% | 0.038 |
| | | (3.32) | | (4.16) | (4.27) | | |
| EXCH | - | -0.45*** | | -0.61*** | -0.51*** | 2.70% | -0.056 |
| | | (-3.35) | | (-4.91) | (-4.26) | | |
| BDEV | + | 0.41*** | | 0.47*** | 0.53*** | 7.30% | 0.109 |
| | | (6.34) | | (7.79) | (9.32) | | |
| PROP | + | 0.13*** | | 0.08* | 0.09** | 1.20% | 0.023 |
| | | (2.63) | | (1.86) | (2.06) | | |
| CAPOP | + | 0.09*** | | 0.07* | 0.03* | 0.03% | 0.006 |
| | | (3.35) | | (1.93) | (1.90) | | |
| CRISK | - | -0.21*** | | -0.19*** | -0.17*** | 0.04% | -0.029 |
| | | (-3.18) | | (-3.02) | (-2.83) | | |
| DIST | - | | -2.24*** | -2.24*** | -2.33*** | 55.4% | -0.369 |
| | | | (-43.91) | (-42.85) | (-38.69) | | |
| COMLA | + | | 0.80*** | 0.61*** | 0.82*** | 1.50% | 0.037 |
| | | | (5.91) | (4.34) | (5.95) | | |
| BILTR | + | | 0.04*** | 0.03** | 0.02*** | 0.06% | 0.001 |
| | | | (4.54) | (2.14) | (2.97) | | |
| UNTAV | - | | -0.06*** | -0.06*** | -0.05*** | 28.20% | -0.266 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | (-29.69) | (-28.82) | (-22.95) | | |
| MASC | + | | 0.04*** | 0.03*** | 0.02*** | 2.30% | 0.122 |
| | | | (15.49) | (14.14) | (5.45) | | |
| INSB | + | | | | 0.80*** | | |
| | | | | | (25.60) | | |
| Year Fixed | | | | | YES | | |
| Country Fixed | | | | | YES | | |
| Constant | | -8.81*** | -2.55*** | -6.61*** | -0.88 | | |
| | | (-21.51) | (-16.16) | (-16.26) | (-0.85) | | |
| $R^2$ | | 0.03 | 0.21 | 0.24 | 0.34 | | |
| Observations | | 14102 | 14102 | 14102 | 14102 | | |

**Table 3.5: Examining Reverse Causality**

The dependent variable is foreign bias (*FBIAS*), the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. Two sets of regressors are included: i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*) net of inflation and sovereign risk, log (natural) of exchange rate volatility (EXCH), log of bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP),* and country risk *(CRISK)*. Familiarity Factors include log of kilometer distance between countries (*DIST*), common language (*COMLA*) dummy, average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country. *INSB* equals one minus home bias of source country *i* and controls for the obvious impact of country *i*'s domestic bias. All variables are constructed or sourced as reported in Table 1. All models report results with the standard errors corrected for heteroscedasticity and autocorrelation at panel level using Newey and West (1987) estimator. Data is for years 2001 to 2012. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in parenthesis.

| | Expected Sign | Model I OLS | Model II OLS | Model III OLS | Model IV LSDV |
|---|---|---|---|---|---|
| YLD | + | 0.06*** | | 0.06*** | 0.06*** |
| | | (3.85) | | (4.36) | (4.26) |
| EXCH | - | -0.50*** | | -0.66*** | -0.55*** |
| | | (-3.64) | | (-5.22) | (-4.54) |
| BDEV (1-yr lag) | + | 0.28*** | | 0.38*** | 0.45*** |
| | | (3.87) | | (5.71) | (7.13) |
| PROP (1-yr lag) | + | 0.16*** | | 0.08* | 0.09* |
| | | (3.15) | | (1.76) | (1.88) |
| CAPOP (1-yr lag) | + | 0.07*** | | 0.05* | 0.04* |
| | | (2.77) | | (1.85) | (1.74) |
| CRISK (1-yr lag) | - | -0.27*** | | -0.23*** | -0.20*** |
| | | (-3.63) | | (-3.35) | (-3.04) |
| DIST | - | | -2.13*** | -2.13*** | -1.92*** |
| | | | (-40.02) | (-38.75) | (-35.53) |
| COMLA | + | | 0.69*** | 0.54*** | 0.72*** |
| | | | (5.03) | (3.78) | (5.13) |
| BILTR (1-yr lag) | + | | 0.03*** | 0.02** | 0.02*** |
| | | | (3.93) | (2.09) | (2.63) |
| UNTAV | - | | -0.07*** | -0.06*** | -0.05*** |
| | | | (-29.06) | (-27.80) | (-23.25) |

| | | | | | |
|---|---|---|---|---|---|
| MASC | + | | 0.04*** | 0.03*** | 0.02*** |
| | | | (16.08) | (14.57) | (6.38) |
| INSB | + | | | | 0.77*** |
| | | | | | (22.30) |
| Year Fixed | | | | | YES |
| Country Fixed | | | | | YES |
| Constant | | -8.42*** | -2.23*** | -6.16*** | -0.82 |
| | | (-19.60) | (-14.04) | (-14.61) | (-0.73) |
| $R^2$ | | 0.03 | 0.21 | 0.23 | 0.33 |
| Observations | | 11715 | 11715 | 11715 | 11715 |

**Table 3.6: Regression Analysis of Foreign Bias Excluding Financial Centres**

The dependent variable is foreign bias (*FBIAS*), the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. Two sets of regressors are included: i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*) net of inflation and sovereign risk, log (natural) of exchange rate volatility (EXCH), log of bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP),* and country risk *(CRISK)*. Familiarity Factors include log of kilometer distance between countries (*DIST*), common language (*COMLA*) dummy, average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country. *INSB* equals one minus home bias of source country *i* and controls for the obvious impact of country *i*'s domestic bias. All variables are constructed or sourced as reported in Table 1. All models report results with the standard errors corrected for heteroscedasticity and autocorrelation at panel level using Newey and West (1987) estimator. Data is for years 2001 to 2012. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in parenthesis.

| | Expected Sign | Model I OLS | Model II OLS | Model III OLS | Model IV LSDV |
|---|---|---|---|---|---|
| YLD | + | 0.06*** | | 0.07*** | 0.07*** |
| | | (3.50) | | (3.98) | (4.26) |
| EXCH | - | -0.53*** | | -0.67*** | -0.58*** |
| | | (-3.49) | | (-4.65) | (-4.17) |
| BDEV | + | 0.48*** | | 0.57*** | 0.63*** |
| | | (6.39) | | (8.12) | (9.46) |
| PROP | + | 0.10* | | 0.06* | 0.07* |
| | | (1.89) | | (1.87) | (1.92) |
| CAPOP | + | 0.12*** | | 0.07* | 0.05* |
| | | (4.23) | | (1.82) | (1.87) |
| CRISK | - | -0.22*** | | -0.20*** | -0.18** |
| | | (-2.85) | | (-2.64) | (-2.47) |
| DIST | - | | -2.54*** | -2.53*** | -2.23*** |
| | | | (-43.11) | (-41.96) | (-36.00) |
| COMLA | + | | 0.84*** | 0.59*** | 0.95*** |
| | | | (4.76) | (3.26) | (5.36) |
| BILTR | + | | 0.05*** | 0.04** | 0.03*** |
| | | | (5.44) | (2.20) | (3.88) |
| UNTAV | - | | -0.05*** | -0.05*** | -0.04*** |
| | | | (-16.90) | (-15.98) | (-11.90) |

| | | | | | |
|---|---|---|---|---|---|
| MASC | + | | 0.03*** | 0.02** | 0.02** |
| | | | (3.85) | (2.47) | (2.45) |
| INSB | + | | | | 0.89*** |
| | | | | | (22.05) |
| Year Fixed | | | | | YES |
| Country Fixed | | | | | YES |
| Constant | | -9.94*** | -2.55*** | -7.10*** | -1.50 |
| | | (-21.21) | (-12.86) | (-14.77) | (-1.22) |
| $R^2$ | | 0.03 | 0.19 | 0.22 | 0.33 |
| Observations | | 11539 | 11539 | 11539 | 11539 |

**Table 3.7: Examining Foreign Bias During Crises And Normal Times**

Foreign bias (*FBIAS*) is the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. This table shows the comparative average foreign bias of *country j* during crisis and non-crisis periods using a t-test. Crisis periods include global financial crisis (2007-2008) and Eurozone sovereign debt crisis (2009-2011).

**Panel A: Foreign Bias – Normal Period versus Global Financial Crisis (2007-08) and Eurozone Debt Crisis (2009-11)**

| | 2001-06, 2012 | 2007-2011 | Difference | t-statistics | p-value |
|---|---|---|---|---|---|
| *FBIAS* | -4.867 | -5.289 | 0.422 | 4.610 | 0.000 |
| No. of Observations | 20123 | | | | |

**Panel B: Foreign Bias – Normal Period versus Global Financial Crisis (2007-08)**

| | 2001-06, 2012 | 2007-08 | Difference | t- statistics | p-value |
|---|---|---|---|---|---|
| *FBIAS* | -4.867 | -4.716 | -0.151 | -1.211 | 0.226 |
| No. of Observations | 13845 | | | | |

**Panel C: Foreign Bias – Normal Period versus Eurozone Debt Crisis (2009-11)**

| | 2001-06, 2012 | 2009-11 | Difference | t- statistics | p-value |
|---|---|---|---|---|---|
| *FBIAS* | -4.867 | -5.599 | 0.732 | 6.985 | 0.000 |
| No. of Observations | 16735 | | | | |

**Panel D: Foreign Bias – Normal Period versus Eurozone Debt Crisis (2009-11) (GIIPS countries only)**

| | 2001-06, 2012 | 2009-11 | Difference | t- statistics | p-value |
|---|---|---|---|---|---|
| *FBIAS* | -3.616 | -4.428 | 0.813 | 2.933 | 0.003 |
| No. of Observations | 2101 | | | | |

**Table 3.8: Bond Foreign Bias During Eurozone Debt Crisis and Global Financial Crisis**

The dependent variable is foreign bias (*FBIAS*), the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. *GIIPSCr* is an interaction term of *ECrisis* and *GIIPS*. *ECrisis* is a dummy variable of 1 for Eurozone crisis years 2009 - 2011 and *GIIPS* is a dummy variable of 1 for five Eurozone crisis countries namely Greece, Italy, Ireland, Portugal and Spain (GIIPS), 0 otherwise. *EuZCr* is an interaction term of *ECrisis* and *EZone*. *EZone* is a dummy variable of 1 for all countries within the European Monetary Union, 0 otherwise. *GCrisis* is a dummy variable of 1 for Global Financial crisis years 2007 – 2008; 0 otherwise. Other regressors include: i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*) net of inflation and sovereign risk, log (natural) of exchange rate volatility (EXCH), log of bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP)*, and country risk *(CRISK)*. Familiarity Factors include log of kilometer distance between countries (*DIST*), common language (*COMLA*) dummy, average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country. *INSB* equals one minus home bias of source country *i* and controls for the obvious impact of country *i*'s domestic bias. All variables are constructed or sourced as reported in Table 1. All models report results with the standard errors corrected for heteroscedasticity and autocorrelation at panel level using Newey and West (1987) estimator. Data is for years 2001 to 2012. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in parenthesis.

| | Model I<br>All Countries | Model II<br>Interaction with EMU | Model III<br>Interaction with EMU except Germany and France | Model IV<br>Interaction with GIIPS |
|---|---|---|---|---|
| ECrisis | -0.90*** | -0.93*** | -0.79*** | -0.85*** |
| | (-7.17) | (-6.10) | (-5.48) | (-6.39) |
| GCrisis | 0.11 | 0.10 | 0.11 | 0.11 |
| | (0.91) | (0.82) | (0.88) | (0.89) |
| EuZCr | | -0.14 | -0.45* | |
| | | (-0.62) | (-1.84) | |
| EZone | | 0.70*** | 0.29* | |
| | | (4.24) | (1.75) | |
| GIIPSCr | | | | -0.40* |
| | | | | (-1.75) |
| GIIPS | | | | 0.15 |
| | | | | (0.77) |
| YLD | 0.03** | 0.02* | 0.03** | 0.03*** |
| | (2.54) | (1.77) | (2.52) | (2.61) |
| EXCH | -0.26** | -0.17* | -0.21* | -0.26** |
| | (-2.14) | (-1.88) | (-1.97) | (-2.02) |
| BDEV | 0.63*** | 0.59*** | 0.62*** | 0.63*** |
| | (10.75) | (9.85) | (10.37) | (10.26) |
| PROP | 0.04* | 0.07* | 0.05* | 0.04* |
| | (1.94) | (1.80) | (1.91) | (1.90) |
| CAPOP | 0.02* | 0.02* | 0.02* | 0.02* |
| | (1.88) | (1.82) | (1.92) | (1.91) |
| CRISK | -0.19*** | -0.21*** | -0.19*** | -0.19*** |
| | (-3.24) | (-3.49) | (-3.21) | (-3.14) |

| | | | | |
|---|---|---|---|---|
| DIST | -2.05*** | -2.01*** | -2.04*** | -2.05*** |
| | (-39.36) | (-38.43) | (-38.77) | (-39.28) |
| COMLA | 0.78*** | 0.90*** | 0.80*** | 0.79*** |
| | (5.68) | (6.47) | (5.84) | (5.72) |
| BILTR | 0.02** | 0.02** | 0.02** | 0.02** |
| | (2.34) | (2.47) | (2.46) | (2.32) |
| UNTAV | -0.05*** | -0.05*** | -0.05*** | -0.05*** |
| | (-23.02) | (-22.88) | (-23.01) | (-23.01) |
| MASC | 0.02*** | 0.02*** | 0.02*** | 0.02*** |
| | (5.57) | (5.41) | (5.54) | (5.57) |
| INSB | 0.79*** | 0.80*** | 0.79*** | 0.79*** |
| | (25.29) | (25.54) | (25.34) | (25.30) |
| Constant | -2.50*** | -1.64*** | -2.42*** | -2.52*** |
| | (-5.91) | (-3.39) | (-5.35) | (-5.96) |
| $R^2$ | 0.29 | 0.29 | 0.29 | 0.29 |
| Observations | 14102 | 14102 | 14102 | 14102 |

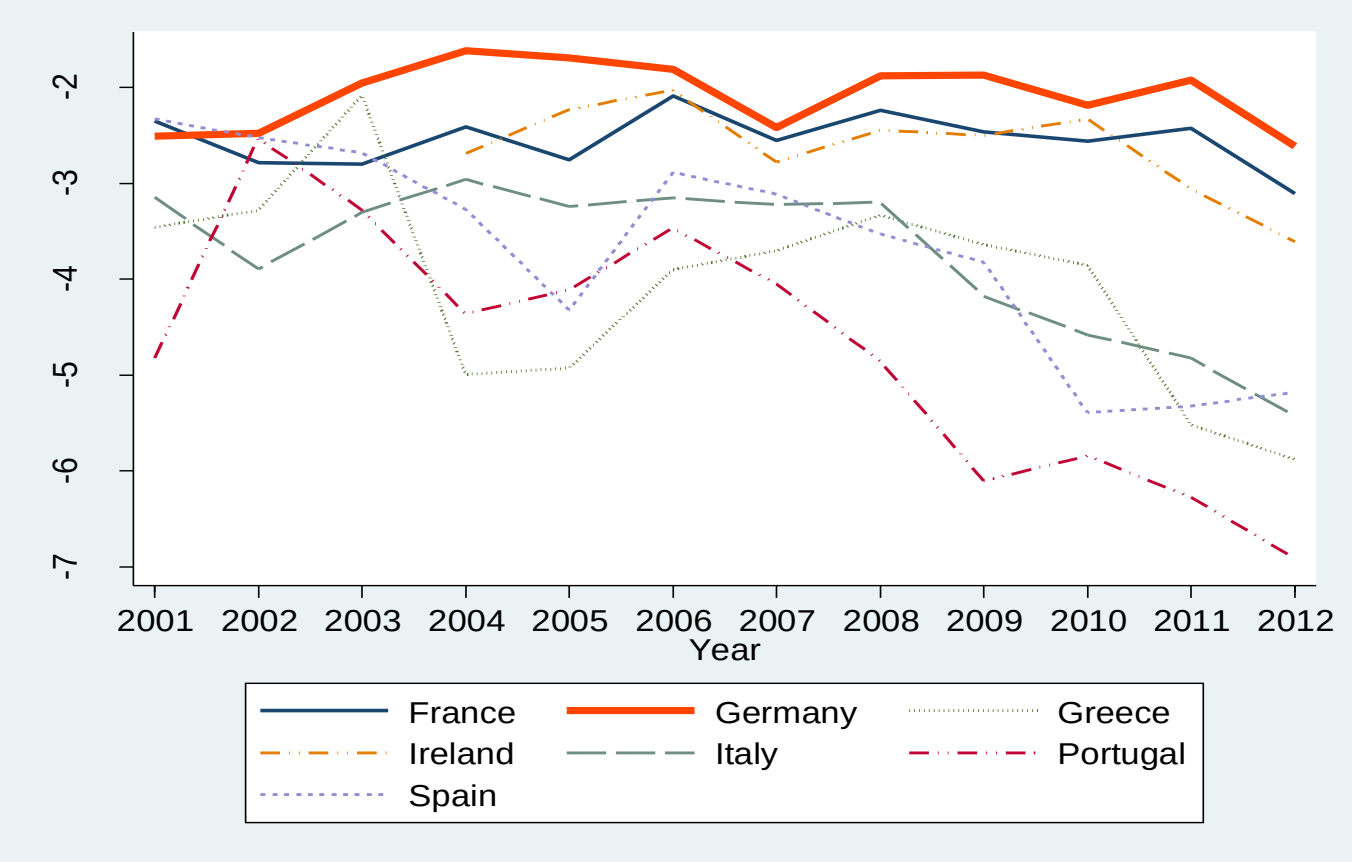
**Table 3.9: Importance of Economic and Non-Economic Factors During Eurozone Debt Crisis**

The dependent variable is foreign bias (*FBIAS*), the log ratio of the share of a host country (*country j*) in bond holdings of a source country (*country i*) to the world bond market weight of *country j*. Two sets of regressors are included: i) Economic Fundamentals for host country *j* and ii) bilateral and investor-specific Familiarity Factors. Economic Fundamentals include annual yield on long-term government bonds (*YLD*) net of inflation and sovereign risk, log (natural) of exchange rate volatility (EXCH), log of bond market development (*BDEV*), protection of property rights (*PROP*), capital openness (*CAPOP);* country risk (*CRISK*) and are represented by *FactorFund* using factor analysis. Familiarity Factors include log of distance (in kilometers) between countries (*DIST*), common language (*COMLA*), average bilateral trade weight assigned by partner countries (*BILTR*), uncertainty avoidance (*UNTAV*) of source country, and masculinity (*MASC*) of source country; and are represented by *FactorFam* using factor analysis. *INSB* equals one minus domestic bias for source country *i* and controls for the obvious impact of country *i*'s domestic allocation as a share of total investment. *CrFundW* (*CrFamW* ) is an interaction term between *FactorFund* (*FactorFam*) and *ECrisis*. *ECrisis* is a dummy variable of 1 for years 2009-2011; otherwise 0. *CrFundEu* (*CrFamEu*) is an interaction term between *FactorFund* (*FactorFam*) and a dummy variable of 1 for all Eurozone countries during years 2009-2011, otherwise 0. *CrFund5* (*CrFam5*) is an interaction term between *FactorFund* (*FactorFam*) and a dummy variable of 1 for five countries Greece, Ireland, Italy, Portugal, and Spain (GIIPS) during years 2009-2011, otherwise 0. All models report results with the standard errors corrected for heteroscedasticity and autocorrelation at panel level using Newey and West (1987) estimator. Data is for years 2001 to 2012. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in parenthesis.

| | Model I<br>Interaction with All | Model II<br>Interaction with Eurozone | Model III<br>Interaction with GIIPS |
|---|---|---|---|
| FactorFund | 0.83***<br>(3.68) | 0.79***<br>(3.51) | 0.76***<br>(3.43) |
| FactorFam | -2.96***<br>(-20.89) | -3.17***<br>(-24.08) | -3.20***<br>(-25.22) |
| CrFundW | 0.13<br>(0.96) | | |
| CrFamW | -1.06***<br>(-4.10) | | |
| CrFundEu | | -0.27<br>(-0.96) | |
| CrFamEu | | -1.06***<br>(-3.14) | |
| CrFund5 | | | -0.03<br>(-0.05) |

| | | | |
|---|---|---|---|
| CrFam5 | | | -2.67*** |
| | | | (-3.49) |
| INSB | 1.04*** | 1.04*** | 1.05*** |
| | (34.28) | (34.23) | (34.28) |
| Country Fixed | YES | YES | YES |
| Constant | 2.06*** | 1.81*** | 1.76*** |
| | (3.03) | (2.72) | (2.66) |
| $R^2$ | 0.28 | 0.28 | 0.28 |
| Observations | 14102 | 14102 | 14102 |

**Figure 3.1: Average Foreign Bias of GIIPS Countries (compared to Germany and France).**




Source**:** Author's calculation using raw data from BIS and CPIS. Average foreign bias is the simple average of foreign bias registered for a given country by all the other countries.

**Appendix 3.1: Factor loadings for Economic Fundamentals and Non- Economic Familiarity**

(Variables as defined in Table 3.1)

| **Economic Fundamentals** | **Factor 1** | **Non- Economic Familiarity** | **Factor 1** |
|---|---|---|---|
| YLD | -0.21 | DIST | +0.31 |
| EXCH | -0.58 | COMLA | -0.30 |
| BDEV | +0.71 | BITRD | -0.39 |
| PROP | +0.79 | UNTAV | +0.28 |
| CAPOP | +0.52 | MASC | +0.15 |
| CRISK | -0.80 | | |

## 4. Implications of Foreign Bias

This chapter explores if investment preferences of foreign bond portfolio investors influence host country's cost of debt. Finance theory suggests that foreign portfolio investors should follow the benchmark country allocation prescribed by the International Capital Asset Pricing Model (ICAPM) (see Markowitz, 1952; Sharpe, 1964). However, it is well established in the literature that barriers to international investments induce portfolio investors to ignore the normative prediction of the ICAPM and discriminate between countries by either under-weighting or over-weighting their investments relative to the prescribed optimal benchmark (see Cooper et al., 2012 for a review). With respect to foreign investment, such sub-optimal allocation is known as foreign bias. Finance theory further notes that varying degrees of foreign biases should differentially affect market integration and thus international risk sharing (see Stulz, 1999; Bekaert and Harvey, 2000).

When markets are perfectly integrated and barriers to international investments are absent, a country's expected return on a portfolio of tradeable assets is determined by the covariance between its return and that of the world market portfolio (Adler and Dumas, 1983). At the other extreme, for a severely segmented market, the expected return of a portfolio is a function of covariance between the portfolio return and the local market return. Domowitz et al. (1998) show that investors from segmented markets are not able to attain the full benefits of international diversification. Investors investing in a highly segmented local market require a higher return to compensate for the lower level of global risk sharing between domestic and foreign investors (for a mathematical derivation, see Lau et al., 2010). When a market is partially integrated with the world market, the country's

expected return on a portfolio is determined by the weighted average of covariance of the portfolio with the local market and the covariance of the portfolio with the world market, the weight being the level of market integration with the world (see Bekaert and Harvey, 1995). Consequently, it follows that higher level of foreign bias (i.e. over-allocation relative to benchmark) towards domestic market should enhance global risk sharing (higher integration) of domestic assets, which in turn should lower the cost of capital (see Stulz, 1999). To illustrate further, Lau et al. (2010) show that higher home bias leads to higher cost of equity; if domestic investors invest disproportionately higher at home, foreigners, on average, must be investing disproportionately lower in such markets. It is plausible that domestic investors overinvest in domestic assets not because they are eager to do so but because foreigners are reluctant to invest in such local markets (Cooper et al., 2017). However, empirical studies investigating the implications of suboptimal allocations are scarce, and mainly limited to equity. To the best of my knowledge, no prior study examines the impact of suboptimal foreign investments (i.e. foreign bias) on the cost of debt. Therefore, this chapter examines whether biases observed by foreign bond portfolio investors have any implication for host country's cost of debt. Specifically, it is argued that a higher level of foreign bond bias should result in a lower cost of debt.

A fundamental question may arise at this stage as to whether ICAPM is the appropriate benchmark for bonds. To illustrate, let us assume that a rational investor invests in bonds of 10 different countries all of which have an exchange rate risk of 0.55 already factored in the bond prices. Assume that half of the countries' exchange rate risk lowers to a score of 0.5 by the following year while the risk scores of the

remaining half worsen to 0.6. To a large extent, this fluctuation in exchange rate is a risk that has already been diversified by this rational investor. This argument can be extended to include other risks like default risk, political risks etc. that may be embedded in bond prices.

In order to test the research question, this chapter uses panel data sets from multiple sources reflecting sub-optimal foreign bond allocations, and sovereign debt yield spread as the measure of cost of debt. Specifically, the empirical analyses in this chapter use the yield spread, over US Treasury bond, of comparable sovereign debt of emerging markets. For developed markets, the sovereign bond yield spread, over similar German bonds, for Eurozone (EMU) countries, is used as a measure of cost of debt. Consistent with theory, the results provide evidence that varying degrees of foreign bias have significant implication for the yield spreads of sovereign bonds. In particular, the results show that the cost of debt across the sample countries is strongly and negatively related to foreign bond portfolio investors' foreign bias.

The key findings remain qualitatively unchanged when the issue of endogeneity is addressed using different robustness tests including vector auto-regressive models and instrumental variables. The results are also consistent when data from different sources such as JP Morgan Emerging Market Bond Indices (EMBI) series, Thomson Reuters, Coordinated International Portfolio Survey (CPIS) and EPFR Global Inc. are used. Further, the recent Eurozone sovereign debt crisis offers an ideal experimental setup to observe whether any difference in foreign bias observed between the five most affected countries (i.e. Greece, Ireland, Italy, Portugal and Spain, hereafter referred to as GIIPS) and five relatively less affected

Eurozone countries is related to the observed changes in sovereign spread between these two groups.

This chapter contributes to two different strands of the finance literature. First, it adds to the limited but growing literature that investigates the implications of suboptimal international diversification. To the best of my knowledge, this is the first study which investigates the link between the theoretically inconsistent phenomenon of foreign bias and cost of debt. This study has similarities to that of Lau et al. (2010) who examine the effect of home bias on cost of equity capital; however, this paper differs in a number of important aspects. Foremost, rather than investigating how home investors' suboptimal investments in their home market affect the cost of capital, I explore how foreign investors' preferences (i.e. foreign bias) of the host markets is associated with the cost of capital. The choice of foreign bias (as opposed to home bias) theoretically offers a better reflection of international risk sharing position at country level.[41] I also use a more rigorous research approach[42] by addressing the possibility of endogeneity using country fixed effects, vector auto regression, instrumental variable estimation, and by using a quasi-natural experimental setup. Further, to the best of my knowledge, this is the first study to investigate the implication of foreign bias on cost of debt. Cost of equity is merely one part of the overall cost of capital and thus it is also important to understand the role of international foreign diversification on cost of debt. The examination of debt

[41] To illustrate this point, consider a country with all domestic investors investing in local assets only (i.e. maximum home bias). This may be the case in a market where only inward foreign private investments are allowed with restrictions on foreign investments by domestic investors, as may be the case in many emerging markets. It is thus theoretically possible that foreign investors also invest in these domestic markets allowing for some degree of global risk sharing. If only the home bias position of this country was to be considered, which is at its maximum, the global risk-sharing would be erroneously ignored.

[42] Lau et al. (2010) use pooled OLS regressions and the Fama-Macbeth approach.

(as opposed to equity) also carries significant economic importance because the size of global bond markets is nearly twice the size of equity markets, and has witnessed steady growth in the past decade as debt has become a key source of finance for governments, financial institutions and other firms.[43]

Second, this study also adds to the finance literature investigating the determinants of sovereign bond spreads i.e. credit risk (e.g. Longstaff et al., 2011, Cruces and Trebesch 2013, Bekaert et al., 2014). This paper differs from these studies by considering the idea that sub-optimal foreign bond allocation (i.e. foreign bias) is also related to cost of sovereign debt. A number of recent studies also explore the relation between foreign bond investments and spreads [44]. This study is conceptually different as it focuses on theoretically inconsistent foreign bias phenomena rather than the absolute value of foreign holdings.

The rest of this chapter is structured as follows: Section 4.1 describes the data and variables used in this study. Section 4.2 presents discussions on summary statistics of variables along with empirical analyses; section 4.3 presents robustness tests; section 4.4 discusses the limitations of this chapter; and section 4.5 offers concluding remarks.

### *4.1. Data*

First, this section discusses the two sources of data that have been used to obtain the sovereign debt yield spreads (our proxy for cost of debt). Second, it also

[43] Data from Bank for International Settlements (BIS) show that bond market size increased from USD 35.5 trillion in year 2001 to USD 97.8 trillion in 2013. During the corresponding period, cross-border holdings of long-term debt (excluding money market instruments) grew from USD 6.4 trillion to USD 24.2 trillion, as reported by International Monetary Fund (IMF) in CPIS.

[44] See (Andritzky (2012), Arslanalp and Poghosyan (2014), Jaramillo and Zhang (2013), and Peiris (2010).

explains the construction of foreign bias measure reflecting the cross-country allocation preferences of foreign bond portfolio investors relative to that prescribed by finance theory (see Chan et al., 2005; Cooper et al., 2012). Finally, a brief description is provided for all the control variables used in this study. Throughout this chapter, data is used either in quarterly or annual frequency; these choices are constrained by the availability of data on the benchmark portfolio as discussed below.

### *4.1.1. Sovereign bond spreads – cost of debt*

The varying characteristics of bonds as asset class complicate the comparability of cross-country cost of debt. Thus, this chapter focuses mainly on the yield spreads of long-term dollar denominated sovereign bonds issued by emerging markets because the availability of this data set allows for a meaningful comparison across countries.[45] These spreads are the yield to maturity (YTM) of emerging market sovereign bonds in excess of the YTM of US Treasuries with comparable maturities. As an additional test to extend the examination to more developed markets, separate analysis is conducted for ten EMU members. The choice of these countries is dictated by the availability of comparable bond data.

Sovereign bond yield spreads (SPRD) are obtained from two different sources. First, the emerging market spreads are from the Emerging Market Bond Indices (EMBI) database on a quarterly basis (from 2002 to 2014). This data set has also been used recently by a number of studies including Bekaert et al. (2014) and

[45] Sovereign yields also proxy the cost of cross-country corporate debt, given the strong evidence that corporate spreads are generally positively correlated with sovereign spreads (see Durbin and Ng, 2005). Further, as noted earlier, Borensztein et al. (2013) suggest that sovereign rating represents a strong upper bound rating assigned to corporates. They empirically show that sovereign risk is a significant factor in the pricing of corporate debt.

Cruces and Trebesch (2013). The EMBI data set includes EMBI Plus (EMBIP) and EMBI Global (EMBIG). EMBIP is available for a smaller number of emerging countries (17 countries as at Dec 2014) and consists of bonds which meet strict criteria in terms of comparable liquidity, size, currency, maturity and other characteristics. One of the advantages of using EMBI data is the availability of "stripped spreads" which is the excess basis points (bps) over US Treasuries of similar maturity and net of collateralized portion of payments on such bonds (which are mostly Brady bonds). EMBIG incorporates less liquid instruments than EMBIP, but is available for a wider number of countries (60 as at December 2014). For most of the analyses, I use *SPRD* from the EMBIG database. However, *SPRD* from EMBIP is also used as an additional robustness test in Section 4.3.5 to address concerns related to country-specific bond market liquidity.

For EMU countries, I source the benchmark 10-year government bond index from Thompson Reuters on a quarterly basis and compute the yield spread over the benchmark German Bunds (Ebner, 2009). These YTMs on Euro-denominated bonds are available for 11 EMU countries only.[46] The average maturity for the constituent bonds in these indices is close to 10 years for all countries (including Germany).

### *4.1.2. Independent variable – foreign bias*

As noted in the literature (Chan et al., 2005; Cooper et al., 2012), for a foreign investor domiciled in country *i* investing in bonds of host country *j* at time *t*, the deviation from optimal ICAPM allocations for the host market can be shown by equation (4.1) :

[46] GIIPS (Greece, Italy, Ireland, Portugal and Spain) and non-GIIPS (Austria, Belgium, Finland, France, Germany and the Netherlands).

$$FBIAS_{ijt} = \ln(w_{ijt} / w^*_{jt}) \quad (4.1)$$

where $FBIAS_{ijt}$ denotes foreign bias exhibited from investors in country ($i$) towards bonds of host country ($j$) for time period $t$ (quarter-end in the case of EPFR Global and year-end in the case of CPIS data). $w_{ijt}$ is the weight of bond holdings of host country ($j$) in the portfolio of investors from country ($i$) and $w^*_{jt}$ is the share of country ($j$) in the world bond market, used as the ICAPM benchmark.

Data from two different sources are used to construct measures of $w_{ijt}$ for emerging and EMU host markets. For emerging markets (which is the main data set in this chapter), data is from EPFR Global, which provides monthly bond allocations (from 2002 to 2014) of funds that have a strategic focus of investing across emerging markets.[47] As of December 2014, this database includes 78 funds with a combined fund size of USD 80.6 billion allocated across emerging markets. These funds are domiciled in eight developed markets[48] and $w_{ijt}$ is the share of each fund's allocation domiciled in country *i* for the host country *j* for the period *t*. Given the fact that the benchmark allocation measures, discussed below, are only available at quarterly frequency, I take the funds' quarter-end allocations instead of month-end allocations. For EMU host markets, the foreign allocations to these countries are computed by using the yearly foreign holdings data provided in CPIS.[49]

[47] The full database as at December 2014 additionally contains 56 international funds focusing globally, five funds focusing on Latin America, 70 focusing on Europe (available only for 2014), two focusing on Emerging Europe, and 20 focusing on Asia, except Japan. I only include emerging market funds as the main data for bond spreads covers emerging markets only.

[48] Canada (1), Denmark (2), Germany (1), Ireland (9), Japan (1), Luxembourg (30), United Kingdom (6), and United States (28).

[49] A few caveats need to be noted in using the CPIS data set. For example, investment from some countries, (notably China) are not reported; some investments are shown as negative values; a small sample is reported as unallocated; some data is reported as confidential and investments from 'international organizations' are also reported. I ignore the negative and unallocated cross-border

Next, the benchmark weight of country $j$ in the world bond market is calculated as shown in equation (4.2):

$$w_{jt}^{*} = V_{jt} \Big/ \sum_{j=1}^{n} V_{jt} \tag{4.2}$$

where $w_{jt}^{*}$ is the share of country $j$ in the world bond market and $V_{jt}$ is the bond market outstanding of country $j$ at the end of period $t$ as obtained from BIS.[50] When calculating benchmark weights for emerging markets, $n$ in equation (4.2) equals 50 since the EPFR funds' allocations are strategically focussed across the 50 most investable emerging markets in our dataset and are specifically known as emerging markets' global funds. However, in the case of EMU markets, $n$ includes the entire number of countries in the world for which bond market outstanding data is available on BIS (i.e. 110 countries). This is because bond allocation to EMU host markets is computed from CPIS which provides cross-border bond holdings across the world. Theoretically, this does not affect the construction and use of benchmark portfolio.

For each period $t$ (again quarter-end in the case of using EPFR Global and year-end in the case of CPIS data), I take the average foreign bias ($AFBIAS_{jt}$) that is computed by taking the average across all source country investors ($i=1.....k$) towards the host country $j$ for each period $t$ as shown below:

investments. Following Cooper et al. (2012) I also replace all zero international investment as USD 1 to ensure that complete underinvestment in host markets are not ignored.

[50] This is consistent with Fidora et al. (2007). An alternative option would be to use country weights from indices such as MSCI or JP Morgan bond indices. This is not desirable in our study because funds are known to closely follow such indices while making country-wise allocations (see Raddatz et al., 2014). Our interest is in finding out how the deviation of foreign allocation, vis-a-vis a country's share in world market capitalization, impacts on spread. Using such bond indices (that are tracked by funds) as a benchmark defeats this purpose.

$$AFBIAS_{jt} = \frac{\sum_{i=1}^{k} FBIAS_{ijt}}{k} \quad i \neq j \tag{4.3}$$

*4.1.3. Control variables*

One important characteristic of sovereign bonds that constitute the EMBI series is that time remaining to maturity is different in each country index. This can influence variations in the spreads. Following Bekaert et al. (2014), I control for this disparity by including average remaining years to maturity (*LIFE*) in the empirical model. *LIFE,* as reported by JP Morgan and used in the analyses in natural log form, is expected to be positively associated with bond spread.

Spreads in sovereign debts can be a function of country-specific macroeconomic factors such as level of indebtedness, foreign exchange reserves, debt service burden etc. (Boehmer and Megginson, 1990). However, more recent evidence (Longstaff et al., 2011; Afonso et al., 2015) highlights the importance of global economic factors as the driving force behind sovereign spreads. Accordingly, I include both global macroeconomic factors and country-specific macroeconomic conditions as additional control variables.

For a measure of global macroeconomic factors (*GBL*), I follow Cruces and Trebesch (2013) and Bekaert et al. (2014) and take the yield spread between Barclays US Corporate High Yield and Barclays US Treasury bonds (sourced from Thomson Reuters). *GBL* is used in its natural logarithmic form and is anticipated to have a positive association with bond yield spread. To capture various aspects of country-specific macroeconomic conditions, I use data from the International Country Risk Guide (ICRG) on economic risk, financial risk, and political risk ratings (provided by The PRS Group). For economic and financial risks, the ICRG

provides measures of each of these risks as an aggregate of five different components at country level on a scale of 0–50 with higher scores denoting lower potential risk.[51] Following Bekaert et al. (2014), I aggregate the economic and financial risk scores for each country and subtract them from 100 to equate higher score to higher potential risk (*EFRisk*).

I also control for country-specific political risk drivers by including the composite political index of the ICRG, consisting of 12 different risk factors,[52] measured on a scale of 0-100 with a higher score implying lower potential political risk. I similarly subtract each country's score from 100 to obtain the measure of political risk (*PRisk*). Both *EFRisk* and *PRisk* are used in natural log form of each country, less that of the US rating, and are expected to have a positive association with bond spreads.

Liquidity is also clearly an important element in security value (Amihud and Mendelson, 1986). The use of *EFRisk* captures variations in cross-country liquidity to a certain extent. For example, one of the sub-components of *EFRisk* is foreign debt scaled by GDP which itself reflects the depth and breadth of the foreign bond market relative to the size of the economy. To address any remaining concerns related to country-specific bond market liquidity, I use the yield spread from EMBIP, which includes highly comparable bonds with respect to liquidity than that of

[51] ICRG Economic risks include i) GDP per capita, ii) real GDP growth, iii) annual inflation, iv) budget balance to GDP ratio, and v) current account to GDP ratio. ICRG Financial risks include i) foreign debt to GDP, ii) foreign debt service to exports, iii) current account to exports, iv) international reserve as months of import cover, and v) exchange rate stability. See http://www.prsgroup.com for further details.

[52] ICRG Political risks include i) government stability, ii) socioeconomic conditions, iii) investment profile, iv) internal conflict, v) external conflict, vi) corruption, vii) military in politics, viii) religious tensions, ix) law and order, x) ethnic tensions, xi) democratic accountability, and xii) bureaucracy quality.

EMBIG (see additional robustness test in section 4.3.5). In the case of regression using EPFR data, all the controls are at a quarterly frequency (averaged over three months); and for CPIS data, the controls are at an annual frequency (averaged over 12 months).

## *4.2. Empirical analysis*

This section first provides a brief discussion on the summary statistics of the key variables. Thereafter, it provides a discussion on the results of basic regression estimations followed by robustness tests.

### *4.2.1. Summary statistics*

Table 4.1 provides the summary statistics of all key variables. *SPRD* in column I is the yield spread over US Treasury bonds (from EMBIG) available for the 50 emerging markets' sovereign bonds that have the most active bond markets. There are wide variations across countries with respect to their spreads. For example, Ivory Coast, Argentina, Ecuador, Venezuela and Belarus are the top five countries with highest level of spreads and China, Chile, Malaysia, Poland and Slovakia have the lowest spreads.

To show the temporal variation in *SPRD*, additional data is provided in Appendix 4.1 with the average *SPRD* during four sub-periods within the sample; it shows that countries such as Argentina, Brazil, Dominican Republic, Georgia, Ivory Coast, Nigeria, Uruguay etc. have witnessed a decline in their spreads during the sample period. On the other hand, Egypt, Hungary, Ukraine, Venezuela etc. have witnessed increasing spreads during this period.

Column II (of Table 4.1) shows the $AFBIAS_{jt}$ measure for host countries. Some countries that exhibit low average yield spreads also have relatively low levels of foreign bias (see Slovakia and China). In contrast, Belarus, Ivory Coast, Ukraine, Venezuela etc. have high levels of average yield spreads and high levels of foreign bias. Apart from indicating possible panel effects, this suggests that other important country-specific factors could also play important roles in explaining the varying degrees of yield spread observed across the cross-section of countries and thus the importance of incorporating controls.

Time remaining to maturity (*LIFE*) for the constituent bonds of EMBIG country indices is shown in Column III in Table 4.1. The average *LIFE* is 9.8 years indicating the long term nature of the constituent bonds in EMBI. Argentina, El Salvador, Jamaica, Peru, and Uruguay, have an average *LIFE* of 15 years or more, but Belarus (3.8 years), Morocco (4.1), Pakistan (4.9), and Ukraine (4.9) are among the countries with the lowest *LIFE* implying a relatively short period of time remaining to pay off their debts. Over time, the underlying trend (not shown for brevity) reveals a gradual decrease in *LIFE* – as would be expected. However, it also shows sharp and sudden increases for most countries, presumably due to the issuance of more long-term debts.

The ICRG risk ratings in columns IV, V and VI in Table 4.1 show quarterly average Economic Risk (ER), Financial Risk (FR) and Political Risk (PR) ratings of the respective countries, as reported by the ICRG, with a higher score denoting lower risk. There are some significant variations between emerging market countries. The between variations (and within variations) in ER, FR, and PR ratings are 3.1 (2.9), 4.5 (2.8), and 8.9 (2.8) standard deviations respectively (relative to their average

ratings). For example, in terms of individual countries, Jamaica and Lebanon have the lowest ER ratings (i.e. highest economic risk). Belarus and Latvia are the countries with lowest FR measures (higher financial risk). Finally, in terms of the PR scores, Iraq, Nigeria, and Pakistan are among the countries with highest level of political risk (i.e. low PR score).

### *4.2.2. Regression analysis*

The general regression specification for assessing the impact of foreign bias on sovereign bond spread ($SPRD_{jt}$) is shown in equation (4.4):

$$SPRD_{jt} = \beta_1 AFBIAS_{jt} + \beta_2 LIFE_{jt} + \beta_3 Local_{jt} + \beta_4 Global_t + \beta_5 \alpha_t + \beta_6 \alpha_j + \epsilon_{jt} \quad (4.4)$$

where $AFBIAS_{jt}$ is the average foreign bias registered across all funds ($i$) towards the host country ($j$) at time $t$; $LIFE_{jt}$ is the time remaining to maturity of the constituent bonds; $Local_{jt}$ is the vector of control variables specific to host country ($j$), and $Global_t$ is the global macroeconomic control. $\alpha_t$ is the vector of time dummies and $\alpha_j$ are host country dummies. The sample exhibits a substantial level of cross-sectional dependence.[53] To address the spatial dependence (except when stated specifically), I report results with standard errors corrected for heteroscedasticity, autocorrelation, and cross-sectional dependence.

The results of different specifications of the general equation (4.4) are shown in Table 4.2. Across models I – VI, the foreign bias (*AFBIAS*) coefficients have the

[53] Due to the possible presence of common shocks and unobserved variables in the disturbance terms, panel data models are likely to possess elements of spatial dependence, especially when time period lengthens. The absolute correlation of error terms between countries is 0.5 on average for the emerging markets sample.

expected signs and are statistically significant at the 1% level.[54] Assuming exogeneity,[55] an interpretation of the coefficient of *AFBIAS* in column VI suggests that an increase in *AFBIAS* measure by one unit reduces bond spread by 64 bps. For illustrative purposes, if a country with a median value of *AFBIAS* measure (1.32) could improve its position to 75 percentile (2.25), its bond yield spread would drop by approximately 60 bps [(2.25-1.32) x 64bps]. These results strongly indicate that markets which are successful in attracting higher foreign bond allocations relative to the benchmark are associated with lower cost of debt.

In terms of the control variables, time remaining to maturity (*LIFE*) has an unexpected negative sign, but is not statistically significant across the models. The introduction of the global macroeconomic variable (*GBL*) in Column III produces no material change to the key variable (*AFBIAS*).[56] As expected, the *GBL* is positively related to *SPRD* and is statistically significant at the 1% level. This signifies that global macroeconomic shocks adversely affect the cost of debt. The *EFRisk* factor also enters the regression with the expected sign and is statistically significant at the 1% level. This suggests that country economic factors also play an important role in explaining the yield spread. Similarly, the results show that political risk (*PRisk*) is significant in determining country yield spread. These results are generally consistent with the evidence reported in the current literature (see Bekaert et al., 2014). The significance

[54] Hausman's specification test justifies the use of fixed effects.

[55] The issue of endogeneity is addressed in section 3. However, as with any empirical work using non-experimental data, caution should be exercised when evaluating economic significance as it is extremely challenging to fully mitigate the issue of endogeneity. Further, these results are limited to the sample period and data set used in this study. Despite the obvious limitations of any observational study, the results provide a strong indication of the association as predicted by the theory.

[56] As an alternative, I replace *GBL* by the option-implied volatility on the S&P 500 index (VIX) which serves as a proxy for global risk aversion. The use of VIX leads to no material change in our main results. Note that *GBL* is dropped in column VI due to the introduction of time fixed effects as the latter capture aggregate fluctuations.

of *AFBIAS* remains unaltered across all specifications in models I to VI. Overall, these results support the negative association of foreign bond bias with sovereign spreads, consistent with the prediction of ICAPM.

It is noted that periods of sovereign defaults can also have a substantial impact on the spreads of defaulting countries. Recent evidence shows that the intensity of default and associated cost to investors, rather than just default *per se*, impacts on the cost of capital for emerging market governments (Cruces and Trebesch, 2013). In this sample, six countries have defaulted during the sample period (for a total of eight times).[57] Therefore I include a dummy variable for periods of default as a control variable in equation (4.4). Untabulated results reveal that this does not lead to any significant change in the results of Table 4.2.

## *4.3. Robustness checks*

This section discusses some of the problems in the general econometric modelling, as specified in equation (4.4), and how they are addressed.

### *4.3.1. Endogeneity*

Though finance theory, as discussed earlier, leads to the conjecture that sovereign bond spread could be a function of foreign bias, there might be other unobserved explanatory factors that could influence bond yield spread. However, provided that such unobserved factors remain stable over time, the panel data set in econometric modelling with the inclusion of country fixed effects mitigates the concerns related to omitted variables to a certain extent. However, the estimates

[57] Defaulting countries are Argentina (once in 2005), Dominican Republic (twice in 2005), Ecuador (once in 2009), Ivory Coast (2010 and 2012), Iraq (2006) and Uruguay (once in 2003). Data is from Cruces and Trebesch (2013) with the updated file available at https://sites.google.com/site/christophtrebesch/data

could still be questioned over concerns related to reverse causality. It could be the case that the fall in the country spreads itself motivates investors to invest more. Although it is challenging to fully address the concern of endogeneity in observational studies, additional robustness tests are taken to mitigate the concerns as far as possible.

First, following Carrieri et al. (2013), I replace *AFBIAS* by its single-period lagged values *AFBIAS (lag 1)* as a predetermined variable addressing the potential concern of reverse causality. As shown in Table 4.3, the results for *AFBIAS (lag 1)* are consistent with the earlier findings.

Second, similarly to Gelos and Wei (2005), I estimate a vector auto-regresssion (VAR) model. It is assumed that *SPRD* and *AFBIAS* are endogenously determined variables and all control variables are exogenous variables. The endogenous variables are modelled as a linear function of one period lagged values of all endogenous variables plus the contemporary values of all exogenous variables as shown in equation (4.5) and (4.6):[58]

$$SPRD_{jt} = \beta_1 AFBIAS_{jt-1} + \beta_2 SPRD_{jt-1} + \beta_3 LIFE_{jt} + \beta_4 Local_{jt} + \beta_5 Global_t + \beta_6 \alpha_t + \beta_7 \alpha_j + \epsilon_{jt} \quad (4.5)$$

$$AFBIAS_{jt} = \beta_1 AFBIAS_{jt-1} + \beta_2 SPRD_{jt-1} + \beta_3 LIFE_{jt} + \beta_4 Local_{jt} + \beta_5 Global_t + \beta_6 \alpha_t + \beta_7 \alpha_j + \epsilon_{jt} \quad (4.6)$$

[58] Gelos and Wei (2005) and Statman et al. (2006) amongst others use VAR models to examine endogeneity.

Results from the VAR model are presented in Table 4.4 (using the EMBIG sample). The results show that *AFBIAS* Granger-causes *SPRD* (Columns I and II) although the coefficients are smaller in magnitude as compared to our earlier results.[59] However, the evidence do not show that *SPRD* Granger-causes *AFBIAS*.

I further use the two-stage least square (2SLS) technique using an instrumental variable for *AFBIAS*. Empirical evidence shows that investors tend to invest more in familiar assets, ignoring optimal asset allocation to some extent (Huberman, 2001). Familiarity in this context is represented by the first principal component of three variables: mobile usage per 100; broadband usage per 100; and telephone usage per 100. For all the host countries, these three variables are sourced from the World Development Indicators of the World Bank. The intuition is that having higher usage of digital information and communication would lead to higher informational linkage, thus enhancing familiarity of the host markets (see Forbes, 2010; Portes et al., 2001, amongst others). Based on this familiarity literature, it can be argued that having higher scores on these aspects makes a country more familiar to the rest of the world, encouraging more foreign bias. Results from the 2SLS regression, presented in Table 4.5, show that *AFBIAS* is still negatively significant, consistent with the overall results.[60] It is to be noted, however, that the statistical significance at 99% confidence level (in the second stage regression) for the instrumental variable is stronger than expected: the t-statistics for the instrumental variable (-4.82) is higher than that of the raw variable. The high statistical significance could be the result of the instrument capturing development indicators.

[59] This is expected as the model specification has completely alternated to address the endogeneity issue.
[60] The Sargan test does not reject the null of correlation between the instrument and the error term with a p-value of 0.35.

As a final step to address endogeneity, this chapter undertakes a shock-based natural experiment exploiting the recent Euro debt crisis as an exogenous shock. Given the nature of shock affecting Eurozone countries (see sections 4.3.3 and 4.3.4), this experiment is conducted only for EMU markets. The experiment and results are discussed in section 4.3.4.

### *4.3.2. Alternative data source – CPIS*

This chapter also uses alternative cross-border holdings of long-term debt data from CPIS to obtain a measure of foreign bias for global markets. As of December 2014, CPIS provides cross-border bond holdings from 80 source countries into roughly 240 host countries. The country benchmark from BIS is available on a quarterly basis, but bond holding figures from CPIS are available only on an annual basis.[61] Therefore, the CPIS-based *AFBIAS* measure are computed on an annual frequency (instead of quarterly frequency) for this alternative test.

I repeat the baseline regression (specification (4.4)) with the measure of *AFBIAS* constructed using data from CPIS and show the results in Table 4.6. Though the coefficients of interest are much lower in magnitude compared to earlier results, they are still economically and statistically significant with the expected sign thus supporting the earlier finding that *AFBIAS* is negatively related with *SPRD*.[62]

### *4.3.3. Spread and foreign bias using developed market data*

*AFBIAS* constructed from CPIS also makes it possible to extend empirical analysis to developed markets. As EMBIG/EMBIP data is available only for

[61] CPIS data is available on a half-yearly basis from 2013 onwards.
[62] Standard errors are corrected using the Newey-West method.

emerging markets, I use the YTM of euro-denominated debt available for 11 EMU countries including Germany. Using Germany as the yardstick, the spread (*SPRD_EMU)* for the 10 remaining EMU countries is calculated by subtracting the YTM of Germany from that of the respective countries (Ebner, 2009). By using just the euro-denominated bonds for the YTM, a relatively cleaner measure of spread - that is devoid of exchange rate volatility and inflation - can be exploited. Focusing just on the EMU market also carries additional benefit by allowing to conduct a quasi-natural experiment, as discussed in section 4.3. I re-run specification (4.4) by using *SPRD_EMU* and *AFBIAS* for 10 EMU members only (excluding Germany). As such, both *EFRisk* and *PRisk* scores are taken as the differences from those of Germany (instead of the US).

The results presented in Table 4.7 are consistent with earlier main results. A strict interpretation of Model VI suggests that a unit increase in *AFBIAS* measure is associated with a reduction of 378 bps in *SPRD_EMU*. This is high compared to the earlier findings. This could possibly be attributed to significant movement in *AFBIAS* and *SPRD_EMU* measures in different directions, especially for GIIPS countries after the Eurozone debt crisis, as can be seen in Figure 4.1 and Figure 4.2. These two figures show that the GIIPS countries experienced a dramatic increase in their spread compared to non-GIIPS euro countries. This is also accompanied by a significant drop in the measure of foreign bias for GIIPS countries. The average 378 bps coefficient is thus capturing the covariation between *AFBIAS* and *SPRD_EMU*.

It can be noted in passing that the *SPRD_EMU* of EMU countries in the sample is strongly linked to economic and financial risk (*EFRisk*) but less so to global factors (*GBL*) and political risk (*PRisk*). I run further robustness tests for these

results for EMU markets by replacing *AFBIAS* by its lagged value by one period in specification (4.4) and also by running a VAR model as shown in specifications (4.5) and (4.6). Results, not shown in this chapter for brevity, are consistent with the key findings.

### *4.3.4. Difference in differences (DID) analysis*

Reporting interesting developments in the sovereign debt crisis in Europe, Acharya et al. (2011) note that the stress-test held in 2010 of 91 European banks shows evidence of significant home bias, i.e. lower foreign bias, in that local banks held a substantial portion of their own government bonds. Such suboptimal investments were highest for countries with greatest risk of government debt default, i.e. Greece, Ireland, Italy, Portugal and Spain (GIIPS). Thus, the Eurozone debt crisis provides an excellent set-up to conduct a quasi-natural experiment using the DID technique to investigate whether the exogenous shock, which triggered changes in foreign bias, had any impact on cost of debt. The year 2009 is chosen as the start of the Eurozone debt crisis due to the fact that the global financial crisis had already peaked and started to transform into sovereign debt crisis in the EMU countries by mid-2009 (Afonso et al., 2015). I treat the Eurozone crisis as an exogenous shock that impacted on the *AFBIAS* of two different sets of EMU countries in different ways. As evident from Figure 4.2, the GIIPS countries were more severely affected by the crisis and witnessed a significant drop in *AFBIAS* measures after the start of the crisis whereas the *AFBIAS* of the other five EMU countries (control countries) in the sample remained relatively steady, even after the onset of the crisis. Following theoretical prediction, this decline (change) in the *AFBIAS* trend of GIIPS should lead to higher spread for GIIPS after controlling for any other factors that might

affect *SPRD_EMU*. To put this argument to the test, I run the regression as shown in specification (4.7):

$$SPRD\_EMU_{jt} = \beta_1(Giips * Post) + \Omega_1\, Giips + \Omega_2\, Post + \beta_2 LIFE_{jt} + \beta_3 Local_{jt} + \beta_4 Global_t + \beta_5 \alpha_t + \beta_6 \alpha_j + \epsilon_{jt} \quad (4.7)$$

where *Giips* is a dummy variable equalling one for GIIPS, also known as "treated" (0 otherwise), and *Post* is a dummy equal to one for time periods starting from 2009 (0 otherwise). If the exogenous shock in the form of crisis subdued the *AFBIAS* measures in the most affected countries (i.e. GIIPS), it would lead to higher *SPRD_EMU* in such treated countries relative to the "control" countries. In Equation(4.7), since *Giips* is the treatment, $\beta_1$ can be expected to be positive to indicate that *SPRD_EMU* increased relatively more for the GIIPS countries' debt as a result of the exogenous shock that reduced the *AFBIAS* measure.

Results from specification (4.7) are presented in Table 4.8. As expected, the coefficient for the DID effect (i. e. $Giips * Post$) is positive and statistically significant even after controlling for a range of country-specific and global variables that might affect *SPRD_EMU*. These results provide support to the notion that the decline in *AFBIAS*, due to the Eurozone crisis, led to an increase in bond spread for GIIPS countries more than for the control countries. In quantitative terms, it can be observed that the DID effect is roughly 433 bps for the GIIPS countries, reflecting the severity of the effect of the crisis on these countries' bond spreads.

### *4.3.5. Country-specific liquidity effects*

Finally, this section considers the effect of market-specific liquidity in the basic regression model by replacing the EMBIG spread in the baseline regression by spread from the EMBIP series, which is composed of homogeneously more liquid bonds. Results in Table 4.9 show that the overall finding is consistent as compared to the results in Table 4.2. Due to the availability of EMBIP across a narrower set of countries[63], the number of observation decreases substantially (compared to Table 4.2). The influence of *AFBIAS* on *SPRD* is in the expected direction and similar to the main result but the degree of impact is much more pronounced in comparison to Table 4.2.

I also test the spreads from EMBIP with the same robustness tests, as discussed in 4.3. Results - not included in this chapter for brevity - show that the key findings remain essentially the same. These findings alleviate any concerns that may arise due to the difference in bond market liquidity among the sample countries.

## *4.4. Limitations of this chapter and areas for future research*

Similar to the first empirical chapter of this thesis, a limitation of this chapter is that it considers foreign investments in bonds only and ignores the other investable assets that could help diversify risk. The omission of these assets may create a bias to optimal allocation, and the degree of any such bias depends on the additional scope for diversification such assets may be able to provide (Cooper et al., 2012). Further, investors following certain Bayesian techniques will select portfolio weights different to the ones used in this (and earlier) chapter.

[63] EMBIP is available for 22 countries as shown in Appendix 4.1

Further, regarding the econometric model, the term *Giips*Post* is constructed by interacting dummy variables of five countries with time dummy; this has the potential to lead to severe identification problem and the overall results should be interpreted within this context. Another set of limitations in this study is related to availability of data. This study focuses only in those countries for which comparable bond spread data is available. For example, the proprietary spread figures from EMBI are available only for select emerging market countries only; similarly, Euro-denominated bond spread is available for a limited number of Eurozone countries. This has been a deciding factor in choosing the set of emerging markets and Eurozone markets separately in this study. This limitation also provides a cue for further research: encompassing a wider set of countries and wider range of investable assets – not just bonds – could provide more interesting results.

Further, foreign bias could have an impact on a variety of other factors like the issuance of debt and equity; productivity of a country; and level of capital investment, and a variety of other issues of macroeconomic interest. These issues remain areas of future research.

### *4.5. Conclusion*

It is well recognized in the finance literature that barriers to international investments compel portfolio investors to deviate from the normative prediction of optimal allocation in a foreign country (known as foreign bias). Theory further notes that varying degrees of foreign biases differentially affect the degree of market integration and thus international risk sharing. This suggests that higher levels of foreign bias (i.e. over-allocation relative to benchmark) towards a host market should boost global risk sharing, which should further lead to a lower cost of capital.

However, studies examining the implications of such suboptimal allocations are scarce and focus mainly on equity investments. This paucity of studies in the literature, along with room for methodological improvements, provides motivation to examine whether foreign biases observed by foreign bond portfolio investors are related to the lower cost of debt for the host market.

This research issue is tested using sovereign debt yield spread as a measure of cost of debt; and using the standard measure of foreign bias. The results show that a higher degree of foreign bias, i.e. preference to over-allocate relative to the implied benchmark, has significant implications for the yield spreads of sovereign bonds. Specifically, the findings show that costs of debt across countries are strongly and negatively related to foreign bias. The statistical and economic significance of the results hold even after a number of robustness checks.

The results of this study hold important policy implications, particularly for the capital constrained emerging markets. The negative association between spread and foreign bias suggests that policymakers should strive to reduce barriers to inward foreign portfolio investments which would allow foreign investors to optimally hold the host country's share of allocation in their portfolios. This should help reduce the cost of sovereign debt and that of tradable corporate bonds. Given that the current global bond outstanding stands roughly at USD 100 trillion, reduction of bond spread by even a few bps has the potential to translate into significant savings and encourage capital investments.

**Table 4.1: Summary Statistics**

This table presents quarterly averages from (3rd quarter of 2002 to 4th quarter of 2014) of key variables for host country *j*. *SPRD* is the measure of sovereign bond spreads obtained from JP Morgan's EMBI Global. Average foreign bias (*AFBIAS)* reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($w_{ij,}\ i \neq j$) from the world bond market capitalization weight of country *j* ($w^*_j$). AFBIAS is calculated as the natural log of ($w_{ij} / w^*_j$). *LIFE* is the average years remaining to maturity for constituent bonds. Economic Risk (*ER*) is the sum of five ICRG components reflecting various economic risks; Similarly, Financial Risk (*FR*) is the sum of five components reflecting various financial risks of country *j*; and Political Risk (*PR*) is the sum of 12 components reflecting various political risks.

| | I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|
| **Country** | **SPRD (bps)** | **AFBIAS** | **LIFE** | **ER (0-50)** | **FR (0-50)** | **PR (0-100)** |
| Argentina | 1764.71 | 0.34 | 18.9 | 36.68 | 34.62 | 65.60 |
| Azerbaijan | 283.95 | 1.76 | 6.3 | 37.29 | 48.18 | 60.90 |
| Belarus | 844.96 | 2.15 | 3.8 | 30.28 | 29.96 | 55.25 |
| Bolivia | 293.89 | 1.67 | 9.1 | 39.51 | 45.82 | 58.02 |
| Brazil | 372.93 | -0.26 | 14.0 | 36.23 | 36.76 | 66.86 |
| Bulgaria | 187.15 | 1.74 | 5.8 | 34.37 | 35.11 | 68.94 |
| Chile | 134.63 | 0.06 | 9.3 | 40.15 | 38.80 | 77.88 |
| China | 118.96 | -3.76 | 6.8 | 40.02 | 47.03 | 65.36 |
| Colombia | 274.61 | 1.16 | 11.8 | 35.51 | 38.15 | 58.48 |
| Costa Rica | 337.40 | 2.56 | 13.0 | 35.14 | 39.93 | 72.02 |
| Croatia | 211.67 | -0.29 | 5.1 | 34.70 | 34.44 | 73.67 |
| Dominican Republic | 542.33 | 3.07 | 7.4 | 34.94 | 36.89 | 65.44 |
| Ecuador | 963.07 | 1.77 | 12.2 | 35.55 | 37.62 | 55.40 |
| Egypt | 263.91 | 1.38 | 7.3 | 31.61 | 40.55 | 57.71 |
| El Salvador | 341.37 | 2.14 | 17.0 | 34.23 | 37.07 | 66.64 |
| Gabon | 410.63 | 1.47 | 7.5 | 44.01 | 44.30 | 58.90 |
| Georgia | 551.53 | 1.23 | 6.2 | n/a | n/a | n/a |
| Ghana | 560.43 | 3.45 | 7.1 | 30.53 | 36.38 | 65.74 |
| Guatemala | 261.03 | 2.24 | 10.7 | 34.72 | 39.00 | 60.44 |
| Hungary | 209.06 | 0.17 | 7.1 | 34.55 | 33.08 | 77.20 |
| India | 223.78 | -1.20 | 6.3 | 33.04 | 40.47 | 59.14 |
| Indonesia | 282.09 | 1.15 | 13.4 | 36.78 | 38.76 | 58.04 |
| Iraq | 549.08 | 2.58 | 13.5 | 34.17 | 40.72 | 39.26 |
| Ivory Coast | 1948.73 | 2.03 | 10.1 | 35.97 | 38.60 | 48.56 |
| Jamaica | 593.91 | 1.29 | 20.1 | 27.78 | 33.44 | 72.07 |
| Kazakhstan | 419.42 | 3.07 | 8.2 | 37.40 | 34.50 | 69.79 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Latvia | 154.70 | 1.85 | 5.3 | 37.95 | 25.32 | 71.69 |
| Lebanon | 416.19 | -1.13 | 5.4 | 28.98 | 30.96 | 56.73 |
| Lithuania | 241.96 | 2.10 | 6.5 | 33.81 | 33.50 | 72.14 |
| Malaysia | 139.56 | -0.23 | 7.4 | 40.55 | 42.60 | 73.64 |
| Mexico | 204.71 | 0.88 | 14.5 | 36.59 | 39.92 | 70.38 |
| Morocco | 146.81 | 1.89 | 4.1 | 34.91 | 40.55 | 69.80 |
| Namibia | 259.98 | 2.17 | 8.3 | 33.27 | 36.30 | 75.26 |
| Nigeria | 532.72 | 3.09 | 8.3 | 35.21 | 43.86 | 43.89 |
| Pakistan | 612.49 | -1.66 | 4.9 | 32.57 | 38.09 | 46.72 |
| Paraguay | 252.13 | 1.74 | 12.5 | 36.02 | 41.46 | 58.04 |
| Peru | 250.74 | 1.81 | 15.0 | 38.40 | 40.90 | 63.02 |
| Philippines | 280.44 | 1.00 | 12.5 | 37.50 | 40.00 | 62.62 |
| Poland | 129.11 | -0.47 | 7.2 | 36.70 | 36.38 | 77.05 |
| Romania | 265.07 | 2.11 | 10.2 | 35.53 | 34.85 | 65.28 |
| Russia | 251.22 | 1.28 | 9.3 | 39.61 | 43.93 | 63.35 |
| Slovakia | 111.50 | -2.38 | 8.0 | 39.56 | 35.52 | 73.91 |
| South Africa | 194.62 | -0.15 | 7.9 | 35.02 | 38.33 | 67.22 |
| Sri Lanka | 558.61 | 2.03 | 5.4 | 32.80 | 36.75 | 55.91 |
| Trinidad and Tobago | 210.67 | 1.39 | 5.8 | 39.18 | 46.08 | 69.38 |
| Turkey | 333.08 | 0.79 | 11.9 | 32.69 | 32.57 | 60.12 |
| Ukraine | 654.73 | 2.37 | 4.9 | 32.98 | 35.88 | 63.76 |
| Uruguay | 377.21 | 2.28 | 18.3 | 35.92 | 33.85 | 71.86 |
| Venezuela | 880.68 | 2.25 | 13.4 | 32.71 | 41.61 | 48.60 |
| Vietnam | 301.53 | 1.51 | 6.9 | 32.92 | 39.57 | 64.91 |
| **Average** | **445.6** | **1.06** | **9.8** | **35.3** | **38.0** | **63.9** |

**Table 4.2: Regression of Sovereign Bond Spread on Foreign Bias**

This table shows regression results in which the dependent variable is sovereign bond spread (SPRD) for country *j*. The key independent variable is average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected for heteroscedasticity, autocorrelation, and spatial dependence using the Driscoll and Kraay (1998) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|
| AFBIAS | -83.35*** | -77.46*** | -85.32*** | -65.82*** | -67.79*** | -64.54*** |
| | (-3.12) | (-3.21) | (-3.29) | (-3.45) | (-3.52) | (-3.14) |
| LIFE | | -46.88 | -40.81 | -26.47 | -25.33 | -78.03 |
| | | (-0.84) | (-0.70) | (-0.48) | (-0.47) | (-1.14) |
| GBL | | | 337.9*** | 294.0*** | 280.8*** | |
| | | | (5.43) | (7.21) | (6.69) | |
| EFRisk | | | | 793.5*** | 785.0*** | 671.3*** |
| | | | | (5.17) | (4.86) | (4.43) |
| PRisk | | | | | 186.1** | 354.9*** |
| | | | | | (2.21) | (5.54) |
| Country Fixed Effects | YES | YES | YES | YES | YES | YES |
| Time Fixed Effects | | | | | | YES |
| Constant | 536.2*** | 631.4*** | 648.6*** | 646.4*** | 548.9*** | 171.6 |
| | (9.25) | (5.03) | (3.14) | (3.05) | (3.44) | (0.97) |
| Adjusted $R^2$ | 0.448 | 0.449 | 0.497 | 0.510 | 0.512 | 0.544 |
| Number of observations | 1737 | 1736 | 1736 | 1678 | 1678 | 1644 |

**Table 4.3: Regression of Sovereign Bond Spread on Lagged Value of Foreign Bias**

This table shows the regression results in which the dependent variable is sovereign bond spread (*SPRD*) for country *j*. The key independent variable is the lagged value of average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected for heteroscedasticity, autocorrelation, and spatial dependence using the Driscoll and Kraay (1998) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|
| AFBIAS (lag 1) | -84.60*** | -78.25** | -81.41*** | -61.47*** | -63.56*** | -66.19*** |
| | (-2.70) | (-2.61) | (-2.95) | (-2.78) | (-2.83) | (-2.88) |
| LIFE | | -51.72 | -45.68 | -29.21 | -27.44 | -44.95 |
| | | (-0.87) | (-0.75) | (-0.49) | (-0.47) | (-0.76) |
| GBL | | | 342.3*** | 293.2*** | 279.6*** | |
| | | | (5.34) | (7.06) | (6.58) | |
| EFRisk | | | | 802.7*** | 795.2*** | 683.4*** |
| | | | | (4.89) | (4.61) | (4.20) |
| PRisk | | | | | 188.6** | 359.1*** |
| | | | | | (2.14) | (5.47) |
| Country Fixed Effects | YES | YES | YES | YES | YES | YES |
| Time Fixed Effects | | | | | | YES |
| Constant | 539.5*** | 644.6*** | 516.7*** | 186.2*** | 221.4*** | 132.5 |
| | (8.91) | (4.79) | (3.44) | (3.38) | (3.48) | (1.03) |
| Adjusted $R^2$ | 0.453 | 0.454 | 0.503 | 0.513 | 0.515 | 0.548 |
| Number of observations | 1693 | 1692 | 1692 | 1635 | 1635 | 1603 |

**Table 4.4: Vector Auto-regression of Sovereign Spread and Foreign Bias**

This table presents the results of the Vector Auto Regression (VAR) to model country *j*'s sovereign spread (SPRD) and average foreign bias (AFBIAS) as endogenously determined dependent variables. *AFBIAS* reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Exogenous variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected for heteroscedasticity, autocorrelation, and spatial dependence using the Driscoll and Kraay (1998) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | **I**<br>**SPRD** | **II**<br>**SPRD** | **III**<br>**AFBIAS** | **IV**<br>**AFBIAS** |
|---|---|---|---|---|
| SPRD (lag 1) | 0.836*** | 0.849*** | **0.00003** | **0.00001** |
| | (10.92) | (11.75) | **(1.04)** | **(0.44)** |
| AFBIAS( lag 1) | **-27.74**** | **-19.775*** | 0.876*** | 0.870*** |
| | **(-2.39)** | **(-1.90)** | (39.60) | (39.36) |
| LIFE | -23.82 | -16.32 | 0.0863** | 0.0852** |
| | (-0.92) | (-0.69) | (2.26) | (2.10) |
| GBL | 199.73*** | | 0.0241 | |
| | (3.06) | | (0.97) | |
| EFRisk | 173.4** | 137.0** | -0.112** | -0.115** |
| | (2.12) | (2.28) | (-2.30) | (-2.09) |
| PRisk | 108.1* | 125.3* | -0.0258 | 0.00531 |
| | (1.72) | (1.89) | (-0.41) | (0.04) |
| Country Fixed Effects | YES | YES | YES | YES |
| Time Fixed Effects | | YES | | YES |
| Constant | 526.2** | 775.3*** | 0.224 | 0.473 |
| | (2.08) | (3.18) | (1.09) | (1.69) |
| Adjusted $R^2$ | 0.825 | 0.862 | 0.935 | 0.953 |
| Number of observations | 1635 | 1603 | 1613 | 1592 |

**Table 4.5: Two-Stage Least Squares Regression of Sovereign Bond Spread on Foreign Bias**

This table presents results from 2nd stage regression of 2SLS regression. The dependent variable is sovereign bond spread (*SPRD*) for country *j*. The key independent variable is average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). AFBIAS is instrumented by familiarity level (*Familiarity*) with country *j* which is taken as the first principal component of country *j*'s mobile usage per 100, telephone usage per 100, and broadband usage per 100. Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected for heteroscedasticity, autocorrelation, and spatial dependence using the Driscoll and Kraay (1998) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | 2SLS-2nd stage |
|---|---|
| AFBIAS | -94.70*** |
| | (-4.82) |
| LIFEG | 359.1*** |
| | (5.49) |
| EFRisk | 1010.0*** |
| | (5.82) |
| PRisk | 376.2*** |
| | (3.92) |
| Country Fixed Effects | YES |
| Time Fixed Effects | YES |
| Constant | 129.7*** |
| | (5.91) |
| Adjusted $R^2$ | 0.513 |
| Number of observations | 1412 |

**Table 4.6: Regression of Sovereign Bond Spread on Foreign Bias – using CPIS data for AFBIAS**

This table shows regression results in which the dependent variable is sovereign bond spread (SPRD) for country *j*. The key independent variable is average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected using Newey-West (1997) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets

| | I | II | III | IV | V | YF |
|---|---|---|---|---|---|---|
| AFBIAS | -32.30*** | -24.97*** | -23.13*** | -38.00*** | -30.56*** | -22.48*** |
| | (-3.15) | (-2.58) | (-2.82) | (-3.38) | (-2.67) | (-2.75) |
| LIFE | | 10.67 | 10.46 | 21.46** | 21.31** | 23.50** |
| | | (1.44) | (1.57) | (2.30) | (2.29) | (2.14) |
| GBL | | | 325.9*** | 208.1* | 218.9** | |
| | | | (3.00) | (1.93) | (2.03) | |
| EFRisk | | | | 848.7** | 805.5** | 687.8** |
| | | | | (2.46) | (2.26) | (2.38) |
| PRisk | | | | | 208.9** | 349.9*** |
| | | | | | (2.25) | (3.47) |
| Country Fixed Effects | YES | YES | YES | YES | YES | YES |
| Time Fixed Effects | | | | | | YES |
| Constant | 397.4*** | 300.3*** | -1761.5** | -1029.1 | -1216.6* | -2463.0 |
| | (7.47) | (4.51) | (-2.57) | (-1.50) | (-1.75) | (-1.24) |
| Adjusted $R^2$ | 0.410 | 0.513 | 0.549 | 0.630 | 0.633 | 0.651 |
| Number of observations | 239 | 239 | 239 | 239 | 239 | 239 |

**Table 4.7: Regression of Sovereign Bond Spread on Foreign Bias for EMU countries**

This table shows the regression results in which the dependent variable is 10-year sovereign bond spread (*SPRD_EMU*) for Eurozone country *j* against that of Germany. The key independent variable is average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in the bond holdings of source countries *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of Germany (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of Germany (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is yearly from 2001 to 2013. Countries include Austria, Belgium, Finland, France, **Greece**, **Ireland**, **Italy**, Netherlands, **Portugal**, and **Spain** with GIIPS countries in bold. All models report results with the standard errors corrected using Newey-West (1997) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets

| | I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|
| AFBIAS | -493.9*** | -505.1*** | -499.4*** | -408.3*** | -418.4*** | -378.2** |
| | (-3.86) | (-3.95) | (-4.01) | (-3.85) | (-3.54) | (-3.22) |
| LIFE | | 427.6 | 402.8 | 118.5 | 118.6 | 170.3 |
| | | (0.85) | (0.78) | (0.20) | (0.21) | (0.25) |
| GBL | | | 42.66 | 18.11 | 19.67 | |
| | | | (1.43) | (0.87) | (0.91) | |
| EFRisk | | | | 348.8*** | 370.2** | 188.10** |
| | | | | (3.89) | (3.25) | (2.59) |
| PRisk | | | | | -53.42 | -30.70 |
| | | | | | (-0.53) | (-0.28) |
| Country Fixed Effects | YES | YES | YES | YES | YES | YES |
| Time Fixed Effects | | | | | | YES |
| Constant | -43.08 | -519.7 | -542.2 | -295.3 | -303.6 | -248.38 |
| | (-1.57) | (-1.00) | (-1.05) | (-0.51) | (-0.54) | (-0.42) |
| Adjusted $R^2$ | 0.424 | 0.428 | 0.430 | 0.486 | 0.487 | 0.526 |
| Number of observations | 127 | 127 | 127 | 127 | 127 | 127 |

**Table 4.8: Regression of Sovereign Bond Spread on Foreign Bias for EMU countries – Difference-in-difference**

This table shows the regression results in which the dependent variable is 10-year sovereign bond spread (*SPRD_EMU*) for Eurozone country *j* against that of Germany. Variables of interest include *Giips*Post* which is a multiplicative term of *Giips* and *Post*. *Giips* is a dummy of 1 for five GIIPS countries, otherwise 0. *Post* is a dummy equal to 1 if time period ≥ 2009 Q1, otherwise 0. Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of Germany (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of Germany (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is yearly from 2001 to 2013. Countries include Austria, Belgium, Finland, France, **Greece**, **Ireland**, **Italy**, Netherlands, **Portugal**, and **Spain** with GIIPS countries in bold. All models report results with the standard errors corrected using Newey-West (1997) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | I | II | III |
|---|---|---|---|
| *Giips* * Post | 429.9*** | 440.4*** | 433.3*** |
| | (3.72) | (3.78) | (3.51) |
| Post | 46.71*** | -31.84 | -133.9 |
| | (5.77) | (-1.08) | (-1.39) |
| LIFE | | -592.8 | -237.6 |
| | | (-0.92) | (-0.36) |
| GBL | | 28.11 | |
| | | (0.34) | |
| EFRisk | | 319.6** | 177.3 |
| | | (2.40) | (1.22) |
| PRisk | | -83.88 | -26.69 |
| | | (-0.92) | (-0.31) |
| Country Fixed Effects | YES | YES | YES |
| Time Fixed Effects | | | YES |
| Constant | 14.40** | 351.1 | -2.764 |
| | (2.36) | (0.95) | (-0.50) |
| Adjusted $R^2$ | 0.464 | 0.493 | 0.534 |
| Number of observations | 127 | 127 | 127 |

**Table 4.9: Regression of Sovereign Bond Spread on Foreign Bias – using spread from EMBIP database**

This table shows regression results in which the dependent variable is sovereign bond spread (SPRD) for country *j*. The key independent variable is average foreign bias (*AFBIAS)* which reflects the deviation of country *j*'s share in bond holdings for emerging-market-focused mutual funds *i* ($i \neq j$) ($w_{ij}$) from the world bond market capitalization weight of country *j* ($w^*_j$). *AFBIAS* is calculated as the natural log of ($w_{ij} / w^*_j$). Control variables include: i) bond-specific time remaining to maturity in years expressed in natural log form (*LIFE*); ii) global macroeconomic variable taken as the difference between Barclays Corporate High Yield and Barclays US Treasury, expressed in natural log form (*GBL*); iii) economic and financial risk of country *j* expressed as the natural log of (100 – ER – FR) less the comparable figure of USA (*EFRisk*); and iv) political risk of country *j* expressed as the natural log of (100 – PR) less the comparable figure of USA (*PRisk*). ER is the raw score from ICRG representing Economic Risk; FR is the raw score from ICRG reflecting financial risk; and PR is the raw score from ICRG reflecting political risk of country *j*. Data is quarterly from 3rd quarter of 2002 to 4th quarter of 2014. All models report results with the standard errors corrected for heteroscedasticity, autocorrelation, and spatial dependence using the Driscoll and Kraay (1998) approach. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics are shown in brackets.

| | I | II | III | IV | V | VI |
|---|---|---|---|---|---|---|
| AFBIAS | -242.8*** | -226.2*** | -225.1*** | -202.7*** | -192.5*** | -191.8*** |
| | (-3.99) | (-3.77) | (-3.72) | (-3.92) | (-3.90) | (-4.35) |
| LIFE | | -86.24 | -123.7 | -102.4 | -101.8 | -116.2 |
| | | (-0.61) | (-0.98) | (-0.94) | (-0.98) | (-1.07) |
| GBL | | | 436.5*** | 300.9*** | 300.3*** | |
| | | | (3.77) | (3.35) | (3.32) | |
| EFRisk | | | | 1014.4*** | 1013.9*** | 794.2** |
| | | | | (3.46) | (3.46) | (2.48) |
| PRisk | | | | | 10.50 | 1812.1*** |
| | | | | | (0.07) | (4.64) |
| Country Fixed Effects | YES | YES | YES | YES | YES | YES |
| Time Fixed Effects | | | | | | YES |
| Constant | 752.8*** | 933.1** | -1723.7** | -835.9 | -840.2 | 277.9 |
| | (6.33) | (2.78) | (-2.11) | (-1.10) | (-1.13) | (1.21) |
| Adjusted $R^2$ | 0.354 | 0.354 | 0.413 | 0.496 | 0.495 | 0.539 |
| Number of observations | 784 | 784 | 784 | 784 | 784 | 781 |

**Figure 4.1: Long term sovereign bond spread of GIIPS vs. Non-GIIPS countries**

This figure shows the trend in the soverign spread (over German sovereign bonds) for the GIIPS and non-GIIPS EMU countries. Time 2009 Q1 corresponds to the quarter prior to the start of the Eurozone sovereign debt crisis. Source: Authors' calculation. Raw data obtained from Thompson Reuters.

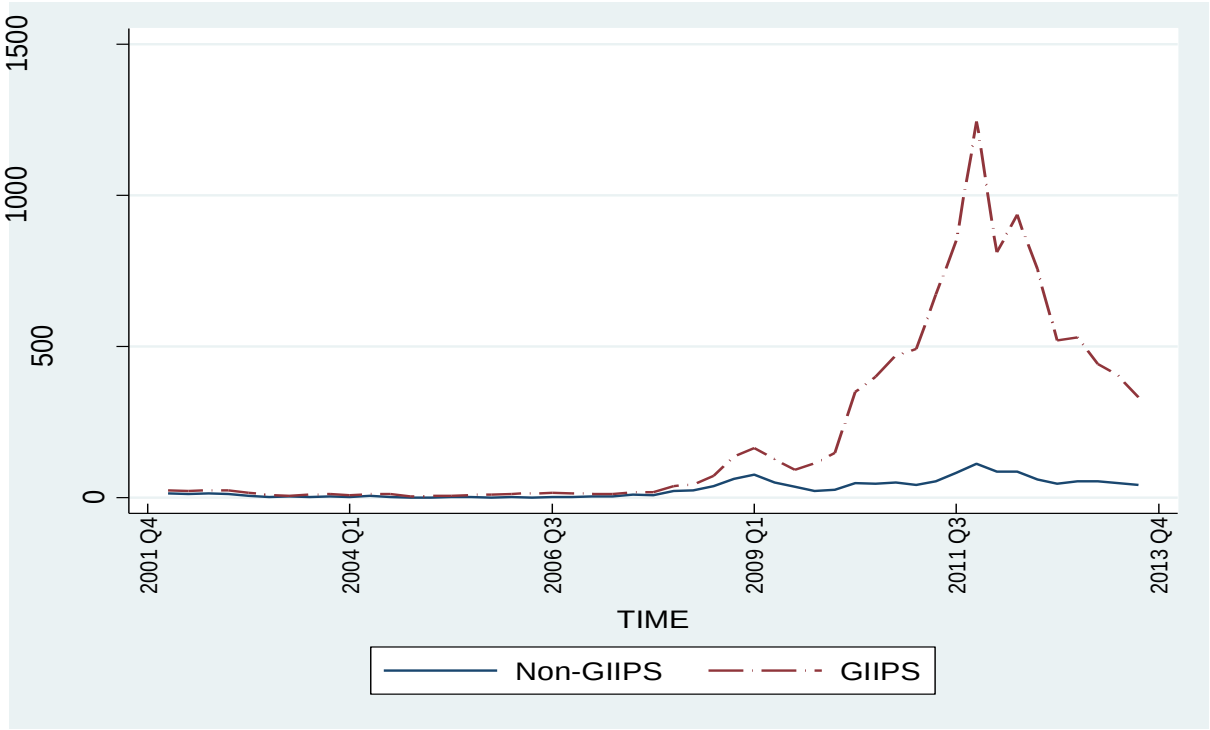
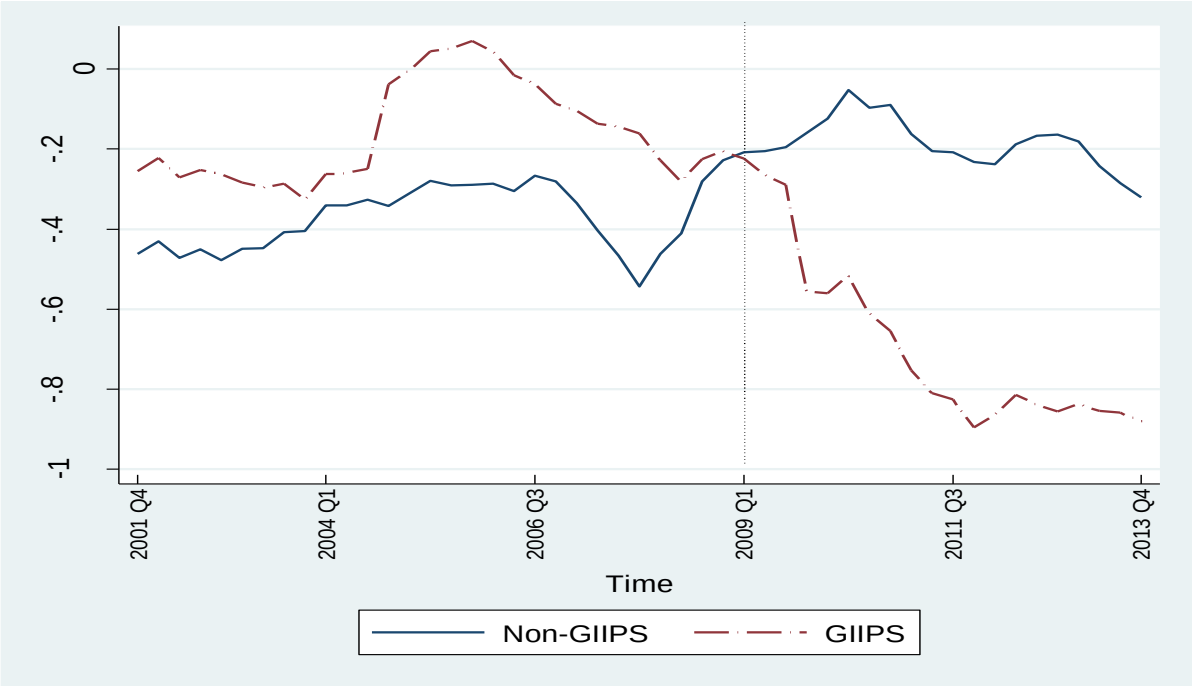


**Figure 4.2: Foreign bias of GIIPS vs. Non-GIIPS countries**

This figure shows the AFBIAS for GIIPS and non-GIIPS countries over time. Time 2009 Q1 corresponds to the quarter prior to the start of the Eurozone sovereign debt crisis. AFBIAS measures other than of year ends are calculated using interpolated (linear) CPIS data. Source: Authors' calculations. Raw data obtained from BIS and CPIS.



**Appendix 4.1: SPRD (from EMBIG) over different time periods**

| Country | 2002-2006 Normal economic period | 2007-2008 Global financial crisis | 2009 - 2011 Eurozone sovereign debt crisis period | 2012-2014 Post sovereign debt crisis period |
|---|---|---|---|---|
| Argentina * | 3,432.7 | 648.6 | 842.6 | 928.9 |
| Azerbaijan | | | | 284.0 |
| Belarus | | | 994.1 | 770.4 |
| Bolivia | | | | 293.9 |
| Brazil * | 629.6 | 248.9 | 231.3 | 212.2 |
| Bulgaria * | 152.6 | 222.5 | 287.9 | 114.6 |
| Chile | 98.7 | 170.1 | 149.6 | 149.8 |
| China | 63.7 | 128.1 | 143.6 | 171.1 |
| Colombia * | 401.7 | 241.6 | 221.4 | 159.2 |
| Costa Rica | | | | 337.4 |
| Croatia * | 115.8 | 111.1 | 284.7 | 349.4 |
| Dominican Republic | 666.8 | 513.4 | 524.9 | 392.3 |
| Ecuador * | 925.9 | 1,197.7 | 1,153.8 | 671.6 |
| Egypt * | 151.3 | 195.1 | 264.9 | 477.7 |
| El Salvador | 271.7 | 309.6 | 397.5 | 411.0 |
| Gabon | | 572.3 | 446.7 | 307.2 |
| Georgia | | 1,009.5 | 610.2 | 378.4 |
| Ghana | | 664.7 | 561.1 | 516.3 |
| Guatemala | | | | 261.0 |
| Hungary * | 50.3 | 159.1 | 345.3 | 344.3 |
| India | | | | 223.8 |
| Indonesia * | 252.4 | 348.6 | 295.0 | 252.1 |
| Iraq | 494.6 | 651.3 | 517.4 | 526.3 |
| Ivory Coast | 2,940.1 | 2,447.8 | 1,566.1 | 511.7 |
| Jamaica | | 589.9 | 595.5 | 594.0 |
| Kazakhstan | | 550.6 | 470.0 | 292.3 |

| | | | | |
|---|---|---|---|---|
| Latvia | | | | 154.7 |
| Lebanon | 424.4 | 511.3 | 364.8 | 392.0 |
| Lithuania * | | | 319.1 | 184.1 |
| Malaysia * | 115.7 | 154.5 | 168.9 | 136.1 |
| Mexico * | 204.7 | 203.1 | 223.3 | 187.2 |
| Morocco * | 189.5 | 72.4 | 72.4 | 206.9 |
| Namibia | | | 337.0 | 253.6 |
| Nigeria * | 736.7 | 16.4 | 402.3 | 330.2 |
| Pakistan | 262.1 | 784.5 | 879.0 | 756.9 |
| Paraguay | | | | 252.1 |
| Peru * | 344.7 | 225.2 | 217.2 | 160.4 |
| Philippines * | 396.3 | 269.8 | 242.0 | 152.1 |
| Poland * | 62.3 | 119.9 | 198.3 | 138.4 |
| Romania | | | | 265.1 |
| Russia * | 174.3 | 262.0 | 303.9 | 268.2 |
| Slovakia | | | | 111.5 |
| South Africa * | 143.2 | 233.5 | 216.3 | 224.2 |
| Sri Lanka | | 983.4 | 554.7 | 385.5 |
| Trinidad and Tobago | | | | 210.7 |
| Turkey * | 425.2 | 315.3 | 283.3 | 256.6 |
| Ukraine * | 309.4 | 665.4 | 893.8 | 926.6 |
| Uruguay | 602.4 | 316.3 | 273.7 | 183.6 |
| Venezuela * | 592.7 | 698.0 | 1,174.9 | 1,140.2 |
| Vietnam | 152.7 | 298.8 | 373.9 | 293.0 |

* Spread data also available in EMBIP series for these countries

## 5. Enforcement of Corporate Governance and Foreign Ownership

Existing literature notes the importance of not just having investor protection laws but also of strict enforcement of such laws. This chapter examines the impact of such enforcement of corporate governance laws in foreign equity ownership of firms using a natural experiment. Intuitively, enforcement of corporate governance laws lowers the monitoring costs of foreign investors thereby helping to enhance foreign equity ownership. By using panel data from 2001 to 2007 for publicly listed firms in India, this chapter provides compelling evidence that enforcement of corporate governance regulations leads to higher proportion of foreign ownership of firms. The findings are consistent with the existing notion that foreigners tend to possess lower level of firm ownership than domestic investors because foreigners have access to lower level of information (Brennan and Cao, 1997); face adverse selection problems (Akerlof, 1970); and are burdened with higher monitoring costs (Leuz et al., 2010). Consequently, this chapter provides support to the notion that imposing harsher penalties (for existing regulations) has the potential to increase foreign bias on equity investments.

### *5.1. Introduction*

Financial liberalization is known to reduce the cost of capital in emerging markets (Bekaert and Harvey, 2000) but the influence of such liberalizations has been surprisingly limited (Stulz, 2005). Despite the benefits that investors could achieve by holding the world market portfolio in line with International Capital Pricing Model, it is well documented that investors apportion overwhelmingly more in domestic assets thus allocating less-than-optimal part of their portfolio abroad (see

Cooper and Kaplanis, 1994; French and Poterba, 1991, among others). In this context, the importance of learning about the determinants of foreign investment cannot be overstated.

Out of many possible determinants of attracting foreign investment, this paper focuses specifically on the role of corporate governance enforcement in attracting foreign investment. Local investors enjoy a higher level of informational flow from local firms as compared to foreign investors (see Brennan and Cao, 1997 among others). This informational disadvantage for investors seeking to invest in foreign markets has serious implications on their foreign investment decisions. As Akerlof (1970) notes, such investors wanting to invest in foreign markets are burdened with adverse selection problem and hence invest less in such markets as they do not expect to achieve a similar level of return as the locals. Countries with weaker regulatory regime and lower disclosure requirements provide greater advantage to local investors (Stulz, 1999). Stulz (2005) further notes in a similar vein that the potential positive impact of globalization has been stifled due to what he terms as 'twin agency problem'. Monitoring costs in poorly-governed firms are also likely to be higher for foreign investors as they do not have the same level of local expertise (as local investors) to extract information out of opaque financial statements produced by poorly governed firms (Leuz et al., 2010).

Hence, agency costs arising out of poor corporate governance influence investor behaviour. The law of the land is an important element in determining the level of such agency costs between owners and managers (see Jensen and Meckling, 1976). Shleifer and Vishny (1997) note that legal protection of investors along with certain level of ownership concentration are the essential ingredients of good

corporate governance. They note that legal protection for investors is generally inadequate in most of the emerging markets mainly because laws are either lacking or difficult to enforce.

Even within the context of corporate governance, it is imperative to note the importance of enforcement (of corporate governance laws), rather than mere existence of such laws, as the former is an important element of protecting shareholders' rights. As La Porta et al. (2000, pp-15) note, "*For both shareholders and creditors, protection includes not only the rights written into the laws and regulations but also the effectiveness of their enforcement.*" In certain cases, having no law is better indeed than having a law that is not enforced (Bhattacharya and Daouk, 2009). Though the level of existing investor protection laws do not differ significantly between rich and poor countries, the enforcement of such laws is particularly weak in poorer countries (La Porta et al., 2000). These previous findings have very important implications for foreign investors seeking to invest in emerging markets; and this provides the motivation of investigating the impact of enforcement of corporate governance in foreign investment in emerging markets. Subsequent empirical analyses in this chapter, involving natural experiment, demonstrate that the enforcement of existing corporate governance regulation leads to significant increase in foreign equity investment of firms. This enforcement of existing regulation is related to the change in securities law in India introduced by Securities and Exchange Board of India (SEBI), which acts as the regulator of the securities market in India. This regulatory reform and its subsequent enforcement is discussed in detail in section 5.2.

There exists a rich literature examining the relationship between corporate governance issues and firm ownership. Notable and relevant recent papers within this strand of literature include that of Leuz et al. (2010); they examine foreign investment preferences of United States (US) investors in the context of corporate governance. This study is most closely related to this paper of Leuz et al. Aggarwal et al. (2005) also conduct a study in a similar vein for US institutional investors. Giannetti and Simonov (2006) examine the relationship between corporate governance and equity ownership in Sweden. This chapter builds on the existing literature and examines the impact of enforcement of (existing) corporate governance regulation on foreign equity ownership in an emerging market.

Other recent related studies include that of Ammer et al. (2012), Bhattacharya et al. (2003), Dharmapala and Khanna (2013), Gelos and Wei (2005), Li (2010), Miletkov et al. (2014), among others. Ammer et al. (2012) investigate the determinants of international investment for American investors and find cross-listing to be a very important factor; Bhattacharya et al. (2003) examine the cost of capital associated with opaque earnings disclosure; Dharmapala and Khanna examine the impact of corporate governance on firm value; Gelos and Wei examine the importance of transparent financial disclosures on attracting foreign investment; and Li examines the influence of adopting new accounting standard on cost of equity. Miletkov et al. examine the influence of corporate board independence on firms' ability to attract foreign capital.

There are several additional reasons - which are broadly related - that provide the motivation to conduct this empirical examination. These should also outline the overall contribution of this chapter to the existing literature. First, there is a tension

in the literature related to simultaneity between foreign investment and corporate governance. Does higher level of corporate governance attract more foreign investment or do foreign investors, after investing, demand better corporate governance? Or are these two factors determined simultaneously? There is no clear answer to this as yet since previous studies have used a cross-sectional data (e.g. Aggarwal et al., 2005; Leuz et al., 2010). Among other things, including control variables like financial leverage, cross-listing etc., which are related to ownership and governance structures of firms, leads to endogeneity concerns (see Doidge et al., 2004; Harvey et al., 2004). The use of panel data would be more suitable to study the relationship between these factors by checking within-firm variation over time (see Baltagi, 2005). The inclusion of exogenous shock in the form of regulatory reform – to be discussed shortly – adds to the robustness of the results.

Second, previous examinations have studied the foreign investment patterns of US investors (Aggarwal et al., 2005; Ammer et al., 2012; Leuz et al., 2010). While American investors are important to world investment, they still do not reflect the full picture as they constitute less than one-third of all foreign investors.[64] In other words, focusing on just American investors would run the risk of ignoring the remaining two-third of foreign investors and could lead to incomplete results. The rich dataset used in this study makes it possible to examine the foreign investment in India from all foreign investors, thus providing a more comprehensive representation of foreign investors.

[64] CPIS data shows total international equity investment of USD 22.1 trillion as of December 2014. International equity investment by US investors account for 30.3% (USD 6.7 trillion) of this total.

Third, finding float - or the investable proportion of asset, after taking into account insider ownership - has been a very tricky issue mainly because of lack of clear information regarding ownership structure (see Claessens et al., 2000; Dahlquist and Robertsson, 2001; Faccio and Lang, 2002; Foley and Greenwood, 2010; Kim, 2012, among others). The richness in the employed data permits construction of a relatively simple measure of float, as shall be discussed later.

Fourth, many previous studies tend to use a comprehensive survey data of US investors provided by US authorities. This data tends to belong to a certain point in time [e.g December 1997 in the case of Leuz et al. (2010)] [65] and related experimental data from different countries may not be available for the same point in time (for example, see Leuz et al.). This has the potential to lead to distorted results. The dataset used in this study corrects for this noise due to its very nature.

Fifth, existing studies generally use proxies related to ownership structure to get measures of corporate governance (e.g. Giannetti and Simonov, 2006; Leuz et al., 2010). This approach has its shortcomings. An underlying assumption with these studies is that most large shareholders will try to expropriate more than their rightful share of the firms' cash flows; institutional investors may have little incentive in doing so. On the other hand, smaller shareholders could collaborate to collectively control the firms. Further, questions can be raised regarding the validity of such numerical proxies. For example, firm-level data from Swedish market exhibit a considerable variation in corporate governance proxy across firms (Giannetti and Simonov, 2006). As Sweden has a well-established rule of law and judicial

[65] See http://ticdata.treasury.gov/Publish/flts.pdf for details. This data is also used by Ammer et al. (2012).

efficiency (La Porta et al., 1998), such disparity in corporate governance across Swedish firms could be capturing something else. This study employs an exogenous legal shock that can be expected to enforce corporate governance regulations (rather than relying solely on such numerical proxies).

Finally, the focus of this study is on a single emerging country: India. Many previous studies tend to look at cross-section of countries that differ significantly in important aspects like legal origin, language, distance, financial development, market liquidity, market integration, capital openness, accounting standards, transparency, culture, etc. Arguably, there are no best single proxies of these macroeconomic variables at country level. Although there is some consensus in the literature regarding the impact of global macroeconomic variables on explaining capital flows to emerging markets (e.g. Milesi-Ferretti and Tille, 2011), our understanding as to how such global factors have different level of impact across emerging markets is limited (Cerutti et al., 2015). The use of sole country in this analysis, coupled with the use of panel data, assists in controlling these country-specific variables much more effectively.

Using panel data set for approximately 1200 publicly-listed firms in India during 2001 to 2007, and using an exogenous systemic shock to conduct a natural experiment[66], this chapter provides evidence that enforcement of corporate governance leads to higher level of foreign equity ownership. This exogenous shock relates to a recent legislation enacted in 2000 that required listed firms - meeting certain threshold related to paid-up capital or net worth - to make their disclosures

[66] See Meyer (1995) for advantages of using natural experiments.

more transparent, to make their board more independent, and to make their internal audit committee more powerful.[67] It is important to reiterate that the focus of this study is in the stricter enforcement of this legislation starting from 2004 (rather than the legislation itself).

The rest of this chapter is structured as follows: section 5.2 discusses the relevant regulatory reform and enforcement in India; section 5.3 discusses the dependent and independent variables; section 5.4 presents the empirical analyses, with robustness tests in section 5.5; section 5.6 discusses the limitations of this chapter; and section 5.7 provides concluding remarks.

### *5.2. Related regulatory reforms in India*

In February of the year 2000, SEBI brought about regulatory changes in the Indian securities market in the form of Clause 49 of the Listing Agreement (henceforth also referred to as 'regulatory reform'). Among other things, this regulatory reform required greater board independence, enhanced disclosures, and more powerful audit committees in listed firms. Existing studies show that greater transparency and board independence can result in higher foreign ownership (see Akerlof, 1970; Gelos and Wei, 2005). However, this reform did not apply uniformly to all listed firms, and its application depended on crossing given thresholds related to level of equity capital or enlistment date.[68] All firms that were listed in the stock exchange on/after 2000 were required to comply with Clause 49 immediately. For all the other firms that were listed prior to 2000, only those were required to comply

[67] For details and more recent revisions, see http://www.sebi.gov.in/circulars/2004/cfdcir0104.pdf
[68] Even for firms that crossed the given thresholds, the reform applied in a step-wise manner from Feb 2000 to March 2003; see Dharmapala and Khanna (2013) for a primer on Clause 49

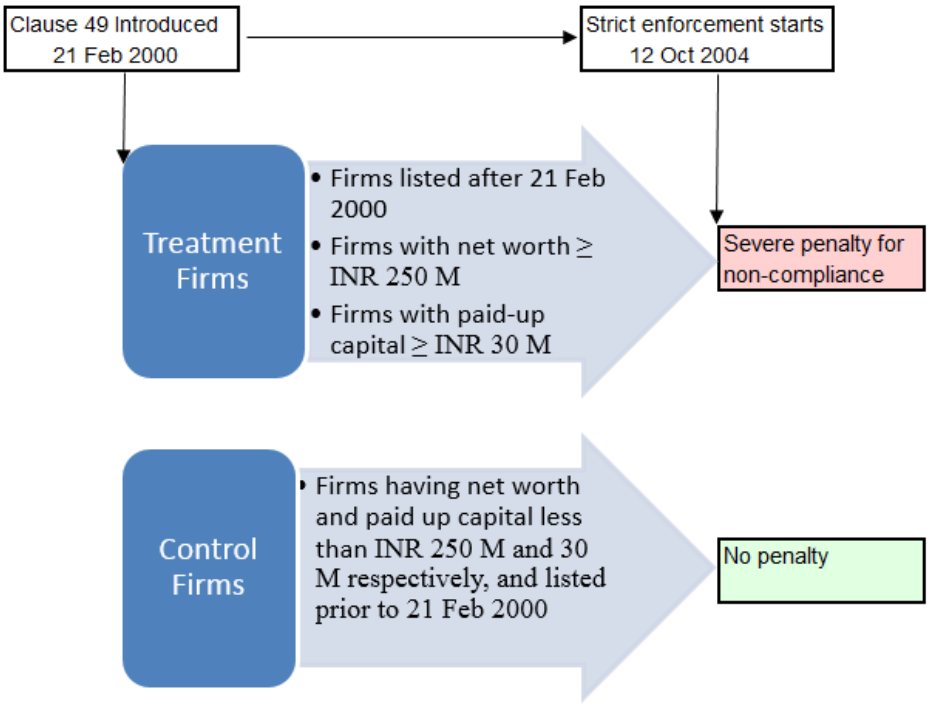
whose paid-up capital was at least Indian Rupee (INR) 30 million at any point in time or whose net worth was at least INR 250 million at any point in time. Hence, for the purpose of empirical analysis, this creates two separate sets of firms: treatment firms (i.e. firms that are subject to Clause 49); and control firms (i.e. firms not subject to Clause 49).

The focus of this chapter lies not just on the Clause 49 but more importantly on a subsequent unexpected enforcement of this regulatory reform in 2004 that mandated strict criminal and financial penalties (up to INR 250 million) on individuals and firms for breaching Clause 49. Prior to the introduction of this severe penalty, violation of Clause 49 was sanctioned only with delisting from stock exchanges. Hence, this unexpected introduction of severe penalties from 2004 can be expected to lead to better compliance of Clause 49 thus improving corporate governance of treatment firms (see Dharmapala and Khanna, 2013). This enforcement of existing regulatory reforms makes it possible to examine the impact of enforcement of better corporate governance on foreign equity ownership.

A simplified view of the regulatory reform, its stricter enforcement, key dates, and the applicability to new and existing firms is illustrated below:

*Figure 5.1*

**Clause 49 regulation and its enforceability**




As discussed by Dharmapala and Khanna (2013), an obvious concern - for empirical analysis – is whether the firms endogenously chose either to be or not to be bound by the regulatory reform. Since the regulatory reform was backward-looking (regarding how much equity capital they had in the past), firms subject to Clause 49 could not escape the reform by choosing to decrease their paid-up capital or networth. However, firms with equity capital or net worth lower than the threshold could potentially increase their capital base to attract the regulatory reform and the subsequent enforcement upon themselves. But the existing data does not provide support to possibility of such strategic manipulation of capital, as capital base for control firms have remained quite stable prior to and during the study period.

## *5.3. Data*

This section contains discussion on data, source of the data and construction of variables.

### *5.3.1. Dependent variable: foreign equity ownership*

The data on foreign ownership is from database called (India) Prowess which is maintained by Centre for Monitoring Indian Economy Pvt Ltd. (CMIE). Prowess contains data from the financial reports of roughly 37000 Indian firms, both public and private, from as far back as 1990, at various frequencies. Out of these firms, I take the subset of (approximately 7600) firms that are listed on Bombay Stock Exchange and National Stock Exchange of India[69]. Share ownership of promoters, non-promoters and custodians is reported separately for all firms and share ownership as of year-end is taken into consideration for all firms. I drop those observations (76 observations) where the total share ownership looks erroneous (as the total is significantly different from 100%).

Share ownership for promoters and non-promoters is further subdivided into various components that makes it possible to calculate proportion of total foreign ownership as well as non-promoters' foreign ownership of equity. For the purpose of computing foreign equity ownership (*FEO*) in this empirical chapter, I take equity held by foreign non-promoters only as a share of total equity held by non-promoters, thus excluding foreign promoters' holdings from the numerator. This exclusion of foreign promotors' share is warranted for two reasons. First, Indian Company Act defines promoters as, inter alia, insiders[70] and, as such, their monitoring costs are

[69] India has other exchanges but BSE and NSE are the two major ones.
[70] See http://www.mca.gov.in/MinistryV2/companiesact.html

unlikely to be impacted by enforcement of corporate governance as they are expected to have access to insider information anyway. Second, excluding insiders' holdings - whether they are foreign or domestic insiders – makes it possible to construct foreign ownership measure by taking into account only the investable portion of a firm's equity (see Dahlquist et al., 2003). Specifically, foreign equity ownership (*FEO*) is computed as shown in (5.1) below[71]:

$$FEO = \frac{total\ equity\ shares\ held\ by\ foreign\ nonpromoters}{total\ equity\ shares\ held\ by\ nonpromoters} \qquad (5.1)$$

I also discard all firms whose equity ownership data is not available for periods before and on/after the enforcement is applicable; i.e. all firms whose time series data is available only up to 2003 or only after 2003 are dropped. This helps to obviate one of the pitfalls of panel data whereby objects of interest – firms in this case – might move in and out of the sample. Cross-listing of shares in foreign exchanges has the potential to attract foreign investors (Ammer et al., 2012). To keep empirical analyses free from this positive influence of foreign listing on foreign equity investment, 90 such firms[72] are identified and dropped from the analysis. I drop firms that have negative net worth at any point during 2001 – 2007 (as they are technically bankrupt) and also those firms that have no foreign ownership during the entire period. This leaves 1213 listed firms in the data for empirical analysis.

[71] Holdings of foreign promoters are also not included as the Indian Company Act ( http://www.mca.gov.in/MinistryV2/companiesact.html ) defines promoters as, inter alia, insiders. As such, transparency and other internal corporate governance related information of a firm is duly accessible to insiders compared to outside investors, which includes the foreign non-promoters. In fact the reforms were oriented to protect the interest of minority (outside) shareholders from the insiders.

[72] Cross-listing data is from https://www.adrbnymellon.com/indices/adr-index/constituents and https://www.adr.com/Investors/Markets

Time series data is retained only up to 2007. This provides a more balanced length of time before and after the enforcement of regulation.

### *5.3.2. Control variables*

Drawing from the existing literature (e.g. Aggarwal et al., 2005; Ammer et al., 2012; Leuz et al., 2010), I control for various firm-level factors that might influence foreign ownership of a firm.

High concentration of ownership (*Insider*) within a family or group of promoters can possibly lead to expropriation of minority rights (see La Porta et al., 1999). On the other hand, low concentration of ownership control could also be detrimental to shareholders due to non-alignment of interest between the dispersed owners and managers (see Morck et al., 1988). The intuition is that level of family / management control could be beneficial up to an extent before it can become problematic. Hence, I control for family/management control in its linear as well as quadratic form. As a measure of ownership control, the proportion of equity shares held by promoters is used.

Size of a firm is an important control variable and there are competing theories as to how it might influence foreign investment. Larger firms that enjoy more media coverage and analyst-following (relative to smaller firms) may be perceived to be more transparent hence commanding higher level of foreign investment (see Ammer et al., 2012). However, contrary to conventional wisdom, ownership of most large firms is typically controlled by families or government in those economies that do not offer adequate shareholder rights and legal protection (La Porta et al., 1999). Hence, I control for firm size as an empirical issue without

subscribing to any a priori expectation. Some existing studies use market capitalization as a proxy of firm size especially in relation to different countries as the accounting standard (and hence the balance sheet size) could be different across countries (e.g. Ammer et al., 2012). Since this study uses firms from a single country, I use the balance sheet size of firms (*Size*) in this study in its natural log form.[73]

Dividend payout can send out positive signals to investors by suggesting that the firm is keen to pay out what is due to them without expropriating minority interest (Faccio et al., 2001; Jensen, 1986). Hence, I introduce a dummy variable (*Dividend*) (equal to one) for each firm year where firms have paid dividends (and zero otherwise). Evidence suggests that investors may want to buy past winners in what is known as positive feedback trading (see Nofsinger and Sias, 1999). As such, foreign investors can be expected to hold on to, or even increase their holdings on, firms that have provided positive stock returns in the recent past. Stock return (*Return*) is the annual stock return to equity investors for the given year. Stock return data is taken from Prowess and includes all benefits that accrue to shareholders including dividend payouts and capital gains arising out of capital actions of the firms. Following Leuz et al. (2010), I also control for price-to-book ratio (*Price/Book*) of firms. This variable captures the growth prospect of a firm; and investors may be inclined to invest more in firms with higher price-to-book ratio. Further, I control for firm-specific stock market liquidity (see Bailey et al., 1999) which can also influence foreign ownership. Market liquidity (*Turnover*) is taken as

[73] Market capitalization could also be simultaneously determined with foreign investment (see Aggarwal et al., 2005). In addition, market capitalization can differ between two exchanges (BSE and NSE) whereas balance sheet size provides a consistent measure.

the annual combined number of equity shares traded in BSE and NSE scaled by the total number of equity shares for a given firm.

Level of gearing (*Leverage*) is also known to impact foreigners' decision to invest in domestic firms. Dahlquist and Robertsson (2001), Kang and Stulz (1997) provide evidence – in the context of Japanese and Swedish investors – that foreigners invest less in small highly leveraged firms. I take long-term debt scaled by total equity as a measure of *Leverage*. Considering the time that may be needed for firm-specific variables to filter into investor sentiments, all firm-level control variables are lagged by one period, i.e. one year.

Various country-specific and global macroeconomic factors could also influence foreign ownership of Indian firms. Existing literature documents the importance of "push factors", i.e. shocks in advanced economies that persuade investors to invest in emerging markets, and "pull factors" that are related to the attractive features of macroeconomic fundamentals in emerging markets (see Fratzscher, 2011). The econometric modelling used in this chapter, as shall be discussed in section 5.4.2, makes it possible to control for these aggregate fluctuations.

A table of the key variables with brief description on the sources, and how they are constructed, is provided in Appendix 5.1.

## *5.4. Empirical analyses and discussions*

### *5.4.1. Summary statistics*

Summary statistics of key variables are shown in Table 5.1. Panel A shows year-wise statistics for the key variables while Panel B exhibits a comparison between control and treatment groups.[74] It is evident from Column I that average FEO is in an increasing trend after 2003. The mean and the median values for FEO differ substantially: for instance, in year 2004, mean and median FEO stand at 5.56 % and 0.06 % respectively; for the entire period, mean and median FEO are 12.53 % and 4.15 % with a Std. Dev of 17.03. This points to a considerable variability in foreign equity ownership structure of the firms in our data. The average value of FEO differs considerably between control group (average 2.89 %) and treatment group (average 6.94 %). Further insight into this disparity and change over time will be discussed in this section later.

Column II shows insider ownership structure of firms. Insider ownership, measured by the proportion of a firm's equity shares held by promoters, has remained relatively stable throughout the years, with the median values just over 50% in all the years. However, average size of the firms (Column III) in the data has increased throughout the years. These average values for *Size* are considerably higher than the median values due to relatively small number of firms with comparatively large balance sheets. The high level of dispersion of *Size* is also evident by its

[74] All exchange-specific data, except *Turnover*, are primarily based on the figures from BSE; if BSE figures are missing, data is supplemented by figures from NSE. *Turnover* is taken as the combined stock turnover in BSE and NSE.

measure of standard deviation. Even the median value for *Size* has steadily increased over the years, a trend witnessed in the dependent variable as well. [75]

Regarding dividends (Column IV), roughly 60 percent of the treatment firms paid dividends as compared to 31 percent for control firms (Panel B). Column V shows the average annual stock returns (*Return*) and this measure takes into account not just the capital gains but all other benefits that has accrued to an equity investor of the firm. This data is taken from Prowess and the calculations are not adjusted for foreign exchange fluctuations. Investors on average made losses in the initial years (2001 and 2002) but the annual returns are substantial and positive thereafter. For the entire period, firms have commanded an average yearly return of 61.2 percent (though the median annual return is lower at 18.1 percent). This figure represents a positive return of approximately 428 percent return over the seven-year period. Though this level of return seems to be substantially high compared to developed economies, it is reasonable to expect such healthy stock returns given that BSE market index (S&P BSE SENSEX) increased by 5.6 times during the sample period.[76] Comparison of stock returns for control and treatment firms reveal average daily return of control group firms to be even higher at 67.5 percent while that for treatment firms is 60.9 percent (see Panel B). Closer inspection reveals that this seemingly high return figure is not inconsistent with the increase in stock prices of the Indian firms throughout the years in the sample. The standard deviation (Std. Dev) figure for Return is particularly high (731.9) in year 2003. This is owing to

[75] Pairwise correlation coefficient between *FEO* and *Size* is 0.22

[76] S&P BSE Sensex increased from 3623 at the end of 2001 to 20287 at the end of 2007; see http://www.bseindia.com/ ; During the corresponding period, Dow Jones Industrial Average increased from 10260 to 12800; see www.djindexes.com

unusually high returns (more than 500%) for twelve firms. Out of these twelve firms, Hindustan Bio Sciences Ltd has provided the highest return of approximately 22400 % to their shareholders in local currency terms. Data from CMIE further shows that BSE closing price for Hindustan Bio Sciences Ltd has increased from around USD 0.002 to USD 0.832 from 2002 to 2003. As such, return to shareholder of approximately 22,400 % (in local currency term), though unusual, is not inconsistent with the figures provided by CMIE. At any rate, if returns of Hindustan Bio Sciences Ltd were to be considered erroneous and hence excluded from the calculation, the standard deviation of Return for 2003 would drop to 246. Further, if the returns of all the twelve firms (where returns are higher than 500%) were to be ignored, the standard deviation for Return for 2003 falls down to 80.9.

Price-to-book ratio (*Price/Book*) has increased especially during 2003-2006 (Column VI) with an overall average of 2.1 during the study period. Treatment firms on average fare better in this aspect with a *Price/Book* of 2.12 as compared to control group firms (1.46). With respect to annual stock turnover (*Turnover*) in Column VII, treatment group firms exhibit considerably higher stock turnover (201%) compared to that of control groups (14%). This disparity is less severe if the median values are taken into account (31% for treatment firms and 3% for control firms). This signifies that treatment firms enjoy a higher degree of market liquidity compared to control group firms.

Median values for *Leverage* (Column VII) has remained relatively stable throughout the years between 1 percent and 2 percent but the average *Leverage* is lower for control firms ( 2 percent) compared to treatment firms (4 percent). Since

treatment firms are composed of bigger firms in our data, this points to the possibility that bigger firms are relying comparatively more on external debt.

Now a closer look is taken into the pattern of *FEO* for control and treatment groups over time. Until 2003, the average *FEO* is slightly lower for control firms (see Figure 5.2) though this difference is not statistically significant at conventional level (Table 5.2). However, the average *FEO* for treatment group firms has witnessed a pronounced increase after 2004 while that for control group has remained somewhat stagnant. In figurative terms, FEO for treatment group firms was 0.69 percentage point higher than control firms up to 2003, though the difference is not statistically significant; this difference increases up to 6.4 percentage point after 2003 with a high statistical significance (see Panel B of Table 5.2).

Hence, preliminary examination suggests a significant increase in *FEO* for treatment group firms after the enforcement took effect.

### *5.4.2. Regression analysis*

The general regression specification for assessing the impact of corporate governance on foreign equity ownership (*FEO*) is shown in equation (5.2):

$$FEO_{jt} = \beta_1\left[Clause_t * Treat_j\right] + \beta_2 Clause_t + \beta_3 Treat_j + \boldsymbol{X_{jt-1}}\gamma + \alpha_j + \Omega_t + \dagger_j t + \varepsilon_{jt} \quad (5.2)$$

where $Clause_t$ is an indicator variable for years following 2003 when severe penalties were introduced for breaching Clause 49 (i.e. years 2004 - 2007); $Treat_j$ is the dummy variable of 1 for treatment firms (i.e. those firms where Clause 49 is applicable); $X_{jt-1}$ is a vector of firm-specific control variables as discussed in section

5.3.2. All of these control variables are lagged by one period in all regressions. $\alpha_j$ represents firm fixed effect (which gets omitted as the values within firms are time-demeaned (see Wooldridge, 2010), $\Omega_t$ is year fixed effect, and $\varepsilon_{jt}$ is the error term. Following Dharmapala and Khanna (2013), one more control variable is added: firm-specific time trend of the dependent variable. It could be the case that *FEO* in treatment group firms – which are presumably larger and more successful - increased after 2004 for alternative reasons not associated with the enforcement of corporate governance. Hence the growth rate of firms' *FEO* ($\uparrow_j t$) is included as an additional control measure to clean out the effect of underlying time trend in *FEO*.

In the difference-in-difference (DID) approach[77] specified in equation (5.2) above, the focus lies in $\beta_1$ which is expected to be positive. This is because foreign ownership in treatment firms is expected to increase at a higher degree than in control firms (that are not subject to the enforcement rules), even after controlling for a host of firm-specific variables and the underlying time trend in growth of *FEO*. The inclusion of time trend ($\uparrow_j t$) in the model above is a very conservative approach - as controls for possible determinants of FEO are already in place - and will put a downward pressure on $\beta_1$.

Results from various forms of equation (5.2) is shown in Table 5.3 with standard errors corrected at firm level. Column I shows results from simplest of settings without using any firm-level control variables apart from the time trend in *FEO* (*GrFEO*). As expected, the interaction term *Clause*Treat* is economically and

[77] This estimation technique basically relies on the difference between observed changes in treatment group firms before and after the cut-off date with that of control group firms. See Wooldridge, 2013; p - 455

statistically significant. Addition of other firm-specific control variables in step-wise manner (in column II – VIII) leads to no material change in the coefficient of interest. To consider the economic significance, FEO has increased in the treatment firms by roughly four percentage points more than in control firms (column VIII) during the enforcement period (2004 – 2007). In all columns, I control for any macroeconomic and global factors that might influence foreigners' decision to invest in India. This is done by allowing for separate intercepts for years which can absorb aggregate shocks like India-specific GDP growth, inflation, or global volatility.

Diverting attention away from the key variable of interest, control variables also bear expected sign though some of them are not statistically significant. *Insider* is initially positive and changes to negative in its quadratic form supporting the notion (Morck et al., 1988) that insider ownership can be attractive to foreign investors to certain extent but becomes unattractive once it crosses a threshold. The coefficient for *Size* is economically pronounced and statistically significant lending support to the view that larger firms are more attractive to foreigners (e.g. Ammer et al., 2012). The positive coefficient of *Return* suggests a strong tendency of foreigners towards positive feedback trading. The impact of growth prospects (Price/*Book*) and leverage (*Leverage*) is also in the expected direction and consistent with the existing literature but the economic significance is subdued for both.

### *5.5. Robustness tests*

The empirical analysis so far in the previous section (5.4) provides support to the notion that FEO has increased in firms that were subject to the enforcement of corporate governance rules. However, there are some considerable sources of concern. A closer inspection discloses that treatment group consists of firms from

133 different industries while control group is made up firms from just 40 industries. It is quite possible that the industries present only in the treatment group became more attractive to foreigners after 2003 – for reasons other than the enforcement – thus resulting in a positive and significant $\beta_1$ in the empirical findings. To provide an illustration, suppose that the treatment group contains firms from steel, cement, IT, and a host of other industries that suddenly became attractive to foreign investors after 2003 due to an external or global shock; and also suppose that firms from these industries are not present in the control group at all. Under this situation, coefficient of $\beta_1$ would be buoyed upwards with statistical significance even in the absence of D-i-D among comparable treatment and control firms. This upward bias is also possible if a vast majority of firms from such attractive industries fall in the treatment group even if the industry is not unique to treatment group alone; this remains a possibility given that the firms in the control group are vastly outnumbered by firms in the treatment group.

To address these aforementioned concerns, I control for time-varying industry-specific macroeconomic shocks by replacing year fixed effects by industry-year fixed effects.[78] Results shown in Table 5.4 exhibit qualitatively similar results.

### *5.5.1. Comparable treatment and control firms*

A causal impact of the enforcement on FEO, as witnessed in the results above, is subject to the assumption that the control and treatment group firms are similar to each other in other dimensions (apart from being subjected to the enforcement laws). Though I have controlled for a variety of firm-specific factors

[78] This technique is similar in spirit to Vig (2013).

that could impact *FEO*, the control firms may still not be good 'controls' for the treatment firms which are much larger in size; one can suspect that the treatment firms would have attracted higher *FEO* after 2003 for a variety of reasons not related to the enforcement of corporate governance. This leads to concerns regarding comparability of firms in treatment versus control group. I address this concern, in the following ways. First, I drop all firms belonging to industries that are unique to the treatment group; i.e. only those firms are retained which belong to industries in both treatment and control groups.[79] In doing so, about half the observations (all from the treatment group firms) are lost but the differences along firm-specific dimensions of control and treatment group firms become less severe (see Appendix 5.2, Panel B). Next, I focus attention to only those treatment firms that are relatively close to the threshold of applicability of the enforcement law. One way of achieving this is by taking firms having similar networth - to the extent allowed by the data - in control firms and treatment firms. This exploits the fact that the applicability of enforcement law between control firms and treatment firms is determined on the basis of past capital actions of the firms: two firms with similar networth (say, INR 249 million each) could be either treatment firm or control firm depending upon whether their paid-up capital exceeds the threshold of INR 30 million.[80]

In order to find firms with comparable net worth, I take the following steps: I first find the average net worth of all the 74 control firms for the enforcement year (2004) which happens to be INR 65.1 million; I then take the highest possible number of treatment firms in the sample so as to make the median networth of the

[79] All further empirical tests are done using this pared down sample.
[80] The implicit assumption is that the past capital actions of firms (i.e. increasing the paid-up capital beyond the threshold) were not made in anticipation or as a result of the enforcement laws.

treatment firms (for 2004) as close as possible to the average networth of the control firms (INR 65.1 million). This yields 72 treatment firms with average and median networth of INR 65.9 million and 65.4 million respectively. The average differences along most of the other firm-specific dimensions in this pared down sample are also less severe for these two groups (see Appendix 5.2, Panel C) as compared to the full sample. For example, the difference in *FEO* is narrowed down to 1.71 percentage point (as compared to a difference of 4.1 percentage point in the full sample); difference in *Size* has drastically declined to USD 2.8 million (from 494 million in the full sample).[81] I re-run specification (5.2) using this reduced sample; the results shown in Table 5.5 show that the coefficient of *Clause * Treat* become somewhat weaker but remain economically and statistically significant. This mitigates the concern, to some extent, regarding control group firms and treatment group firms not being comparable.

### *5.5.2. Alternative explanations*

If the year 2004 witnessed any other regulatory reform capable of influencing *FEO* differentially in treatment and control group firms, then the results discussed above would be misleading. In an extreme case, all such positive increase in *FEO* in treatment firms could be attributable to such reforms rather than the enforcement of Clause 49. Dharmapala and Khanna (2013) do an "extensive search of Indian newspapers and other news sources for other important events in 2004" and find no such event apart from one related to California Public Employees' Retirement

[81] Differences in *Return* and *Turnover* have also narrowed down; but differences in two variables viz. *Insider* and *Price/Book* become more severe.

System (Calpers)[82]. In 2004, Calpers decided to include Indian equity market within its range of investable emerging markets. [83] Until the preceding year, Calpers had ruled out investing in India. As such, it could be argued that the increase in FEO of treatment firms came about due to increased investment of Calpers and not due to the enforcement of corporate governance. In this context, I offer some explanations as to why Calpers' investments would have little or no impact on the interpretation of the empirical results. First, it can be expected that Calpers did not invest in a large number of treatment firms in 2004 itself because they had invested in only 77 Indian firms by 2006 (see Dharmapala and Khanna, 2013). Such a small proportion of treatment firms would not possibly be able to dent the overall results in a significant way. [84] Second, any investment Calpers made in Indian firms can be reasonably expected to be in larger firms (which are treatment firms). If this was indeed the case, these larger treatment firms would have already been dropped from the sample in the robustness test with comparable treatment and control firms in section 5.5.1. Third, in the unlikely event that Calpers made investments in the control group (smaller) firms, it would provide more conservative estimates of the key interaction term (*Clause *Treat*) in the above econometric models because it would subdue the D-i-D effect. Finally, if the decision of Calpers - to invest in India - was indeed due to the enforcement of corporate governance laws, it would actually complement the overall finding discussed in the empirical analyses above.

[82] Calpers is the largest public pension fund in the US. For details, see https://www.calpers.ca.gov/page/home

[83] See "India back on Calpers' investment radar", *The Economic Times*, 20 April 2004 available at http://articles.economictimes.indiatimes.com

[84] It is implied that Calpers' investment in number of Indian firms increased rather than decreased after 2004. The obverse would be very unlikely. Total number of treatment firms are 1032 in the baseline regression.

### *5.5.3. False experiment*

I now conduct a "false experiment" which is similar in spirit to Dharmapala and Khanna (2013). The objective is to check if the same incremental effect in *Clause*Treat* can be observed if the enforcement year is falsely set to 2003 (instead of the actual 2004). For this purpose, the year 2003 is assumed to be the start of the false enforcement year *ClauseF* and a false interaction of key variable (*ClauseF * Treat*) is created accordingly. I retain data only up to year 2004 and re-run specification (5.2) and provide the results in Table 5.6. Column I shows that the key interaction term *ClauseF*Treat* is economically important but statistically insignificant. The economic significance is due to the fact that the data is inclusive of observations from year 2004 when the treatment firms commanded higher *FEO* compared to the previous year (see Figure 5.2); and the coefficient is a reflection of how much FEO increased in treatment firms in years 2003 and 2004 combined (compared to previous years in the data). To check the coefficient of the interaction term just for year 2003 when the enforcement is falsely assumed to have taken place, I narrow down the data upto 2003 in column II and the coefficient of *ClauseF*Treat* now becomes economically as well as statistically insignificant. The coefficient of the interaction term in column II is an indication of how much FEO increased in the treatment firms in year 2003 and the figure is a reflection of what can be seen in Figure 5.2 and earlier results. In column III, for comparison purpose, I provide results from the normal experiment (specification (5.2)) where the enforcement year is the actual year (2004). *Clause*Treat* in column III is economically and statistically significant and the coefficient represents how much *FEO* changed in year 2004

compared to earlier years (2001-2003). This finding is consistent with the earlier results in this chapter.

### *5.5.4. First-differenced regression discontinuity*

As an additional test, the panel data structure in the sample makes it possible to examine any sudden change in FEO during 2004 in the treatment firms using a first-differenced regression discontinuity (Lemieux and Milligan, 2008). This approach allows to control for unobserved variables that may have an impact on the firm's FEO. This test is similar in spirit to that of Dharmapala and Khanna (2013) and is specifically focussed on the year 2004 and on the effect around the threshold applicability of Clause 49. More specifically, this test involves conducting a regression analysis of the following form:

$$\Delta FEO_{j,2004} = \beta_1 Treat + f[P_{2004,} N_j] + \gamma \Delta X_{j,2004} + \alpha_j + \varepsilon_{j,2004} \quad (5.3)$$

where $\Delta FEO_{j,2004} = FEO_{j,2004} - FEO_{j,2003}$, $Treat$ is the dummy variable of one for treatment firms, otherwise zero, $P_{2004}$ is the firm *j's* paid-up capital in 2004, $N_j$ is the maximum net worth of the firm *j* in the years 2001 to 2004, $X_j$ is a column vector of firm-level control variables as discussed in section 5.3.2 and $\alpha_j$ indicates dummies for industries. The main identifying assumption of this approach is that $f[P_{2004,} N_j]$ is a smooth function of paid-up share capital and net worth, and controls for any continuous impact of paid-up capital and net worth on the change of firm's FEO in 2004. $\beta_1$ reflects the discontinuity in FEO for the treatment firms.

The results for specification (5.3) are shown in Table 5.7. The coefficient of 0.96 for the variable of interest *Treat* shows that the treatment effect is economically

and statistically significant. It is worth noting that this coefficient reflects the increase in the first difference FEO of treatment firms for the year 2004 only and is thus generally comparable to the DiD estimate where we run our baseline regression only up to year 2004 (Column III of Table 5.6). This exercise thus underpins the results so far.

### *5.6. Limitations of this chapter and areas for future research*

In this study, insider shareholders and non-insiders are delineated based on whether or not the investors hold promoters' shares; this is because promoters, in this context, are defined by the relevant law as insiders. However, it is quite possible that at least some of the non-promoters are insiders as well; and this study ignores that possibility because the available data does not identify such non-promoter insiders. Existing studies in the literature (e.g. Ammer et al., 2012) have adopted an approach of considering large shareholders as insiders but all large shareholders are not insiders and this approach is unable to detect a group of insiders who may severally hold small number of shares but collectively own enough shares to control a firm. Hence, the possible non-detection of insiders remains as a caveat in this study.

Another source of concern in this study emanates from the significant differences between the key characteristics of control and treatment firms and this difference is particularly severe in size. Though a number of empirical steps have been taken to ensure that results are clean, there still remains a possibility that the foreign share ownership in treatment firms is driven not just due to the enforcement of corporate governance but due to the inherent characteristics of the firms themselves. Ideally, control and treatment firms having similar characteristics should

have been chosen for the empirical analyses; but the available data does not allow that. Nevertheless, this issue remains as another limitation of this study.

Though there exists a rich literature on the impact of corporate governance, this field still offers plenty of areas for future research. For example, providing a more reliable measure of insider ownership in itself would be a worthwhile undertaking. Further, does the impact of corporate governance apply uniformly across domestic and foreign investors especially in emerging markets? An attempt to answer this question could provide interesting results.

### *5.7. Conclusion*

By employing difference in difference technique using shock-based experiment in a panel dataset of publicly listed firms over seven years, this chapter provides consistent evidence that foreign investors invest more in firms where corporate governance measures have been enforced. These results are robust to firm size, industry-specific systemic shocks, foreign cross-listing, and sample selection bias. The results show that the impact of enforcement of corporate governance at country level has a positive influence on foreign equity ownership and the impact is economically and statistically significant.

Through this empirical exercise, this chapter contributes mainly to two strands of literature. First, it adds to the literature related to the influence of legal factors on external finance, initiated by La Porta et al. (1998, 1997) and built upon by Beck et al. (2005). These studies examine the relationship among legal origins, investor protection, and capital markets. In addition, this paper also adds to the literature examining the determinants of foreign investment and how foreign

investors are influenced by country and firm characteristics (e.g. Aggarwal et al., 2005; Gelos and Wei, 2005; Leuz et al., 2010). Unlike these existing papers, this study identifies the positive link between enforcement of existing corporate governance laws and foreign ownership at firm level by using a natural experiment involving an exogenous legal shock.

The findings of this paper have policy implications for domestic firm owners as well as governments. Domestic firm owners can demand their respective governments to strictly enforce corporate governance rules to increase foreign investment in their firms. In a similar vein, policymakers can choose to implement corporate governance regulations, in a strict manner, within their jurisdiction to increase proportion of foreign equity investment in their domestic markets, thus improving foreign bias and international risk-sharing.

**Table 5.1: Summary Statistics**

This table presents the summary statistics (Mean, Median, Standard Deviation and Number of observations) of all variables used in this study. Panel A reports the year wise statistics while Panel B presents the statistics by treatment, control and overall groups. *FEO* is percentage of equity shares held by foreign non-promoters relative to total shares held by all non-promoters. *Insider* is the percentage of equity shares held by promoters as a share of total number of paid-up equity shares. *Size* is the value of total assets expressed in million USD. *Dividend* is a dummy variable which takes the value of one for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for the year. *Price/Book* is the ratio of market price to book value of the equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is ratio of long term debt to total equity.

**Panel A: Year wise summary statistics**

| Year | Statistics | FEO (%) | Insider (%) | Size (USD Million) | Dividend (0-1) | Return (%) | Price/Book (times) | Turnover | Leverage |
|---|---|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | V | VI | VII | VIII |
| | No. of obs. | 987 | 987 | 936 | 987 | 941 | 933 | 940 | 882 |
| 2001 | Mean | 3.94 | 49.20 | 320.70 | 0.61 | -20.13 | 1.94 | 0.57 | 0.03 |
| | Median | 0.04 | 50.39 | 32.75 | 1.00 | -40.09 | 0.70 | 0.10 | 0.02 |
| | Std. Dev | 8.66 | 19.86 | 2241.19 | 0.49 | 165.51 | 4.01 | 2.64 | 0.11 |
| | No. of obs. | 1069 | 1069 | 998 | 1069 | 1008 | 1000 | 1006 | 926 |
| 2002 | Mean | 3.23 | 50.30 | 317.99 | 0.55 | -17.69 | 0.94 | 0.64 | 0.13 |
| | Median | 0.02 | 50.99 | 30.74 | 1.00 | -27.37 | 0.44 | 0.05 | 0.02 |
| | Std. Dev | 8.22 | 19.57 | 2393.70 | 0.50 | 71.27 | 1.64 | 3.47 | 3.20 |
| | No. of obs. | 1118 | 1118 | 1070 | 1118 | 1052 | 1050 | 1052 | 985 |
| 2003 | Mean | 3.05 | 51.54 | 371.69 | 0.52 | 77.05 | 0.99 | 1.06 | 0.04 |
| | Median | 0.02 | 52.41 | 30.38 | 1.00 | 24.17 | 0.52 | 0.10 | 0.01 |
| | Std. Dev | 7.89 | 19.74 | 2613.35 | 0.50 | 731.90 | 1.83 | 6.31 | 0.24 |
| | No. of obs. | 1106 | 1106 | 1070 | 1106 | 1058 | 1057 | 1057 | 976 |
| 2004 | Mean | 5.57 | 51.41 | 407.44 | 0.55 | 166.87 | 1.33 | 1.13 | 0.03 |
| | Median | 0.07 | 52.29 | 33.54 | 1.00 | 125.38 | 0.74 | 0.31 | 0.01 |
| | Std. Dev | 11.51 | 19.62 | 2879.37 | 0.50 | 177.79 | 2.97 | 4.05 | 0.23 |
| | No. of obs. | 1108 | 1108 | 1066 | 1108 | 1069 | 1068 | 1069 | 975 |
| 2005 | Mean | 7.61 | 50.84 | 492.85 | 0.59 | 71.77 | 1.93 | 0.90 | 0.03 |
| | Median | 0.83 | 51.76 | 40.21 | 1.00 | 35.57 | 1.10 | 0.46 | 0.01 |
| | Std. Dev | 13.28 | 19.26 | 3387.70 | 0.49 | 146.27 | 5.46 | 1.31 | 0.14 |
| | No. of obs. | 1084 | 1084 | 1056 | 1084 | 1058 | 1057 | 1058 | 966 |
| 2006 | Mean | 10.87 | 48.95 | 621.51 | 0.67 | 103.50 | 3.65 | 1.49 | 0.02 |
| | Median | 2.89 | 50.16 | 49.53 | 1.00 | 51.20 | 2.07 | 0.90 | 0.01 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Std. Dev | 15.43 | 19.14 | 4086.53 | 0.47 | 203.16 | 13.24 | 1.87 | 0.06 |
| | No. of obs. | 1084 | 1084 | 1055 | 1084 | 1058 | 1056 | 1058 | 959 |
| 2007 | Mean | 12.83 | 48.43 | 728.41 | 0.67 | 34.30 | 3.42 | 7.51 | 0.02 |
| | Median | 4.48 | 50.14 | 57.09 | 1.00 | 4.28 | 2.10 | 0.55 | 0.01 |
| | Std. Dev | 17.17 | 19.11 | 4612.89 | 0.47 | 166.63 | 5.99 | 212.58 | 0.04 |

**Panel B: Summary statistics by control and treatment groups**

| Group | Statistics | FEO | Insider | Size | Dividend | Return(%) | Price-Book | Turnover | Leverage |
|---|---|---|---|---|---|---|---|---|---|
| | No. of obs. | 449 | 449 | 420 | 449 | 324 | 313 | 321 | 293 |
| Control | Mean | 2.89 | 51.80 | 3.42 | 0.28 | 67.53 | 1.27 | 0.14 | 0.02 |
| (74 firms) | Median | 1.96 | 51.73 | 2.61 | 0.00 | 19.41 | 0.62 | 0.03 | 0.01 |
| | Std. Dev | 5.20 | 21.59 | 3.58 | 0.45 | 210.07 | 2.02 | 0.32 | 0.04 |
| | No. of obs. | 7107 | 7107 | 6831 | 7107 | 6920 | 6908 | 6919 | 6376 |
| Treatment | Mean | 7.00 | 50.01 | 497.72 | 0.61 | 60.91 | 2.07 | 2.01 | 0.04 |
| (1139 firms) | Median | 0.17 | 51.01 | 43.74 | 1.00 | 18.12 | 1.01 | 0.31 | 0.01 |
| | Std. Dev | 13.06 | 19.35 | 3398.78 | 0.49 | 326.20 | 6.50 | 83.15 | 1.23 |
| | No. of obs. | 7556 | 7556 | 7251 | 7556 | 7244 | 7221 | 7240 | 6669 |
| All firms | Mean | 6.75 | 50.12 | 469.09 | 0.59 | 61.21 | 2.04 | 1.93 | 0.04 |
| | Median | 0.26 | 51.01 | 38.77 | 1.00 | 18.18 | 0.99 | 0.28 | 0.01 |
| | Std. Dev | 12.77 | 19.49 | 3300.89 | 0.49 | 321.90 | 6.37 | 81.28 | 1.20 |

**Table 5.2: Univariate difference-in-difference results**

This table shows the DiD results for the treatment and control groups. Panel A reports the average FEO for both groups over the period of 2001-2003 while Panel B presents the average FEO over the period of 2004-2007. *FEO* is the percentage of equity shares held by foreign non-promoters relative to total shares held by all non-promoters. Treatment firms are subject to Clause 49 and its enforcement while Control firms are not

| **Panel A:** | **Year 2001 - 2003** | | | |
|---|---|---|---|---|
| Group | No. of obs | Mean FEO (%) | Std. Err. | t-statistics |
| Control | 206 | 2.717 | 0.451 | |
| Treatment | 2988 | 3.414 | 0.153 | |
| Difference | | 0.697 | 0.593 | **1.175** |

| **Panel B:** | **Year 2004 - 2007** | | | |
|---|---|---|---|---|
| Group | No. of obs | Mean FEO(%) | Std. Err. | t-statistics |
| Control | 243 | 3.033 | 0.244 | |
| Treatment | 4222 | 9.435 | 0.231 | |
| Difference-in-difference | | 6.403 | 0.964 | **6.645** |

**Table 5.3: Regression of foreign equity ownership (FEO) on enforcement of corporate governance**

Dependent variable is *FEO* which is the number of equity shares held by foreign non-promoters scaled by total number of equity shares held by non-promoters. *Treat* is a dummy variable of 1 for firms subject to Clause 49, otherwise 0. *Clause* is a dummy variable of 1 for years 2004 and beyond when Clause 49 was strictly enforced. *Insider* is the number of equity shares held by promoters as a share of total number of equity shares. *Insider2* is quadratic form of *Insider*. *Size* is the total assets from balance sheet of firms, expressed in million USD. *Dividend* is a dummy variable of 1 for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for investors. *Price/Book* is market price of equity divided by book value of equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is long term debt divided by total equity. *GrFEO* is the yearly growth rate in FEO for firms. All continuous control variables are lagged by one year. Data is yearly and is from 2001 to 2007. All models report results with the standard errors corrected at firm level. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics shown in brackets.

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| Clause*Treat | 5.074*** | 5.198*** | 4.283*** | 4.277*** | 4.586*** | 4.549*** | 4.545*** | 4.001*** |
| | (8.97) | (8.50) | (6.81) | (6.83) | (5.20) | (5.16) | (5.16) | (8.41) |
| Insider | | 0.221*** | 0.194*** | 0.191*** | 0.222*** | 0.220*** | 0.218*** | 0.232*** |
| | | (3.89) | (3.34) | (3.30) | (3.75) | (3.72) | (3.69) | (3.53) |
| Insider2 | | -0.00359*** | -0.00310*** | -0.00308*** | -0.00345*** | -0.00345*** | -0.00344*** | -0.00363*** |
| | | (-5.43) | (-4.57) | (-4.54) | (-4.98) | (-4.98) | (-4.96) | (-4.79) |
| Size | | | 5.611*** | 5.563*** | 5.825*** | 5.846*** | 5.853*** | 6.712*** |
| | | | (10.26) | (10.14) | (10.15) | (10.25) | (10.20) | (10.41) |
| Dividend | | | | 0.425 | 0.316 | 0.302 | 0.308 | -0.0117 |
| | | | | (0.90) | (0.66) | (0.63) | (0.64) | (-0.02) |
| Return | | | | | 0.000633 | 0.000590 | 0.000589 | 0.000700 |
| | | | | | (1.63) | (1.60) | (1.60) | (1.60) |
| Price/Book | | | | | | 0.0757* | 0.0756* | 0.0550 |
| | | | | | | (1.77) | (1.77) | (1.61) |
| Turnover | | | | | | | 0.00200*** | 0.00202*** |
| | | | | | | | (23.90) | (24.66) |
| Leverage | | | | | | | | -0.0322*** |
| | | | | | | | | (-2.65) |
| GrFEO | YES | YES | YES | YES | YES | YES | YES | YES |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Firm Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Year Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Constant | 3.830*** | 3.067** | -16.17*** | -16.23*** | -18.20*** | -18.33*** | -18.34*** | -22.07*** |
| | (16.14) | (2.47) | (-7.05) | (-7.10) | (-7.34) | (-7.43) | (-7.40) | (-7.78) |
| Adjusted $R^2$ | 0.196 | 0.216 | 0.273 | 0.274 | 0.278 | 0.280 | 0.280 | 0.295 |
| No. of obs. | 7567 | 7567 | 7258 | 7258 | 6975 | 6967 | 6965 | 6458 |

**Table 5.4: Regression of foreign equity ownership (FEO) on enforcement of corporate governance – Industry-year fixed effects**

Dependent variable is *FEO* which is the number of equity shares held by foreign non-promoters scaled by total number of equity shares held by non-promoters. *Treat* is a dummy variable of 1 for firms subject to Clause 49, zero otherwise. *Clause* is a dummy variable of 1 for years 2004 and beyond when Clause 49 was strictly enforced. *Insider* is the number of equity shares held by promoters as a share of total number of equity shares. *Insider2* is quadratic form of *Insider*. *Size* is the total assets from balance sheet of firms, expressed in million USD. *Dividend* is a dummy variable of 1 for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for investors. *Price/Book* is market price of equity divided by book value of equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is long term debt divided by total equity. *GrFEO* is the yearly growth rate in FEO for firms. All continuous control variables are lagged by one year. Data is yearly and is from 2001 to 2007. All models report results with the standard errors corrected at firm level. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics shown in brackets.

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| Clause*Treat | 4.275*** | 4.423*** | 3.999*** | 3.985*** | 4.065*** | 4.027*** | 4.001*** | 3.970*** |
| | (5.19) | (5.28) | (4.58) | (4.56) | (3.82) | (3.56) | (3.55) | (4.19) |
| Insider | | 0.211*** | 0.188*** | 0.184*** | 0.224*** | 0.224*** | 0.224*** | 0.225*** |
| | | (3.09) | (2.71) | (2.65) | (5.69) | (3.15) | (3.14) | (2.79) |
| Insider2 | | -0.00350*** | -0.00311*** | -0.00307*** | -0.00355*** | -0.00356*** | -0.00356*** | -0.00366*** |
| | | (-4.66) | (-4.04) | (-3.99) | (-8.38) | (-4.53) | (-4.52) | (-4.17) |
| Size | | | 5.093*** | 4.986*** | 5.305*** | 5.316*** | 5.320*** | 6.087*** |
| | | | (8.51) | (8.33) | (16.96) | (8.73) | (8.68) | (9.17) |
| Dividend | | | | 0.845 | 0.740* | 0.729 | 0.733 | 0.422 |
| | | | | (1.62) | (1.92) | (1.38) | (1.39) | (0.78) |
| Return | | | | | 0.000486 | 0.000451 | 0.000451 | 0.000497 |
| | | | | | (1.52) | (1.32) | (1.32) | (1.32) |
| Price/Book | | | | | | 0.0775* | 0.0774* | 0.0531* |
| | | | | | | (1.93) | (1.93) | (1.90) |
| Turnover | | | | | | | 0.00281*** | 0.00432*** |
| | | | | | | | (3.61) | (42.27) |
| Leverage | | | | | | | | -0.0304* |
| | | | | | | | | (-1.72) |
| GrFEO | YES | YES | YES | YES | YES | YES | YES | YES |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Firm Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Year * Industry Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Adjusted $R^2$ | 0.620 | 0.630 | 0.654 | 0.654 | 0.665 | 0.658 | 0.658 | 0.670 |
| No. of obs. | 7372 | 7372 | 7053 | 7053 | 6757 | 6749 | 6746 | 6215 |

**Table 5.5: Regression of FEO – comparable control and treatment firms**

Dependent variable is FEO which is the number of equity shares held by foreign non-promoters scaled by total number of equity shares held by non-promoters. Treat is a dummy variable of 1 for firms subject to Clause 49, zero otherwise. Clause is a dummy variable of 1 for years 2004 and beyond when Clause 49 was strictly enforced. Insider is the number of equity shares held by promoters as a share of total number of equity shares. Insider2 is quadratic form of Insider. Size is the total assets from balance sheet of firms, expressed in million USD. Dividend is a dummy variable of 1 for firms that paid dividend during that year, zero otherwise. Return is the annual stock return for investors. Price/Book is market price of equity divided by book value of equity. Turnover is the number of equity shares traded in a year scaled by the total number of equity shares of firms. Leverage is long term debt divided by total equity. GrFEO is the yearly growth rate in FEO for firms. All continuous control variables are lagged by one year. Data is yearly and is from 2001 to 2007. All models report results with the standard errors corrected at firm level. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. t-statistics shown in brackets.

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| Clause*Treat | 2.046** | 2.064** | 2.139** | 2.090** | 3.027** | 3.019** | 2.925** | 2.893** |
| | (2.24) | (2.27) | (2.35) | (2.32) | (2.57) | (2.58) | (2.33) | (2.49) |
| Insider | | -0.109 | -0.141 | -0.143 | -0.129 | -0.129 | -0.113 | 0.0409 |
| | | (-0.72) | (-0.79) | (-0.80) | (-0.69) | (-0.69) | (-0.61) | (0.17) |
| Insider2 | | 0.000774 | 0.00109 | 0.00113 | 0.000857 | 0.000860 | 0.000832 | -0.00188 |
| | | (0.40) | (0.48) | (0.49) | (0.35) | (0.35) | (0.33) | (-0.59) |
| Size | | | 2.179** | 1.939** | 1.661* | 1.667* | 1.428 | 2.290* |
| | | | (2.44) | (2.31) | (1.81) | (1.83) | (1.63) | (1.68) |
| Dividend | | | | 2.368* | 2.768** | 2.804** | 2.474** | 1.944 |
| | | | | (1.84) | (2.01) | (2.03) | (1.98) | (1.39) |
| Return | | | | | 0.000115 | 0.000110 | 0.000191 | 0.000247 |
| | | | | | (0.88) | (0.85) | (1.37) | (1.37) |
| Price/Book | | | | | | 0.0231 | 0.0289 | 0.0154 |
| | | | | | | (0.87) | (1.15) | (0.97) |
| Turnover | | | | | | | 1.541** | 1.842* |
| | | | | | | | (2.13) | (1.78) |
| Leverage | | | | | | | | -9.851 |
| | | | | | | | | (-0.91) |
| GrFEO | YES | YES | YES | YES | YES | YES | YES | YES |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Firm Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Year Fixed | YES | YES | YES | YES | YES | YES | YES | YES |
| Constant | 2.972*** | 5.994** | 5.354* | 4.831 | 4.236 | 4.122 | 3.435 | 1.540 |
| | (5.51) | (2.35) | (1.78) | (1.64) | (1.28) | (1.25) | (1.06) | (0.36) |
| Adjusted $R^2$ | 0.0607 | 0.0649 | 0.100 | 0.110 | 0.115 | 0.115 | 0.135 | 0.203 |
| No. of obs. | 916 | 916 | 858 | 858 | 710 | 708 | 707 | 571 |

**Table 5.6: Regression of Foreign Equity Ownership (FEO) on corporate governance – False experiment (comparing similar industries)**

Dependent variable is *FEO* which is the number of equity shares held by foreign non-promoters scaled by total number of equity shares held by non-promoters. Column I and II show results from false experiment and Column III shows regular results for comparison. Treat is a dummy variable of 1 for firms subject to Clause 49, zero otherwise. ClauseF is a dummy variable of 1 for years 2003 and beyond. Clause is a dummy variable of 1 for years 2004 and beyond when Clause 49 was strictly enforced. Insider is the number of equity shares held by promoters as a share of total number of equity shares. Insider2 is quadratic form of Insider. Size is the total assets from balance sheet of firms, expressed in million USD. *Dividend* is a dummy variable of 1 for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for investors. *Price/Book* is market price of equity divided by book value of equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is long term debt divided by total equity. *GrFEO* is the yearly growth rate in FEO for firms. All continuous control variables are lagged by one year. Data is yearly and starts from 2001. All models report results with the standard errors corrected at firm level. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels. *t*-statistics shown in brackets.

| | I | II | III |
|---|---|---|---|
| | False experiment year<=2004 | False experiment year<=2003 | Normal Year <=2004 |
| ClauseF*Treat | 0.593 | 0.0117 | |
| | (1.13) | (0.02) | |
| Clause*Treat | | | 1.340*** |
| | | | (2.90) |
| Insider | 0.233*** | 0.131 | 0.231** |
| | (2.59) | (1.24) | (2.58) |
| Insider2 | -0.00319*** | -0.00164 | -0.00318*** |
| | (-3.03) | (-1.43) | (-3.02) |
| Size | 4.116*** | 0.175 | 4.114*** |
| | (3.94) | (0.25) | (3.96) |
| Dividend | -0.143 | -0.779 | -0.147 |
| | (-0.26) | (-1.53) | (-0.27) |
| Return | 0.000280 | 0.000392 | 0.000282 |
| | (1.60) | (1.36) | (1.48) |
| Price/Book | 0.246 | -0.0109 | 0.246 |
| | (1.29) | (-0.06) | (1.29) |

| | | | |
|---|---|---|---|
| Turnover | 0.0775 | -0.0731 | 0.0775 |
| | (0.75) | (-0.64) | (0.75) |
| Leverage | -9.091** | -1.951 | -8.946** |
| | (-2.08) | (-0.97) | (-2.05) |
| GrFEO | YES | YES | YES |
| Firm Fixed | YES | YES | YES |
| Year Fixed | YES | YES | YES |
| Constant | -12.05*** | 1.527 | -12.02*** |
| | (-3.17) | (0.61) | (-3.17) |
| Adjusted $R^2$ | 0.115 | 0.0422 | 0.116 |
| No. of obs. | 1738 | 1277 | 1738 |

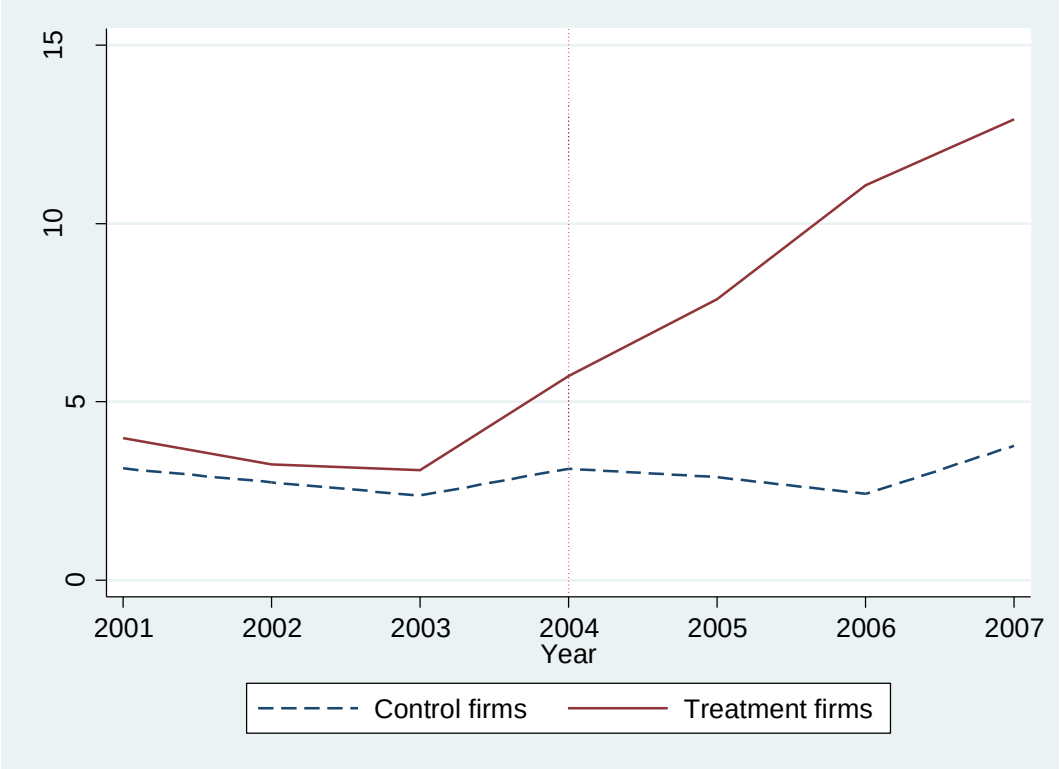
**Table 5.7: First-differenced regression discontinuity**

This table shows the results for first-differenced regression discontinuity (as specified in specification (5.3)). Dependent variable is *FEO* which is the number of equity shares held by foreign non-promoters scaled by total number of equity shares held by all non-promoters. *Treat* is a dummy variable of 1 for firms subject to Clause 49, otherwise 0. *Paid up capital* is the paid-up capital in INR million for firms in 2004. *Net worth* is the maximum net worth of firms in INR million during 2001 to 2004. *Insider* is the number of equity shares held by promoters as a share of total number of equity shares. *Insider*$^2$ is quadratic form of *Insider*. *Size* is the total assets from balance sheet of firms, included in natural logarithm form of million USD. *Dividend* is a yearly dummy variable of 1 for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for investors. *Price/Book* is market price of equity divided by book value of equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is long term debt divided by total equity. All dependent, independent and control variables, except *Paid up Capital* and *Net worth*, are taken as the change in the values in 2004 with respect to year 2003. All estimates are reported with the standard errors corrected at firm level. Statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels with *t*-statistics shown in brackets.

| | Dependent variable (FEO) |
|---|---|
| Clause 49 Group | 0.960*** |
| | (2.68) |
| Paid-up Capital | -0.000209 |
| | (-1.54) |
| Net worth | 0.000110** |
| | (2.30) |
| Insider | 0.149 |
| | (0.95) |
| Insider2 | -0.00292* |
| | (-1.75) |
| Size | 4.015** |
| | (2.44) |
| Dividend | 0.720 |
| | (0.92) |
| Returns | 0.000220* |
| | (1.83) |
| Price-Book | 1.394** |
| | (2.26) |
| Turnover | 0.210 |
| | (0.50) |
| Leverage | -1.595 |
| | (-0.56) |
| Industry Fixed (130 industries) | Yes |
| $R^2$ | 0.266 |
| Adjusted $R^2$ | 0.121 |
| Number of observations | 849 |

**Figure 5.2: Comparative FEO of control and treatment firms for years 2001-2007**

*FEO* is the percentage of equity shares held by foreign non-promoters relative to total shares held by all non-promoters. Treatment firms are subject to Clause 49 and its enforcement while Control firms are not. 2004 pertains to the start of the stricter enforcement of Clause 49.



**Appendix 5.1: Description of key variables used in this study**

| Variable | Description | Source |
|---|---|---|
| ***Dependent variable*** | | |
| FEO | number of equity shares held by foreign non-promoters scaled by total shares held by non-promoters | Prowess, CMIE |
| ***Key independent variables*** | | |
| *Clause* | Dummy variable of 1 for years after 2003 (to coincide with the enforcement of Clause 49 law) | Author's observations |
| *Treat* | Dummy variable of 1 for firms that are subject to Clause 49 law | Author's observations |
| *Clause*Treat* | Interaction term of Clause and Treat (= Clause * Treat) | |
| Insider | Equity held by promoters as a share of total equity shares | Prowess, CMIE |
| *Insider2* | Squared form of *Insider* ( = *Insider * Insider*) | own calculation; raw data from Prowess |
| *Size* | Balance sheet size of a firm (in USD million) taken in natural log form | Prowess, CMIE |

| | | |
|---|---|---|
| *Dividend* | Dummy variable of 1 for firms that paid dividend in a given year | Prowess, CMIE |
| *Return* | Annual stock return in INR; includes dividends earned and any gain or loss to the investor arising out of capital actions of the firm | Own calculation; raw data from Prowess |
| *Price/Book* | Ratio of market price of a share to book value of share | Prowess, CMIE |
| *Turnover* | Annual stock turnover is the combined number of equity shares traded annually in BSE and NSE, scaled by total number of outstanding equity shares of the firm. | own calculation; raw data from Prowess |
| *Leverage* | Long term debt scaled by shareholders' equity | own calculation; raw data from Prowess |
| *GrFEO* | Yearly growth rate of FEO to allow for time trend, taken as natural log of (FEO / FEO of previous year) | own calculation; raw data from Prowess |

**Appendix 5.2: Summary statistics by control and treatment groups**

This table presents the summary statistics (Mean, Median, Standard Deviation and Number of observations) of all variables used in this study, compared by treatment and control group firms from different samples (Panel A, Panel B, and Panel C). *FEO* is percentage of equity shares held by foreign non-promoters relative to total shares held by all non-promoters. *Insider* is the percentage of equity shares held by promoters as a share of total number of equity shares. *Size* is the value of total assets expressed in million USD. *Dividend* is a dummy variable which takes the value of one for firms that paid dividend during that year, zero otherwise. *Return* is the annual stock return for investors. *Price/Book* is the ratio of market price to book value of the equity. *Turnover* is the number of equity shares traded in a year scaled by the total number of equity shares of firms. *Leverage* is the ratio of long term debt to total equity.

**Panel A: All firms in the sample**

| | Treatment | Control | Difference | t-statistics |
|---|---|---|---|---|
| *Number of Firms* | *7561* | *74* | | |
| FEO | 7.001 | 2.887 | 4.114*** | (8.42) |
| Insider | 50.01 | 51.77 | -1.763 | (-0.73) |
| Size | 497.5 | 3.400 | 494.1*** | (4.81) |
| Dividend | 0.614 | 0.281 | 0.333*** | (7.67) |
| Return | 60.91 | 67.24 | -6.326 | (-0.49) |
| Price-Book | 2.073 | 1.268 | 0.805*** | (4.06) |
| Turnover | 2.011 | 0.143 | 1.868* | (1.86) |
| Leverage | 0.0444 | 0.0241 | 0.0203 | (1.24) |

**Panel B: Firms from similar industry**

| | Treatment | Control | Difference | t-statistics |
|---|---|---|---|---|
| *Number of Firms* | *3860* | *74* | | |
| FEO | 6.110 | 2.887 | 3.224*** | (5.74) |
| Insider | 48.63 | 51.77 | -3.138 | (-1.27) |
| Size | 101.5 | 3.400 | 98.08*** | (5.98) |
| Dividend | 0.557 | 0.281 | 0.276*** | (6.09) |
| Return | 66.89 | 67.24 | -0.349 | (-0.02) |
| Price-Book | 2.043 | 1.268 | 0.776*** | (3.83) |

| | | | | |
|---|---|---|---|---|
| Turnover | 3.383 | 0.143 | 3.240 | (1.54) |
| Leverage | 0.0208 | 0.0241 | -0.00326 | (-0.66) |

**Panel C: Firms having similar networth**

| | Treatment | Control | Difference | t-statistics |
|---|---|---|---|---|
| *Number of Firms* | *72* | *74* | | |
| FEO | 4.601 | 2.887 | 1.714* | (1.69) |
| Insider | 41.40 | 51.77 | -10.37*** | (-3.40) |
| Size | 6.204 | 3.400 | 2.804** | (2.50) |
| Dividend | 0.165 | 0.281 | -0.116** | (-2.24) |
| Return | 126.5 | 67.24 | 59.29 | (1.12) |
| Price-Book | 2.977 | 1.268 | 1.709** | (2.12) |
| Turnover | 0.571 | 0.143 | 0.429*** | (6.19) |
| Leverage | 0.0240 | 0.0241 | -0.0000735 | (-0.01) |

## 6. Conclusion

This PhD thesis is an amalgamation of three empirical chapters in international finance; and these three chapters are motivated by the fact that investors have yet to extract the full benefits of international diversification despite the lowering of investment barriers in the past decades. The first empirical chapter (Chapter 3) explores the determinants of foreign bias during normal times and turbulent times, and also identifies the relative importance of economic and non-economic factors in determining foreign bias; the second empirical chapter (Chapter 4) examines the impact of foreign bias on cost of debt; and the third empirical chapter (Chapter 5) investigates whether or not enforcement of existing governance regulations can attract foreign investors in emerging markets.

This chapter provides a synopsis for all the three empirical chapters contained within this thesis. For each of the three empirical chapters, I briefly discuss the motivation behind the study, research methods, main findings, and contributions to the literature. For the first empirical chapter (related to determinants of foreign bias), I also summarize the variables used, since this chapter is an exploratory study. Limitations of each of the empirical chapters along with areas for future research are combined in a separate sub-section.

The rest of this chapter proceeds as follows: Section 6.1 summarizes the first empirical chapter; section 6.2 summarizes the second empirical chapter; and section 6.3 summarizes the third empirical chapter of this thesis. Section 6.4 summarizes the limitations of this thesis and also discusses further areas for future research. Section 6.5 provides concluding remarks.

## *6.1. Determinants of foreign bias*

This section provides a summary of Chapter 3 that explores the determinants of foreign bias by focusing the examination particularly on two sets of variables: economic variables and non-economic variables. In the subsequent sections, I first reiterate the motivation behind the study. Since this first empirical chapter is an exploratory work, I then summarize the variables that have been used in this study before briefly discussing the findings, and implications of the study.

### *6.1.1. Motivation*

Despite the possible benefits that could be gained by optimal level of international investment (see Solnik, 1974), investors all over the world choose to invest disproportionately low in foreign assets (see Cooper and Kaplanis, 1994; French and Poterba, 1991). This phenomenon - known as foreign bias - has puzzled researchers for many years; and there are studies that attempt to identify the determinants of this phenomenon. Most of these existing studies focus their examination in equities (e.g. Chan et al., 2005); and bond investment - despite its rising importance in international and domestic markets - has attracted relatively lower level of interest in this regard. Since bonds possess different characteristics to equity, the observed biases in international bond investments could be influenced in a different way by the factors that are known to influence biases in international equity investments. This forms one of the sources of motivation for the first empirical chapter.

Further, existing studies examining determinants of foreign investment biases tend to focus more on macroeconomic fundamentals though some attention is also focussed in non-economic factors like distance and language (e.g Chan et al., 2005; De Moor and Vanpée, 2013). But this is not enough because investors are known to make decisions based on their personal or societal traits (see Chui and Kwok, 2008; Graham et al., 2009; Kaplanski et al., 2015; Kirkman et al., 2006; Kwok and Tadesse, 2006). Inclusion of behavioural attitudes of investors, along with the standard familiarity factors, could help understand the foreign bias phenomenon in a better way and this forms another source of motivation for this empirical chapter. Examining the relative importance of economic versus non-economic factors can also be beneficial to policymakers and researchers and this chapter embarks along that path as well.

Finally, given the recent global financial crisis and Eurozone debt crisis, it is important to examine whether or not the impact of various economic and non-economic factors remain the same during such crises.

Hence, the first empirical chapter explores the determinants of foreign bias by segregating variables into two separate categories: economic and non-economic factors. This first chapter also examines the relative importance of these two sets of variables and explores if the influence of these two sets of factors on foreign bias remains the same during periods of market crisis.

### *6.1.2. Economic variables*

Available evidence suggests that investors tend to enhance their returns by increasing holdings in assets that have yielded better returns (e.g. Chan et al., 2005;

Curcuru et al., 2011). Hence, markets exhibiting recent healthy bond returns may attract more foreign investors thus leading to more foreign bias. I use real annual yield on long-term government bonds - net of sovereign default risk premium and expected inflation - as the measure of real yield. Exchange rate volatility of host countries can also determine an investor's appetite for bonds issued in that host market (Fidora et al., 2007). Since higher foreign exchange rate volatility is expected to lower foreign bias in the host country, I include trade-weighted and inflation-adjusted real effective exchange rate as an economic factor influential in foreign bias. Another important factor that could explain foreign bias is the overall bond market development of the host market (see Forbes, 2010) as well-developed bond markets can offer better liquidity and efficiency to investors. To capture this element of a host country, I take the sum of private domestic and international bonds, scaled by GDP of that country.

Investor protection has featured prominently in the finance literature especially since La Porta et al. (1997) documented that markets with poor quality of legal protection have smaller and narrower capital markets. Investors also invest more in countries where investors' property rights are safeguarded (Bae et al., 2006). Hence, I include investor protection measure for my empirical analysis and this measure is taken from Economic Freedom Network (EFN). Similarly, restrictions on capital movement can impact foreign bias in that host country (Ahearne et al., 2004; Forbes, 2010). Specifically, the lower the restrictions on capital movement, the higher is the expected foreign bias in that market. I include an aggregate measure of capital openness, taken from EFN, compiled by using 13 different types of capital control measures by IMF. There might be other factors like macroeconomic

imbalances, financial risks, political risks, etc. associated with a market that impacts foreign bias. For instance, severe budget deficits on the part of government could foreshadow impending shocks in their bond markets thus making such markets less attractive to foreign investors. To control for such a variety of country level risks not specifically accounted for so far, I also include country risk scores from Moody's ratings. Hence, the macroeconomic variables in this analysis include real bond yields, foreign exchange risk, bond market development, investor protection, capital control, and any remaining risks that constitute country risk.

### *6.1.3. Non-economic variables*

Non-economic factors include subsets of familiarity factors along with cultural factors, both of which are known to impact investment decisions. Huberman (2001) suggests that familiarity of a host market leads to more investment in such markets. Distance, language and trade are variables that are commonly used in the familiarity literature. Distance and common language are known to impact investors' decisions (see Cuypers et al., 2015; Grinblatt and Keloharju, 2001). An investor would invest more in such foreign markets that are geographically closer and that share a common language. I take the distance between country pairs as the measure of geographic proximity. Dummy variable is used for country pairs that share a common official language. Bilateral trade between two markets is also expected to increase familiarity between country pairs (Lane and Milesi-Ferretti, 2008). Bilateral trade is taken as the proportion of international trade allocated to a host country by its trade partners.

I complement these three familiarity factors with two behavioural factors to form the full set of non-economic factors. The two behavioural factors are related to

societies' tendency to avoid ambiguous situation, and their attitude towards competitiveness and material rewards. Countries with higher level of uncertainty avoidance are known to invest less in foreign assets (Anderson et al., 2011; Beugelsdijk and Frijns, 2010). High level of uncertainty avoidance is also associated with less risky financial markets (Kwok and Tadesse, 2006). Country-specific measure of uncertainty avoidance is taken from Hofstede (1980). On the other hand, countries that value competitiveness, assertiveness, and material rewards invest a larger portion of their wealth in foreign assets (Graham et al., 2009). This reward-seeking tendency of a society is represented by score for masculinity, which is also taken from Hofstede.

### *6.1.4. Research methods, findings and implications*

This study employs panel data of cross-country bond allocation for 54 developed and emerging markets from 2001 to 2013. It mainly utilizes regression analysis with host country fixed effects. The findings suggest that non-economic factors, i.e. familiarity with foreign markets and behavioural characteristics of source markets, are the stronger drivers of biases in foreign bond allocations. This finding is supported by three different metrics: comparing the R-squared figures for economic and non-economic factors; using variance decomposition analysis; and using standardized beta figures. For robustness, this study also uses values of endogenous variables lagged by one period (year); this yields qualitatively similar results. This robustness test mitigates concerns related to endogeneity. The results are also robust to exclusion of financial centres from the data.

Further, using the recent 2009-11 European sovereign debt crisis as an experimental set-up, this study reveals that foreign investors reduced their foreign

bond allocations during the debt crisis, with the withdrawals being more severe from the most affected countries. The findings further suggest that the relevance of familiarity with foreign markets become more pronounced during a debt crisis.

The policy implications of this study are obvious: governments and policymakers should focus not just on the economic factors but non-economic factors as well if they are to encourage optimal level of foreign investments in bonds. By being aware of how various economic and non-economic factors affect foreign bias differently during normal and crisis periods, policymakers can formulate better policies to effectively manage foreign fund flows in bonds during crisis periods.

### *6.2. Impact of foreign bias on cost of debt*

This section provides a summary of Chapter 4 that examines whether or not higher foreign bias can lead to lower cost of debt. I first restate the motivation for the study before briefly discussing the findings, contributions and implications.

#### *6.2.1. Motivation*

International finance theory suggests international diversification to lower risk for a given level of return. The prescribed portfolio as per ICAPM is the world market portfolio where all investors are expected to hold similarly diversified portfolio (Sharpe, 1964). It has also been documented that investors have the tendency to invest disproportionately more in domestic assets, and less in foreign assets (e.g., Chan et al., 2005; Cooper and Kaplanis, 2000; French and Poterba, 1991). The lower the foreign investment in a given country relative to the prescribed benchmark of ICAPM, the lower is the risk-sharing with the rest of the world which theoretically should lead to higher cost of capital (see Lau et al., 2010; Lewis, 1999).

This intuition is used in this study to examine if higher foreign bias in bonds leads to lower cost of debt.

### *6.2.2. Research methods, findings and implications*

Main empirical analysis in this study includes panel data for 50 emerging countries starting from the year 2002 to 2014; the analysis is extended to 10 developed markets subsequently using a different data set altogether. The empirical analyses are primarily conducted using regression with country fixed effects.

I regress this dependent variable (bond spread) on country measure of foreign bias after controlling for a host of other factors that can influence cost of debt. Country-specific macroeconomic factors, like level of debt, foreign exchange, debt servicing burden, etc., are important determinants of cost of debt (Boehmer and Megginson, 1990; Edwards, 1984). I control for these macroeconomic variables by using various components of economic risk, financial risk, and political risk from International Country Risk Guide (ICRG) (see Bekaert et al., 2014). Since global economic factors are also important in explaining cost of debt (see Afonso et al., 2015; Longstaff et al., 2011; Mauro et al., 2002), I additionally control for global macroeconomic variables as well.

Due to datasets being available from different sources for emerging and Eurozone markets, I conduct empirical analyses on these two markets separately. For both the datasets, the results show that higher level of foreign bias in a host country is strongly associated with lower cost of debt in that country. These results are robust to various additional tests to address concerns related to endogeneity. First, I lag the key variable of interest, i.e. foreign bias, by one period in the econometric model.

Second, I estimate a vector auto-regression model where both foreign bias and cost of debt are assumed to be endogenously determined (see Sims, 1980). Third, I employ two stage least square technique[85] by using instrumental variable for foreign bias. Following familiarity literature (e.g. Grinblatt and Keloharju, 2001; Huberman, 2001), I construct an instrument by taking the first principal component of three country-specific communication factors that are related to increasing familiarity of host countries. The initial empirical findings remain robust to these tests.

Finally, to address any remaining concerns related to endogeneity, this study exploits a shock-based quasi natural experiment in the case of Eurozone countries. This systemic shock relates to Eurozone debt crisis, unfolding from mid-2009, that had significantly unequal impact to two different sets of countries within the Eurozone. The first set of countries, whose foreign bias measures were impacted more severely by the crisis, include Greece, Italy, Ireland, Portugal, and Spain (GIIPS) forming the treatment group; and the second set of countries include five other countries that were impacted relatively mildly, namely Austria, Belgium, Finland, France, and Netherlands (forming the control group). Estimation using difference-in-differences between the treatment and control group exhibits that the bond spread is strongly and negatively related to foreign bias, even after controlling for other factors that could influence bond spreads of these countries.

The results of this study are of importance to governments and firms alike. Firms should demand that governments formulate appropriate policies so as to increase foreign bias in that host country so that firms can benefit from lower cost of

[85] See Wooldridge (2010)

debt. By the same token, the governments also benefit if they can lower their borrowing costs.

### *6.3. Enforcement of corporate governance and foreign ownership*

This section provides a summary of Chapter 5 that examines if enforcement of corporate governance regulations in emerging markets can attract higher level of foreign ownership in firms. I first reaffirm the motivation for the study before briefly discussing the findings, contributions and implications.

#### *6.3.1. Motivation*

Local investors are known to enjoy higher level of informational flows as compared to their foreign counterparts (see, for example, Brennan and Cao, 1997). This phenomenon is more conspicuous in emerging markets due to their weaker regulations and lower disclosure requirements. Since proper enforcement of existing rules is inadequate in emerging markets (see La Porta et al., 2000; Stulz, 1999), strict implementation of corporate governance regulations could help attract foreign investors. This provides the motivation to examine the impact of enforcement of governance rules on foreign equity ownership, especially in an emerging market.

#### *6.3.2. Research methods, findings, and implications*

In 2004 in India, new laws were introduced to penalize firms and directors that flouted existing regulations on corporate governance. Initially, penalty for breach of this regulation was de-listing from stock exchanges (see Dharmapala and Khanna, 2013). However, stringent enforcement approach was taken starting from 2004 that could lead to criminal proceedings for violating this legislation. Not all firms were subject to this enforcement thus providing two separate groups of firms.

Hence this study allows for the use of difference-in-differences estimation technique (see Wooldridge, 2013; p - 455) and first-differenced regression discontinuity (see Lemieux and Milligan, 2008) between treatment group firms (that are affected by the enforcement rules) and control group firms (that are not affected by the change in regulation). Using firm-level panel data and taking 2004 as the cut-off date when the enforcement rules came into force, the difference-in-differences empirical method mainly involves the use of regression analysis with firm fixed effects. This allows to estimate the observed changes in foreign ownership before and after the cut-off date for both the treatment group firms and control group firms. The results from this difference-in-difference as well as the regression discontinuity technique clearly show that foreign equity ownership increased significantly in those firms that were subject to enforcement of corporate governance rules, compared to those firms exempt from the change in regulation.

It is possible that increment in foreign ownership of treatment firms may have come about due to other firm-specific or industry-specific factors rather than due to the enforcement of corporate governance rules. Of particular concern is the fact that treatment firms in the sample are generally bigger in size than control firms. Existing studies show that size of a firm plays a role in determining level of foreign investment in that firm. As larger firms tend to command a better media coverage and are followed more by analysts, they can be perceived as more transparent which can lead to higher foreign ownership (see Ammer et al., 2012). Larger firms can also be more family-controlled than smaller firms thereby raising concerns about their transparency, especially in countries with poor level of shareholder protection (La

Porta et al., 1999). I address this concern by including the balance sheet size of firms to control for the size of firms.

Other firm-specific characteristics are also important in this analysis. High level of insider ownership or family control can lead to these insiders enjoying power in excess of their cash flows rights, at the expense of minority shareholders (La Porta et al., 1999). Low concentration of ownership across a highly dispersed shareholders, on the other hand, is not necessarily good as this can lead to non-alignment of interest between managers and owners (see Morck et al., 1988). This suggests that the relationship between foreign ownership and insider control can be non-linear in nature. To allow for this, I control for insider ownership of firms by taking proportion of shares held by promoters in its nominal as well as squared form.

Level of debt is also known to influence foreigners' decision to invest in firms: Dahlquist and Robertsson (2001), Kang and Stulz (1997) show that foreigners invest less in highly leveraged firms. I control for leverage by taking the ratio of long term debt to equity for the firms. Similarly, dividend payments by firms can also influence foreign ownership by conveying positive message to investors (Faccio et al., 2001; Jensen, 1986). Hence, I control for payment of dividends by including a dummy variable of one for firms that paid dividends for the given year, and zero otherwise (see Ammer et al., 2012). Firm-specific growth prospect is another factor that could influence foreign ownership of firms and I control for this by using market price to book value ratio for each firm (e.g Aggarwal et al., 2005; Leuz et al., 2010). Further, I control for firm-specific stock market liquidity (see Bailey et al., 1999) and stock return (Nofsinger and Sias, 1999) both of which can influence foreign ownership. Market liquidity is taken as the annual stock turnover for each firm and

stock return is the yearly stock return to investors. Considering the time that may be needed for firm-specific variables to filter into investor sentiments, these firm-level control variables are lagged by one time period.

Following Dharmapala and Khanna (2013), one more control variable is added to the econometric model: firm-specific time trend of the dependent variable. It could be the case that *FEO* in treatment group firms – which are presumably larger and more successful - increased after 2004 for alternative reasons not associated with the enforcement of corporate governance. I also control for various country-specific and global macroeconomic factors that could influence foreign ownership of Indian firms. Existing literature documents the importance of "push factors", i.e. shocks in advanced economies that persuade investors to invest in emerging markets, and "pull factors" that are related to the attractive features of macroeconomic fundamentals in emerging markets (see Fratzscher, 2011). I also control for industry-specific factors because industry-specific trend over time can potentially explain some of the foreign investment decisions.

The empirical findings show a positive impact of enforcement (of regulations) on foreign equity ownership. A possible concern in the empirical setting relates to significant variances in firm-specific characteristics of control and treatment firms. This issue is addressed by selecting a narrower band of firms that are more comparable and closer to the threshold of applicability (of enforcement). The findings are also robust to various additional tests that include, among other things, first-differenced regression discontinuity technique. The robustness tests do not lead to any material change to the main results; thus providing compelling evidence that

enforcement of corporate governance laws leads to higher foreign ownership in firms.

### *6.4. Limitations of this thesis and future areas of research*

The first two empirical chapters in this thesis focus towards the determinants of foreign bond bias and implications. Both of these chapters follow a similar approach in constructing two key figures of interest, namely measure of foreign bias, and benchmark for markets. There are alternative ways of constructing measures of foreign bias (see Cooper et al., 2012) and it is still too early to pinpoint one superior method over others for constructing this variable. Further, investors may have the tendency to hedge against various risks (e.g. inflation risks) and in such cases the model benchmark prescribed by ICAPM may not be the optimal benchmark (Cooper and Kaplanis, 1994). Additionally, in certain conditions, investors employing Bayesian portfolio techniques will choose allocation weights that are different to the global market weights (Baele et al., 2007).

These two empirical chapters also take into account the international investment in single asset class: bonds. In a very strict sense, the return on the market portfolio should be the value-weighted return on all investable assets which would consequently include equities, bonds, real estate and precious metals, among other things (Bekaert and Hodrick, 2012). This thesis does not use the exhaustive list of tradeable assets and this is a common shortcoming in the suboptimal diversification literature is. In fact, most of the studies focus on single asset class thereby ignoring asset allocations in bonds, human capital, real estate, etc. The omission of these assets has the potential to create a bias to optimal allocation; the degree of this bias

being dependent upon whether these supplementary assets provide additional scope for diversification (Cooper et al., 2012).

Additionally, banks may be obliged to increase their holdings of domestic bonds - through moral suasion - especially during times of financial turmoil (Altavilla et al., 2016). This has the potential to impact the home and foreign bias measures in bond investments. Though this phenomenon may have been accounted for, to a certain extent, by the crisis period proxies and country risk measures in the empirical analyses, this thesis lacks a formal examination of possible impact of such moral suasion on foreign bias; this remains as another caveat of the first empirical chapter.

Given the aforementioned limitations, an obvious direction for future research is to take into account wider range of investable assets and examine if the impacts of the various economic and non-economic factors still remain the same. Further, a deeper examination specifically pertaining to the impact of cultural attitudes and geographical distance on foreign investment could provide new insights. After all, the impact of geographical distance on making decisions related to transactions and trade is not fully understood (see Blum and Goldfarb, 2006; Butler, 2008; Disdier and Head, 2008) and human attitude towards financial decisions contain various elements that are still shrouded in mystery (see Chui and Kwok, 2008; Graham et al., 2009; Kaplanski et al., 2015; Kirkman et al., 2006; Kwok and Tadesse, 2006).

Another set of limitations in this thesis can be ascribed to unavailability of data. The second empirical chapter focuses only in those countries for which comparable bond spread data is available. This is because the comparable bond

spread figures (from EMBI) are available only for selected emerging market countries; similarly, Euro-denominated bond spread is available for a limited number of Eurozone countries only. This has been a deciding factor in choosing the set of emerging markets and Eurozone markets separately in this study. This limitation also provides a signal for further research: encompassing a wider set of countries and wider range of investable assets – not just bonds – could provide more interesting results.

Further, regarding implications of foreign bias, this thesis examines just a single aspect: how foreign bond bias could impact cost of debt. It would be interesting to see if biases in foreign bond investment have any impact on a variety of other factors, like issuance of debt (and equity); capital investment and productivity of a country; and a variety of other issues of macroeconomic interest. These will be areas of future research.

The third empirical chapter in this thesis distinguishes insider shareholders from non-insiders based on relevant laws of the land: promoters are treated as insiders. But it is possible that some of the non-promoters are also insiders; this possibility is ignored in this study because the available data does not identify such insiders. An alternative option would have been to treat large shareholders as insiders like a number of existing studies have done (e.g. Ammer et al., 2012). But considering all large shareholders as insiders is a rather far-fetched idea; additionally, a group of small investors could collectively hold enough shares to control a firm and such groups of small investors (insiders) would still remain undetected (Ammer et al.). Hence, the possible non-detection of insiders is a limitation of this thesis.

Additional concern in the third empirical chapter emanates from the significant differences observed between the key characteristics of control and treatment firms. A mitigating factor is that this chapter includes a number of robustness tests to ensure the validity of the results. But there still remains a possibility that the foreign share ownership in treatment firms is driven not just by the enforcement of corporate governance but by the inherent characteristics of the firms themselves. In an ideal situation, control and treatment firms having similar characteristics would have been used; however, the available data does not allow this.

Considering the caveats mentioned above, the third empirical chapter points to possible areas for future research. It would be a worthwhile task to try to get a more reliable measure of insider ownership in firms. Further, does the impact of corporate governance apply uniformly across domestic and foreign investors especially in emerging markets? An attempt to answer this question could provide interesting results.

### *6.5. Concluding remarks*

Researchers have been puzzled by the reluctance of investors to take full advantage of international diversification. Even with the embracing of globalization in much of the globe in the past decades, investors are still keen on investing disproportionately more in domestic assets than theory would prescribe. This thesis offers interesting insights into this issue. First, it explores the determinants of such suboptimal foreign diversification and shows that though economic and non-economic factors are both important drivers of foreign bias, it is the non-economic factors – and not economic ones - that influence foreign bond bias more; and the

importance of such non-economic factors get further enhanced during periods of debt crisis. Second, this thesis explores one of the consequences of suboptimal diversification in bonds and shows that lower foreign bond bias in a given host country leads to higher cost of debt for that host country market. Finally, this thesis provides a partial remedy towards enhancing higher level of foreign investment by showing that enforcement of existing corporate governance rules in an emerging market leads to higher level of foreign ownership of firms in that market. Embracing the insights provided in this thesis may prove to be helpful to policymakers, academics and investors.

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