FOREIGN AND DOMESTIC INVESTMENT IN GLOBAL BOND MARKETS

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ABSTRACT

Gauging foreign (domestic) biases as the deviation of foreign (domestic) investors' actual portfolio allocation of a bond market from the same bond market's weight in global bond market, we investigate the determinants of foreign and domestic investment biases in 41 global bond markets. We find that foreign investors significantly overweigh markets that offer better risk–return profiles. In addition, greater market openness and sound macroeconomic outlook attract foreign investment. Such return driven behavior of foreign investors is especially pronounced in emerging bond markets. Meanwhile, home bias is higher in smaller bond markets. Our evidence sheds some light on the role of regional financial integration on broadening investor base and improving investor profile in emerging markets.

Key words: bond market, financial integration, home bias, portfolio decisions

JEL codes: F30, G11, G15, G20

I. INTRODUCTION

Despite the pivotal role of commercial banks in the financial systems of Asian economies, equity and bond markets have grown rapidly in past decades. Well-functioning financial markets contribute to economic growth by improving resource allocation, reducing transaction and agency costs, channeling capital resources, ameliorating risk sharing, and boosting innovation.[1] As a complement to bank loans, a deep and liquid bond market plays a salient role in financing budget deficits, infrastructure investments, and private sector projects. The development of bond markets benefits Asian economic growth by providing long-term financing while diversifying banking sector risks and mitigating maturity and currency mismatches.

However, challenges have emerged to Asian bond markets development, including a lack of liquidity, inactive institutional participation, and less favorable investor profiles (Plummer and Click2005).The active participation of institutions facilitates market liquidity and depth, and enhances market efficiency by incorporating information into bond prices via trading. According to the International Monetary Fund (2005), in many emerging Asian markets, domestic institutions trade passively in bond markets by adopting a buy-and-hold trading strategy, which reduces liquidity in the market. More foreign investor participation improves market liquidity in emerging markets (Peiris 2010). Foreign participation in local currency bond markets has also been found to lower interest rates in the United States (US) (Warnock and Warnock 2009) and emerging markets (Peiris 2010). Lack of foreign participation in bond markets tends to increase an economy's dependence on foreign currency debt (Burger and Warnock 2007), which exacerbates currency mismatch risk. In addition to foreign participation, a balanced investor profile consisting of investors with diversified mandates, especially investors with long-term investment horizons, helps mitigate risks arising from maturity mismatches and increases market resilience to external shocks.

On the other hand, as global financial integration deepens, foreign participation in financial markets may become a channel for risk transmission. According to Belke and Rees (2014), bond yields in emerging markets are affected by external factors, which weakens the effectiveness of domestic monetary policy. During the low-interest-rate era following the global financial crisis, emerging bond markets attracted global investors seeking higher returns, which lowered bond yields but also posed risksdue to capital flow volatility. Therefore, understanding the determinants of the investment decisions of both foreign and domestic investors in bond markets fosters further development of emerging bond markets, which contributes to financial stability in emerging economies.

In this study, we extend the literature on the drivers of foreign investment in global financial markets with some new evidence on bond market development. First, we add to the literature on international portfolio allocation. It has been widely established that investors benefit from global risk sharing and diversification (Lintner 1965).However, existing literature documents that investors do not seem to purely seek better returns worldwide as implied in the "Feldstein–Horioka puzzle" (Feldstein and Horioka 1980), a strong correlation between national saving and investment—i.e., a home bias in investment. The puzzle suggests that explicit trading barriers such as capital controls, different tax treatment, and transaction fees, as well as implicit trading barriers such as information asymmetry, exchange rate, and regulatory risk, significantly impede cross-border capital flows. Although many explicit barriers have been gradually lifted amid deepening global financial integration, investment biases, or deviations of an individual market's actual portfolio allocation from its market capitalization

[1] See, among others, Greenwood and Jovanovic (1990); King and Levine (1993); Bencivenga and Smith (1993); Levine (1997);Rajan and Zingales (1998);Aghion,Howitt, and Mayer-Foulkes (2005); and Greenwood, Sanchez, and Wang (2010).

weight in the global market portfolio, have been found to persist in global capital markets due to various deadweight costs arising from remaining market frictions (French and Poterba 1991, Lewis 1999; Chan, Covrig, and Ng 2005; Horioka, Terada-Hagiwara, and Nomoto 2016).

While the majority of empirical evidence on international investment decisions concentrates on equity markets,[2]relatively less is known about the determinants of investment behavior in global bond markets.[3] With their rapid expansion and ameliorated liquidity and transparency in recent decades (Bunda, Hamann, and Lall2009; McGuire and Schrijvers 2006), emerging bond markets have become more important in global portfolio allocation due to an improved risk–return profile. Hence, up-to-date evidence of factors influencing investment decisions in bond markets will improve our understanding of the investment preferences of global investors.

Existing evidence on investment decisions in bond markets show that bond market risk and return attributes significantly influence home bias (Fidora, Fratzscher, and Thimann2007; Kim et al. 2014) and foreign bias (Burger and Warnock 2007; Burger, Warnock, and Warnock 2012; Horioka,Terada-Hagiwara, and Nomoto 2016) in bond markets. In this study, we contribute to the literature by assessing and comparing foreign and domestic investor preferences toward risk–return profiles in global bond markets. By highlighting key factors that lead to discrepancies in their bond investment patterns, we address the following research questions: (i)What attracts foreign investments into global bond markets?(ii) What factors drive discrepancies in the portfolio decisions of foreign versus domestic investors? By addressing the above questions, we extend Fidora, Fratzscher, and Thimann (2007) and Kim et al. (2014) with novel evidence on how foreign investors react to risk–return attributes in global bond markets. We also add to Burger and Warnock (2007);Burger, Warnock, and Warnock (2012);and Horioka, Terada-Hagiwara, and Nomoto (2016) a new angle that compares the investment behaviour of foreign versus domestic investors in global bond markets. In addition, we provide a useful reference for policy makers on guiding investment behavior and improving their investor profile in order to promote bond market development.

Using a sample from 41 bond markets during the period 2010–2015, we find evidence that foreign investors overweigh markets with better risk–return profiles. In particular, foreign investors chase return momentum and avoid high return volatilities. This is not necessarily true for domestic investors. Further evidence suggests that the return-chasing behavior of foreign investors is more pronounced in emerging bond markets than in developed bond markets. We also find that foreign participation is significantly increased when sovereign ratings improve and that markets with fewer capital controls tend to be overweighed by global foreign investors. These results imply the importance of integration and economic soundness in attracting greater foreign participation in bond markets. Given that foreign participation contributes to liquidity and market efficiency in emerging markets, our evidence suggests that capital account openness will contribute to bond market development by improving investor profile and enhancing market depth. Meanwhile, the return-chasing behavior of foreign investors in emerging bond markets highlights the importance of sound public finances to not only maintaining good credit ratings but also to improving risk–return profile.

Our paper is organized as follows. Section II reviews the relevant literature on international portfolio allocation. Section III outlines the empirical research design and data sources. Section IV

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[2] See, among others, Dahlquist and Robertsson (2001); Dahlquist et al.(2003); Edison and Warnock (2004); Faruqee, Li, and Yan(2004); Ahearne, Griever, and Warnock(2004); Chan, Covrig, and Ng (2005); Aggarwal, Klapper, and Wysocki (2005); Covrig, Lau, and Ng (2006); Ferreira and Matos (2008); Kho, Stulz, and Warnock (2009).

[3] See, among others, Burger and Warnock (2007); Fidora, Fratzscher, and Thimann (2007); and Horioka,Terada-Hagiwara, and Nomoto (2016).

reports and discusses our main findings on the determinants of investment behavior in bond markets. Section V concludes our paper.

II. LITERATURE REVIEW

In a world of perfect global capital mobility, rational investors will chase assets that offer higher returns. According to Feldstein and Horioka (1980), investors' return-chasing behavior will theoretically lead to a weak correlation between domestic saving and the investment rate, but their empirical evidence does not support this argument. This phenomenon is known as the Feldstein–Horioka puzzle. Consistently, the "home bias" literature documents that despite the benefits of global diversification and risk sharing, investors are widely found to underinvest in foreign markets and overinvest in domestic markets in their portfolio allocation(French and Poterba 1991, Lewis 1999).[4]

Chan, Covrig, and Ng (2005) develop an international assets allocation model and show that various deadweight costs arising from market friction erode the expected returns on overseas investments and lead to investment biases favoring either domestic (home bias) market or some foreign (foreign bias) markets. Empirical evidence from global equity markets suggests that deadweight costs caused by explicit trading barriers such as capital controls and tax treatment, as well as implicit barriers such as information asymmetry and investor protections, contribute to investment biases worldwide.[5]

Even though global bond market capitalization is much larger than equity market capitalization, and assets with lower volatility (e.g., bonds) tend to exhibit more pronounced home bias than assets with higher volatility (e.g., equities) (Fidora, Fratzscher, and Thimann 2007), existing empirical studies of the composition of international asset portfolios look primarily at equity markets. Compared to equity markets, there is relatively less evidence on bond markets, hindering our understanding of global bond portfolio allocation and the preferences of bond market investors.

In the literature on investment behavior in global bond markets, there is a group of studies that examine how risk–return factors drive investment bias. Evidence on domestic bias includes Fidora, Fratzscher, and Thimann (2007) and Kim et al. (2014). Fidora, Fratzscher, and Thimann (2007) examine the role of real exchange rate volatility on global bond and equity portfolio decisions. They show that real exchange rate volatility significantly explains home bias in global financial markets and that reduced real exchange rate volatility helps decrease home bias, especially for bond portfolios. Kim et al. (2014) investigate foreign investment in global bond and stock markets, and find that market performance has a more pronounced impact than macroeconomic factors on home biases in both bond and equity markets. Other researchers look at foreign biases. Burger and Warnock (2007) investigate US investors' bond holdings in 40 global markets and find that they do not diversify holdings well. They also avoid emerging bond markets with unfavorable risk–return profiles, such as higher variance and negative skewness, that are related to unstable macroeconomic conditions. Burger, Warnock, and Warnock (2012) analyze factors that attract US investors into emerging local currency bond markets in 2006 and 2008,and find that US investors overweigh markets with higher returns, positive skewness, and greater openness. The finding suggests that risks stemming from economic, political, and market factors limit global risk sharing and financial integration. Horioka, Terada-Hagiwara, and Nomoto (2016) examine foreign holdings in

[4] Global investors do not allocate international portfolios in the same way as predicated in the international version of the asset pricing model (Levy and Sarnat 1970, Solnik 1974).

[5] See, among others, Faruqee, Li, and Yan (2004); Ahearne et al. (2004); Aggarwal, Klapper, and Wysocki (2005); Chan, Covrig, and Ng (2005); Ferreira and Matos (2008); Kho, Stulz, and Warnock (2009).

Asian bond markets and find that foreign investors value higher risk-adjusted returns and lower exchange rate risk when investing in Asian bond markets.

Other studies look at social and political factors and examine how various deadweight costs associated with social and political factors shape investors' portfolio decisions in bond markets. For example, there are studies investigating investor behavior with regard to factors such as familiarity (Ferreira and Miguel 2011); patriotism, culture, and domestic creditor protection (Pradkhan 2016a, 2016b); and political constraints and instability (Eichler andPlaga2017).

The increasing size and improving risk–return profiles of global bond markets calls for more research to better understand the determinants of foreign versus domestic investor preferences and behavior. The evidence from such research would be especially helpful to policy makers in improving investor profiles in individual markets. Foreign and domestic investors may have different preferences in terms of investment horizon, risk appetite, and mandates. Knowledge that depicts how they behave differently in the bond market could shed light on policy measures that promote a more desirable investor profile.

III. EMPIRICAL DESIGN

A. Research Method

1. Empirical Model Estimations

To identify the determinants of foreign and domestic bond investment biases (FBand DB), the following model was estimated:

$$Bias_{i,t} = \alpha + \beta X_{i,t} + \gamma Dummy + \varepsilon_{i,t}, \quad (1)$$

where $Bias_{i,t}$is the market level investment biases (FB and DB) for market i at time t, $X_{i,t}$ is the vector of market attributes and investor mandate variables, and dummy is the vector of time and country fixed effects to reflect information that is not captured by the independent variables. We estimate the model specifications using panel fixed effects, with clustered standard errors at the market level.[6] We also use systematic generalized method of moments (GMM) to account for possible endogeneity concerns.

2. Dependent Variables

In the spirit of Dahlquist and Robertsson (2001) and Chan, Covrig, and Ng (2005), this study defines foreign (domestic) bias (FB [DB])as the deviation of a country's weightin the aggregate foreign (domestic)investment portfolio from the country's weight in the world bond portfolio, which is calculated as follows:

$$FB_{i,t} = \log\left(\frac{w_{i,t}^{FI}}{w_{i,t}^{M}}\right),$$

$$\text{and } DB_{i,t} = \log\left(\frac{w_{i,t}^{DI}}{w_{i,t}^{M}}\right), \quad (2)$$

[6] Hausman tests give different results for different model specifications. Therefore, we use both fixed-effect and report random-effect estimations to check robustness.

where $w_{i,t}^{FI}$, $w_{i,t}^{DI}$, and $w_{i,t}^{M}$ denote the weights of market i in foreign investors' global portfolio, domestic investors' global portfolio, and world bond market portfolio, respectively, at time t. Since a market's weight in the global portfolio reflects the relative importance of an individual market in the global market, while its weight in the foreign (domestic) global portfolio captures the actual proportion that foreign (domestic) investors allocate to it relative to its benchmark size. Thus, foreign (domestic) investment bias reflects the relative preference of foreign (domestic) investors toward a particular bond market.

3. Independent Variables

According to extant literature, factors that may influence foreign investment in domestic financial markets fall into several categories: asset risk–return profile, currency risks, financial development, and macroeconomic stability. In this study, we group these factors into two aspects capturing investor mandates and the market-level environment.

Investor Mandates

Trading strategies and investment mandates shape investment behavior. The literature has documented that historical performance affects investors' portfolio decisions. Investors tend to choose assets with strong historical performance (Grinblatt and Keloharju 2001, Edison and Warnock 2004, and Ferreira and Matos 2008). Existing literature also shows that the riskiness of assets affects investment decisions. Del Guercio (1996) suggests that the "prudent-man rule" affects the investment behavior of institutions such as banks and mutual funds. Gompers and Metrick (2001) indicate that institutional investors bear the legal role of fiduciaries and avoid risky assets due to such motives. Covrig, Lau, and Ng (2006) find that foreign and domestic mutual funds prefer stocks with low return variability. In bond market investments, Burger and Warnock (2007) and Burger, Warnock, and Warnock (2012) find that bond risk–return characteristics significantly affect US investor preferences. Fidora, Fratzscher, and Thimann (2007) and Horioka, Terada-Hagiwara, and Nomoto (2016) show that exchange rate volatility is a significant factor contributing to home bias and foreign investment in bond markets, respectively.

In empirical tests, we capture momentum-seeking by following Edison and Warnock (2004) and measure return level (RMEAN) as the average monthly return on a bond market index during the past 12 months. We address the prudent-man's rule in institutional investment decisions with measures of volatility and skewness of bond returns. This study calculates the return volatility (RVOL) and skewness (RSKE) as the standard deviation and skewness of monthly returns on bond indexes over the past 12 months. To account for currency risk, we follow Fidora, Fratzscher, and Thimann (2007) and construct effective real exchange rate volatility (FXVOL) as the standard deviation of the monthly effective real exchange rate during the past 12 months. To further consider the role of less frequent large swings in exchange rate movements, we also account for exchange rate skewness (FXSKE) in individual markets using skewness of monthly percentage changes of real effective exchange rates during the past 12 months.

Market Investment Environment

Well-developed financial markets offer more investment instruments, less investment controls, and better liquidity, thus making these markets more accessible to investors. Macroeconomic stability means an economy has sound economic fundamentals and a good public debt management situation. Greater macroeconomic stability facilitates an improved risk–return profile for debt instruments as well as a robust currency. To depict the investment environment in bonds, this study follows existing literature and considers the following aspects: financial development and macroeconomic stability.

Market depth and liquidity matter for investors, especially institutional investors who trade in relatively large volumes (Tesar and Werner 1995). To maintain a liquid trading environment, financial markets need to reach a certain minimum efficient scale. Empirical research commonly adopts market size and trading turnover as proxies for liquidity (Edison and Warnock 2004; Ahearne, Griever, and Warnock 2004; Dahlquist and Robertsson 2001; Tesar and Werner 1995). Empirically, due to the limited availability of data on trading volume, this study gauges market depth using bond market size (SIZE),which is measured as the natural logarithm of the aggregated value of outstanding bonds in a bond market as of the end of the year. In addition to capturing market depth, market size is also found to play multiple roles in affecting investment behavior. Greater market size can imply greater information availability (Edison and Warnock 2004) and better corporate governance quality (Kho, Stulz, and Warnock 2009). Eichengreen and Luengnaruemitchai (2004) document that the size of Asian bond marketsis positively related to a stronger institutional environment and a competitive banking sector. Thus, the inclusion of market size also captures institutional quality and financial development.

A well-functioning financial market also features more mature financial institutions such as banks and brokers serving as market makers (Eichengreen and Luengnaruemitchai 2004), which facilitates better liquidity and improve market efficiency. In empirical tests, we measure financial market development (FINDEV) as the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). This financial development index comprehensively covers financial market depth, accessibility, and efficiency, and the level of financial institution development. The index ranges between 0 (less developed) to 1 (well developed).

There is evidence that explicit investment barriers in the form of capital controls significantly shape foreign portfolio investment decisions (Chan, Covrig, and Ng2005). Following Chan, Covrig, and Ng(2005), we use the index on capital flow controls (OPENNESS) constructed by the Economic Freedom Network. Empirically, we construct OPENNESS as the natural logarithm of the capital control index from Table 4Dii of the Economic Freedom Network, where a higher score indicates that an economy imposes fewer restrictions on capital flows. The lowest score of 0 and the highest score of 10 indicate full capital controls and a fully open capital account, respectively.

To quantify macroeconomic stability and outlooks, we employ S&P Global Ratings' sovereign ratings on foreign and local currency government bonds (RATING) to proxy for macroeconomic fundamentals. A higher rating indicates a more stable economic outlook. Empirically, we allocate numeric scores to S&P Global Ratings' 23 sovereign bond rating levels, with the highest score of 22 representing AAA, which is the highest investment grade, and 0 representing D, which is default. We take the simple average of foreign and local currency government bond ratings to capture the average level of macroeconomic stability.

B. Data

We collect year-end, cross-border portfolio holdings in debt securities from the International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS).[7]We identify the source markets and destination markets of bond portfolio investments to obtain the aggregated bond investments into and out of each market. To avoid the influence of the global financial crisis on international investment behavior, our sample covers the period 2010–2015. The outstanding amount of debt securities issued by all domestic entities is collected from Table C1 of the Bank for International Settlements (BIS)debt

[7] The IMF's CPIS covers year-end global holdings in debt instruments from 2001 to 2015. Since data on June holdings are only available since 2013, we only include year-end holdings to keep record frequency consistent. The database is accessible athttp://data.imf.org/?sk=B981B4E3-4E58-467E-9B90-9DE0C3367363.

securities statistics (DEBT_SEC2), which contains data on the aggregated amount of outstanding international and domestic debt securities. For markets that do not report aggregated outstanding debt securities, we sum the outstanding amounts of foreign and domestic debt securities. Real effective exchange rates are also collected from BIS. Sovereign bond ratings form S&P Global Ratings are collected from Bloomberg. The index on capital controls is from Table 4Diiconstructed by the Economic Freedom Network. Monthly returns on local bond markets are collected from the JP Morgan GBI Aggregate Diversified Index and Emerging Market Bond Index Global Diversified via Bloomberg. The financial development indicator is collected from Svirydzenka (2016).After matching all the variables, we get a final panel dataset consisting of 241 observations covering 41 bond markets for the period 2010–2015. Our sample is reasonably representative. The 41 target markets receive 86.7% of total foreign holdings from the 88 reporting markets in the CPIS and the aggregated bond market size of the 41 sample markets account for 95.3% of the global bond market size.

Table 1 reports summary statistics of foreign and domestic biases in our sample across markets and years. We first compare our statistics with Kim et al. (2014) since we use the same data sources. In general, the home bias measures in our sample are very comparable to those in Kim et al. (2014). Panel A shows that in terms of mean foreign bias, most developed bond markets are overweighed by foreign investors with a foreign bias higher than 0, while emerging bond markets are underweighed by foreign investors. Compared to developed bond markets, most emerging bond markets, especially those in Latin America and emerging Asia, are generally underweighed. Among these markets, the People's Republic of China's bond market has the lowest foreign investment bias, largely driven by its relatively large bond market size and limited access for foreign investors. In contrast to emerging Latin America and Asia, emerging European bond markets are generally not underweighed by foreign investors, which probably reflects better financial integration in the euro area. In contrast, home bias is still pervasive in global bond markets, with all mean domestic biases higher than 0. Panel B depicts foreign and domestic biases across sample years. On average, home bias is still prevalent in global bond markets after years of globalization and integration, while foreign bias seems to increase during the review period, indicating that foreign investors are becoming more willing to invest in global bond markets.

To get a clear picture of how investment biases have evolved during the past decade, we calculate foreign and domestic biases for both developed and emerging markets. Based on the BIS classification of economic development status and regional location, we depict the evolution of foreign and domestic biases in developed and emerging markets in Figure 1. While the home bias persists worldwide, home biases in developed markets are generally lower than in emerging markets. As global financial integration has deepened in recent decades, the whole world in general witnessed a slight decline in home bias in bond markets. At the same time, developed markets are largely invested in by global foreign investors compared to emerging markets, which are underweighed in foreign investor portfolios relative to their scale. While foreign bias remains stable in developed markets, foreign bias in emerging markets picked up after the global financial crisis, indicating that global investors were seeking higher returns in emerging markets during the easy money era.

Table 1: Summary Statistics of Foreign and Domestic Biases in Global Bond Markets

Panel A. Foreign and domestic biases across markets

Developed Markets	Foreign Bias Mean	Domestic Bias Mean	Emerging Markets	Foreign Bias Mean	Domestic Bias Mean
Austria	0.92	4.82	Argentina	(0.41)	6.38
Belgium	0.78	4.63	Brazil	(0.80)	3.82
Canada	0.38	3.82	Chile	(0.23)	6.37
Denmark	0.03	4.46	China, People's Republic of	(1.81)	3.02
Finland	1.07	4.96	Greece	0.24	5.40
France	0.58	2.57	Hungary	0.69	6.74
Germany	0.62	2.59	India	(0.68)	4.97
Hong Kong, China	(0.22)	4.85	Indonesia	0.57	6.32
Ireland	0.82	3.50	Israel	(0.46)	5.88
Italy	0.39	3.08	Malaysia	(0.02)	5.58
Japan	(1.92)	1.81	Mexico	0.17	4.86
Korea, Republic of	(0.70)	4.16	Philippines	0.21	6.60
Luxembourg	1.34	2.33	Poland	0.46	5.78
The Netherlands	1.10	3.03	Russian Federation	(0.59)	5.31
New Zealand	0.95	6.73	South Africa	(0.08)	5.99
Norway	0.77	4.40	Thailand	(1.05)	5.73
Portugal	0.48	5.18	Turkey	0.36	5.83
Singapore	0.09	4.79	Venezuela	0.64	7.28
Spain	0.46	3.60			
Sweden	0.93	4.51			
Switzerland	0.41	4.38			
United Kingdom	0.35	2.39			
United States	(0.68)	0.95			

( ) = negative.

Notes: This table lists the detailed summary statistics of foreign and domestic investment biases in bond markets across 41 global markets. Foreign and domestic biases are defined as the deviations of a country's weight in the aggregate foreign and domestic bond investment portfolios from the country's weight in the world bond portfolio. The calculation is conducted using the following formulas for foreign and domestic bias, respectively:

$$FB_{i,t} = \log\left(\frac{w_{i,t}^{FI}}{w_{i,t}^{M}}\right) \text{ and } DB_{i,t} = \log\left(\frac{w_{i,t}^{DI}}{w_{i,t}^{M}}\right).$$

Panel B. Foreign and domestic biases across years

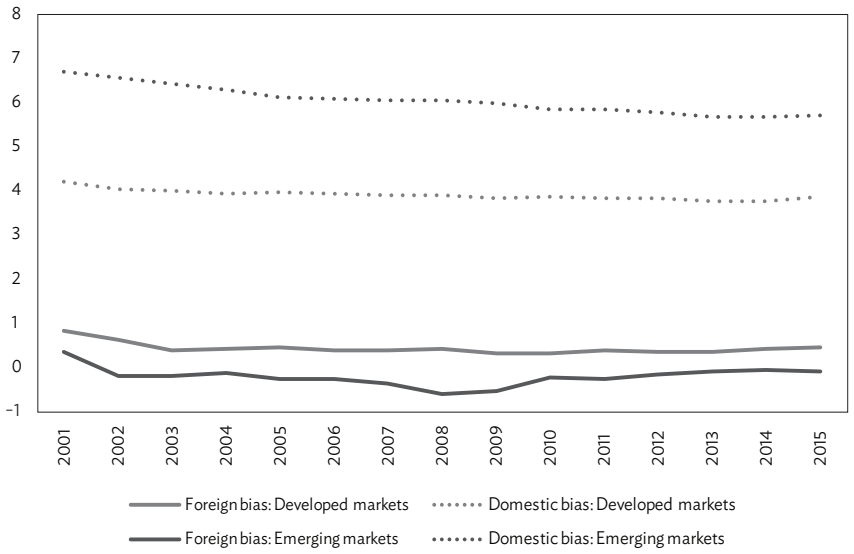
Year	N	Foreign Bias							Domestic Bias						
		Mean	Min	p25	p50	p75	Max	Std.	Mean	Min	p25	p50	p75	Max	Std.
2010	39	0.09	(2.31)	(0.33)	0.29	0.68	1.36	0.82	4.62	0.98	3.39	4.92	5.78	7.29	1.56
2011	39	0.16	(1.94)	(0.31)	0.37	0.64	1.53	0.77	4.63	0.99	3.29	4.99	5.91	7.19	1.58
2012	40	0.17	(1.98)	(0.30)	0.29	0.74	1.31	0.75	4.61	0.99	3.41	4.88	5.76	7.14	1.52
2013	41	0.14	(1.92)	(0.24)	0.31	0.70	1.32	0.71	4.57	0.96	3.58	4.74	5.75	7.25	1.51
2014	41	0.20	(1.77)	(0.06)	0.43	0.68	1.26	0.73	4.57	0.91	3.66	4.63	5.79	7.37	1.50
2015	41	0.24	(1.86)	(0.10)	0.49	0.73	1.26	0.75	4.66	0.88	3.81	4.63	5.82	7.43	1.48
Total	241	0.17	(2.31)	(0.29)	0.34	0.69	1.53	0.75	4.61	0.88	3.55	4.75	5.79	7.43	1.51

( ) = negative.

Note: This table lists the detailed summary statistics of foreign and domestic investment biases in bond markets across 6 sample years.

Source: Authors' calculations.

Figure 1: The Evolution of Foreign and Domestic Biases in Global Bond Markets



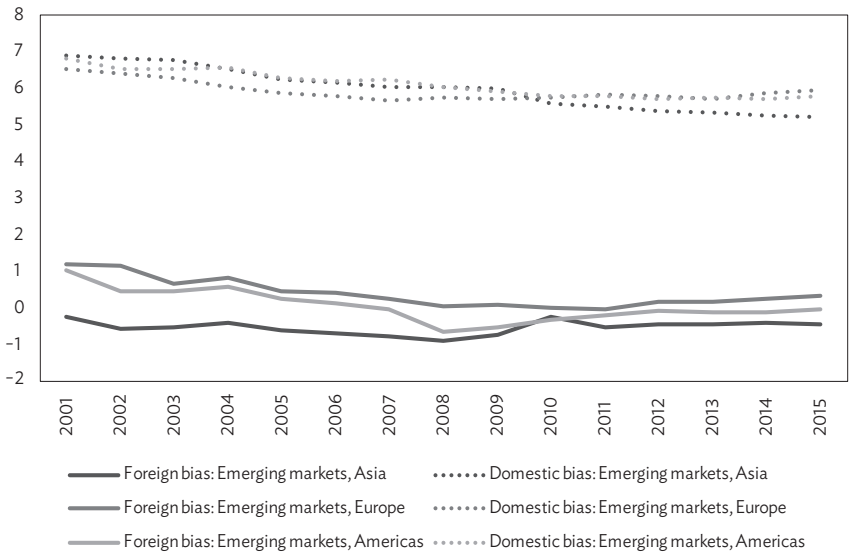
Source: Authors' calculation using IMF and BIS databases.

To take a closer look at trends at the regional level, we break down developed and emerging markets into three subregions: the Americas, the Asia and Pacific region, and Europe. Figure 2a and Figure 2b show the investment biases of emerging and developed markets across different subregions, respectively. As shown in Figure 2a, while home bias levels in emerging markets in all three subregions are quite close to each other and present a similar decreasing trend, emerging markets exhibit different foreign bias patterns across subregions.

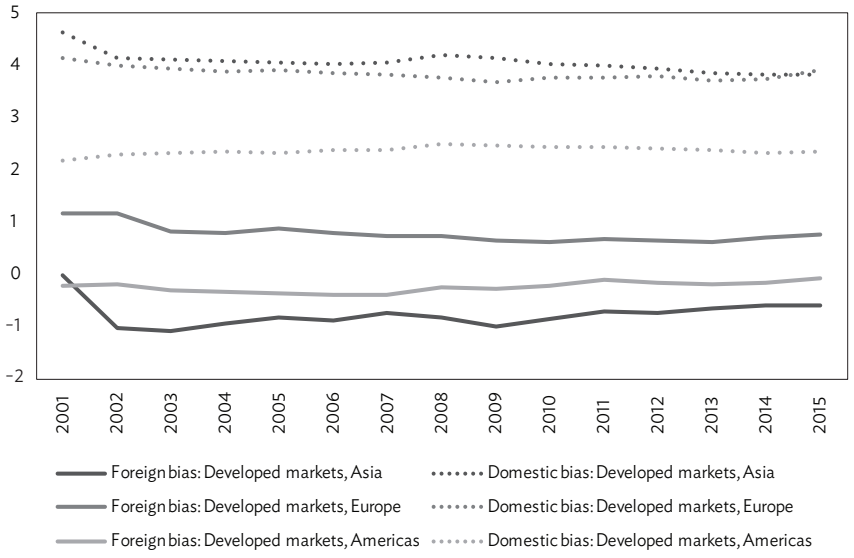
First, emerging European markets are fairly weighed by global investors. Before the global financial crisis, emerging European markets were overweighed by foreign investors. Foreign bias decreased to a fair level during the global financial crisis and slightly picked up again after 2011. Overall, European emerging bond markets are overweighed by foreign investors due to deepened financial integration within the euro area. Second, emerging Latin America was overweighed before the global financial crisis and experienced a sell-off during the crisis. Foreign bias gradually increased after the global financial crisis and now emerging Latin American bond markets' weight in foreign investor portfolios is close to their relative size. Third, emerging Asian bond markets have generally been underweighed compared to their relative size in past decades. Foreign investors reduced investments during the global financial crisis and resumed investments during the postcrisis period. The underweighing of emerging Asian bond markets in global investor portfolios is partially driven by capital control measures adopted in some Asian markets.

Figure 2: Investment Biases in E.merging and Developed Markets

(a) Emerging markets



(b) Developed markets



Source: Authors' calculation using IMF and BIS databases.

Figure 2b shows interesting patterns for developed markets across subregions. A positive foreign bias in developed European markets serves as evidence of deepened financial integration. Developed markets in the Americas have lower home bias levels, while developed Asia and the Pacific markets have the highest home bias levels along with a clear decreasing trend during the review period. However, both developed America and the developed Asia and the Pacific have a negative foreign bias, partially because of the large size of these bond markets (especially the US and Japan) and their relatively low returns. Overall, home bias is still pervasive in global bond markets but shows a decreasing trend in certain markets. Foreign investors mostly underweigh bond markets outside of Europe, especially Asian bond markets.

Table 2 and Table 3 list the summary statistics and pair-wise Pearson correlation coefficients of all key variables that are used in our sample, respectively.[8] Table 3 suggests that most variables in our sample arenot subject to multicollinearity.

Table 2: Summary Statistics for Key Variables

Variable	N	Mean	Min	p5	p10	p50	p90	p95	Max	Std.
FB	241	0.17	(.31)	(1.34)	(0.81)	0.34	1.00	1.12	1.53	0.75
DB	241	4.61	0.88	1.99	2.52	4.75	6.52	6.73	7.43	1.51
RMEAN	241	0.47	(7.20)	(0.57)	(0.31)	0.46	1.28	1.74	3.74	0.95
RVOL	241	2.02	0.26	0.59	0.68	1.41	3.78	6.98	11.62	2.03
RSKE	241	0.07	(1.92)	(1.11)	(0.87)	0.05	0.96	1.35	2.07	0.74
FXVOL	241	0.01	0.00	0.01	0.01	0.01	0.02	0.03	0.12	0.01
FXSKE	241	(0.07)	(2.73)	(1.34)	(0.99)	(0.02)	0.81	0.99	2.24	0.77
SIZE	241	13.38	10.78	11.47	11.79	13.07	15.29	15.86	17.43	1.45
FINDEV	241	(0.47)	(1.57)	(1.16)	(0.98)	(0.39)	(0.16)	(0.13)	(0.03)	0.32
OPENNESS	241	1.49	0.00	0.57	0.57	1.58	2.16	2.25	2.33	0.57
RATING	241	17.40	3.00	8.00	11.50	18.50	22.00	22.00	22.00	4.68

( ) = negative.

Notes: This table lists the summary statistics of key variables. The sample period is 2010–2015. Foreign and domestic biases (FB and DB, respectively) are defined as the deviations of a country's weight in the aggregate foreign and domestic bond investment portfolios from the country's weight in the world bond portfolio. RMEAN is the cumulative monthly return on the local bond market index during the past 12 months. RVOL and RSKE are the standard deviation and skewness of monthly returns on bond indexes during the past 12 months. SIZE is the natural logarithm of aggregated value of outstanding bonds in a bond market. FXVOL and FXSKE are the standard deviation and skewness of monthly real effective exchange rates changes during the past 12 months, respectively. FINDEV is the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). OPENNESS is the natural logarithm of the capital control index from Table 4Dii of the Economic Freedom Network. RATING is the average rating of foreign and local currency sovereign bonds from S&P Global Ratings.

Source: Authors' calculations.

Table 3: Correlation Matrix for Key Variables

Variables	FB	DB	RMEAN	RVOL	RSKW	FXVOL	FXSKE	SIZE	FINDEV	OPENNESS	RATING
FB	1.000										
DB	0.136	1.000									
RMEAN	0.342	(0.885)	1.000								
RVOL	0.055	0.105	(0.073)	1.000							
RSKE	0.056	0.333	(0.289)	0.098	1.000						
FXVOL	0.144	(0.074)	0.138	0.051	(0.169)	1.000					
FXSKE	(0.162)	0.289	(0.350)	0.002	0.245	(0.201)	1.000				
SIZE	0.123	(0.125)	0.176	0.005	0.064	0.178	(0.325)	1.000			
FINDEV	(0.301)	(0.938)	0.748	(0.105)	(0.307)	0.045	(0.237)	0.076	1.000		
OPENNESS	0.004	(0.681)	0.648	(0.151)	(0.481)	0.161	(0.364)	0.213	0.587	1.000	
RATING	0.248	(0.397)	0.493	(0.058)	(0.243)	0.149	(0.221)	0.151	0.296	0.650	1.000

( ) = negative.

Note: This table reports Pearson correlation coefficients between each pair of variables. A total of 241 observations for the period 2010–2015 were used for the calculations.

Source: Authors' calculations.

[8] Due to the limited availability of bond index returns, we only have 253 observations with return-related variables such as momentum, volatility, and skewness. We calculated the correlation matrix including these return-related variables using a smaller sample and there is no evidence that these variables are highly correlated. The alternative correlation matrix is available upon request.

IV. EMPIRICAL ANALYSIS

A. What Determines Foreign and Domestic Biases in Global Bond Markets?

Table 4 reports the estimations of the impacts of various market attributes on foreign and domestic investment biases (see the appendix for the definition of the variables). In Panel A, we include bond return characteristics and currency risks. Columns 2 and 3 show that foreign investors display a significant preference toward bond markets with relatively higher returns and lower volatility: a 1% increase in monthly bond index returns increases foreign bias by 0.025% and a 1% increase in bond index volatility decreases foreign bias by 0.032%. However, bond risk–return profiles do not have a significant impact on domestic investor biases. Furthermore, when foreign exchange risk is included in columns 4 and 5, neither foreign nor domestic investor investment preferences are significantly affected by currency risks.

In Panel B, we include additional market developments and macroeconomic conditions. Higher returns on bond market indexes and lower volatility of bond market returns consistently attract foreign investment, but domestic investors are not sensitive to these risk–return profiles in local markets. Still, foreign and domestic investors do not significantly respond to currency risks. In addition to risk–return profiles, there is interesting evidence from market developments and macroeconomic attributes. While bond market size may not have a significant impact on foreign investor decisions, domestic bias is generally lower in larger bond markets. This evidence suggests that smaller bond markets tend to be more domestically biased compared to larger ones. Meanwhile, markets with fewer capital flow restrictions (greater openness) intuitively encourage more foreign investment, but domestic investment is not affected much by domestic market openness. Finally, foreign investors care more about macroeconomic prospects and stability, which are captured by sovereign ratings, while domestic investors are relatively less sensitive to domestic macroeconomic conditions. Overall, this evidence implies that when the risk–return profile, market accessibility, and macroeconomic conditions improve, foreign investment increases. Moreover, larger bond markets tend to be less domestically biased.

Since some bond markets are offshore financial centers, the trading behavior of foreign and domestic investors in such markets may differ from that in common bond markets. Thus, to examine whether our previous findings are sensitive to the inclusion of such offshore financial centers, we follow the classification of BIS and conduct a robustness check by excluding Hong Kong, China and Singapore from our sample. Also, when determining whether to use a panel fixed effects or random effects model, a Hausman test indicates that panel fixed effects are suitable for most model specifications but a few model specifications are more suited for random effects. In the baseline models in Table 4, we report results estimated using a panel fixed effects model. To test whether the results are sensitive to the choice of the estimation model, we also report estimated results using a random effects model. The results of these tests are listed in Table 5.

Table 4: Determinants of Foreign and Domestic Biases

	Panel A				Panel B			
	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias
Risk–Return Profile								
RMEAN	0.0248**	0.0219	0.0247**	0.0217	0.0262**	−0.00883	0.0253***	−0.00869
	(2.30)	(1.34)	(2.31)	(1.34)	(2.67)	(−0.97)	(3.63)	(−0.92)
RVOL	−0.0320***	0.00248	−0.0314***	0.00336	−0.0356***	−0.00213	−0.0305***	−0.00294
	(−2.75)	(0.13)	(−2.77)	(0.16)	(−2.82)	(−0.17)	(−2.79)	(−0.28)
RSKE	0.00640	−0.000625	0.00857	0.00188	0.00183	0.00280	0.00849	0.00176
	(0.41)	(−0.04)	(0.53)	(0.12)	(0.11)	(0.30)	(0.54)	(0.23)
FXVOL			0.908	0.913	1.007	0.0466	0.978	0.0512
			(0.89)	(1.03)	(0.91)	(0.13)	(1.08)	(0.15)
FXSKE			−0.00981	−0.0126	−0.00327	−0.00251	−0.0107	−0.00135
			(−0.74)	(−1.17)	(−0.26)	(−0.33)	(−0.84)	(−0.16)
Market Attributes								
SIZE					−0.0462	−0.652***	−0.0918	−0.645***
					(−0.44)	(−3.88)	(−0.89)	(−3.60)
FINDEV					0.474	0.298	0.501	0.293
					(0.80)	(1.21)	(0.98)	(1.24)
OPENNESS					0.323***	−0.0492	0.311***	−0.0472
					(3.08)	(−0.65)	(2.92)	(−0.64)
RATING							0.0378**	−0.00590
							(2.57)	(−0.35)
Observations	241	241	241	241	241	241	241	241
Number of markets	41	41	41	41	41	41	41	41
Adjusted R-squared	0.195	0.042	0.194	0.041	0.252	0.356	0.301	0.354
Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
F value	6.84	5.53	5.69	5.08	6.30	30.99	9.09	29.74

Notes: This table reports estimated impacts of different variables on foreign and domestic biases in global bond markets. The sample period is from 2010 to 2015. Dependent variables are foreign and domestic biases defined as the deviations of a country's weight in the aggregate foreign and domestic bond investment portfolios from the country's weight in the world bond portfolio. RMEAN is the cumulative monthly return on local bond market index during the past 12 months. RVOL and RSKE are the standard deviation and skewness of monthly returns on bond indexes during the past 12 months. SIZE is the natural logarithm of aggregated value of outstanding bonds in a bond market. FXVOL and FXSKE are the standard deviation and skewness of monthly real effective exchange rates changes during the past 12 months, respectively. FINDEV is the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). OPENNESS is the natural logarithm of capital control index from Table 4Dii of the Economic Freedom Network. RATING is the average rating of foreign and local currency sovereign bonds from S&P Global Ratings. Models are estimated using panel fixed effects by including time and market fixed effects. T values are calculated from standard errors clustered at the market level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' calculations.

Table 5: Determinants of Foreign and Domestic Biases—Robustness (I)

Estimation Method	Panel Fixed Effects (without offshore centers)		Panel Random Effects	
Variables	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias
Risk–Return Profile				
RMEAN	0.0226***	−0.00846	0.0191***	−0.0209***
	(3.04)	(−0.83)	(2.70)	(−3.21)
RVOL	−0.0346***	−0.00158	−0.0252**	−0.000905
	(−3.03)	(−0.15)	(−2.32)	(−0.09)
RSKE	0.00727	0.00147	0.00933	0.00171
	(0.45)	(0.19)	(0.61)	(0.19)
FXVOL	1.048	−0.0528	0.759	−0.00388
	(1.12)	(−0.16)	(0.74)	(−0.01)
FXSKE	−0.00559	−0.00355	−0.00850	0.00200
	(−0.43)	(−0.38)	(−0.66)	(0.24)
Market Attributes				
SIZE	−0.185**	−0.625***	−0.167**	−0.795***
	(−2.10)	(−3.07)	(−2.12)	(−8.14)
FINDEV	0.646	0.217	0.0873	−0.462
	(1.16)	(0.85)	(0.26)	(−1.64)
OPENNESS	0.330***	−0.0475	0.309***	−0.0873
	(2.84)	(−0.62)	(2.68)	(−1.59)
RATING	0.0367**	−0.00556	0.0364***	−0.0141
	(2.55)	(−0.33)	(3.05)	(−1.05)
Observations	229	229	241	241
Number of markets	39	39	41	41
Year fixed effects	YES	YES	YES	YES
Market fixed effects	YES	YES	NO	NO
Adjusted R-squared/Chi^2	0.32	0.31	163.1	1678

Notes: This table reports estimated impacts of different variables on foreign and domestic biases using panel-random effects model on a full sample and using panel fixed effects model on a sample of markets that exclude financial centers (Hong Kong, China; and Singapore), respectively. Dependent variables are foreign and domestic biases. RMEAN is the cumulative monthly return on the local bond market index during the past 12 months. RVOL and RSKE are the standard deviation and skewness of monthly returns on bond indexes over the past 12 months. SIZE is the natural logarithm of the aggregated value of outstanding bonds in a bond market. FXVOL and FXSKE are the standard deviation and skewness of monthly real effective exchange rates changes during the past 12 months, respectively. FINDEV is the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). OPENNESS is the natural logarithm of the capital controls index from Table 4Dii of the Economic Freedom Network. RATING is the average rating of foreign and local currency sovereign bonds from S&P Global Ratings. The first two models are estimated using panel fixed effects by including time and market fixed effects; the last two models are estimated using panel-random effects by including year fixed effects. T values are calculated from standard errors clustered at the market level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

The first two model specifications in Table 5 list the results estimated for the nonfinancial center subsample, and the last two columns report the estimated results using a random effects model. Largely, the results are consistent with those in Table 4. Foreign investors invest more in bond markets that offer higher returns and lower return volatility. Greater market accessibility and higher sovereign ratings also attract more foreign investment. In addition, there is evidence that foreign investors underweigh large bond markets in their portfolio and that home bias declines as bond markets expand in size.

Since the value of foreign and domestic bias is observed within certain ranges, we utilize a Tobit model to deal with the censored dependent variables. To justify that these findings are robust to possible endogenous issues, we also use systematic GMM to tackle possible endogeneity. The results of these robustness checks are reported in Table 6. As shown, the previous results are robust to alternative estimation methods. Consistently, foreign investors overweigh markets that offer higher returns and lower risk, as well as more open bond markets and those in countries with macroeconomic stability. Meanwhile, a less favorable risk–return profile and small bond market size heighten home bias.

Table 6: Determinants of Foreign and Domestic Biases—Robustness (II)

Estimation Method	Tobit		GMM	
Variables	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias
Risk–Return Profile				
RMEAN	0.0195*	−0.0209**	0.0243***	−0.00759
	(1.91)	(−2.03)	(2.72)	(−0.93)
RVOL	−0.0258**	−0.000901	−0.0218**	0.0239**
	(−2.50)	(−0.09)	(−2.05)	(2.55)
RSKE	0.00924	0.00171	0.00297	0.00565
	(0.68)	(0.12)	(0.24)	(0.51)
FXVOL	0.785	−0.00395	1.381	0.173
	(0.75)	(−0.00)	(1.43)	(0.20)
FXSKE	−0.00869	0.00200	−0.00424	−0.00164
	(−0.62)	(0.14)	(−0.33)	(−0.14)
Market Attributes				
SIZE	−0.162***	−0.794***	−0.173**	−0.555***
	(−3.05)	(−17.12)	(−2.46)	(−9.15)
FINDEV	0.113	−0.462**	0.390	−0.0475
	(0.45)	(−2.09)	(1.06)	(−0.14)
OPENNESS	0.308***	−0.0873	0.226***	−0.000846
	(4.02)	(−1.19)	(2.61)	(−0.01)
RATING	0.0364***	−0.0141	0.0348***	0.00438
	(3.89)	(−1.54)	(3.28)	(0.48)
Observations	241	241	200	200
Number of markets	41	41	41	41
Chi^2/F value	107.8	413.1	5.14	11.26

Notes: This table reports estimated impacts of different variables on foreign and domestic biases using Tobit and systematic generalized method of moments (GMM) models, respectively. Dependent variables are foreign and domestic biases. RMEAN is the cumulative monthly return on local bond market index during the past 12 months. RVOL and RSKE are the standard deviation and skewness of monthly returns on bond indexes over the past 12 months. SIZE is the natural logarithm of aggregated value of outstanding bonds in a bond market. FXVOL and FXSKE are the standard deviation and skewness of monthly real effective exchange rates changes during the past 12 months, respectively. FINDEV is the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). OPENNESS is the natural logarithm of the capital control index from Table 4Dii of the Economic Freedom Network. RATING is the average rating on foreign and local currency sovereign bonds from S&P Global Ratings. The first two models are estimated using panel fixed effects by including time and market fixed effects; the last two models are estimated using panel-random effects by including year fixed effects. T values are calculated from standard errors cluster at the market level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

B. Foreign and Domestic Biases in Developed and Emerging Bond Markets

To further explore whether determinants of foreign and domestic holdings are systematically different in emerging and developed bond markets, this section presents additional tests on global investor bond holdings with a breakdown between emerging and developed markets. Our classification of emerging and developed markets is consistent with BIS classifications. Table 7 lists the estimated results for foreign and domestic investment biases in emerging and developed markets.

Table 7: Determinants of Foreign and Domestic Biases in Developed and Emerging Markets

Subsamples	Developed Markets		Emerging Markets	
Variables	Foreign Bias	Domestic Bias	Foreign Bias	Domestic Bias
Risk–Return Profile				
RMEAN	−0.00897	0.0268*	0.0269	−0.0146***
	(−0.58)	(1.78)	(1.47)	(−3.26)
RVOL	−0.0270	−0.0519	−0.0344***	0.00525
	(−1.45)	(−1.57)	(−3.47)	(0.93)
RSKE	0.00417	0.00960	−0.00106	0.000804
	(0.34)	(0.60)	(−0.03)	(0.11)
FXVOL	4.764*	1.239	0.574	−0.181
	(1.73)	(0.31)	(0.58)	(−0.99)
FXSKE	−0.0108	−0.0135	−0.0219	5.06e−05
	(−0.62)	(−0.55)	(−1.09)	(0.01)
Market Attributes				
SIZE	−0.0615	−0.375	−0.0813	−0.742***
	(−0.29)	(−0.98)	(−0.52)	(−7.76)
FINDEV	−0.436	0.503	0.504	0.167
	(−0.51)	(0.45)	(0.77)	(1.17)
OPENNESS	0.273**	0.0506	0.346	−0.0904
	(2.76)	(0.34)	(1.60)	(−1.68)
RATING	0.00316	0.0119	0.0508*	−0.0116***
	(0.18)	(0.31)	(1.92)	(−4.45)
Observations	138	138	103	103
Number of markets	23	23	18	18
Adjusted R-squared	0.277	0.140	0.355	0.931
Time fixed effects	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES
F value	12.49	17.23	37.54	597.0

Notes: This table reports estimated determinants of foreign and domestic biases in emerging and developed bond markets. The market classification is from BIS. Dependent variables are foreign and domestic biases defined as the deviations of a country's weight in the aggregate foreign and domestic bond investment portfolios from the country's weight in the world bond portfolio. RMEAN is the cumulative monthly return on local bond market index during the past 12 months. RVOL and RSKE are the standard deviation and skewness of monthly returns on bond indexes over the past 12 months. SIZE is the natural logarithm of aggregated value of outstanding bonds in a bond market. FXVOL and FXSKE are the standard deviation and skewness of monthly real effective exchange rates changes during the past 12 months, respectively. FINDEV is the natural logarithm of the financial development indicator constructed in Svirydzenka (2016). OPENNESS is the natural logarithm of the capital control index from Table 4Dii of the Economic Freedom Network. RATING is the average rating on foreign and local currency sovereign bonds from S&P Global Ratings. Models are estimated using panel fixed effects by including time and market fixed effects. T values are calculated from standard errors clustered at the market level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

In developed markets, the portfolio decision making of foreign investors significantly depends on the accessibility of financial markets. In other words, global investors do not seem to invest in developed bond markets for return-seeking purposes. Greater market openness will foster foreign participation. However, in emerging markets, foreign investors exhibit concern over risks. They avoid markets with greater return volatility and overweigh markets with better economic fundamentals. Interestingly, among emerging markets, lower returns, a smaller market size, and a weaker sovereign rating lead to greater home bias.

Overall, the breakdown of bond market development offers insight into how foreign and domestic investors may behave in different market environments. In general, for emerging markets, greater market size and a better sovereign rating will broaden the investor base and lower home bias. For economies with a smaller bond market, regional integration would help to diversify the investor base. This finding sheds additional light on how emerging bond markets can improve their investor profile.

V. CONCLUSION

The literature has long established that foreign participation helps to increase financial market liquidity, enhance market efficiency, and lower financing costs. However, foreign participation may also serve as a channel of global shock transmission. Therefore, it is important for policymakers to better understand the factors that drive the participation of foreign and domestic investors in financial markets. This will help policymakers develop policies that improve investor profiles.

The literature on the determinants of bond market investment biases either consider only domestic bias (Fidora, Fratzscher, and Thimann 2007; Kim et al. 2014) or foreign bias for a single market (Burger and Warnock 2007; Burger, Warnock, and Warnock 2012). In this paper, we extend current knowledge on bond market investment biases by investigating both foreign and domestic investors' portfolio decisions in bond markets using the same set of international data. In particular, we try to understand the determinants of foreign and domestic investor behavior. In doing so, we shed some light on how foreign and domestic investors may behave differently in bond markets.

Overall, our evidence indicates that foreign investors chase better risk–return profiles in global bond markets and that their investments are significantly influenced by bond market accessibility and macroeconomic outlook as captured by sovereign ratings. On the other hand, domestic investors as a whole are relatively less sensitive to market performance. In addition, there is evidence that larger bond markets tend to have a lower home bias.

Our findings have some policy implications for broadening the investor base of bond markets. To broaden the investor base, domestic investors can play an anchor role that will stabilize markets in the face of external shocks. At the same time, since many emerging markets lack a strong domestic investor base, foreign investors, especially regional investors with a solid understanding of the market fundamentals can serve as strategic investors that remain calm even when markets experience large swings. Regional integration may help emerging markets to reach an efficient scale to maintain a balanced investor profile. We should remember that while foreign investors may transfer external shocks to local markets, their active trading contributes to market efficiency and liquidity. Emerging markets can attract foreign participations by making their markets more accessible and strengthening their economic outlook, including public finances, to boost foreign investor confidence.

Future work based on the following data will contribute to a more complete picture of foreign and domestic investment behavior in bond markets. First, more disaggregated data on bond holdings of different types of financial institutions can help us better understand how different types of financial institutions, such as banks, investment funds, insurance companies, and pension funds, behave in bond markets. Second, higher frequency data contain richer and more accurate information about how foreign and domestic investors react to volatilities in foreign exchange rate markets. Third, institutional level bond holding data can provide valuable information about the mandates and trading information of individual institutions.

APPENDIX: VARIABLE DEFINITIONS AND DATA SOURCES

Variables	Definitions	Data Sources
Foreign bias and domestic bias (FB and DB)	Deviation of a country's weight in the aggregate foreign (domestic) investment portfolio from the country's weight in the world bond portfolio: $FB_{i,t} = \log(\frac{w_{i,t}^{FI}}{w_{i,t}^{M}})$ $DB_{i,t} = \log(\frac{w_{i,t}^{DI}}{w_{i,t}^{M}})$	International Monetary Fund's Coordinated Portfolio Investment Survey
Bond market size (SIZE)	Natural logarithm of aggregated value of outstanding bonds in a bond market	BIS debt securities statistics (DEBT_SEC2) Table C1
Return momentum (RMEAN)	Average monthly return on bond market index during the past 12 months	JP Morgan GBI Aggregate Diversified Index; Emerging Market Bond IndexGlobal Diversified
Return volatility (RVOL)	Standard deviation of monthly return on bond market index during the past 12 months	
Return skewness (RSKE)	Skewness of monthly return on bond market index during the past 12 months	
Exchange rate volatility (FXVOL)	Standard deviation of monthly percentage changes of real effective exchange rates during the past 12 months	BIS monthly effective exchange rates
Exchange rate skewness (FXSKE)	Skewness of monthly percentage changes of real effective exchange rates during the past 12 months	
Financial development (FINDEV)	Natural logarithm of financial development indicator constructed in Svirydzenka (2016): 0 (less developed) to 1 (well developed)	Svirydzenka (2016)
Financial market openness (OPENNESS)	Natural logarithm of capital control index from Table 4Dii of the Economic Freedom Network: 0 (fully controlled) to 10 (fully open)	Economic Freedom Network
Sovereign rating (RATING)	Average rating on foreign and local currency sovereign bonds from S&P Global Ratings	Bloomberg

BIS = Bank for International Settlements.
Source: Authors' compilation.

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Foreign and Domestic Investment in Global Bond Markets

The Asian equity and bond markets have grown rapidly in the past decades. However, challenges have emerged including lack of liquidity, inactive institutional participation, and less favorable investor profiles. This paper analyzes the drivers of foreign versus domestic investment in global bond markets. The analysis suggests that there are some differences between foreign and domestic investors in both advanced and emerging bond markets. Foreign investors seem more sensitive to risk–return profile than domestic investors, especially in emerging markets. They are also attracted by greater market openness and sound sovereign credit ratings. Finally, regional market integration can benefit emerging bond markets by broadening the investor base.

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