

Home bias in the global portfolio investment of selected OIC countries

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ABSTRACT

Home bias reflects the propensity of investors to allocate their portfolio substantially in domestic market. The existence of home bias offers a new discovery that enables for a comprehensive and robust investigation of such phenomenon. Therefore, the main agenda of this research is to examine the determinants of home bias in the global portfolio investment of selected OIC countries. An unbalanced bilateral panel data of 12 OIC countries' outward equity investment in 74 host countries from year 2001 to 2016 was analysed. System Generalized Method of Moments (GMM) estimator was employed to determine the factors influencing home bias. The findings show that home bias can be explained by factors related to institutional quality, familiarity, and global financial crisis. The relative factors introduced in the current study significantly explained the existence of home bias phenomenon. Summative findings indicate that home bias may discourage global portfolio investment, but there is a tendency of over-investment in MENA region based on geographical preferences. This study has a significant implication to investors, fund managers and regulators of the OIC countries. Investors and fund managers in OIC countries should be aware of the existence of home bias in their global portfolio that may potentially reduce the benefits of optimal diversification. It is a call for policy makers in the OIC countries to convince their local investors that international portfolio diversifications are able to minimize portfolio's risk and eventually increase the investment returns.

1. Introduction

Home bias phenomenon was first documented in a seminal paper by French and Poterba (1991) when it was reported that domestic equity holding by investors in the United States, Japan, and Britain were 98%, 94%, and 82% respectively. The findings reveal that there was an overinvestment in the domestic market beyond optimal benchmark as suggested by the international version of Capital Asset Pricing Model (CAPM). In the international market, CAPM proposes that the world market portfolio is an optimal portfolio. The model suggests that the proportion of the assets invested in a domestic equity market should be equal to its weight in the world market portfolio (Levy & Sarnat, 1970).

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Home bias reflects the propensity of investors to hold domestic securities rather than foreign securities in their portfolio. Home bias is identified as one of the major puzzles in the financial economics since investors miss-allocate their assets optimally across global market by systematically overweighting their investment funds in the local market. Over the last decades, the global financial landscape has dynamically shifted into financial integration phase across global financial markets. Market integration also fosters dramatic increase in cross-border equity transactions due to free flow of information. Intuitively, home bias is expected to be non-existent.

Despite voluminous empirical research on home bias phenomena, a majority of scholars have agreed that home bias research is rather inconclusive. Mukherjee, Paul and Shankar (2018) argue that home bias is one of the most persistent and unsettled empirical puzzles in financial economics. Similarly, Vanpée and De Moor, (2012) concede that the equity home bias puzzle is still something that is not fully understood. Thapa and Poshakwale (2012) documented those emerging countries (Argentina, Chile, China, India, Malaysia, Peru, Philippines, and Taiwan) and developed countries (Canada and New Zealand) are among countries ranked with the highest score of home bias. However, the home bias phenomenon in emerging countries is much more severe and demands for the controlling impact of this under diversification phenomena. Similarly, Diyarbakirlioglu (2011) claims that investors in developed countries exhibit lower home bias as compared to those investors in developing countries. The findings also suggest that home bias phenomenon is more critical in emerging countries, compared to developed countries. On average, the home bias score is 65% and 93% for developed and emerging countries respectively. In emerging economies like Turkey and India, domestic investors allocate most of their equity investment into their domestic market. Coeurdacier and Rey (2013) confirmed that the average home bias score in emerging markets is 0.90 although the Asian region has a lower score than the Latin America region. They reported that only one-tenth of the equity investment was allocated in foreign equity beyond the suggested level of the optimal benchmark.

Against this backdrop, the sample of countries in this study is based on their membership in the Organization of Islamic Cooperation (OIC). Conducting research in the context of OIC countries offers an interesting opportunity. Phenomenal growth of capital markets in OIC countries calls for attention and further explorations. These countries have grown from less than 1% of the total value of the world capital markets to almost 3%. Mostly, previous empirical studies on home bias have overlooked OIC countries despite the remarkable economic growth of these markets. The OIC represents the world's second largest intergovernmental organization after the United Nation. It comprises of 57 Islamic countries around the world, represented by several regions like the Middle East and North Africa, East Asia and Pacific, Europe and Central Asia, as well as South Asia. The OIC aims to promote Islamic solidarity by coordinating social, economic, scientific, and cultural activities among the members. Despite their important economic role to the world through oil exports and tourism, the international investment in OIC countries has been largely unrevealed. Hence, their significant contribution has been bypassed by financial market research. Previous literature shows that home bias phenomenon is high among developing countries (Diyarbakirlioglu, 2011; Coeurdacier & Rey, 2013; Chiou & Lee, 2013). The result is quite convincing since majority of the OIC member countries are those with developing-country status. Despite their global economic importance, the tendency of high investment in home countries may indicate that there are barriers to foreign portfolio investment.

Therefore, the goal of the current study is to investigate the factors that contribute to the existence of home bias in the global portfolio investment of the selected OIC countries. Concentrating on the selected OIC countries allows for new additional knowledge in this research area. Furthermore, with the growth of Shariah compliant investment products worldwide, this study provides opportunities for Muslim investors to diversify their portfolio globally. Thus, it is worth assessing the barriers that limit the Muslim investors to access global market. The findings are expected to contribute to the contextual gap in this research area.

2. Literature review

There is voluminous empirical evidence regarding the existence of home bias phenomenon. Several empirical studies have demonstrated that home bias is related to the benefits of home market investment relative to foreign market investment. Most of the explanations have been used to highlight the barriers in international portfolio investment that hinder investors to optimally invest in the global market. Based on international investment of mutual funds from 26 developed and developing countries, Chan, Covrig and Ng (2005) found strong evidence that these mutual funds have larger portion of investment in the domestic market. Empirical findings indicate that the market development and familiarity variables have a significant influence on home bias. Sercu and Vanpée (2008) show that the home bias puzzle may be well explained by the implied cost framework. The cost depends on home and host country characteristics and on interactions. The authors found that home bias is significantly explained by factors related to information asymmetries, institutional factors, and explicit costs. Specific to emerging markets, El-Edel (2010) suggests that factors that are related to information asymmetries, economic risks at home, exchange rate volatility, and markets' inefficiencies are the main factors affecting equity domestic bias in the emerging markets.

Concentrating on the restriction of capital flow data from Economic Freedom Network, Chan et al. (2005) shows that a destination country with more restrictions will increase home bias. Focusing on the intensity of capital control data from International Finance Corporation, Ahearne et al. (2004) found a contradicting result where capital control is no longer explaining home bias. Earlier, a study by Lane and Milesi-Ferretti (2000) shows that the influence of capital control on international investment position is negative and statistically significant. It indicates that high capital control will discourage international portfolio investment.

Mishra and Ratti (2013) documented the evidence on the influence of governance variables on international investment flows. The governance variable was treated as the difference between home and foreign country and it shows a close relationship with portfolio holdings. Abdioglu et al. (2013) examined the influence of foreigners' country-level governance quality on their investment preferences when they invested in the United States. The result reveals that the institutional investors from countries with governance quality similar to that of the U.S. invested more in the U.S. firms, but investors from countries with governance quality just below (just above) that of the U.S. invested more (less) in comparison. Thapa and Poshakwale (2012) examined the influence of investor protection on international equity portfolio investments using bilateral portfolio holdings data for 36 countries from 2001 to 2006. The study demonstrates that investor protection measures are important determinants of foreign equity portfolio investments. The authors suggest that any efforts to attract greater international equity portfolio investments from foreign investors are by improving the quality and enforcement efficiency of legal protections.

In addition, Rika (2014) found that familiarity affects foreign investment decisions. Empirical results on the emerging markets show that familiarity factors and foreign investment environments (legal and political) have large impacts on investment allocation. Kim et al. (2015) employed economic development and market development in studying home bias phenomenon in emerging markets. Their findings show that market performance factors generally affect home bias more strongly than do economic development factors. This indicates that an emerging market that is experiencing high economic growth and development may not require such benefits from international foreign investment. Rather, stock market performance is more detrimental in their international asset diversifications. This is justified by the fact that their stock market is relatively small compared to stock markets in the developed countries. Mhadhbi (2013) shows a positive effect of financial market development on global portfolio investment. Higher financial market development in the destination countries indicates that foreign countries are more developed. This condition offers greater investment opportunities, making investors more inclined to hold portfolio in this economy.

Mishra (2008) shows that informational variables, like the share of the number of firms listed on the domestic market and the share of internet users in the total population of the host country, has a significant impact on equity home bias. The result suggests that efficiency of information exchange between home and host countries removes information barriers, hence, increases the international portfolio holdings and reduces home bias. Similarly, Foad (2011) studied the subset of investors' information and the relationship between immigration and equity home bias. He found that inward migration is positively correlated with increased foreign equity positions and reduced home bias. The results suggest that immigration generates a positive externality of increased information flows for the developed countries, but not for the developing nations. The effects of immigration on investment are stronger within the Euro-Zone, suggesting that this positive externality of immigration is larger when barriers to portfolio diversification (such as currency risk) are lowest. Leblang (2010) emphasises on the role of diaspora networks; the connections between migrants residing in investing countries and their home country. They demonstrate that migrant networks play an important role in decreasing information asymmetries and consequently promote both portfolio and FDI.

Rika (2014) confirms that home bias rises during global financial crisis and investors are more inclined towards diversification benefits by allocating their assets in foreign markets that correlated more with their home markets. Investors are more likely to hold their positions in less risky investment and prefer to invest in host countries that they are familiar with, especially their trading counterparts. Conversely, Wynter (2019) proves that home bias is reduced during global financial crisis due to active portfolio rebalancing activities among the investors. Vermeulen (2013) demonstrates that during a global financial crisis, investors were found to actively rebalance their global portfolio investment towards low correlated countries. This implies that investors tend to maximize diversification benefits through active portfolio rebalancing. Furthermore, investors were willing to tolerate up to 3% of additional cost by switching from passive to active portfolio management. Most of previous studies have offered explanations on home bias based on the host country perspective. However, to the best of the authors' knowledge, no empirical reports have been found so far in the use of relative factors of home and host countries. The current study posits that home factors do have some influence on this phenomenon. Rather than concentrating on either home country or host country factors separately, it is worth it to derive the factors based on relative factors between home and host countries' perspectives. Thus, several explanatory variables are derived from relative factors between home and host countries' proxies. Expectantly, the results may provide meaningful interpretation for the determinants of home bias and foreign bias. Therefore, it is pertinent to fill the literature gap by providing the best method to explain empirical patterns of home bias. The findings of this study have also contributed to the methodological gap in this research area.

3. Data and methodology

The current research is engaged with the data from the International Monetary Fund's (IMF) Coordinated Investment Portfolio Survey (CPIS). It files the amount of portfolio investment securities (in USD at market prices) that country i 's residents own in country j at the end of December in year t . Specific to this study, country i represents the home (source) country while country j denotes the host (destination) country. The CPIS consists of different asset classes (equity and investment fund shares, long-term debt instruments, and short-term debt instruments) that can be retrieved separately from the database. Specifically, this study concentrates on the equity portfolio investments of countries in the sample of study.

The dataset represents panel data that consists of time series and cross-sectional data. It also represents bilateral panel data that contains of 12 OIC (home) countries towards 74 host countries around the world. These countries are among OIC countries that periodically report their bilateral equity investment to the IMF. The current study deals with a big scale of bilateral panel data with 4,956 observations spanning over 15 years, from 2001 to 2016. The following Table 1 presents the demographic profile of the home countries

in the sample. Majority of the participating home countries are from the Middle East and North Africa region, followed by East Asia and Pacific, Europe and Central Asia, and South Asia. In terms of income status, most of the OIC countries in the sample are from the lower middle-income status, followed by the high-income, and upper middle-income status.

The sample of this study includes 4,956 observations that represent OIC countries' outwards equity portfolio investment across the world. This is assigned as the global sample of the study. Other two sub-samples were derived from this global sample, namely intra-OIC and non-OIC samples. In the intra-OIC sample, the host countries represent OIC member countries. In other words, it represents the global portfolio investment from the OIC countries and the OIC counterparts. In the non-OIC sample, the host countries represent non-OIC member countries. It represents the global portfolio investment from OIC countries to the non-OIC countries. The main difference between these two samples is the host countries: either OIC countries or non-OIC countries. Extension research in sub-sampling is useful to further comprehend home bias phenomena in the context of OIC countries. Furthermore, it also allows for test of robustness in determining factors explaining home bias of OIC countries' global portfolio investment towards different group of the host countries.

In the previous study, Ferreira and Miguel (2011) split the sample into European monetary Union (EMU) and non-EMU samples. The finding shows that investors from EMU countries invested more in their own market compared to non-EMU countries. In addition, Balli, Basher and Ozer-Balli (2010) show that the existence of EMU in 1999 has fostered the integration among Euro financial markets. As a result, home bias declined across the European financial markets, but it induced regional (Euro) bias where investors in this region had a tendency to hold a large proportion of assets issued within their region. Beugelsdijk and Frijns (2010) show that economic and regional cooperation, like NAFTA, EU, and ASEAN, encourage international portfolio diversification. The results concur with Pradkhan's (2014) that shows a negative relationship between economic integration with home bias in EU, NAFTA, MERCOSUR, and ASEAN.

Table 1. Demographic profile of OIC countries

	Home countries	Region	Income status
1.	Bahrain	Middle East & North Africa	High Income
2.	Bangladesh	South Asia	Lower Middle Income
3.	Egypt	Middle East & North Africa	Lower Middle Income
4.	Indonesia	East Asia & Pacific	Lower Middle Income
5.	Kazakhstan	Europe & Central Asia	Upper Middle Income
6.	Kuwait	Middle East & North Africa	High Income
7.	Lebanon	Middle East & North Africa	Upper Middle Income
8.	Malaysia	East Asia & Pacific	Upper Middle Income
9.	Pakistan	South Asia	Lower Middle Income
10.	Saudi Arabia	Middle East & North Africa	High Income
11.	Turkey	Europe & Central Asia	Upper Middle Income
12.	West Bank and Gaza	Middle East & North Africa	Lower Middle Income

The dependent variable of home bias (HB) is based on the model-based approach that represents variations between the actual foreign portfolio holdings and the optimal benchmark (Mishra, 2011; Mishra & Ratti, 2013; Mishra & Conteh, 2014; Mishra, 2015; and Mishra, 2016). The model suggests that investors are expected to hold international assets of each country based on its share in the world market. The equity home bias is the deviation from the international version of the Capital Asset Pricing Model (ICAPM) benchmark, derived as one minus the ratio of foreign equities in country i and the world portfolio (Mishra, 2014).

$$HB_{ij} = 1 - \frac{I_j^i}{I_j^*} \quad (1)$$

Where, HB_{ij} is the home bias ratio and $\frac{I_j^i}{I_j^*}$ is foreign bias ratio. (I_j^*) ratio represents optimal portfolio holdings (ICAPM benchmark) in which the actual portfolio is compared.

In the current study, there are a few sets of explanatory variables that are represented as relative factors. These variables represent a ratio between home countries and host countries' factors. This measure allows for relative interpretation between home and host countries' factors. Generally, the explanatory variables were derived from the following formula of relative measures:

$$X_{ijt} = \frac{X_i}{X_j} \quad (2)$$

Where, X_{ijt} represents the relative factors (ratio between home countries' proxy over the host countries' proxy) of the respective explanatory variables in year t . Home country's proxy is presented by X_i , while X_j represents the host country's proxy. The explanatory variables include financial market openness (FMO), institutional quality (INSTQUAL), economic development (EDEV), market development (MDEV), and information asymmetry (IA), familiarity (FAM) and time effect variable of the global financial crisis (GFC). In addition, there are a few proxies under IA (gravity variables), FAM (import-export) and EDEV (real exchange rate) variables that are based on a single factor. Table 2 lists the variables used to examine the determinants of home bias in the global portfolio investment of selected OIC countries.

Financial market openness is represented by capital control and globalisation index. This study uses the Chinn Ito index of financial openness sourced from Chinn and Ito (2006). The index is a measure of a country's degree of capital account openness. It focuses on the regulatory restriction on capital account transactions reported by the IMF. High index score means less restriction on capital flow. In this study, the proxy for capital control (KAO_{ij}) was derived from the relative score ratio between the home and the host countries' index. Our a priori expectation is that with higher capital control in host countries relative to home countries, home bias decreases. Meanwhile, globalisation index represents openness with international linkages and indicates the state of liberalisation between two countries. It is represented by the average score of economic, social, and political dimensions of globalisation. We expect that with a higher globalization in host countries relative to home countries, home bias decreases. In summary, we hypothesize a negative relationship between financial market openness and home bias.

Institutional quality (INSTQUAL_{ij}) is represented by average score of World Governance index that comprises of voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Our a priori expectation is that with higher institutional quality in host countries relative to home countries, home bias decreases. Therefore, we expect a negative relationship between institutional quality and home bias.

Economic development (EDEV_{ij}) measures the degree of economic well-being of a country that signals greater potential for investment opportunities. Following Mishra and Conteh (2014), we expect that higher GDP per capita may positively influence home country's international portfolio investment. Thus, home bias decreases. Expectantly, when relative score of GDP per capita of host countries is higher than home countries' (GDP_{ij}), home bias decreases. In addition, based on Mhadhbi (2013), we expect a positive

relationship between real exchange rate (REX_i) and home bias. We expect that with a higher exchange rate between home countries' currency relative to USD, home bias increases because of higher cost of investment abroad.

Meanwhile, market development ($MDEV_{ij}$) is represented by both market-based and bank-based variables. The proxy for market-based variables are both the number of listed domestic countries (LDC_{ij}) and stock turnover ($STOT_{ij}$) that represent active stock market transactions. We expect that with a higher score of market-based variables of home countries relative to host countries, home bias decreases. On the other hand, bank-based is represented by both domestic credits provided by financial institutions (percentage of GDP), ($DCR1_{ij}$); and domestic credit to the private sector provided by banks (percentage of GDP), ($DCR3_{ij}$). We expect that with a higher score of bank-based variables of home countries relative to host countries, home bias increases. In summary, investors prefer to invest in host countries with higher economic and market development compared to in their own home countries. In the context of market development, investors are expected to invest more in host countries that are more market-based as compared to bank-based.

Information asymmetries represent the information gap between home and host countries. The proxy for this information gap is the information and telecommunication variables represented by fixed telephone subscription (per 100 people), (FTS_{ij}); and individuals using the internet (percentage of population), (INT_{ij}). Both proxies were derived from relative factors between the home and host countries, as well as a set of gravity variables that measure distance between home and host countries ($Contig$, $comlang$, $comcol$, $lnDistance$). Another set of proxy which represents information asymmetry variables were sourced from the Centre of D'Etudre Prospectives Ent D'informations Internationales (CEPII). It is a well-known set of gravity variables developed with the purpose of analysing market access difficulties in global and regional trade flows. The proxies used, among others, include contiguity ($contig$), common language ($comlang$), common colony ($comcol$), and capital city distance between the home and host countries ($lnDistance$). Contiguity represents a dummy variable that indicates if two countries share a common border. Common language represents a dummy variable that indicates if a common language is spoken by at least 9% of the population of the two countries. Common colony represents a dummy variable that indicates if two countries have a colonial link in their past histories. Distance variable represents a logarithm of the distance between the two countries' largest cities, as weighted by the share of each city on the total population of the country. We expect a positive relationship between information asymmetry variables and home bias. On the other hand, we expect a negative relationship between familiarity and home bias. We expect a positive relationship between information asymmetries and home bias. Our a priori expectation is that with higher information asymmetries in host countries relative to host countries, home bias increases.

Familiarity variable ($MiXiGDP_{ij}$) is based on the import and export (trade) between OIC countries with the rest of the world. The proxy is calculated by dividing the amount of import and export of home countries with the sum of Gross Domestic Product (GDP) of both home and host countries. Frequent trading between home countries across the world will induce investors' preference for equity investment. Therefore, a negative relationship is expected between familiarity and home bias.

Year effect is represented by dummy variable of 2007-2008 Global Financial Crisis (GFC). We expect a negative relationship between GFC and home bias. In this study, the year effect variable is represented by a dummy variable of 2007-2008 global financial crisis (GFC). Our a priori expectation is that during a global financial crisis, investors will pull out their investment from foreign markets and shift their investments to domestic markets. Therefore, a positive effect of GFC on home bias is expected.

Table 2. Measurements of variables

	Proxy	Measurement	Sources
Dependent Variables	Outward equity portfolio investment (USD) that country <i>i</i> 's residents hold in country <i>j</i> at the end of December in year <i>t</i> .	$HB_{ijt} = 1 - FB_{ijt}$	CPIS, IMF CPIS, IMF
Explanatory variables	<u>i</u>) Relative factors	$X_{ijt} = \frac{X_i}{X_j}$	
Financial market openness	Capital control Globalization index	KA0ij GLOij AWGIij	Chinn Ito Index KOF Globalisation Index
Institutional quality	Governance index	GDPCij	World Governance Index
Economic development	Gross domestic per capita	LDCij, STOTij	World Bank
Market development	Market-based Bank-based	DCR1ij, DCR3ij Ftij, INTij	World Development Index World Development Index
Information asymmetry	Information and telecommunication		
Information asymmetry	(ii) Single factors Gravity variables	Contig, comlang, comcol, lnDistance	Centre of D'Etudre Prospectives Ent D'informations Internationales (CEPII)
Familiarity	Import-export (Global trade)	MiXiGDPIj	World Development Index
Economic development	Real exchange rate	REXi	World Development Index n/a
Year Effect	Global financial crisis	GFC 1= 2007 and 2008 crisis years 0= other years	

Consistent with the research objectives, the current study is based on the following econometric model that is specifically aimed to investigate the contributing factors of home bias in the global portfolio investment of OIC countries. The econometric model is written below:

$$Y_{ijt} = \beta_0 + Y_{ijt-1} + \beta_1 FMO_{ijt} + \beta_2 INSTQUAL_{ijt} + \beta_3 FAM_{ijt} + \beta_4 EDEV_{ijt} + \beta_5 MDEV_{ijt} + \beta_6 IA_{ijt} + \beta_7 GFC_t + \varepsilon_{ijt} \quad (3)$$

$$ij = 1, \dots, N$$

$$t = 1, \dots, T$$

where:

Y_{ijt}	represents the dependent variables of home bias. It represents the weights of home bias of OIC countries (i) towards host country (j) in year t .
Y_{ijt-1}	represents the lagged dependent variable of home bias. It represents the lagged dependent variable of home bias of OIC countries (i) towards host country (j) in year $t-1$.
β_0	denotes constant.
FMO	denotes financial market openness between home and host country in year t .
INSTQUAL	denotes institutional quality between home and host country in year t .
FAM	denotes familiarity between home country and host country in year t .
EDEV	denotes economic development between home and host country in year t .
MDEV	denotes market development between home country and host country in year t .
IA	denotes information asymmetry between home and host country.
GFC	denotes 2007/2008 global financial crisis.
ε_{ijt}	denotes random error.

4. Results and findings

4.1 Summary statistics on dependent variable

Table 3 depicts the descriptive statistics for the dependent variables across all the samples. Overall, the mean score of home bias in the global sample is 0.9724. The value indicates that about 97.24% of OIC countries' assets (equity) allocation concentrated in the domestic (home) market. When the sample was divided into sub-samples, the score of home bias is higher in non-OIC (0.9817) compared to the score in the intra-OIC sample (0.9317). This shows that OIC countries exhibit higher home bias towards non-OIC compared to their OIC counterparts. The minimum score across the samples is around 0.50, while the maximum score is 1. The maximum score of 1 indicates that there is no global portfolio investment from the home (OIC) countries towards the host countries during that particular year. This shows that the assets (equity) allocation concentrated 100% in the domestic markets.

Table 3. Descriptive analysis of the dependent variable (home bias) across the samples

Variables	Summary Statistics	Samples		
		Global	Intra-OIC	Non-OIC
	Obs.	4,479	834	3,645
	Mean	0.9724	0.9317	0.9817
Home Bias	Std. Dev.	0.0754	0.1173	0.0581
	Min	0.5024	0.5024	0.5051
	Max	1	1	1

4.2 Summary statistics on explanatory variables

Appendix 1 provides the statistic on the mean score of the explanatory variables for home bias. Majority of the explanatory variables were sourced from the relative factors between home and host countries. The calculation in this work suggests that the explanatory variables are supposed to be interpreted as relative scores between the home and host countries' factors. The discussion of descriptive analysis on

the explanatory variables are based on inter-samples comparison across all the samples, namely global, intra-OIC, and non-OIC. Inter-samples comparisons are meaningful since there are no specific acceptable values (threshold) to analyse each of the variables. Furthermore, inter-sampling comparison is important to support robustness test conducted in this study which is helpful for in-depth analysis on the determinants of home bias across different samples of the host countries. The mean scores of all these explanatory variables represent the gap between the home countries' factors and host countries' factors. Generally, a higher mean score indicates that home factors dominate the host factors. This situation may lead to a higher home bias due to less attractiveness of global portfolio investment in the host countries. In contrast, a lower mean score suggests that the host factors dominate the home factors. This situation should result in a lower home bias due to higher attractiveness of global portfolio investment in the host countries.

Financial market openness is represented by capital account openness and globalisation index. The mean score of capital account openness in the global sample is 0.8007. However, inter-samples comparison shows that the mean score (2.3131) is higher for the intra-OIC sample compared to the mean score (0.4601) of non-OIC sample. This indicates that the majority of OIC countries display higher home bias towards non-OIC countries although these countries have higher capital account openness as compared to their OIC counterparts. Similarly, globalisation index in global, intra-OIC, and non-OIC are 0.9170, 1.0773, and 0.8803, respectively. These results indicate that the majority of OIC countries display lower home bias towards their OIC counterparts although these countries are less globalised.

In view of institutional quality, the mean score in the global sample is 0.9170. However, inter-samples comparison shows that the mean score (1.0773) is higher in intra-OIC samples than the mean score (0.8803) in non-OIC samples. The results infer that the majority of OIC countries display higher home bias towards non-OIC although these countries have higher institutional qualities, as compared to their OIC counterparts. The mean scores of familiarity variables across the samples are 0.2762, 0.4117, and 0.2452, respectively. Inter-samples comparison shows that the majority of OIC countries display higher home bias towards non-OIC countries although the bilateral between the home and host countries trade is higher.

The mean score of economic development variables (GDPC) in the global sample is 0.9346. However, the mean score in intra-OIC sample is higher (1.0099) than non-OIC sample (0.9173). This signals that the majority of OIC countries display higher home bias towards non-OIC countries although these countries have higher economic development, as compared to their OIC counterparts. In view of the real exchange rate, the mean score is higher in non-OIC (1,156.42) compared to intra-OIC (484.61). This signals that home bias is high when the real exchange rate of OIC countries against USD is higher. This implies that higher cost of investment abroad induces home bias.

The mean scores of market development variables (bank-based) in the global sample are 0.9887 and 1.1135, respectively. The mean scores of both bank-based proxies are lower (0.9442 and 0.9609) in non-OIC samples compared to intra-OIC samples (1.1830 and 1.7803). This indicates that the majority of OIC countries display higher home bias towards non-OIC countries that are more debt oriented. Market development variables (market-based) show that the mean scores (4.7617 and 5.1315) are higher in intra-OIC samples compared to non-OIC samples (2.6073 and 2.3168). This indicates that the majority of OIC countries display lower home bias towards their OIC counterparts that are more market oriented.

Information asymmetry comprises information and communication variables (FTS_{ij} and INT_{ij}) as well as gravity variables (contiguity, common language, common colony, and capital city distance between the home and host countries). In the global sample, the mean score of fixed telephone subscription (FTS) is 1.7212. The mean score is higher in intra-OIC sample (4.6442) compared to non-OIC sample (1.0518). Similar results are also seen with respect to internet subscriptions (INT). In the global sample, the mean score of INT is 1.3548. The mean score is higher in intra-OIC sample (2.2127) compared to non-OIC sample (1.1576). These results suggest that the majority of OIC countries display higher home bias towards non-OIC countries even though these countries have higher access to information and communication channels.

The mean score of contiguity in the global sample is 0.0223. The mean score is higher in intra-OIC sample (0.0348) compared to non-OIC sample (0.0195). This indicates that the majority of OIC countries display lower home bias towards their OIC counterparts that are sharing similar borders compared to non-OIC countries that are at a distance. In the global sample, the mean score of common language is 0.0873. The mean score (0.2962) is higher in intra-OIC sample compared to non-OIC samples (0.0395), suggesting that the majority of OIC countries display lower home bias when the two countries have the same common language. Generally, the mean score of common colonies in the global sample is 0.0690. The mean score is higher in intra-OIC sample (0.1811) compared to the non-OIC sample (0.0433). These results suggest that the majority of OIC countries display lower home bias when both home and host countries share the same historical colony. The mean score of capital city distance between home and host countries is higher in non-OIC sample (8.0187) compared to intra-OIC sample (8.6106). These results signal that the majority of OIC countries display higher home bias towards countries at a far distance.

The mean score of the global financial crisis (GFC) is higher in non-OIC samples (0.1893) compared to intra-OIC samples (0.1739). This indicates that during the GFC, the majority of OIC countries continuously diversifying their investment in the global markets. However, they display higher home bias towards non-OIC countries as compared to their OIC counterparts.

4.3 Cross-sectional analysis

Table 4 presents the mean score of home bias among OIC countries based on their income status. The findings show that OIC countries from the upper middle-income status exhibit the highest score of home bias, followed by those from the lower middle-income and high-income, respectively. These results indicate that the level of wealthiness may explain the tendency of home bias in the global portfolio investment of a country.

Table 4. Home bias and home countries' income status.

Home countries	Income status	Home bias
Kazakhstan, Lebanon, Malaysia, Turkey	Upper Middle Income	0.8661
Bangladesh, Egypt, Indonesia, Pakistan, and West bank and Gaza	Lower Middle Income	0.8643
Bahrain, Kuwait, and Saudi Arabia	High Income	0.8445

Table 5 shows the home bias phenomena from the perspective of home countries' regional origin. OIC countries from the ECA region display the highest score of home bias, while those from the MENA exhibit the lowest score.

Table 5. Home bias and home countries' region.

Home country	Region	Mean score
		Home bias
Kazakhstan and Turkey	Europe & Central Asia	0.8731
Indonesia and Malaysia	East Asia & Pacific	0.8654
Bangladesh and Pakistan	South Asia	0.8617
Bahrain, Egypt, Kuwait, Lebanon, Saudi Arabia, and West Bank and Gaza	Middle East & North Africa	0.8525

Table 6 presents the home bias phenomena at several levels of income status of the host countries. OIC countries display the highest score of home bias towards the host countries with high-income status, but lowest towards host countries in lower-middle-income.

Table 6. Home bias and host countries' income status

Income status of host countries	Mean score
	Home bias
High Income	0.8658
Low Income	0.8534
Upper Middle Income	0.8557
Lower Middle Income	0.8382

Table 7 explains the varying degrees of home bias phenomena exhibited by OIC countries towards the regional area of host countries. OIC countries display the higher home bias towards host countries in the North America region, as compared to their OIC counterparts in MENA region. This indicates that there is a tendency for regional bias within intra-OIC countries.

Table 7. Home bias and host countries' region

Region of host countries	Mean score
	Home bias
North America	0.8803
Latin America and Caribbean	0.8728
Europe and Central Asia	0.8673
East Asia and Pacific	0.8620
South Asia	0.8456
Sub Saharan Africa	0.8435
Middle East and North Africa	0.8297

4.4 Regression analysis

There are certain limitations in using OLS as an estimation technique. Firstly, some of the explanatory variables can be endogenous and therefore using OLS can result in biased and inconsistent estimates. In addition, the existence of time invariant country characteristics (fixed effects) may be correlated with the explanatory variables. Finally, the inclusion of the lagged dependent variable may possibly lead to auto correlation. To overcome these problems, we used the generalized method of moments (GMM) estimators developed for dynamic panel data. Arellano and Bond (1991) offered a solution by employing the appropriate lags of the dependent and independent variables as instruments. However, one potential problem with this (difference) estimation technique is that the lagged levels of regressors may be considered as weak instruments for the differenced variables. In particular, when the explanatory variables are persistent over time, the first differences of GMM estimator behave poorly and lead to large sample biases (Blundell & Bond, 1998). Moreover, for the first difference GMM estimates, the absence of information about the parameters of interest in the levels of variables can result in the loss of a substantial part of total variation in the data (Arellano & Bover, 1995).

These problems can be avoided by using the “system GMM” estimator. This estimator combines in a system with the regression in first differences and with the regression in levels. To compute the system estimator, variables in differences are instrumented with the lags of their own levels, while variables in levels are instrumented with the lags of their own differences. For the system GMM estimator, although the levels of the dependent variable are necessarily correlated with the individual specific effects, the differences are not correlated, permitting the use of lagged differences as instruments in the levels equation.

The consistency of the GMM estimator depends on the soundness of the instruments. To address this issue, two specification tests suggested by Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998) were employed. The first test is the Sargan test for over-identifying restrictions, where the null hypothesis is the independence of the instruments and the error terms. The second specification test is the tests of serial correlations for the error terms, where the null hypothesis is that there is no serial correlation. The Arellano and Bond tests (AR1) and (AR2) examine the absence of first and second order serial correlation in the differenced residuals. The failure to reject the null hypothesis for Sargan test and for AR2 test indicates that the instruments used are valid.

These two sets of diagnostic tests are also reported in Table 8 for all three models that represent inter-sampling comparison between global, intra-OIC and non-OIC samples. Referring to the Table, the Sargan test statistic indicates that the instruments are uncorrelated with the error term, and their validity is therefore not rejected at the $\alpha=0.05$ level. The p-values for Sargan test are reported in the Table as well. Next, the results of the tests of serial autocorrelation are reported. The AR1 test rejects the null hypothesis of no first order autocorrelation and the AR2 test does not reject the null hypothesis of no second order autocorrelation of residuals, which suggest that the disturbances at levels are uncorrelated. The table also presents the regression results on the determining factor of home bias in the global portfolio investment of selected OIC countries. Column 1 represents the global sample; it specifies the results on the factor influencing home bias from the global perspective. Columns 2 and 3 represent the robustness test of the model where the global sample is split into intra-OIC countries (column 2) and non-OIC countries (column 3) respectively.

Table 8. Empirical results on the determinants of home bias across the samples.

Dependent Variable (Home Bias)	Proxy	(1) Global	(2) Intra-OIC	(3) Non-OIC
Constant		0.484*** (0.0467)	0.665*** (0.00854)	0.552*** (0.0159)
HB _{t-1}		0.405*** (0.0530)	0.247*** (0.00229)	0.349*** (0.0161)
Financial Market Openness	KAO _{ij}	0.000646 (0.000564)	-0.00104*** (0.000176)	-0.000224 (0.000349)
	GLO _{ij}	0.00450 (0.00650)	0.0701*** (0.00328)	0.00199 (0.00285)
Institutional Quality	AWGI _{ij}	-0.00132* (0.000737)	-0.00158*** (0.000342)	-0.000738*** (0.000279)
Economic Development	GDPC _{ij}	-0.00114 (0.0114)	-0.0916*** (0.00779)	0.00315 (0.00370)
	ReXi	-0.000322 (0.000238)	0.000679** (0.000287)	-0.000216** (0.000104)
Market Development (Bank-based)	DCR1 _{ij}	0.0105* (0.00617)	-0.00761*** (0.000924)	0.00432*** (0.00164)

	DCR3ij	-0.0108** (0.00517)	-0.0179*** (0.00177)	-0.00322** (0.00149)
Market Development (Market-based)	LDCij	0.000685 (0.000545)	-0.00237*** (0.000365)	0.000421* (0.000255)
	STOTij	0.000612 (0.000503)	-0.00343*** (0.000253)	0.000197 (0.000193)
Familiarity	MiXiGDPij	-0.00174** (0.000861)	0.00668*** (0.000660)	-0.00118*** (0.000420)
	Contig	-0.0157 (0.0124)	-0.0171*** (0.00638)	-0.0184*** (0.00509)
	Comlang	-0.0115*** (0.00442)	-0.0271*** (0.00152)	-0.000504 (0.00112)
Information Asymmetries	Comcol	-0.00113 (0.00393)	-0.00618*** (0.00123)	0.00161 (0.00286)
	Distcap	0.00411*** (0.00138)	0.00458*** (0.000671)	0.00150*** (0.000529)
	FTSij	0.00101 (0.000902)	0.00726*** (0.000289)	-0.00000131 (0.000476)
	INTij	-0.000689 (0.000832)	0.000879 (0.000886)	-0.000490 (0.000434)
Time effect	GFC	-0.00492*** (0.00141)	-0.00633*** (0.000518)	-0.00150** (0.000644)
Sargan test (p-value)		0.11	0.38	0.13
AR (1)		0.036	0.002	0.002
AR (2)		0.291	0.795	0.331
Observations		1366	638	1117
Country pairs		398	89	308

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Financial market openness is not significant in explaining any variation in home bias. This result is consistent with Ahearne et al. (2004) that documented capital control is no longer a valid explanation for home bias. Possible explanation for this may be due to the removal of cross-border control and lifting of capital control flow in most countries around the world. However, capital control has a significant negative influence on home bias within intra-OIC sample. This indicates that OIC countries are inclined to invest in their OIC counterparts with lower capital control. On the other hand, globalization has a significant positive influence on home bias. This signals that the OIC countries refuse to invest in their OIC counterparts that are more globalized.

Institutional quality (AWGIij) has a significant negative influence on home bias. The inverse relationship between institutional quality and home bias indicates that with a higher relative score of institutional quality between home and host countries, home bias decreases. The OIC countries are inclined to invest in host countries that have higher level of institutional quality. Similar results have been seen in the previous studies by Lane (2000), Mishra (2008), and Rika (2014). Specifically, this result is similar to Abdioglu et al. (2013) who claimed poor governance quality at home relative to host countries will

encourage investors to invest abroad and as such, home bias decreases. The negative relationship between institutional quality and home bias is consistent with the information asymmetry hypothesis. Economic development variables show mixed findings on home bias. Gross domestic Per Capita has a significant inverse relationship with home bias. The result infers that OIC countries prefer to invest in their OIC counterparts that have higher economic development. On the other hand, OIC countries refuse to invest in their OIC counterparts when the cost of investment (foreign exchange) increases. However, OIC countries continuously invest in non-OIC countries although the cost of investment is higher.

Although the bank-based variables show mixed results across the sample, it can be concluded that OIC countries are inclined to invest in the host countries that are debt-oriented. On the other hand, market-based variables are not significant in explaining any variation on home bias in the global sample. The results from intra-OIC sample show that OIC countries prefer to invest in their OIC counterparts that have a high number of listed domestic companies and high liquidity stock market. These findings provide support to information asymmetry hypothesis. There is a significant negative relationship between familiarity and home bias across the samples. Generally, home bias decreases when OIC countries have frequent import and export transaction with various countries around the world. This result is consistent with the literature that shows trade openness has a significant negative influence on home bias. Rika (2014) suggests that greater foreign trade activity will lower home bias. This is because these countries will be more confident in holding assets with their trading partner countries that are well-known to them. The negative relationship between home bias and familiarity is consistent with the information asymmetry hypothesis. However, frequent import and export transaction around the world has neglected the potential global portfolio investment among OIC countries. This is evidenced by the significant positive influence of familiarity with home bias in the intra-OIC sample.

Generally, OIC countries prefer to invest in host countries that are near to them as evidenced by the contiguity and capital city distance. These findings provide support to the gravity theory that explains the attractive force between two countries are inversely related to the distance between them. In specific, OIC prefers to invest into their OIC counterparts that share similar common language, have similar historical colony, share the same borders, and near to each other. These findings provide support to the information asymmetry hypothesis.

Although diverted from priori expectation, Global financial crisis (GFC) has a significant negative influence on home bias across the samples. This indicates that OIC countries prefer to invest globally despite the existence of global financial crisis. Although diverted from priori expectation, these findings are parallel with the previous studies by Mukherjee et al. (2018) and Wynter (2019). They claimed that global portfolio investment increased especially during global financial crisis in between 2007 to 2008. During this phase, investors rebalanced their portfolio into countries with high stock market liquidity.

4.5 Robustness

As mentioned in the previous section, sub-samples in this study serve as robustness test of the research model (refer to column 2 and 3 in Table 8). The model consistently validates the research findings although the host countries are divided into intra-OIC and non-OIC samples. Consistent with previous study, OIC exhibits different investment behaviours towards different traits of host countries, particularly with respect to inter-government co-operation. In this study, OIC exhibits geographical preference towards their OIC counterparts. Findings in cross-sectional analysis show that OIC countries demonstrate higher home bias towards non-OIC countries, than their OIC counterparts. In addition, OIC countries exhibit lower home bias towards their OIC counterparts especially to those in MENA region. This shows a tendency towards regional bias among OIC countries. The result is robust when empirical findings show that the lagged dependent variables of home bias in intra-OIC sample is lower than the similar variable in the non-OIC sample.

Familiarity variables show a consistent result across the samples. This indicates that OIC countries are inclined to invest in host countries that are familiar to them. For instance, capital city distance variable provides support to the research model across all samples. It indicates that OIC countries are inclined to invest in host countries that are close and near to them. These findings provide a strong support to the information asymmetry hypothesis and gravity model. On the other hand, global financial crisis also shows coherent result across the samples. This indicates that OIC continues to invest in host countries although there is a financial crisis. There is a possibility that OIC countries tilted their investment into MENA region. This is evidenced by lower home bias towards this region as well as high liquidity of stock market in their OIC counterparts.

5. Summary and conclusion

Major research findings conclude that the home bias phenomenon among OIC countries is substantially high. In this study, findings from different set of samples triumph over previous empirical results that claim home bias in emerging countries is higher than in developed countries (Sahin, Doogukanli & Sengul, 2016; Bose et al., 2015; Kim et al., 2015; Coeurdacier & Rey, 2013; Diyarbakirlioglu, 2011 and Chan et al., 2005). Home bias in the global portfolio investment of selected OIC countries may relate to factors such as institutional quality, familiarity, and global financial crisis. Overall, it is imperative to conclude that elements of home bias may discourage global portfolio investment.

Generally, this study has significantly contributed to the contextual gap in the scope of emerging markets. In addition, relative measures applied in this study has significantly explained the existence of home bias based on factors from both home and host countries' perspectives. This effort has contributed to the methodological gap in this research area. Most importantly, research findings provide support to the existing model that explains the home bias phenomena. Specifically, the findings on factor related to information asymmetry and familiarity provide support to information asymmetry hypothesis and gravity model that serve as the underpinning theory in explaining puzzling home bias phenomena in the international financial economics.

The findings from this research strive for a policy implication to the regulators of OIC countries. Home bias is seen as a deterrence for global portfolio investment of OIC countries. Additionally, OIC countries' over-investment in MENA region (regional bias) may discourage global portfolio investment around the world especially towards OIC counterparts. These outcomes may hamper the initiative to enhance co-operation among the OIC countries, defeating the agenda of the OIC to promote Islamic solidarity by coordinating social, economic, scientific, and cultural activities. It is a call for policy makers in the OIC countries to convince their local investors that international portfolio diversifications are able to minimize portfolio's risk and eventually increase the investment returns. In addition, policy makers in OIC countries need to design a comprehensive investment agreement to attract active participation and inter-regional investments among OIC countries. Future research agenda may consider to research on the tendency of over-concentration of investment in certain host countries. In international portfolio investment, over-concentration in certain foreign markets is termed as foreign bias. This future research efforts may bring into deeper understanding on the puzzling issues in global portfolio investment.

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A. Appendix 1. The statistic on the mean score of the explanatory variables for home bias.

Explanatory Variables	Summary Statistics	Samples		
		Global	Intra-OIC	Non-OIC
KAO_ij	Obs.	4,450	818	3,632
	Mean	0.8007	2.3131	0.4601
GLO_ij	Obs.	4,479	834	3,645
	Mean	0.9170	1.0773	0.8803
AWGI_ij	Obs.	4,479	834	3,645
	Mean	0.2898	0.5999	0.2188
FAM_ij	Obs.	4,479	834	3,645
	Mean	0.2762	0.4117	0.2452
GDPC_ij	Obs.	4,479	834	3,645
	Mean	0.9346	1.0099	0.9173
REX_i	Obs.	4,468	827	3,641
	Mean	1,032.07	484.6072	1,156.42
DCR1_ij	Obs.	4,479	834	3,645
	Mean	0.9887	1.1830	0.9442
DCR3_ij	Obs.	4,479	834	3,645
	Mean	1.1135	1.7803	0.9609
LDC_ij	Obs.	4,460	818	3,642
	Mean	3.0024	4.7617	2.6073
STOT_ij	Obs.	4,463	818	3,645
	Mean	2.8327	5.1315	2.3168
FTS_ij	Obs.	4,476	834	3,645
	Mean	1.7212	4.6442	1.0518
INT_ij	Obs.	4,464	834	3,630
	Mean	1.3548	2.2127	1.1576
Contiguity	Obs.	4,479	834	3,645
	Mean	0.0223	0.0348	0.0195
ComLang	Obs.	4,479	834	3,645
	Mean	0.0873	0.2962	0.0395
ComCol	Obs.	4,479	834	3,645
	Mean	0.0690	0.1811	0.0433
DistCap	Obs.	4,479	834	3,645
	Mean	8.5004	8.0187	8.6106
GFC	Obs.	4,956	834	3,645
	Mean	0.1864	0.1739	0.1893