HOME BIAS AND PERFORMANCE: A STUDY WITH BRAZILIAN MUTUAL FUNDS

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ABSTRACT

Considering the benefits of investing in foreign stocks, and, in contrast, the occurrence of the home bias phenomenon, this research aimed to analyze the relationship between home bias and performance. The sample of the study is comprised of 488 Brazilian mutual funds. We employed a multivariate regression model to analyze the relationship among the variables. As a performance proxy, we adopted the Sharpe index for the period from January, 2010 to December, 2015. The average level of investments in foreign stocks was the independent variable of interest. The main results indicated that home bias seems to be costly and probably it occurs due behavioral biases. In a second regression model, we also found that the mutual funds designed for qualified investors and those requiring higher levels of minimum value for investment tend to present lower levels of home bias.

Keywords: home bias, performance, behavioral biases.

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RESUMO

Considerando os benefícios em investir no exterior e a ocorrência do fenômeno home bias (viés doméstico), o presente estudo teve por objetivo analisar a relação entre home bias e desempenho de fundos mútuos brasileiros. Utilizando uma amostra composta por 488 fundos de investimentos em ações, foi adotado um modelo de regressão multivariada para analisar a relação entre as variáveis. Como proxy de desempenho, utilizou-se o Índice de Sharpe no período de janeiro/2010 a dezembro/2015, sendo o nível médio de investimentos no exterior a variável independente de interesse. Os resultados indicaram que os fundos com menor home bias apresentaram melhor desempenho, indicando que o home bias pode ser dispendioso. Em um segundo modelo de regressão, foi constatado que os fundos destinados a investidores qualificados e aqueles que exigem maiores saldos de investimento tendem a apresentar um menor nível de home bias.

Palavras-Chave: home bias, desempenho, vieses comportamentais.

1 INTRODUCTION

Considering that the correlations between returns on assets from different countries are smaller than the correlations between domestic returns on assets, international diversification leads to risk reduction without reducing expected returns (CHIOU; LEE; CHANG, 2009). Chiou (2008) has pointed out that investors located in less developed countries, especially Eastern Asia and Latin America, can benefit more from diversifying both regionally and internationally.

However, according to Beugelsdijk and Frijns (2010), and Abreu, Mendes and Santos (2011), there is still a large amount of investors who do not invest their resources in international assets, or invest only a small amount of their resources abroad; these investors concentrate their investments exclusively or almost exclusively in the domestic capital market, leading to the phenomenon known as home bias. Some studies justify the occurrence of home bias by behavioral factors such as risk aversion (BEUGELSDIJK; FRIJNS, 2010; ANDERSON et al, 2011), higher safety of investors when investing their resources in what is familiar to them (HUBERMAN, 2001; POOL; STOFFMAN; YONKER, 2012), and perceiving foreign investments as "extra risky" due to having little knowledge of the international market (POTERBA; FRENCH, 1991).

As highlighted in the Brazilian Mutual Fund Industry Yearbook (FUNDAÇÃO GETULIO VARGAS [FGV], 2016), the Brazilian investment fund market reached the sixth position in the world ranking of asset management, showing a substantial increase in the volume of foreign investment in 2015 and becoming even more integrated with the international market. Another highlight is the high level of governance in the Brazilian Mutual Fund Industry, which contributed to increasing this industry's value from R$ 740 million in 2005 to R$ 3 trillion in 2015, placing the Brazilian funds market among the largest in the world. Therefore, the allocation of resources carried out in the funds opened possibilities for investigating a potential effect of home bias on the performance of the Brazilian funds.

Although Brazil has consolidated itself as one of the largest investment fund industries in the world (ASSOCIAÇÃO BRASILEIRA DAS ENTIDADES DOS MERCADOS FINANCEIRO E DE CAPITAIS [ANBIMA], 2014), there are still few studies investigating the relationship between home bias and the performance of the Brazilian investment funds, which represent a specific category of investors inside the context of institutional investors. Therefore, this study aims to answer the following question: What is the relationship between home bias and the performance of the Brazilian stock investment funds?

This research will contribute to the literature by including not only the analysis of this relationship, but also the characteristics of the stock investment funds, how the levels of foreign investment are related to these characteristics, and how the behavioral factors could be related to home bias.

Considering this research issue, the main objective of this study is to analyze the relationship between home bias and the performance of the Brazilian stock investment funds. In line with the main objective of this research are the following specific objectives: investigating and measuring the volume of foreign investment made by the Brazilian stock investment funds; analyzing whether the funds which invest the most in the international market present better performance; verifying how the characteristics of the funds can influence the levels of foreign investment. We expect to contribute to the existing knowledge about investment funds by exploring the role of a new variable (foreign investment) as a potential determiner of fund performance.

This article is divided into four sections in addition to this introduction. The second section presents considerations on home bias and on the Brazilian stock investment funds, and introduces the hypotheses of the study. The third section describes the methodological procedures employed for collecting and analyzing the data. The fourth section presents the results, their discussion, and comparison with previous research. The final section presents the final remarks, limitations and recommendations for future research.

2 THEORETICAL FRAMEWORK

This section presents topics dealing with the relationship between home bias, behavioral finance and performance, as well as considerations about the Brazilian stock investment funds and the hypotheses tested in this study.

2.1 *Home bias:* relationship with behavioral bias and performance

The literature raises many arguments to explain the occurrence of the home bias phenomenon, many of which are based on the theory of behavioral finance. According to this theory, investors have limited rationality and react to available information in different ways (CHEN et al., 2009). According to Huberman (2001), the occurrence of home bias is supposedly related to the fact that investors simply prefer to invest their resources in what is familiar to them, and feel safer when investing in assets that are part of their daily lives. When an investor feels competent about understanding the risks and rewards related with investing in assets from foreign companies, he or she becomes more likely to make investments in international assets (GRAHAM et al., 2009). According to Graham et al. (2009), one of the factors that help understand home bias is also related to informational costs.

On the other hand, home bias could be seen as the understanding that domestic asset risks are supposedly more protected through domestic market assets, such as risks related to domestic inflation, goods that are not directly negotiated in the capital market such as human capital, and the risk related to returns on foreign assets that are implicit in the stocks of domestic companies which operate in other countries (LEWIS, 1999).

For Poterba and French (1991), the perception of risk in the capital market must be taken into consideration in order to understand the behavior of investors, seeing as they perceive an "extra risk" in international investments due to knowing less about the foreign markets, their institutions and companies. Beugelsdijk and Frijns (2010) point out that the level of uncertainty aversion has a significant and negative impact on the level of foreign investment.

When investigating the determiners of international diversification of institutional investors from more than 60 countries, Anderson et al. (2011) verified that investment funds located in countries characterized by an averse behavior regarding uncertainties are likely to invest more in the domestic market, and when they do invest abroad, they do so in a less diversified

way. The authors elaborated a ranking which included 68 countries in increasing order of scores regarding uncertainty aversion, and Brazil was classified in the 41st position, with a score of 76 (above the average of 68.5), which suggests that the country presents a relatively high level of uncertainty aversion when compared to a significant part of the sample analyzed.

Aiming to analyze how the behavioral aspect of familiarity relates to investment decisions made by professional investors in North American mutual investment funds, Pool et al. (2012) determined that familiarity affects investment decisions made by the managers of these funds while the returns on domestic investments were not higher than other investments, confirming that the local investment decisions do not come from informational advantages. In addition, the study showed that this behavioral bias leads investors to build investment portfolios with high risks.

Driessen and Laeven (2007) investigated how the benefits of international diversification of the portfolio are different in 52 countries (29 developing and 23 developed). Using the Sharpe ratio as return proxy, the authors identified higher returns in portfolios that are more internationally diverse, and the advantages of investing abroad were higher for investors located in developing countries. The study also identified that the gains from international diversification are potentially higher for investors located in countries with higher risks.

In line with these findings, when analyzing how the experience in the domestic market is related to the decision to invest abroad, Abreu et al. (2011) found that investing in the international market improves investor performance, while investing only in the domestic market (home bias; home country bias) is costly.

2.2 Remarks on Brazilian stock investment funds

According to the Securities and Exchange Commission of Brazil (*Comissão de Valores Mobiliários* – CVM, 2014), stock investment funds should invest a minimum of 67% of their Total Net Assets (TNA) in stocks and the rest of their TNA in other financial assets. The main risk factor of these funds are price swings of the stocks that compose the investment portfolio. Another risk factor investors should consider for these funds is the limit of concentration per emitter; stock investment funds are not subject to this limit, which means that these funds can concentrate their investments in assets of a few emitters, which reflects on the risk of investments.

Regarding limits for foreign investment, funds of any class aimed at qualified investors – institutional investors and those with investments over R$ 300,000.00 – could invest abroad with no limitations. In turn, multimarket funds and other classes of funds were limited to investing 20% and 10% of their TNA abroad, respectively (CVM, 2014). After Normative Instruction No. 555 of the Securities and Exchange Commission of Brazil (2014) came into force on 07/01/2015, these limits became a maximum of 20% of the TNA for funds aimed at the general public and 40% for funds aimed exclusively at qualified investors who do not meet the conditions provided for in Paragraph 1, Article 101 of that Instruction; the remaining cases were not subjected to limitations for investing abroad.

2.3 Construction and substantiation of the hypotheses

Considering that the correlations between returns on assets from different countries are smaller than the correlations between domestic returns on assets, international diversification leads to risk reduction without reducing expected returns (ABREU et al., 2011; CHIOU et al., 2009). Therefore, taking into account the studies that found a positive relationship between foreign investment and performance (ABREU et al., 2011; POOL et al., 2012), it is expected that

investment funds with less home bias will show better performance. This proposition is the foundation for hypothesis H_1 tested in this research:

H_1: Stock investment funds with a higher level of foreign investment (less home bias) show better performance.

Considering that funds that require a higher minimum volume of investment have a competitive advantage over funds that require a smaller minimum value (PAYNE; PRATHER; BERTIN, 1999), we seek to determine how this competitive advantage is related to the levels of foreign investment. Taking into account that Aragon (2007) found a positive relationship between fund performance and minimum value for initial investment, and that previous studies suggest a positive relationship between level of foreign investment and performance (ABREU et al., 2011; POOL et al., 2012), we expect to find a positive relationship between foreign investment and minimum value for initial investment, indicating that funds with higher minimum values for investment and higher levels of foreign investment tend to show better performance; this idea is the foundation for the second hypothesis of this study:

H_2: Stock investment funds that require higher minimum values for investment show less home bias.

Considering that the investment funds aimed at qualified investors are not subjected to a maximum limit for foreign investment, we infer that the volume of investment in these funds in the international market is subject only to the investment strategies of their managers, which, in turn, seek to meet the expectations of their customer niche. Geranio e Zanotti (2005) point out that qualified investors have high market power, which suggests that the funds aimed at these investors may offer especial investment strategies in order to remain attractive for their customers. Therefore, this study assumes that the levels of foreign investment are related to the characteristics of the customers at which the funds are aimed. This proposition is the foundation of the third hypothesis of this research.

H_3: Stock investment funds aimed at qualified investors show especial behavior regarding the volume of foreign investments.

3 DATA AND METHOD

Considering the main purpose of this study, we employed the quantitative approach and a descriptive research that, according to Vergara (2009), studies the characteristics of a given population or a specific event; it also allows the analysis of correlation between variables.

The sample was comprised of Brazilian equity mutual funds that have data available for the period from December/2009 to December/2015. We excluded mutual funds that have missing values for any of the variables that are considered in the regression model. This procedure resulted in a sample comprised of 488 investment funds. We collected the data on these funds from Economatica database, and analyzed them using the software Stata®.

Returns were calculated based on monthly information. Regarding the percentage that each fund invests in foreign stocks, first, we collected this value at the end of each year (December, 31). Then, we calculated the average percentage, by fund, related to the allocation if foreign stocks. This average represents a proxy for foreign investments in this study. In order to test H_0, we employ the multivariate regression analysis, using standard-errors clustered by sub-categories of the funds in the sample.

Based on previous research (DRIESSEN; LAEVEN, 2007; MALAQUIAS; EID JÚNIOR, 2013; OLIVEIRA; FILHO; SOUSA, 2015), we used the Sharpe Ratio (SR) as a proxy for performance, as presented in equation 1. The returns used in the SR are from January, 2010 to December, 2015

and the risk free ratio is the SELIC of the same period. It would be desirable that the funds of the sample had positive values for the Sharpe Ratio, so higher values would indicate better performance. However, the risk-premium of the fund can be negative in some cases, and, with a positive value in the denominator (since the denominator is a dispersion measure), the Sharpe Ratio can be positive or negative.

$$ SR = \frac{Return\ of\ the\ Portfolio - Risk\ Free\ Ratio}{Volatility\ of\ Portfolio\ Returns} \quad (1) $$

In relation to funds with negative risk-premium, we used the procedure available in Israelsen (2005), in which the risk-premium is multiplied by the volatility instead of divided by it (for funds with negative risk-premium). The variable of interest is foreign investments and the home bias is related with lower levels of allocations in foreign companies. As control variables, the quantitative model also considers fund's size, performance fee and management fee.

$$ SR = \beta 0 + \beta 1 ForInv + \beta 2 AdmFee + \beta 3 PerfFee + \beta 4 Size + \varepsilon \quad (2) $$

Table 1 presents the description of the variables considered in the regression model.

Table 1: Variables of Equation 2

Variable		Expected Sign	Measurement	References
Sharpe Ratio	SR	Dependent Variable	Equation 1	Driessen and Laeven (2007); Malaquias and Eid Júnior (2013); Oliveira Filho and Sousa (2015)
Foreign Investment	ForInv	+	Average of the percentage allocated in foreign companies at the end of each year	Abreu et al (2011); Pool et al (2012)
Administration Fee	AdmFee	− +	Maximum Administration Fee, by year	Malaquias and Eid Júnior (2014); Rochman and Ribeiro (2003)
Performance Fee	PerfFee	+	Dummy variable, and it receives 1 for funds that have performance fees, and 0 for the other cases	Milan and Eid Júnior (2014); Malaquias and Eid Júnior (2013, 2014); Oliveira Filho and Sousa (2015)
Size	Size	+	Dummy variable, and it receives 1 for funds within the 50% large funds (based on TNA) in December, 2015, and 0 for the other cases	Borges and Martelanc (2015); Milan and Eid Júnior (2014); Malaquias and Eid Júnior (2013, 2014)

Sources: the authors.

In order to test H_1 e H_2, we adopted another regression model using the foreign investment as a dependent variable, and considering the minimum value for investment and funds designed to qualified investors as independent variables, as presented in Equation 3.

$$ForInv_{it} = \beta0 + \beta1 QualifINV_{it} + \beta2 MinINV_{it} + \varepsilon_{it} \quad (3)$$

Table 2 presents the description of the variables of Equation 3.

Table 2: Variables of Equation 3

Variable		Expected Sign	Measurement	References
Foreign Investment	ForInv	Dependent Variable	Average of the percentage allocated in foreign companies at the end of each year	Abreu et al (2011); Pool et al (2012)
Minimum Value for Investment	MinINV	+	Value 1: BR$0 to BR$10,000 Value 2: BR$10,000 to BR$50,000 Value 3: BR$50,000 to BR$100,000 Value 4: above BR$100,000	Aragon (2007); Payne et al (1999)
Funds designed to qualified investors	QualifINV	+ / -	Dummy variable, and it receives 1 for funds designed to qualified investors, and 0 for the other cases	Geranio and Zanotti (2005)

Source: the authors.

4 RESULTS

Considering the results for the descriptive statistics, Table 3 indicates that the investment funds of the sample have, on average, low levels of investments in foreign stocks. Among the 488 funds of the sample, 42.4% of the funds are designed to qualified investors and 36.3% have performance fees. The average management fee is 1.875% by year, and it varies from 0 to 10%. The minimum value for investment, on average, is near to the range 2 (from BR$ 10,000.00 to BR$ 50,000.00). This descriptive analysis indicates a low level of investments in foreign stocks, which corroborates with previous research such as Beugelsdijk and Frijns (2010) e Abreu, Mendes and Santos (2011).

Table 3: Descriptive Statistics

Variables	n	Average	St. Dev.	Min	Max
ForInv	488	0.250	1.228	0.000	9.514
Sharpe	488	-4.451	3.970	-22.011	0.264
QualifINV	488	0.424	0.495	0.000	1.000
AdmFee	488	1.875	1.409	0.000	10.000
PerfFee	488	0.363	0.481	0.000	1.000
Size	488	0.500	0.501	0.000	1.000
MinINV	488	1.445	0.895	1.000	4.000

Source: the authors. Data obtained through Economatica Database.

The descriptive information in Table 4 also indicates that funds with high average of investments in foreign stocks (sub-category of "Stocks Foreign Investment"), even this average percentage being relatively low, registered better risk-adjusted performance (-3.044). On the other hand, funds of the sub-categories that did not present foreign investments registered lower risk-adjusted performance, except for the cases of Stocks Small Caps (-3.157) and Stocks Sustainability/Governance (-3.829). The sample of the study consists of equity mutual funds. The classification used in Table 4 considers the sub-categories of equity mutual funds, in the category.

Table 4: Equity mutual funds classification

Sub-Categories	n	For. Inv. *	Sharpe
Stocks Dividends	26	0.000	-4.459
Stocks Indexed	26	0.000	-6.501
Stocks Active Index	116	0.024	-5.326
Stocks Foreign Investment	18	0.964	-3.044
Stocks Free	190	0.519	-3.836
Stocks Sectorial	25	0.000	-6.558
Stocks Small Caps	21	0.000	-3.157
Stocks Sustainability/Governance	21	0.000	-3.829
Stocks Value/Growth	45	0.071	-3.888
Total	488	0.250	-4.451

Source: the authors. Data obtained through Economatica Database.

*Note: average of the values from December 31, 2010 to December 31, 2015.

In relation to the minimum value for investment, Table 5 indicates that the investment funds in the range from BR$ 50,000.00 to BR$ 100,000.00 presented higher foreign investments (0.743), together with those funds that require a minimum value for investment above BR$ 100,000.00 (0.729). This result suggests a relationship between the level of foreign investments and the minimum value for investment. We will use equation 3 to test such relationship.

Table 5: Minimum value for investment of the funds

Minimum Value (in BR$)	n	For. Inv. *
from 0 to 10.000	370	0.147
from 10.000 to 50.000	55	0.388
from 50.000 to 100.000	27	0.743
above 100.000	36	0.729
Total	488	0.250

Source: the authors. Data obtained through Economatica Database.

*Note: average of the values from December 31, 2010 to December 31, 2015.

According to Table 6, funds designed to qualified investors showed higher levels of foreign investments in relation to the other funds in the sample. On average, funds designed to qualified investors presented higher amounts of their portfolios invested in international assets. This result can be related with the possibility of an absence of a limit to make international investments. These funds could choose to invest other percentages, or not investing in foreign stocks. Therefore, it seems that funds which are not specifically designed to qualified investors have some resistance for international diversification (based on the method considered in this paper).

Table 6: Classification of the Funs by Kind of Investor x Foreign Investments

Qualif. Investors	n	For. Inv. *
Not designed to qualified investors	281	0.033
Designed to qualified investors	207	0.544
Total	488	0.250

Source: the authors. Data obtained through Economatica Database.

The results obtained after running equation 2 corroborate with previous research (ABREU et al., 2011; POOL et al., 2012) since they indicate a positive relationship between foreign investments and funds' performance. These results suggest that a potential home bias can be related to behavioral biases, in line with the study of Pool et al (2012), instead of representing the use of inside information.

In the same direction of the results obtained by Borges and Martelanc (2015), Malaquias and Eid Júnior (2013, 2014), and Milan and Eid Júnior (2014), for the variable size, and of the results obtained by Malaquias and Eid Júnior (2013, 2014), Milan and Eid Júnior (2014) and Oliveira Filho and Sousa (2015), for the variable performance fee, we found that both variables (size and performance fee) are positively related with funds' performance at the levels of significance of 5% and 1%, respectively. Therefore, considering the funds of the sample, large funds tend to present higher risk-adjusted performance indexes, which is in accordance with the literature about gain of scale and bargaining power as some characteristics related to large funds. Regarding performance fee, the results suggest that it can serve as a mechanism of alignment of interests, allowing (on average) better performance indexes for investors.

In relation to administration fee, the results of this study were not in accordance with those obtained by Malaquias and Eid Júnior (2014); however, they corroborate with the findings of Rochman and Ribeiro (2003), since the relationship between administration fee and performance was negative and significant at 1%. This result suggests that funds with higher administration fees are not necessarily those with better risk-adjusted performance (based on the methods used in this paper). The adjusted r-squared of the model (Table 7) was 8.76%; so, other variables can be included to improve the portion of variability of the dependent variable (performance) that has been explained. The F-Global test indicates that at least one of the independent variables was significant, in accordance to the previous discussion about the study hypotheses.

Table 7: Potential Variables that affect the Sharpe Ratio (Equation 2)

Variables	Coeff.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
ForInv	0.286*	0.138	2.070	0.072	-0.032	0.604
AdmFee	-0.211***	0.052	-4.070	0.004	-0.331	-0.091
PerfFee	1.307***	0.327	4.000	0.004	0.553	2.060
Size	1.694**	0.670	2.530	0.035	0.150	3.238
Constant	-5.447***	0.289	-18.820	0.000	-6.115	-4.780

Source: the authors. Data obtained through Economatica Database.
n=488; Adj. r-squared: 8.76%; F-Global: 62.86 (p<0.01).
Standard errors clustered by funds sub-categories.
Significance Levels: "***" 1%, "**" 5% e "*" 10%.

Regarding the results for equation 3 (Table 8), they are in line with the initial results observed in the descriptive analysis, that funds with higher amounts of minimum value for investment tend to diversify through foreign investments, which could represent a competitive advantage of these funds. We could argue that managers of these funds can consider the minimum value for investment as a variable that make them more willing in investing in foreign stocks and this discussion can be expanded in further research. The adjusted r-squared of this model (according to Table 8) also shows that other variables can be considered in order to improve the understanding of decisions related to foreign investments, since its value was 4.8%.

We also observed that investment funds designed to qualified investors tend to invest more resources in foreign stocks. This result suggests that some diversification strategies of investment funds can be related to the characteristics of their customers. Investment funds designed to qualified investors usually are acquired by institutional investors and this factor may imply in lower sensitiveness to unexpected redemptions, lower administration fees and higher expected performance.

Table 8: Potential Variables that Affect the Percentage allocated in Foreign Investments (Equation 3)

| Variables	Coeff.	Robust Std. Err.	t	P>t	[95% Conf. Interval]	
QualifINV	0.426**	0.158	2.700	0.027	0.062	0.790
MinINV	0.142**	0.046	3.060	0.016	0.035	0.248
Constant	-0.135*	0.062	-2.200	0.059	-0.277	0.007

Source: the authors. Data obtained through Economatica Database.
n=488; adj. r-squared: 4.80%; F-Global: 8.29 (p=0.0112).
Standard errors clustered by funds sub-categories.
Significance Levels: "***" 1%, "**" 5% e "*" 10%.

The results of the quantitative analysis confirm the hypothesis H_1. So, we found evidence of a positive relationship between foreign investments and the performance of Brazilian investment funds, even with lower levels of allocation in foreign assets observed in the funds of the sample. This result also suggests that the home bias can represent an expense for investors; moreover, the home bias is not necessarily related to insider information in the domestic market, since those managers that invest in foreign markets presented better risk-adjusted returns. Therefore, the home bias may be related with behavioral biases of fund managers. Figure 1 summarizes the relationships addressed in this study.
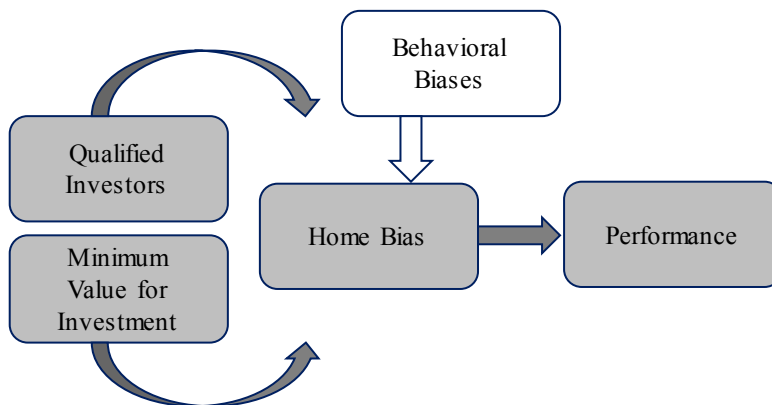
Figure 1 – Funds Characteristics, home bias and performance.
Source: the authors.

In brief, considering the results of this paper, investment funds designed to qualified investors and investment funds that require higher values of minimum value for investment tend to present higher foreign investments. Thereafter, funds that have foreign investments tend to present better risk-adjusted performance. Moreover, the better performance of funds with higher foreign allocations suggest the presence of home bias, and such effect can be related to behavioral biases, in accordance with previous research (ANDERSON et al., 2011; BEUGELSDIJK; FRIJNS, 2010; CHEN et al., 2009; HUBERMAN, 2001; POTERBA; FRENCH, 1991).

5 FINAL REMARKS

The literature in Finance demonstrates that there are benefits to foreign investment, considering that the correlations between returns on assets from different countries are smaller than the correlations between domestic returns on assets, leading to risk reduction without reducing expected returns. However, there is a large amount of investors who do not invest their resources in the international market, or invest only a small portion of resources abroad, leading to the so-called home bias. The main results of this study are in line with previous research, demonstrating that, even within a sample of institutional investors, the level of allocation of foreign investment is still low. However, it is important to highlight the possibility of international diversification through domestic assets (in Brazil's case, BDRs or funds that invest abroad), a factor that was not directly explored in this research but may offer advantages in terms of international diversification for managers and shareholders.

Some studies indicate that home bias happens due to behavioral factors such as uncertainty aversion, higher safety of investors when investing their resources in what is familiar to them, and potentially perceiving foreign investments as "extra risky" due to having little knowledge of the international market. Although Brazil has consolidated itself as one of the largest investment fund industries in the world, there are still few studies investigating the relationship between home bias and the performance of the Brazilian investment funds. Descriptive statistics reinforce this scenario by showing initial evidence about the percentage of portfolios in the funds allocated in foreign assets. In this context, this research will contribute to the literature by including not only the analysis of this relationship, but also considering the characteristics of the stock investment funds, how the levels of foreign investment are related to these characteristics, and how the behavioral factors could be related to home bias.

Considering, on one had, the benefits of investing abroad and, on the other hand, the occurrence of the home bias phenomenon, this study sought to analyze whether the Brazilian stock investment funds that invest the most in the international market show better performance that those who do not invest or invest very little in foreign assets, ascertaining the relationship between home bias and performance.

Corroborating the hypothesis of this study, the results of the regression indicated that funds with a higher level of foreign investment showed better performance, confirming literature findings that home bias seems to be costly and not necessarily governed by rational factors such as the managers' informational advantage about the domestic market, but possibly by the behavioral bias of the fund managers. In line with previous studies, the variables size and performance fee were positively related to fund performance, while the administrative fee showed a negative relationship.

To understand how the level of foreign investments is related to the characteristics of the funds, we adopted a second regression model using the level of foreign investments as the dependent variable, and the minimum value for investment and funds aimed at qualified investors as the independent variables. The regression results indicated that stock investment funds aimed at qualified investors are more likely to invest abroad, which could justify the adoption of more diverse investment strategies in other to maintain the attractiveness of these funds for their customer niche. We also verified a positive relationship between minimum value for investment and the level of investment abroad: funds requiring larger volumes for investment are more likely to invest in the international market.

The main contribution of this study is demonstrating, in the context of an emerging economy (Brazil), a positive relationship between the level of foreign investment and risk-adjusted return in stock funds, suggesting that home bias is not necessarily related to behavioral bias.

One limitation of this study is not including the proxy of level of foreign diversification in the regression model, which would enable the analysis of whether the funds that invest in different international assets show better performance than funds that concentrate their foreign investments in only a few assets. The measure for foreign investment used in this article may also represent a limitation since it is based on the average of allocation made by funds in foreign investments at the end of each year. Another limitation of this study is that we did not directly test whether the home bias of funds is related to behavioral factors; for that, it would be necessary to apply questionnaires to each fund manager, which, in any case, offers opportunities for new studies. Lastly, we recommend that future studies analyze the relationship between the level of foreign diversification (types of assets, volatility of these assets, and correlation with Brazilian market indexes) and the performance of stock funds.

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Contribution of authors

Contribution	[Author 1]	[Author 2]	[Author 3]
1. Definition of research problem	X	X	X
2. Development of hypotheses or research questions (empirical studies)	X	X	X
3. Development of theoretical propositions (theoretical work)	X		
4. Theoretical foundation / Literature review	X		X
5. Definition of methodological procedures		X	
6. Data collection		X	
7. Statistical analysis	X	X	
8. Analysis and interpretation of data	X	X	
9. Critical revision of the manuscript		X	X
10. Manuscript writing	X		
11. Other (please specify)			