

Are foreign investors still beating the Finnish investors?

- **Compering returns of foreign and domestic investors in Finland**

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1. Introduction

During 1994-1996 the foreign investors outperformed the domestic investors in the Finnish stock markets (Grinblatt & Keloharju, 2000). The finding was explained to be caused by more sophisticated foreign investors than the domestic investors. In the early 21st century the local investors performed better than the foreign investors (Kalev, Nguyen, & Oh, 2008). This was seen as the result of the Finnish investors having superior information about the local companies.

The both studies introduced two good explanation for the home bias puzzle - the question why the domestic investors typically underweight their foreign holdings compared to the efficient market portfolio. Globally, many studies found evidence especially that foreign investors have disadvantage compared to the local investors. These findings support the explanation to the home bias that the domestic investors have superior knowledge about the local companies.

In this study, I investigate the monthly foreign share holdings data in Finnish public stocks. I try to answer the question whether the foreign or the domestic investors had better performance in terms of total returns than the other investor group. I research the time period from 2010 to 2016. The time period isn't studied before and therefore there isn't really information which investor group has performed better during the last years. The findings gives more information about these two investor groups and their differences.

Based on my research the domestic investors really performed better than the foreign investors during 2010-2016. However, the risk adjusted returns didn't show statistically significant alphas for either of the investor groups. This means that the previous studies' results might change after conducting Fama-French three factor model. Based on my results, it seems probable that the differing trading strategies and trading behaviour might be the best explanation for the home bias puzzle.

2. Literature review

The home bias refers to the finding that investors are having too big weights on their home country's assets than in foreign assets even though the efficient portfolio would require smaller weights on the domestic assets. It seems that there has to be some kind of barriers behind the home bias explaining why the weights aren't adjusting to match the efficient indexes. Kang and Stulzt (1997) divide the barriers into explicit and implicit barriers restricting international investments. They introduce the explicit barriers to be observable and quantifiable. Therefore, an explicit barrier would be, for instance, foreign exchange controls and differences in taxation. Implicit barriers are opposite to explicit barriers. Thus implicit barriers are hard observe and quantify. Kang and Stulzt give political risk and information asymmetries as examples of implicit barriers.

Explicit barriers do exist. However, the effect of those barriers seem not to be enough to explain the home bias. For instance, observable cross-border investment costs are found not to be adequate explanation for the home bias (Cooper & Kaplanis, 1994). Because the explicit barriers seem not to explain the home bias at least fully the implicit explanations are the modern research area of the home bias.

Probably the most prominent explanations to the home bias are information asymmetries, investor sophistication level and different trading behaviours. It is shown in many studies that the foreign investors underperform compared to the domestic investors. Shukla and Van Inwegen (1995) show that UK fund managers investing in US underperform US domestic fund managers. Based on trading data, Hau (2001) finds that the German investors outperform the foreign investors in German stock markets. Dvorak (2005) finds the foreign investors to underperform the domestic investors in Indonesian markets. Similar findings are found also in Korean stock markets (Choe, Bong-Chan Kho, & Stulz, 2005).

There are a few competing explanation behind the foreign disadvantage. First, it can be argued that the domestic investors have superior information compared to foreign investors. For instance, it is shown that local analysts can predict better the performance of the companies they follow than foreign analysts (Bae, Stulz, & Tan, 2008). In China, it was shown that foreign investors are less informed or they use the information more slowly than domestic investors in China (Chan, Menkveld, & Yang,

2007). The findings are similar in Finland; domestic investors outperform foreign investors but in case of the best known and most global company Nokia, foreign investors have the edge (Kalev et al., 2008).

Second, it is possible that the other investment group is smarter and can use the information more efficiently. Investors having higher IQ seem to perform better than lower IQ investors in the stock markets (Grinblatt, Keloharju, & Linnainmaa, 2012). Two contradicting studies to the foreign disadvantage are explaining their results with the more sophisticated foreign investors. Grinblatt and Keloharju (2000) show that foreign institutions over performed the domestic institutions and retail investors in Finland in 20th century. Also, Chen et al. (2009) show how foreign investors over perform domestic investors when they have the same information available. This refers strongly to more sophisticated and smarter foreign investors.

Third explanation of foreign investors' under performance could be their different trading behaviour. For example, Agarwal et al. (2009) find the foreign disadvantage to be based on aggressive trading in Indonesia. In Finland, the foreign investors followed the momentum strategy and succeeding as the best performing investor segment in 1994-1996 (Grinblatt & Keloharju, 2000).

Consequently, it seems that many studies have recorded clear disadvantage of foreign investors. However, there are a few contradicting studies. Seasholes and Zhu (2010) take a different angle on the puzzle; they find that domestic investors don't have abnormal returns in US, which contradicts the explanation that the foreign disadvantage is caused by the superior information of domestic investors. However, the study is based on brokerage data which includes only retail investors' transaction. In addition, it is recorded that the retail investors are less sophisticated than the institutional investors (Grinblatt & Keloharju, 2000). Therefore, the result might be contradicting due to the only retail investor based data. Grinblatt and Keloharju find also that foreign investors performed better in Finland in 1994-1996. However, Lu, Shan and Westerholm (2016) apply a new horizon-period-invariant portfolio method to the same period than Grinblatt and Keloharju and they find contradict findings – households outperformed domestic and foreign investors.

The academia has a bit mixed view on the area of domestic investors outperforming foreign investors. Many studies have found foreign investors to be in disadvantage

compared to the local investors. The existing literature typically explain the foreign disadvantage by the information asymmetries; the local investors have more knowledge about the companies due to cultural and spatial factors. However, some studies have founded the foreign investors to be more sophisticated and that foreign investors are really performing better than the domestic investors. The mixed results might be caused by multiple factors. For instance, the data sets and methodologies differ between the different studies.

The methodologies can always give different methods. Especially, measuring the performance of two different investor segments isn't easy because performance can vary between short investment horizon and longer time periods. Also, rare studies can be based the true holding data instead the trading data is widely used.

All the studies finding foreign investors better than local investors seem to be based on 20th century data or data before the domestic outperformance showing studies (see (Grinblatt & Keloharju, 2000), (SEASHOLES & ZHU, 2010) and (Froot, O'Connell, & Seasholes, 2001)). Therefore, it might be that the foreign outperformance has been the case before 1998 but the investor performance has changed in favour of the local investors. This might be due to the growing sophistication of retail and domestic investors or grown information asymmetries. It is also possible that when the explicit global investment barriers has decreased and global investment is easier for everyone, the foreign investors aren't anymore representing the most sophisticated ones. Instead, now the foreign investor pool includes more and more foreign retail customers and foreign institutions with different sophistication levels.

In addition, it is possible and probable that the investment performance difference between foreign and local investors differ between different countries. This is supported the fact that foreign investors can use the information more efficiently in emerging markets than domestic markets. This is not as big deal in the developed countries (Froot et al., 2001).

Based on the existing literature, it seems clear that foreign and domestic investors have their differences affecting the performance between these two investor groups. However, it is mixed which investor group has the advantage over the other. Probably this depends on the studied time period and country. The reasons causing the difference might depend also on the previous factors. The most convincing reasons

seem to be information asymmetries, investor sophistication and trading behaviour differences. The existence of these reasons is shown. It is possible that all these reasons together are behind the home bias puzzle.

2. Data and methodology

2.1 Data

My research is based on monthly data comprising the share of foreign holdings in Finnish public stocks. The data is published by Euroclear Finland. Euroclear maintains the national central securities depository in Finland. The holding data is monthly based data and the holdings are calculated on the last day of each month on a company level. The monthly holding data covers period from the end of January 2010 to the end of August 2016.

The foreign owner data is available in Finland accurately due to the legislation promoting public shareholdings. The directly owned shares are easy to divide between foreign and domestic owners. However, without the legislation and Euroclear's rules, the nominee registered holdings couldn't be divided foreign and domestic holdings. The Finnish investors are prohibited to have nominee registered accounts, which means that all the nominee registered accounts are foreign holdings (Euroclear, 2013). Despite this easy division, it can't be eliminated that Finnish investors don't own Finnish shares through foreign entities.

The earlier studies about Finnish stock markets and foreign investors' performance (see (Grinblatt & Keloharju, 2000) and (Kalev et al., 2008)) are also based on Euroclear's data. However, these studies use intraday trading data. Because my data isn't trading data, I can't test any trading behavior differences between foreign and domestic investors. However, my results can give a different angle on the discussion because I don't have knowledge of earlier studies about the foreign investors' performance in Finnish stock markets based on holding data as my research is based on.

The total returns of Finnish listed shares was taken from Thomson One. The total returns take into account the price and the dividend yields.

2.2 Constructing the portfolios

I create two aggregate portfolios; one portfolio consisting the aggregated foreign holdings in Finland and the other comprising Finnish investors' aggregate holdings. These portfolios' returns represent the foreign and domestic investors' performance. I took only into account the companies listed in Helsinki Stock Exchange (Nasdaq Helsinki). The companies listed on the First North list of Nasdaq Helsinki weren't taken into account. This is due to the lighter statement requirements of the companies listed on the First North list, which might affect the results because the information asymmetries are one possible explanation. In addition, the companies not listed or listed only outside Finland weren't taken into account to get unbiased and comparable return data and results.

To compare foreign and domestic investors, I compare foreign and domestic investors' value-weighted returns. Thus, I apply the methodology used also by, for instance, Seasholes and Zhu (2010). Seasholes and Zhu had also monthly holding data (of US retail customers). In addition to monthly returns, I will use daily returns in addition to get more accurate volatility information. This is feasible, because if you are assumed to hold the portfolio over the month you also encounter the daily volatility during the month. Taking account the returns on daily level doesn't change the cumulative returns but instead, it gives more accurate volatility. This is an improvement compared to the methodology of Seasholes and Zhu (2010).

The daily returns are calculated based on the weights on the end of the previous month. This means that the daily holdings are rebalanced every day. It would be more realistic to give the weights change based on the value changes of the stocks. However, it would require a lot of calculating power to compute the new weights for each stock in two portfolios. However, I see this limitation as a quite small problem because I don't have any data about the foreign holdings changes during the month. Therefore, it can be as wrong doing the daily rebalancing or give the weights adjust based on the returns. However, the daily rebalancing affects the monthly cumulative returns when using the daily returns. Thus, it is possible that the monthly cumulative returns differ somewhat between the monthly and daily calculated returns.

The monthly investment period assumption is unfortunate restriction of the research but necessary to get any results. In the reality, investors trade during the month and rebalance their portfolios on a daily basis certainly when we are speaking of two investor groups. Therefore, it is possible that more frequent holding data would change the results. Thus, the limitation should be taken into account when interpreting my results.

When using aggregate data outliers are not problem (SEASHOLES & ZHU, 2010). This advantage means that really detailed descriptive statistics aren't needed. Conversely it is also a problem because I can't do more detailed research studying where the differences between the investment segments are coming from.

2.3. Statistical tests

When comparing the past returns and using real holding data, no statistical tests are required to show which investor group performed better. However, the performance is just a sample that is observed showing the abilities of the different investor groups. Also, the holding data is only monthly sample of the more frequent returns. To generalize the results, statistical tests are needed to say whether it is reasonable to argue the investor groups fundamentally differ from each other. Statistically speaking, are the investor groups performances distributed differently in terms of variance or returns.

Two statistical tests are conducted for foreign and domestic returns. I conduct two-tailed F-test to test whether the two investor group's variances differ. The null hypothesis is that the variances are equal. The alternative hypothesis is that the variances are unequal.

The returns are tested using two-tailed two-sample Student's t-test. If the F-test finds statistically significantly differing variances, the unequal variance t-test is used. And in case of equal variances, it is taken into account in the t-test. The null hypothesis in the t-test is that the means are equal. And the alternative hypothesis is that the means are unequal.

2.4. Risk adjustments

There are many risk factors affecting the returns (Fama & French, 1993). I take this into account using Fama-French three factor model to risk adjust the returns. The possible alphas of the two investor groups are compared with each other to show which investor group performed better in terms of the risk adjusted returns. Also, it is important to show whether statistically significant alphas even exist.

The three factors are listed below:

Mtk-Rf *The excess market return: the market return minus the risk free return*

SMB *Small minus big: the returns on the three small portfolios minus the returns on the three big portfolios*

HML *High minus low: the returns on the two high B/M portfolios minus the two low B/M portfolios*

The SMB, HML and the risk free returns were taken from Ken French's website. The European factors are used in the model. The market return is the total return on the whole main list portfolio of Helsinki Stock Exchange. The models are created separately for the foreign excess return and the domestic market return. And the models are calculated based on both monthly and daily returns.

4. Results

4.1. Comparison based on the monthly returns

First, I calculated the monthly value-weighted total returns for foreign and domestic portfolios from February 2010 to September 2016. The cumulative total returns for domestic investors is 99.1 % and for foreign investors it is 52.9 %. There is a substantial performance difference based on the monthly data. In addition to the difference in the returns, the monthly volatility of domestic investors' portfolio is 4.6 % and the volatility of foreign investors is 5.4 %. The results mean that domestic investors had higher returns and smaller volatility than foreign investors. Thus, the domestic investors had higher Sharpe ratio and superior performance compared to the foreign investors. The results are shown in the Figure 1.

However, it can be seen that the higher cumulative total returns of domestic investors can be attributable by the higher returns during the first months in 2010. Therefore, the lower graph in Figure 1 shows also the cumulative returns calculated starting from January 2011. Now the cumulative returns of the domestic investors are 52.7 % and the cumulative returns of the foreign investors are 36.8 %. The new graph shows also that the somewhat higher returns of the domestic investors is caused only by the higher domestic returns during 2016. This means, that the superior performance of the local investors is mainly based on two periods during 2010 and 2016: the beginning of 2010 and end of 2016. Still, it can be said that Finnish investors performed better than the foreign investors in the Finnish stock markets during 2010-2016.

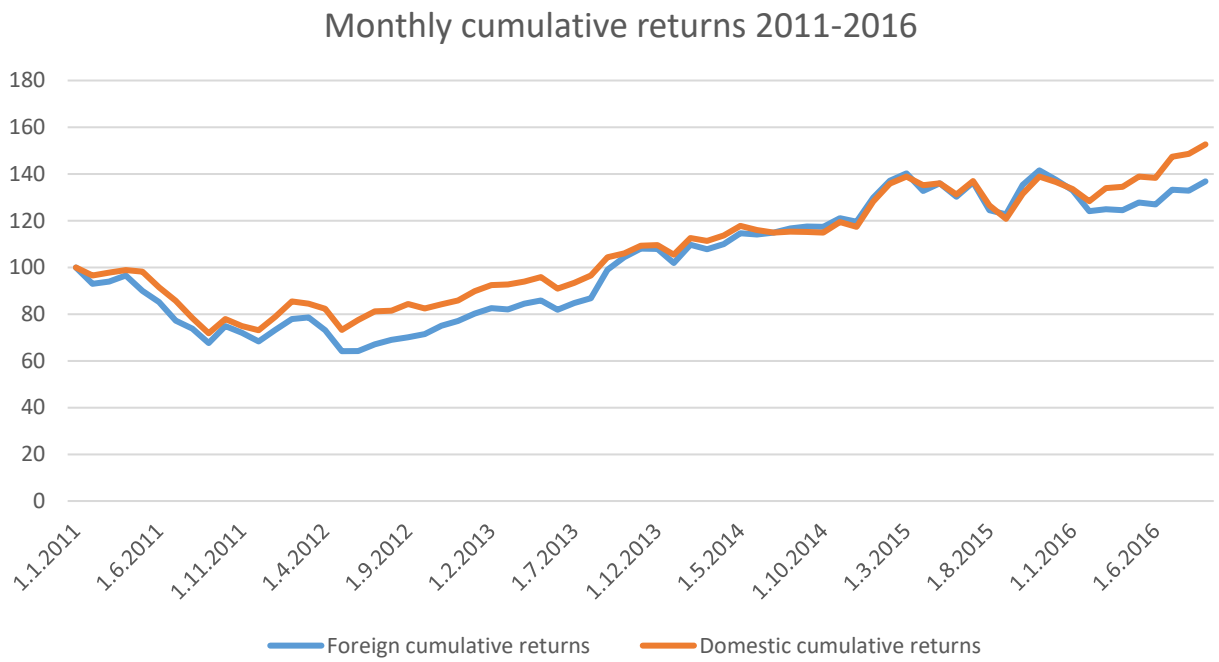
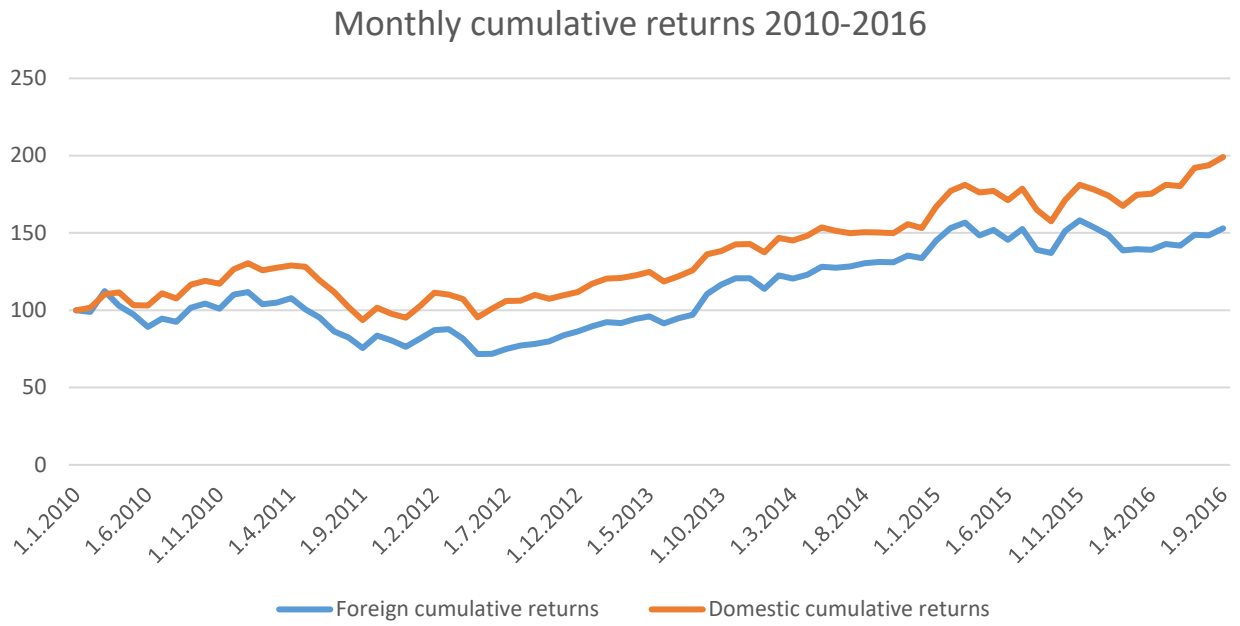
When comparing the results with statistical tests, the previous observation about the local success based on only a few months with higher returns is confirmed. The statistical results are shown in Table 1. The differences between the monthly variances and mean of the returns aren't statistically significant. The F-test of the variances gives p-value of 0.15 in two-tailed test, which means that the variances don't differ from each other statistically. This means that we have to assume the expected variances to be the same. The t-test of the two-sample means with equal variances gives p-value of 0.71. This isn't also statistically significant. This means that the returns are expected to be the same and the monthly comparison can't show real difference between

domestic and foreign investors as an investor types even though the two portfolios have a bit different returns and volatilities.

Table 1: Descriptive statistics and statistical tests of the monthly returns

MONTHLY RETURNS		
	<i>Foreign</i>	<i>Domestic</i>
Descriptive statistics		
Mean	0.00677	0.00969
Variance	0.00294	0.00212
Observations	80	80
F-Test Two-Sample for Variances		
df	79	79
F	1.38787	
P(F<=f) one-tail	0.07369	
P(F<=f) two-tail	0.14739	
t-Test: Two-Sample Assuming Equal Variances		
Pooled Variance	0.00253	
df	158	
t Stat	-0.36737	
P(T<=t) one-tail	0.35692	
P(T<=t) two-tail	0.71384	

Figure 1: Cumulative monthly returns of the foreign and domestic holdings



4.2. Comparison based on the daily returns

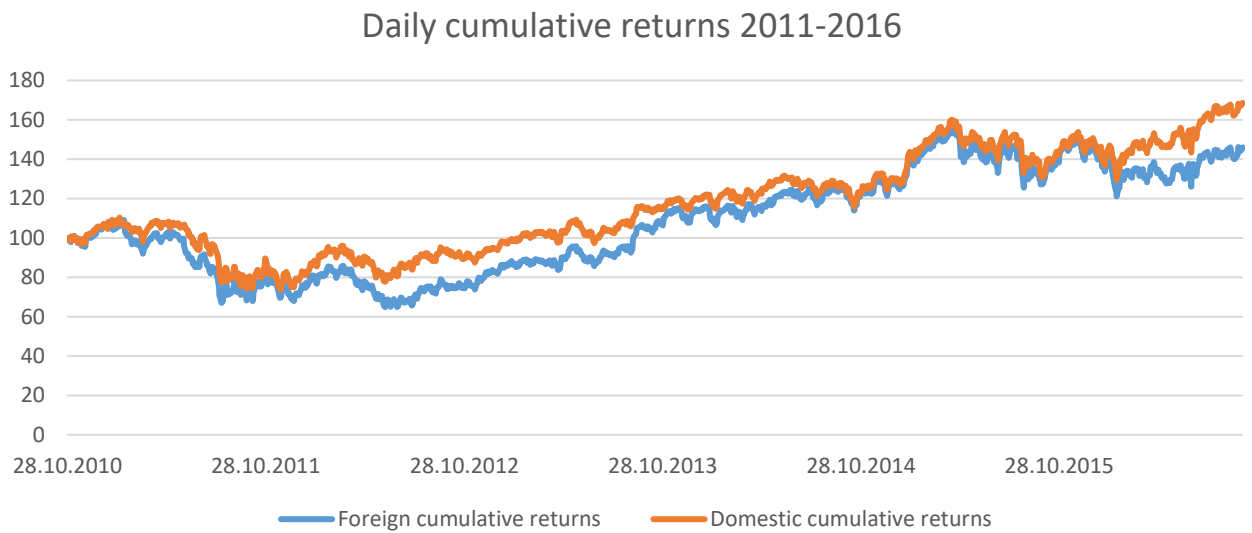
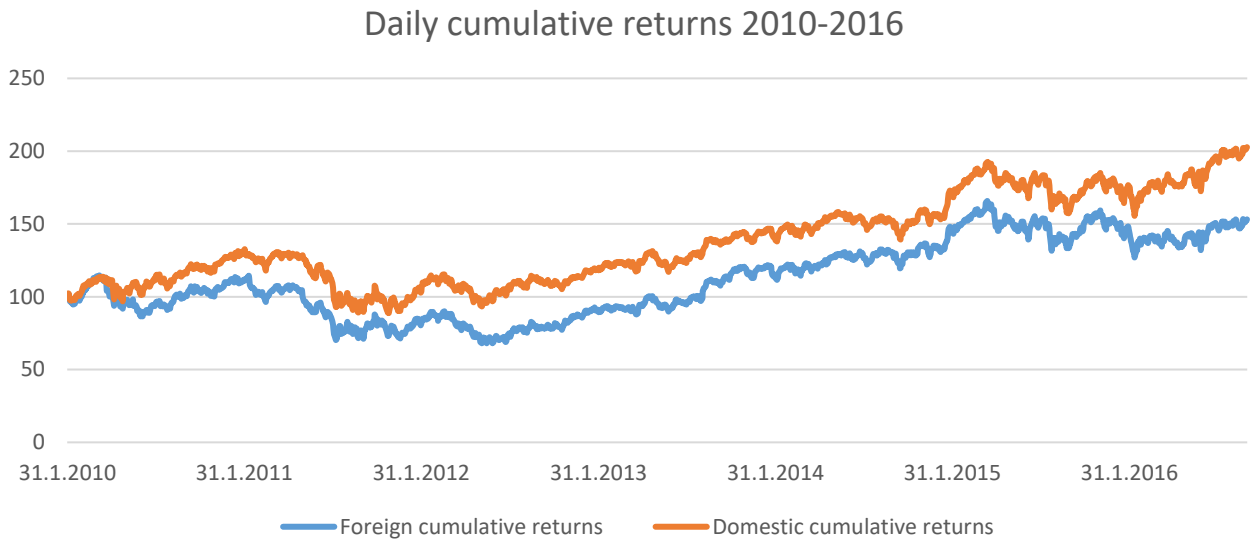
To get more accurate volatilities for the statistical test, I calculated also the daily returns on the portfolios as described in the methodology part. The cumulative daily returns end up at the same level as the cumulative monthly returns during the time period 2010-2016. This means that the calculation error between the daily rebalanced holdings and only monthly balanced holdings is really small, which is a positive finding. The new cumulative returns are shown in Figure 2. The volatilities are a bit higher than in the monthly comparison. The monthly volatility of foreign returns is now 6.6 % and domestic returns it is 6.0 % assuming 21 trading dates in a month. The domestic volatility is still higher than foreign volatility.

However, now I have more data for the statistical tests. The statistical results are shown in Table 2. The F-test of the variances gives now p-value of 0.0001. The really small p-value tells the expected variances to differ between the foreign and domestic holdings. Instead, the t-test with unequal variances gives p-value of 0.75 indicating the expected returns really be equal. This means that the expected returns are assumed to be the same but the Finnish investors are expected to have a lower volatility than the foreign investors. This means that the expected Sharpe ratio is higher for domestic investors and this means them to have superior returns compared to the foreign investors.

Table 2: The descriptive statistics and statistical tests of the daily returns

DAILY RETURNS		
	<i>Foreign</i>	<i>Domestic</i>
Descriptive statistics		
Mean	0.00036	0.00051
Variance	0.00020	0.00017
Observations	1677	1677
F-Test Two-Sample for Variances		
df	1676	1676
F	1.20784	
P(F<=f) one-tail	0.00006	
P(F<=f) two-tail	0.00011	
t-Test: Two-Sample Assuming Unequal Variances		
Pooled Variance	Unequal variances	
df	3323	
t Stat	-0.31666	
P(T<=t) one-tail	0.37576	
P(T<=t) two-tail	0.75152	

Figure 2: Cumulative daily returns of the foreign and domestic investors



4.3. Risk adjusted returns

The returns were also risk adjusted using the Fama-French three factor model. The alphas in the both models, for monthly and daily returns, were negative for the foreign returns and positive for domestic returns. However, the alphas aren't statistically significant. The Fama-French models results are shown in the Table 3.

The results after the risk adjustments tell that there are some weak signs that domestic investors performed better. However, the performance differences between the two investor segments were explained by the three factors of the regression model. On a monthly level the excess market return is the only statistically significant factor. Thus, the foreign and domestic portfolios are proxies of the Finnish market portfolio.

Table 3: Results of the Fama-French three factor model regression

MONTHLY RETURNS				
	Foreign		Domestic	
	<i>Coefficients</i>	<i>P-value</i>	<i>Coefficients</i>	<i>P-value</i>
Alpha (Intercept)	-0.220	0.143	0.193	0.228
Mkt-Rf	1.122	0.000	0.943	0.000
SMB	-0.116	0.171	0.070	0.439
HML	-0.038	0.566	0.004	0.950

DAILY RETURNS				
	Foreign		Domestic	
	<i>Coefficients</i>	<i>P-value</i>	<i>Coefficients</i>	<i>P-value</i>
Alpha (Intercept)	-0.011	0.119	0.012	0.112
Mkt-Rf	1.115	0.000	0.952	0.000
SMB	0.011	0.559	-0.101	0.000
HML	-0.078	0.000	0.102	0.000

4.4. Discussion of the results

Based on my results, the Finnish investors had higher cumulative returns than foreign investors in the Finnish stock markets during 2010-2016. However, the higher cumulative returns were caused by the higher returns during a few months. The risk adjusted returns show that there is not statistical significance between the two investor groups. However, it seems clear that on an aggregate level the investor groups have different strategies. The Finnish investors strategies seem to minimize the traditional risk measure volatility compared to the foreign investors.

The finding is in line with the earlier study of domestic and foreign investors' performance in Finland (Kalev et al., 2008). However, this means that the situation is changed from the 20th century when foreign investors seemed to outperform (Grinblatt & Keloharju, 2000). The previous studies of Finnish markets didn't use risk adjusted returns so my results can't be compared directly with the earlier studies. It would have been interesting to see whether the risk adjusted performance has change over the time. The difference between the studies based on 20th century data and 21st century data is that the Euro has been taken in use as the currency in 1999 in the stock exchange. The currency risk has disappeared from the European investors. It could be that the Finnish monetary politics created superior buying possibilities for the foreign investors through the currency devaluation. Of course, the devaluation causes troubles for the existing holdings but this wasn't taken into account in the study by Grinblatt and Keloharju (2000).

As discussed earlier, the currency rates might affect the performance of foreign and domestic investors. The foreign investors face the currency risk. However, Finland is part of the Euro area, which reduces the effect of the currency risk in my results.

Another thing my study can't answer is the division inside the two investor groups. Has the foreign investors' structure change and has the retail investors share increased? The same can be applied to the Finnish investors. Therefore, it should be kept in mind that the differences might be because I'm really comparing just different shares of retail and institutional investors.

The unadjusted difference in the performance of foreign and domestic investor groups suggests that the home bias puzzle's implicit explanations might have grounds in

Finland. Many previous studies find similar results. However, because the risk adjusted returns don't show significant alpha for domestic investors the better informed local investor explanation isn't the most convincing explanation based on my study. Similarly, the foreign investors don't have significant positive alpha, instead they seem to have negative alpha which isn't statistically significant. Therefore, the more sophisticated foreign investor explanation isn't also very convincing based on my study. It affects to be more probable that the difference is explained by different trading behaviour.

As a major limitation I have to remind that I had to presume constant holding weights during the month due to my monthly based holding data. Therefore, more frequent data could change the results. However, my unadjusted and comparable results are in line with the previous studies, which is a positive thing in terms of my study's finding's robustness.

5. Conclusion

I found that during 2010-2016 domestic investors had higher cumulative returns than foreign investors in Finland. There is no difference between the expected returns of the two investment groups. However, the expected volatility differs based on the daily returns, which means that the Finnish investors have higher expected Sharpe ratio.

The risk adjusted returns finds not statistically significant alphas for either investor groups on the monthly or the daily level. This means that the investor groups have different investment strategies or trading behaviours. The adjusted returns suggest that the locals don't have superior information and that the foreign investors aren't more sophisticated. Therefore, the trading behaviour or different strategies could be the best implicit explanation to the home bias puzzle based on my results.

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