Equity Home Bias, Herding Behavior and Social Interaction
Mutual funds analysis

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Abstract

In the last years, financial markets knew many reforms aiming at fostering foreigner investment. According to modern portfolio theory, when markets are integrated, the funds should be assigned between the national stock markets proportionally to their stock market capitalization (Markowitz, 1952).

However, French and Poterba (1991) underline the lack of diversification of international investors. This excessive under-weighting of the foreign assets is called "the equity home bias puzzle". Some institutional factors (such as barriers to capital movements and information asymmetries) and behavioural factors (such as familiarity and optimism) have been studied but did not succeed to explain the puzzle.

We propose a new behavioral explanation which could contribute to understand the equity home bias, namely, social interaction. A "social" investor finds more attractive to invest in a foreign market when his peers already invested there. We use standard economic literature (Glaeser and Scheinkman, 2001; Glaeser, Sacerdote and Scheinkman, 2003) to model the impact of social interaction on international mutual funds investment choice. We show that social interaction has a significant role in such a domestic investment preference.

1 Introduction

According to modern portfolio theory, investors should diversify their portfolios by investing in countries proportionally to their domestic stock market capitalization (Markowitz, 1952) to optimize their gains. However, despite increasing financial markets integration, the lack of international diversification among investors is persistent. The strong preference for domestic firms is called the "equity home bias" puzzle. This phenomenon introduced by French and Poterba (1991) is a well-established in international finance. Various attempts have been made to explain this puzzle but they still non-conclusive.

Primary explanations of the home bias focused on institutional factors. These factors highlight the importance of investment costs without explicitly considering individual investment behavior.

- The first institutional explanation of the home bias is that it helps hedging against domestic risk. The models of Adler and Dumas (1983) and Stulz (1981) show that when purchasing power parity does not hold, differences in inflation rates across countries create a demand for domestic assets to hedge domestic inflation. However, Cooper and Kaplanis (1994) show that we need very low levels of risk aversion to consider inflation hedging as a plausible explanation for actual equity holdings. Jeske (2001) show that hedging domestic risk would even require to invest in foreign assets.
- Eldor, Pines and Schwarz (1988) and Tesar (1993) explain that home bias allows to hedge against domestic non-traded wealth such as human capital. However, Baxter and Jermann (1997) show that human capital returns are highly correlated with domestic returns but not with foreign stock returns. Hedging require to short sell domestic in favour of foreign equity. They conclude that "The International Diversification Puzzle Is Worse Than You Think".
- Several authors consider that portfolio diversification could be done from internationally operating companies. However, since stock returns of international firms are closely related to their domestic capital markets, investing in those firms doesn't provide better diversification than the domestic market (Heston and Rouwenhorst, 1994; Rowland and Tesar, 1998).
- Ahearne, Griever and Warnok (2001), Stulz and Wasserfallen (1995) and Solnik (1996) consider regulatory restrictions, transaction costs and taxes as a direct barrier to international investment. However, Tesar and Werner (1995) show that the high turnover rate on foreign equity investments relative to domestic equity markets suggests that transaction costs are unlikely to be important deterrents to international investment. Moreover, in recent years, capital markets have been substantially liberalized while the equity home bias did not alleviate.
- A number of papers address asymmetric information in investors home bias by theoretical models (Brennan and Cao, 1997; Gehrig, 1993; Kang and Stulz, 1997; Low, 1993). Coval and Moskowitz (1999, 2001) show that US investment managers strongly prefer locally headquartered companies. However, Information must be very precise in order to reduce the domestic risk considerably (Jeske, 2001).
- Ahearne, Griever, and Warnock (2001) underline the importance of cross listing in reducing home bias. They found that U.S. investment in a country's equities is positively correlated to the share of that country equities listed in U.S. exchange. Moreover, Covrig, DeFond and Hung (2007) find that voluntary International Accounting Standards adoption reduces home bias among foreign investors and thereby improve capital allocation efficiency.
- Pinkowitz, Stulz and Williamson (2001) show that there is a close relation between corporate governance and the portfolios held by investors. The prevalence of closely-held firms in most countries helps explain why these countries exhibit a home bias in share holdings.

In general, institutional explanations seem to be insufficient to explain the home bias puzzle. The costs of diversification do not really seem to be so high to prevent the investors from exploiting the advantages of international diversification. That's why, several authors focus on behavioral explanations based instead on the investor choice.

- Graham, Harvey and Huang (2005) find that investors who feel competent trade more often and have a more internationally diversified portfolio. Also, individuals prefer to bet in a context where they feel competent rather than uninformed. Investors feel more competent in their own market, leading them to "forego the advantage of diversification and concentrate on a small number of companies with which they are presumably familiar" (Heath and Tversky, 1991).
- Huberman (2001) shows that people often ignore the principles of portfolio theory and invest in the familiar. Benartzi (2001) outlines that familiarity with own company stock is positively correlated with the perceived safety of it. Hence, workers excessively invest in their own company which involves the additional risk of not only losing retirement savings but also jobs if the company runs bankrupt.
- Shiller, Kon-Ya, and Tsutsui (1996), French and Poterba (1991), Kilka and Weber (2000) and Strong and Xu (2003) offer an alternative explanation: "relative return optimism towards home markets than towards international markets". Those studies show that investors are then more likely to avoid investing in foreign assets.
- A final explanation is given by Grinblatt and Keloharju (2001). Those authors show that distance, language, and culture influence stockholdings and trades.

While familiarity, optimism, confidence and subjective competence constitute plausible explanations of the equity home bias, they could simply be concomitant of a more fundamental process, namely, social interaction. Our objective is to provide insight into the observed equity home bias phenomenon by exploring the impact of social interaction on the local preference. More generally, Hong, Kubik and Stein (2004) showed that there is a strong link between stock market *participation* and social interaction. A "social" investor finds the market more attractive when more of his peers participate.

The economists carry a growing interest to take into account social interactions in the individuals decision-making processes. A first literature is often gathered under the generic term of social learning. The agents take into account the behaviors of the others when making their decision. Among those one will note the informational cascades. Their main result is to show that the herding behavior is a purely rational process.

A second literature on social interactions stipulates that the individuals build themselves mainly if not entirely in the interaction. This literature is in the line of Becker (1974, 1981) and experienced a significant development since the second half of the years 1990. In this current of research, Glaeser and Scheinkman (2002), Glaeser and Scheinkman (2002) and Glaeser, Sacerdote and Scheinkman (2003) developed models of social interactions and proposed empirical methods to measure these interactions.

In this paper, we are interested in various aspects of social interactions and study their impacts on the equity home bias puzzle. We use various methods in order to quantify the impact of the social interactions on mutual funds home bias. These methods give significant results. Mutual funds home bias is due primarily to the social interactions of mutual funds of the same country. These results are robust to the inclusion of other variables such as familiarity.

2 Herding Behavior and Home Bias

Herding behavior is defined as the behavior which takes place when the individual neglects his private information to follow the behavior of the others. In financial markets, there are four forms of rational herding behavior (Bikhchandani and Sharma, 2000). First of all, norm-based herding behavior (Orlean, 2001). This first form supposes that investor conforms to the group opinion to be recognized by the other members of his peer group. The second form is information-based herding behavior (Banerjee, 1992). This form means that it can be rational for an investor to imitate his fellow when he thinks that he is better informed than him. An example of this type of herding behavior is provided by what is called the "informational cascades" (Hirshleifer and Welch, 1992, Welch, 1992, Avery and Zemsky, 1998). A third form of herding behavior is the reputation-based herding behavior (Scharfstein and Stein, 1990). This form of herding behavior takes up the idea according to which it is better to be wrong together than to be right all alone. Lastly, a fourth form of herding behavior is compensation-based herding behavior (Maug and Naik, 1996). It takes place when a manager compensation is based on a comparison between its own performance and that of its peers.

The empirical studies on herding do not examine a particular model of herding behavior. The approach generally used is purely statistical. Thus, there is a lack of direct link between the herding behavior theory and the empirical specifications used to test it. Moreover, the majority of the studies do not make the difference between "intentional" herding behavior and "spurious" herding behavior where groups take similar decision when they face similar decision problems and information sets.

The first empirical studies relating to herding behavior on financial markets are those of Lakonishok, Schleifer and Vishny (LSV) (1992) and Grinblatt, Titman and Wermers (1995). The two studies use the same measurement of the herding behavior proposed by Lakonishok, Schleifer and Vishny (1992) and find only little indications of a herding behavior in their samples. However, this studies stop in the current of the Eighties. Wermers (1999) uses much more recent data relating to the near total investment funds equity portfolios which existed between 1975 and 1994. He notes that funds directed towards growth stocks have a more marked propensity to herd than those which privilege income.

In this section, we study the herding behavior among French mutual funds managers in their choice to to invest in the European foreign stocks and thus decrease their domestic bias. More precisely, European stocks studied belong to Belgium, Italy, Spain, Portugal, Denmark, Switzerland, Finland and Germany.

2.1 Methodology

To study herding behavior among French mutual funds, we use the most common measure proposed by Lakonishok, Shleifer and Vishny (1992). This measure examines "the extent to which money managers end up on the same side of the market in a given stock in a given quarter, relative to what is expected if managers trade independently".

Let $B(i,t)$ the number of institutional investors that are net buyers of stock i in quarter t, $S(i,t)$ the number of institutional investors that are net sellers of stock i in quarter t and $H(i,t)$ the herding behavior measure of stock i in quarter t.

This measure is defined as follows:

$$H(i,t) = |p(i,t) - p(t)| - AF(i,t) \tag{1}$$

where $p(i,t) = \frac{B(i,t)}{B(i,t)+S(i,t)}$ is the fraction of active managers buying stock i in quarter t and $p(t) = E\left[p\left(i,t\right)\right]$. A proxy for $E\left[p\left(i,t\right)\right]$ used by Lakonishok, Shleifer and Vishny (1992) is the number of institutional investor buying in quarter t relative to the total number of institutional investors active in quarter t aggregated across all stocks. Hence, we calculate $p(t)$ as follows:

$$p(t) = \frac{\sum_{i=1}^{N_{i,t}} B(i,t)}{\sum_{i=1}^{N_{i,t}} B(i,t) + \sum_{i=1}^{N_{i,t}} S(i,t)} \tag{2}$$

where $N_{i,t}$ is the number of stocks traded by at least one institutional investor in quarter t.

Finally, $AF(i,t)$ is an adjustment factor that accounts for the fact that, under the null hypothesis of no herding, the expected value of $|p(i,t) - p(t)|]$ will be greater than zero. Hence,

$$AF(i,t) = E[|p(i,t) - p(t)|] \tag{3}$$

where the expectation is calculated under the null hypothesis of no herding, so that $B(i,t)$ follows a binomial distribution with parameter $p(t)$.

As $B(i,t) + S(i,t)$ increase, with no herding, the adjustment factor will be close to zero, since the fraction of buyers will be equal to the fraction of sellers in this case and $p(i,t)$ will be close to $p(t)$.

If $B(i,t) + S(i,t)$ is low, the adjustment factor will be positive in general. $H(i,t)$ is positive when $|p(i,t) - p(t)| > AF(i,t)$ and this would occur when the extent to buy or sell herding is greater than its expected value under the null hypothesis of no herding. Hence, if $H(i,t)$ is significantly positive and different from zero, we will interpret this as a sign of herding behavior. If $H(i,t)$ is negative, (i. e. $|p(i,t) - p(t)| < AF(i,t)$), this means that the extent to buy or sell herding is less than its expected value under the null hypothesis of no herding. Hence, if $H(i,t)$ is negative, we will interpret this as a sign of no herding behavior.

2.2 Data

Our Analysis is based on a European sample. The *source* investors relate to all French mutual funds which invest in European foreign equities. These mutual funds have various styles of management.The *targets* equities are the stocks of the principal European stock markets indexes. Hence, we have 205 stocks as table 2.1 shows.

Country	**Index**
Belgium	BEL 20
Italy	S&P/MIB
Spain	Ibex 35
Portugal	PSI 20
Denmark	OMX Copenhagen 20
Switzerland	Swiss Market Index: SMI
Finland	OMX Helsinki 25
Germany	DAX 30

Table 2.1: European indices. This table gives, for each country, the index whose component stocks are studied.

We consider a period of two years. We have quarterly data going from June 30, 2005 to March 31, 2007.

In order to study French funds herding in investing in European countries, we study each index separately. For example, if we are interested by the Germany index, the DAX 30, we calculate, for each stock of the index, the number of French mutual funds buying this stock and the number of French mutual funds selling this stock. This is done at the end of each quarter.

2.3 Global measures of herding behavior

We try to see whether French mutual funds tend to being same side of the market for given stock in a given quarter. In other words, we try to see whether there is a disproportionate number of French mutual funds which buy (sell) this stock. Thus if 70 % of the investors are net purchasers of a stock, one can say that there is herding behavior with the purchase. We calculate the average herding behavior measure for each country.

2.3.1 Description of the results

We include initially in computing the mean herding measure the negative values of $H(i,t)$ (meaning no herding) in order to compare our results with prior studies.

Figure 1 gives the results of the herding measure for the total sample, including negative values. The average herding measure for the total sample is -0.085. This value is negative. This suggest that there is no herding among French mutual funds in investing in the most known European stocks.

Figure 2 gives the results of the herding measure for the total sample, excluding negative values. The average herding measure is 0.057. This implies that if $p(t)$ is equal to 0.5, then 55.7% of French mutual funds have changed their holdings on an average stock in one direction and $44,3\%$ in the other direction. The median is also small, only 4.2%, this suggests that there is little herding in a given stock during a given quarter.

Wermers (1999) finds that the average herding measure is only 3.4%. This value is slightly higher than that reported by Lakonishok, Schleifer and Vishny (1992) for their sample of pension funds (only 2.7 %).

This low value should not be surprising since we consider aggregate data. We focus then on herding by country.

Table 2.2 reports the herding measures by country. The average herding measure including negative value is negative except for Belgium. However, this measure is low.

We consider now average values of herding measures where $H(i,t) > 0$. The lower average herding measure is for the German Market (4.2 %). The higher herding measures relate to Portugal (12.7 %) and Finland (8 %).

The intentional herding must be higher in the stocks that are less known by French mutual funds. Indeed, weak information on these stocks obliges investors to give more importance to their fellows behavior and to make decisions based on the purchases and sales of the other French funds. We notice that the most traded stocks by French mutual funds are the German stocks. However there is little herding on this market. This enables us to note that the German market is better known by the French funds.

On the other hand few French mutual funds trade Portuguese stocks. On average only 5 French mutual funds bought a Portuguese stock per period and only 3 French funds sold them. The herding measure is high in this country like already mentioned. This suggests that the Portuguese market is less known by French investors.

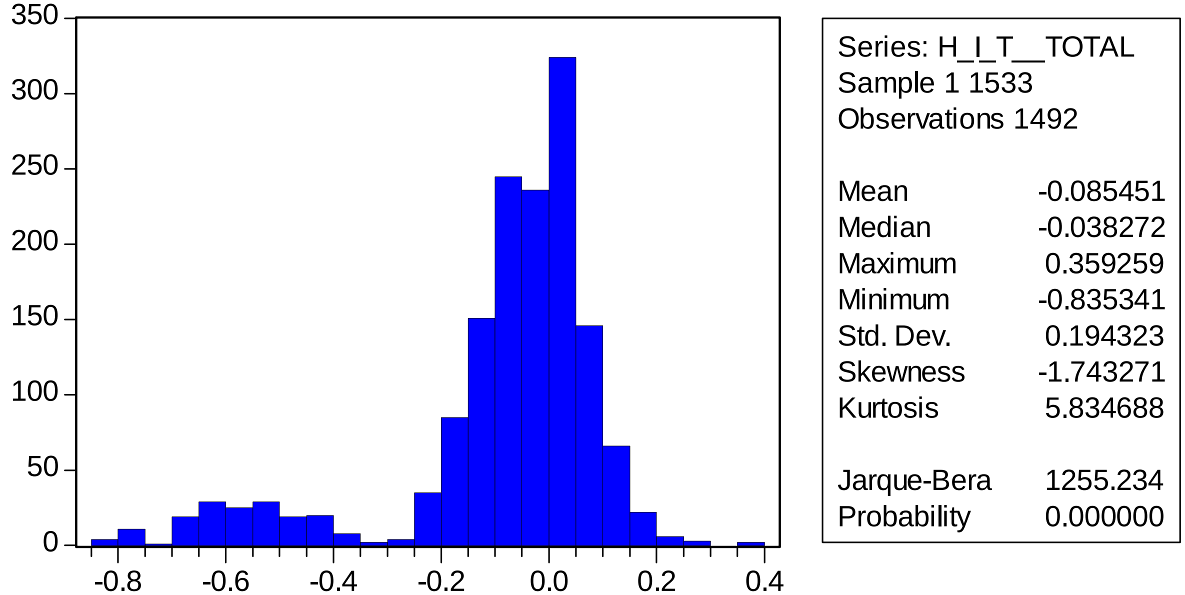
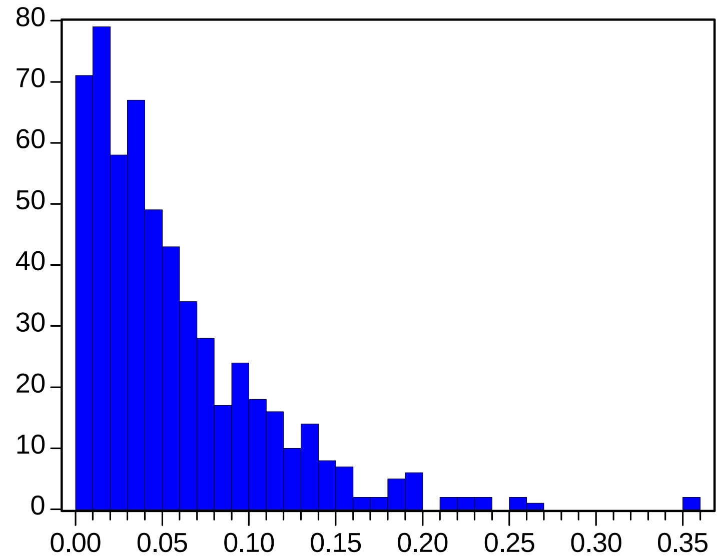


Figure 1: **Descriptive statistics of the H(i,t) herding measure including negative values - Period June 30, 2005 to march 31, 2007.** This figure presents the histogram of the herding measure calculated for each stock-quarter as $|p(i,t) - E[p(i,t)]| - E|p(i,t) - E[p(i,t)]|$ where $p(i,t)$ equals the proportion of funds buying stock i in quarter t among all funds trading that stock in that quarter.



Series: H_I_T__POSITIF_TOTAL
Sample 1 569
Observations 569

Mean	0.057330
Median	0.042922
Maximum	0.359259
Minimum	0.000593
Std. Dev.	0.052530
Skewness	1.811196
Kurtosis	7.688915
Jarque-Bera	832.3440
Probability	0.000000

Figure 2: **Descriptive statistics of the H(i,t) herding measure excluding negative values - Period June 30, 2005 to march 31, 2007.** This figure presents the histogram of the herding measure calculated for each stock-quarter as $|p(i,t) - E[p(i,t)]| - E|p(i,t) - E[p(i,t)]|$ where $p(i,t)$ equals the proportion of funds buying stock i in quarter t among all funds trading that stock in that quarter.

Country	$\overline{B(i,t)}$	$\overline{S\,(i,t)}$	$\overline{H\,(i,t)}$
Belgium	15	11	0.070
Italiy	17	11	0.069
Spain	14	15	0.059
Portugal	5	3	0.127
Denmark	7	4	0.059
Switzerland	14	14	0.044
Finland	13	6	0.08
Germany	31	26	0.042

Table 2.2: Global herding measures. The first column gives the average number of French mutual funds having bought a given stock in a given quarter for each index country. The second column gives the average number of French mutual funds having sold a given stock in a given quarter for each index country. The third column gives the average measure of herding including negative values. The last column gives the average measure of herding including only the positive values.

2.3.2 Buy and sell herding measures

We use the modified herding measures proposed by Wermers (1999) in order to differentiate stocks by whether they had a higher (or lower) proportion of buyers that the average stock during the same period.

The relation between the unconditional herding measure, $H(i,t)$, and these conditional herding measure called "buy herding measure", $BH(i,t)$, and "sell herding measure", $SH(i,t)$, is described as follows:

$$BH\,(i,t) = H\,(i,t) \;\; / \; p\,(i,t) > p\,(t) \quad (4)$$

$$SH\,(i,t) = H\,(i,t) \;\; / \; p\,(i,t) < p\,(t) \quad (5)$$

The calculation of the average $BH\,(i,t)$ (denoted $\overline{BH\,(i,t)}$) separately of the average $SH\,(i,t)$ (denoted $\overline{SH\,(i,t)}$) is useful to analyze the French funds herding *into* the European stocks and that *out of* European stocks. If the mutual funds tend to herd in the purchases of stocks more frequently than in the sales, then $\overline{BH\,(i,t)}$ will be higher than $\overline{SH\,(i,t)}$. As table 2.3 shows, herding measure on the side of the sales are slightly higher than herding measure on the side of the purchases. The differential between the buy ans sell herding measure is pronounced for Portugal where the French mutual funds adopt a herd behavior to the purchase more marked than that with the sale. The differential between the buy ans sell herding measure is almost non-existent for Germany.

Pays	$\overline{BH(i,t)}$	$\overline{SH\,(i,t)}$	$\overline{H\,(i,t)}$
Belgium	$0,070$	$0,071$	$0,070$
Italy	$0,060$	$0,082$	$0,069$
Spain	$0,052$	$0,069$	$0,059$
Portugal	$0,078$	$0,141$	$0,127$
Denmark	$0,059$	$0,06$	$0,059$
Switzerland	$0,037$	$0,052$	$0,044$
Finland	0	$0,08$	$0,08$
Germany	$0,042$	$0,041$	$0,042$

Table 2.3: Buy and sell herding measure. The first column the average buy herding measure. The second column gives the average sell herding measure.

2.4 Herding measure by stocks characteristics

In this section, we focus on herding measure according to stock last performance (to see if the investors have "positive feedback strategies") as well as stock size (to see if the investors herd more in small companies).

2.4.1 Herding measure according to past return

We test the tendency of French mutual funds to buy or sell stocks because of a common feedback strategy. Grinblatt, Titmann and Wermers (1995) showed that mutual funds follow "positive - feedback" strategies[1] and can either stabilize, or to destabilize prices. In the same way, Lakonishok, Shleifer, Thaler and Robert (1991) showed that the mutual funds may herd because they adopt "window - dressing" strategies[2].

Table 2.4 gives herding measure according to past return. For each stock and each quarter, we calculate the return during the quarter which precedes immediately. We divide our sample according to whether stocks recorded a low, medium or high past return.

The global, buy and sell herding measures are higher in low past return stocks than in high past return stocks (except for Switzerland). French mutual funds sell more in herd stocks that have registered past low return which suggest that they adopt "window - dressing" strategies but not "positive - feedback" strategies.

[1] A positive feedback strategy corresponds to an increase in a long position when the prices increase.

[2] A "window - dressing" strategy is a strategy used by the mutual funds managers at the end of the quarter or the year in order to improve portfolios appearance before presenting them at their customers or shareholders. The manager will sell stocks having recorded strong losses and will buy the stocks having recorded profits at the end of the quarter.

Country		Total	low past return	medium past return	high past return
Belgium	H(i,t)	0,071	0,070	0,071	0,074
	BH(i,t)	0,070	0,089	0,038	0,081
	SH(i,t)	0,071	0,067	0,080	0,064
Italy	H(i,t)	0,064	0,065	0,068	0,060
	BH(i,t)	0,063	0,073	0,067	0,047
	SH(i,t)	0,065	0,053	0,070	0,070
Spain	H(i,t)	0,061	0,066	0,058	0,058
	BH(i,t)	0,060	0,070	0,071	0,042
	SH(i,t)	0,062	0,070	0,036	0,066
Portugal	H(i,t)	0,136	0,203	0,082	0,109
	BH(i,t)	0,070	0,022	0,102	0
	SH(i,t)	0,166	0,293	0,053	0,109
Denmark	H(i,t)	0,059	0,065	0,068	0,044
	BH(i,t)	0,059	0,080	0,048	0,051
	SH(i,t)	0,060	0,076	0,074	0,039
Switzerland	H(i,t)	0,044	0,034	0,042	0,052
	BH(i,t)	0,043	0,030	0,044	0,054
	SH(i,t)	0,044	0,041	0,039	0,050
Finland	H(i,t)	0,080	0,048	0,111	0
	BH(i,t)	0	0	0	0
	SH(i,t)	0,080	0,048	0,111	0
Germany	H(i,t)	0,042	0,043	0,039	0,043
	BH(i,t)	0,044	0,044	0,045	0,044
	SH(i,t)	0,039	0,042	0,030	0,043

Tableau 2.4 : Herding behavior measures according to past return. The table gives for each category of past return (low, medium and high) the average herding measures.

2.4.2 Herding measure according to stocks size

We test the tendency of French mutual funds to buy small, medium or large stocks. We examine the data in this manner because most theories would predict higher levels Some authors show that mutual funds adopt a herding behavior in companies where information is limited, i. e. small stocks.

Table 2.5 gives herding measures according to companies size. For each stock and each quarter, we calculate the stock market capitalization. We divide our sample according to whether the companies have a small, medium or large market capitalization. The results are in conformity with our expectations. Indeed, in general, herding is higher in small stocks than in large stocks.

Country		Total	Small Cap	Mid Cap	Large Cap
	H(i,t)	0,071	0,080	0,057	0,080
Belgium	BH(i,t)	0,070	0,102	0,073	0,044
	SH(i,t)	0,071	0,097	0,071	0,061
	H(i,t)	0,064	0,085	0,065	0,054
Italy	BH(i,t)	0,063	0,101	0,060	0,041
	SH(i,t)	0,065	0,051	0,075	0,065
	H(i,t)	0,061	0,063	0,050	0,069
Spain	BH(i,t)	0,060	0,061	0,047	0,072
	SH(i,t)	0,062	0,066	0,054	0,064
	H(i,t)	0,136	0,209	0,107	0,066
Portugal	BH(i,t)	0,070	0,138	0	0,025
	SH(i,t)	0,166	0,237	0,107	0,107
	H(i,t)	0,059	0,074	0,052	0,059
Denmark	BH(i,t)	0,059	0,062	0,051	0,062
	SH(i,t)	0,060	0,093	0,052	0,052
	H(i,t)	0,044	0,034	0,042	0,052
Switzerland	BH(i,t)	0,043	0,030	0,044	0,054
	SH(i,t)	0,044	0,041	0,039	0,050
	H(i,t)	0,080	0,080	0	0
Finland	BH(i,t)	0	0	0	0
	SH(i,t)	0,080	0,080	0	0
	H(i,t)	0,042	0,066	0,037	0,034
Germany	BH(i,t)	0,044	0,066	0,037	0,027
	SH(i,t)	0,039	0,058	0,035	0,038

Tableau 2.5 : Herding measure according to stocks size. The table reports for every stock size (small, medium ou large) the average herding measures.

3 Social Interaction and home bias

During the last decade, international financial markets knew many evolutions of a strong width. These developments are difficult to explain by current financial theories. The search for new explanations resulted in proposing models of social phenomena, such as "informational cascades". These models are very mechanical and do not lend much attention to the flexibility and the variability of social behaviors. The personal convictions are thus neglected in these models in favour of herding mechanisms.

The social interactions seem to play a significant role in the financial markets. However, theoretical economic models are usually based on the individual utility optimization and do not take into account of the actions of the other actors in the economy. This is not due to the fact that the social interactions are not important but rather to the fact that it is difficult to model the social interactions theoretically and to measure them empirically (Becker, 1974).

Since Adam Smith, and to Gary Becker, Herbert Simon or Kenneth Arrow, the economists sought to integrate in economic behavior analysis these elements of individual decision by taking again the individual preferences. In this current of research, Glaeser and Scheinkman (2002), Glaeser and Scheinkman (2002) and Glaeser, Sacerdote and Scheinkman (2003) developed models of social interactions and proposed empirical methods to measure these interactions.

In what follows, we first expose their model. Second, we detail the empirical approaches to measure social interaction. We use these approaches in order to measure the impact of social interaction on international mutual funds portfolio choice. We concentrate on a particular form of social interaction , namely, geographical social interaction. This form of interaction was used in several models (Benabou, 1993, Glaeser, Sacerdote and Scheinkman, 1996, Mobius, 1999). Thus, the reference group of each funds mutual is constituted other mutual funds belonging to the same country. Finally, we expose the data and the results.

3.1 Social Interaction Model

Glaeser and Scheinkman (2002, 2001) consider a model where the utility of an agent i depends on the action chosen by him, a_i, a "taste shock" θ_i, and the actions chosen by all other agents in his peer group. More precisely, the utility function of an agent i is given by:

$$U^i(a_i, A_i, \theta_i) = -\frac{1-\beta}{2}a_i^2 - \frac{\beta}{2}(a_i - A_i)^2 + \theta_i a_i \quad (6)$$

where β is a term that measures the size of social interactions, $A_i = \frac{1}{n-1}\sum_{j\neq i} a_j$ where the sum is over the agents j belonging to the group of agent i, and n is the group size.

The first order condition gives:

$$a_i = \beta A_i + \theta_i \quad (7)$$

We will also assume that $\theta_i = \lambda_l + \epsilon_i$ where the ϵ_i's are idiosyncratic shocks assumed to be i.i.d., with mean zero, and λ_l is a place specific variable that affects everyone in the group.

In what follows, we detail four methods of measuring the social interaction term β.

3.1.1 Variance Method

The first and simplest method to measure the size of social interactions is to use the variance of the group average action.

Glaeser and Scheinkman (2002, 2001) show that the "individual" variance of the average action within a group ($Var(ai)$) converges to $\frac{\sigma_\lambda^2}{(1-\beta)^2} + \sigma_\epsilon^2$ as $n \longrightarrow \infty$ where σ_λ^2 is the variance of λ_l and σ_ϵ^2 is the variance of ϵ_i.

Moreover, the sum of the n group members' actions, normalized by dividing by the square root of the number of observations, will have the "aggregate" variance:

$$var\left(\frac{\sum_i a_i}{\sqrt{n}}\right) = \frac{n\sigma_\lambda^2}{(1-\beta)^2} + \frac{\sigma_\epsilon^2}{(1-\beta)^2} \tag{8}$$

When $\sigma_\lambda^2 = 0$, the ratio of the variance of the aggregate variance to the individual variance converges to $\frac{1}{(1-\beta)^2}$ as $n \longrightarrow \infty$.

3.1.2 OLS Regression Method

The most common methodology for estimating the size of social interactions is to regress the individual action on the group average action. The univariate ordinary least squares coefficient for a regression of an individual action on the average action of the group is:

$$\frac{Cov\left(a_i, \sum_{j\neq i} a_j/\left(n-1\right)\right)}{Var\left(\sum_{j\neq i} a_j/\left(n-1\right)\right)} = 2\beta\frac{\left(n-1\right)^2}{n\left(n-1+\beta\right)} - \beta^2\frac{\left(n-1\right)^2}{\left(n-1+\beta\right)^2} \tag{9}$$

When this OLS coefficient converges to $2\beta - \beta^2$ as $n \longrightarrow \infty$.

3.1.3 Instrumental variables Method

To deal with cases where $\sigma_\lambda^2 \neq 0$, one approach is to use peer group background characteristics as instruments for peer group actions. To illustrate this approach, we assume that there is a parameter X which can be observed for all people, and which is part of the individual error term, i.e. $\epsilon_i = \gamma X_i + \mu_i$. Thus, the error term can be decomposed into a term that is idiosyncratic and unobservable μ_i, and a term that is directly observable X_i. Under the assumptions that both components of ϵ_i are orthogonal to λ_l and to each other, using the formula for an instrumental variables estimator we find that:

$$\frac{Cov\left(a_i, \sum_{j\neq i} X_j/\left(n-1\right)\right)}{Cov\left(\sum_{j\neq i} a_j/\left(n-1\right), \sum_{j\neq i} X_j/\left(n-1\right)\right)} = \beta \tag{10}$$

3.1.4 Social Multipliers Method

Glaeser and Scheinkman (2001) and Glaeser, Laibson and Sacerdote (2000) discuss the social multiplier method to measure social interactions. When social interactions exist, the effect of an exogenous increase in a variable includes not only the direct effect on individual outcomes, but also the indirect effect that works through peer influence.

Again we assume that $\epsilon_i = \gamma X_i + \mu_i$.When we estimate the micro regression of individual outcomes on characteristic X, when X is orthogonal to all other error terms, this estimated "individual" coefficient will be quite close to γ as n becomes large.

When we run an ordinary least squares regression of aggregate actions on aggregate X variables, assuming that the terms are orthogonal to both the λ_l and μ_i terms, this "aggregate" coefficient from this regression converges to $\frac{\gamma}{1-\beta}$ as n becomes large.

Thus, the ratio of the individual coefficient to the aggregate coefficient (called the social multiplier) converges to $1-\beta$ as n becomes large. This provides us with another mean of estimating the social interaction term β.

3.2 Data

We use various sources. The data relate to 5141 mutual funds whose management is active. These mutual funds belong to 27 countries (Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Greece, Hong Kong, India, Ireland, Italy, Japan, Luxembourg, Malaysia, Netherlands, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, the United Kingdom and the United States of America). These countries represent at the end of the year 2006 more than 92 % of world markets capitalization. The number of funds per country is almost proportional to their market size.

The data on mutual funds structure of property are collected from the Thomson One Banker data base. This base also contains data on mutual funds characteristics.

The data on countries market capitalization are collected from the annual report 2006 of World Federation of Exchange and of the sites of the financial markets stock exchanges. Figure 3 gives summary statistics of mutual funds equity holdings for each country.

3.3 Variables

In this section, we detail how to measure the different variables. The dependent variable a_i is the individual mutual fund home bias; the independent variables are the aggregate home bias Ai and funds-specific control variables .

- Individual Home Bias

The variable "home bias" of mutual fund i is calculated as follows:

$$a_i = \text{Percentage of mutual fund local investment} - \text{Percentage of the country market capitalization in theworld markets capitalization} \quad (11)$$

- Aggregate Home Bias

This variable is calculated as follows:

$$A_i = \frac{1}{n_p - 1} \sum_{j \neq i} a_j \quad (12)$$

where n_p is the number of the mutual funds in the country p. This variable measure the average home bias of all the others funds belonging to the same country,

Except home bias variables, for each mutual fund, control variables concern turnover, evaluation ratios, dividend, profitability, share holdings size and leverage.

- Turnover Variable

This variable measures the percentage of a fund's assets that have changed over the year. Turnover rate for a mutual fund is calculated by dividing the average assets during the period by the lesser of the value of purchases and the value of sales during the same period. We use a dummy variables "TurnoverH" which takes 1 if the fund has a high turnover and 0 otherwise. We expect that when turnover is high, the home bias decrease.

- Leverage variable

Leverage variables include "Long Term Debt / Equity" as proxy for borrowing constraints. A high ratio generally shows that the fund was aggressive in its choice to finance its growth with the debts.

- Evaluation variables

Evaluation variables include the variables "Price to Earnings ratio" (12 Months Forward) and "5 Year Projected Earnings to Growth ratio" (the numerator in the equation, is the P/E ratio for the fiscal period selected, the denominator, is the appropriate growth rate for the fiscal period), "Price to Sales ratio" and "Price to Book ratio".

- Profitability variables

Profitability variables include "Return on Assets ratio" and "Net Revenue".

- Dividend variable

We use the variable "Dividend Payout" which calculates the percentage of the benefit paid to the shareholders in cash (annual dividends by action/earnings per share). This ratio shows at which point the benefit support the payments of the dividends. Mature companies tend to have a high ratio.

- Share holdings size variable

The mutual funds invest in large, medium and small equities. Studies show that the investors prefer to invest in the large companies. We use the variable "Large Capital Assets". It measures (in million dollar) the total stock exchange capitalization of large companies where the funds invests. This variable can be seen as an indirect measurement of information costs and familiarity.

3.4 The effects of mutual funds characteristics on home bias

3.4.1 Methodology

Figure 3 shows that there is a strong home bias among mutual funds. For example, French mutual funds invest 46.66 % of their assets at their home country which represents only 4.29 % of the total world market. The bias is more pronounced in the Asian emerging countries (for example: 98.04 % Vs 1.16 % for Taiwan, 96.44 % Vs 1.26 % for India).

We estimate the following equation:

$$a_i = c(1) + c(2)A_i + \sum_{k=1}^{K} \gamma_k X_i^k + \mu_i \tag{13}$$

where a_i is the home bias of mutual fund i, A_i is the average home bias of all the other funds belonging to the same country p, n_p is the number of mutual funds belonging to the country p and X_i^k represent the variables which control for the k mutual funds characteristics.

This regression will enable us to estimate the coefficients $c(1)$ and $c(2)$ as well as the coefficients γ_k.

To mitigate the heteroscedasticity problem, we use the weighted least square method. Figure 4 shows the results of this estimation. The model is significant (Adjusted R-squared = 0.82).

3.4.2 Results

In general, results show that the more the mutual funds are in good health, the less they skew their portfolio domestically.

- Turnover

The variable "TurnoverH" measuring a high turnover is negative and very significant. The more the mutual fund has a high turnover, the less it is biased towards the domestic assets. Indeed, mutual funds which have a strong trade activity are more willing to buy foreign equities and thus to decrease their home bias.

- Leverage variables

The leverage variables show that the more the fund adopts an aggressive strategy in its financial choice (high "LT Debt to Equity" ratio), the less it is biased locally.

- Evaluation variables

The evaluation variables "Price to Earnings - 12 Months Forward" and "5 Year Projected EPS Growth" have negative signs. A high "Price to earnings" ratio suggests that investors expect a high growth of the benefits in the future in comparison with funds having a small ratio "Price to earnings". In the same way, a ratio "5 Year Projected EPS high Growth" indicates the funds expect a high growth of the benefit. Thus, the results show that the more the mutual fund expects a raised benefit, the less it is biased locally.

- Profitability variables

Profitability variables have a negative sign. The more profits the company do, the less it invests in the domestic equities. Indeed, when the benefit of funds mutual is high, this encourages the mutual funds to invest abroad.

- Dividend variables

The "Payout" ratio is significantly positive indicating that the more the benefits percentage is paid to shareholders, the more home bias is high. A high rate

Country	# mutual funds	% Home Investment	% World SE	Stock Exchange
Australia	106	64,17	1,96	Australian SE
Austria	100	9,42	0,31	Wiener Börse
Belgium	200	17,16	0,70	Euronext Brusells
canada	223	70,14	3,62	TSX Group
China	17	94,62	0,98	Shanghai SE/Shenzhen SE
Denmark	133	15,12	0,41	KFX - OMX
Finland	80	37,43	0,54	HEX - OMX
France	505	46,66	4,29	Euronext Paris
Germany	429	26,6	2,98	Deutsche Börse
Greece	70	70,01	0,35	Athens Exchange
Hong Kong	98	15	2,57	Hong Kong Exchanges
India	120	96,44	1,26	National Stock Exchange India
Ireland	57	6,02	0,28	Irish SE
Italy	272	30,46	1,95	Borsa Italiana
Japan	414	80,02	11,16	Tokyo SE
Luxembourg	144	2,55	0,13	Luxembourg SE
Malaysia	59	99,53	0,44	Bursa Malaysia
Netherlands	64	25,64	1,45	Euronext Amsterdam
Portugal	53	36,53	0,16	Euronext Lisbon
Singapore	141	11,79	0,63	Singapore Exchange
Spain	113	47,02	2,34	BME Spanish Exchanges
Sweden	162	48,07	0,98	SSE - OMX
Switzerland	172	30,62	2,28	Swiss Exchange
Taiwan	183	98,04	1,16	Taiwan SE Corp.
Thailand	38	100	0,30	Thailand SE
UK	649	42,6	7,46	London SE
USA	539	63,17	41,49	American SE / Nasdaq / NYSE
Total	**5141**		92,20	

Figure 3: **Summary Statistics of Mutual Funds Equity Holdings**. The first row of the table reports, for each country, the stock exchanges market capitalization in percentage of the market capitalization of the world markets in year 2006. This data are collected from the annual report in year 2006 of World Federation of Exchange and from of the sites of financial markets stock exchanges. The second row gives the number of studied mutual funds in each country. The third row of the table reports average mutual funds investment in their domestic market (%). Data are collected from Datastream.

Dependent Variable: Individual Home Bias
Method: Least Squares
Sample: 1 5134
Included observations: 4412
Weighting series: Agregate Home Bias

Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Aggregate Home Bias	0.727337	0.024238	30.00803	0.0000
Control Variables				
Constant	32.16428	2.755641	11.67216	0.0000
TurnoverH	-4.741622	0.894555	-5.300536	0.0000
Large Capitalization	0.000395	0.000187	2.109577	0.0350
Payout Ratio	0.364388	0.041978	8.680346	0.0000
LT Debt to Equity	-0.048831	0.009495	-5.142997	0.0000
Evaluation variables				
Price to Earnings Forward 12 mths	-0.143789	0.032388	-4.439543	0.0000
5 Years EPS Growth	-0.177702	0.020470	-8.681277	0.0000
Profitability variables				
Net Revenue	-0.000395	0.000187	-2.109577	0.0350
Return On Assets	-1.841684	0.145533	-12.65471	0.0000

Weighted Statistics

R-squared	0.820990	**Mean dependent var**	55.42852
Adjusted R-squared	0.820585	**S.D. dependent var**	75.65639
S.E. of regression	32.04613	**Akaike info criterion**	9.774713
Sum squared resid	4531950.	**Schwarz criterion**	9.790613
Log likelihood	-21610.67	**F-statistic**	489.7426
Durbin-Watson stat	1.932139	**Prob(F-statistic)**	0.000000

Unweighted Statistics

R-squared	0.369522	**Mean dependent var**	39.58561
Adjusted R-squared	0.368094	**S.D. dependent var**	41.55353
S.E. of regression	33.03196	**Sum squared resid**	4815069.
Durbin-Watson stat	1.909935		

Figure 4: **The Impact of mutual funds characteristics and Aggregate Home Bias in Mutual Fund Local Preference**. The table reports the coefficient of weignted least square regression of equation 13. The dependant variable is the individual mutual fund bias a_i measured the percentage of mutual fund investment in its own country - Percentage of the market capitalization of the country in the total market capitalization of the world markets. The explanatory variables are the aggregate home bias A_i and funds characteristics control variables X_k^i.

of dividend is a sign of maturity of the funds. High domestic bias in mature mutual funds can be due to the fact that these funds are slow to change their domestic portfolios composition despite increasing financial markets globalisation.

- Share holdings size variables

The variable "Large capitalization" is positive. The more the funds invests in the large companies, the more is domestic bias high. This result is in conformity with the explanations of homebias based on familiarity. The mutual funds prefer to invest in the large domestic companies because they are more known and more familiar for them. They give up the advantages of international diversification.

3.5 Measuring Social Interaction

3.5.1 Tests based on variance method

According to this method, the social interaction term β can be estimated in the following way:

$$\frac{1}{(1-\beta)^2} = \frac{Var\left(\frac{\sum_i a_i}{\sqrt{n_p}}\right)}{Var(a_i)} \tag{14}$$

where $Var(a_i)$ is the individual variance of the variable a_i on the total sample, $Var\left(\frac{\sum_i a_i}{\sqrt{n_p}}\right)$ is the variance of the aggregate home bias at the country level, n_p is the number of mutual funds belonging to the country p.

The results show that the individual variance for the sample is equal to 1 720.74 and the aggregate variance is equal to 138 382.22. The value of the social multiplier is $\beta = 0.89$ which is a value that is very close to 1 and far from zero. Social interaction affects mutual funds investment choice. The social interaction term is economically and statistically significant.

However, this method does not account for the mutual funds characteristics. We therefore consider the second approach to measure the social interaction term β.

3.5.2 Tests based on OLS regression

First, we run an ordinary least square regression to the equation 13.

This method allows controlling for the other determinants of the decision to invest at the home market. It also distinguishes social interaction from other determinants of home bias. As figure 5 shows, the estimated coefficient is $c(2) = 0.92 = 2\beta - \beta^2$. The value of the social multiplier is then $\beta = 0.72$. Again the social multiplier term is very significant and far from zero. Thus, an average increase in domestic equities implies for the mutual fund an increase in the domestic equities of 72% of this average increase. Note that the ordinary least squares method makes it possible to control the other mutual funds characteristics . Moreover, the value found is close to that calculated by the variances method.

The estimation used is a simple OLS. It supposes that the characteristics are independent within the country, and independent of the aggregate home bias term. In the next section, we use instrumental variables method, which cure to the problem of errors correlation (Manski, 1993).

3.5.3 Tests based on instrumental variables method

We estimate equation 13 using the instrumental variable methodology. The instruments used for the social interaction are the backgrounds characteristics aggregated at the country level. Hence, for each variable Xi representing a fund characteristic, we construct the instrumental variable $Xag_i = \sum_{j \neq i} X_j$. We also add a constant as an instrumental variable. Figure 6 shows that the estimated coefficient is $\beta = 1,00$.

Again, the estimated coefficient is significantly different from zero. This coefficient is slightly higher than one. As Manski (1993) underlines it, the estimator of the instrumental variables can over-estimate the social interactions in case of group selection , i.e. if the funds choose to settle in a given country.

3.5.4 Tests based on social multipliers method

We first estimate the equation:

.

$$a_i = \alpha_0 + \sum_{k=1}^{K} \alpha_k X_i^k \tag{15}$$

Results of this estimation are shown in figure 7.

We use the estimated coefficients $\widehat{\alpha_k}$ to calculate the estimated aggregate home bias $\frac{1}{n_p}\widehat{\sum_i} a_i = \sum_k \widehat{\alpha_k} \frac{\sum_i X_i^k}{n_p}$. Finally, we regress the aggregate home bias per country $\frac{1}{n_p}\sum_i a_i$ on the estimated aggregate home bias $\sum_k \widehat{\alpha_k} \frac{\sum_i X_i^k}{n_p}$. When n_p becomes large, the estimated coefficient converges towards $\frac{1}{1-\beta}$.

The results of the regression of aggregate home bias on the estimated home bias gives a coefficient equal to 2.17 (see Figure 8). This coefficient is equal to $\frac{1}{1-\beta}$ which gives $\beta = 1 - (1/2.17) = 0,54$. Thus, the term of social interaction β is high and is significantly different from zero (the coefficient of the variable "estimated agregate bias" is significantly different from 1).

The social multipliers method gives the weakest β among the four methods used. This is probably due to the fact that the coefficient of determination is not high in the regression of individual home bias on mutual funds characteristics. Indeed, not to include aggregate home bias in the regression gives a regression with a weak explanatory power.

4 Conclusion

Our study of international mutual funds portfolio holdings produces several interesting findings. Contrary to the prediction of the CAPM, mutual funds

Dependent Variable: Individual Home Bias
Method: Least Squares
Sample: 1 5134
Included observations: 4424

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Aggregate Home Bias	0.922678	0.022576	40.87058	0.0000
Control Variables				
Constant	11.38545	2.927387	3.889287	0.0001
TurnoverH	-8.582569	1.019134	-8.421434	0.0000
Large Capitalization	0.000342	0.000114	3.000990	0.0027
Payout Ratio	0.379786	0.055383	6.857456	0.0000
LT Debt to Equity	-0.017902	0.008644	-2.071057	0.0384
Evaluation variables				
Price to Earnings Forward 12 mths	-0.140126	0.034912	-4.013656	0.0001
5 Years EPS Growth	-0.107945	0.029649	-3.640778	0.0003
Profitability variables				
Net Revenue	-0.003479	0.000268	-12.98124	0.0000
Return On Assets	-1.359744	0.203028	-6.697337	0.0000

R-squared	0.410262	**Mean dependent var**	39.58561
Adjusted R-squared	0.408926	**S.D. dependent var**	41.55353
S.E. of regression	31.94691	**Akaike info criterion**	9.768511
Sum squared resid	4503930.	**Schwarz criterion**	9.784412
Log likelihood	-21596.95	**F-statistic**	306.9989
Durbin-Watson stat	1.927147	**Prob(F-statistic)**	0.000000

Figure 5: **OLS regression method**. The table reports the coefficient of weignted least square regression of equation 13. The dependant variable is the individual mutual fund bias a_i. The explanatory variables are the aggregate home bias A_i and funds characteristics control variables X_k^i.

Method: Two-Stage Least Squares
Sample: 1 1534
Included observations: 1486
Instrument list: C TurnoverHAG LargecaAG PayoutAG ROAAG EPSgrowthAG Ltdebt/equityAG RevenuenetAG

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.003592	1.032122	0.003481	0.9972
Aggregate Home Bias	1.007908	0.023132	43.57124	0.0000

R-squared	0.359148	**Mean dependent var**	39.77040
Adjusted R-squared	0.359013	**S.D. dependent var**	41.59334
S.E. of regression	33.30031	**Sum squared resid**	5291721.
F-statistic	1898.453	**Durbin-Watson stat**	1.876996
Prob(F-statistic)	0.000000		

Figure 6: **Instrumental variables method**. The table gives the estimator of the aggregate home bias variable by the TSLS method. The instruments are the aggregate mutual funds characteristics.

exhibit high home bias. We use different methods from economic literature to test the impact of social interaction on home bias. The various methods give significant results. The mutual funds home bias is connected to the social interactions. The choice of mutual funds to invest locally depends on the choice of the other funds belonging to the same country. These results hold some is the method. Moreover, the results are robust to the inclusion of the variables approximating familiarity.

Hence, social interactions in their weak form - where the investors imitate the behaviors of others -; and in their broader form - with the more recent literature on social interactions - influence strongly financial markets and, more particularly, home bias in portfolio choice.

Several interpretations are possible. First, mutual funds managers of the same country can engage in direct communications, thus sharing information and ideas on domestic and foreign investments. Managers of the same country can also be concerned with their reputations. Hence, managers end up having a portfolio which is very close to the other managers of the same country. These portfolios are very biased domestically.

Comparison between our results and those of individual investors would be interesting since the latter are not subjected to reputation considerations. However, individual investors by themselves would be not very likely to exert a significant influence on stock exchanges. In fact, it would be interesting to

Dependent Variable: Individual Home Bias
Method: Least Squares
Sample: 1 5134
Included observations: 4424

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Constant	40.46763	3.333594	12.13934	0.0000
TurnoverH	-5.340464	1.192803	-4.477238	0.0000
Large Capitalization	0.000437	0.000156	2.808590	0.0050
Price to Earnings Forward 12 mths	-0.224944	0.040914	-5.498024	0.0000
Payout ratio	0.672138	0.064473	10.42506	0.0000
Return On Assets	-0.530398	0.254909	-2.080735	0.0375
5 Years EPS Growth	-0.252735	0.034558	-7.313429	0.0000
LT Debt to Equity	-0.075922	0.010010	-7.584593	0.0000
Net Revenue	-0.006856	0.000299	-22.90402	0.0000

R-squared	0.187036	**Mean dependent var**	39.58561
Adjusted R-squared	0.185378	**S.D. dependent var**	41.55353
S.E. of regression	37.50473	**Akaike info criterion**	10.08907
Sum squared resid	6208754.	**Schwarz criterion**	10.10352
Log likelihood	-22307.02	**F-statistic**	112.8346
Durbin-Watson stat	1.878346	**Prob(F-statistic)**	0.000000

Figure 7: **Regression of individual home bias on individual characteristics**.

Dependent Variable: Aggregate Home Bias
Method: Least Squares
Sample: 1 27
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constante	-49.00033	12.79471	-3.829732	0.0008
Aggregate estimated home bias	2.173308	0.287048	7.571240	0.0000

R-squared	0.696321	**Mean dependent var**	44.29092
Adjusted R-squared	0.684173	**S.D. dependent var**	31.86632
S.E. of regression	17.90838	**Akaike info criterion**	8.679601
Sum squared resid	8017.748	**Schwarz criterion**	8.775589
Log likelihood	-115.1746	**F-statistic**	57.32367
Durbin-Watson stat	2.151093	**Prob(F-statistic)**	0.000000

Figure 8: **Regression of aggregate home bias on estimated aggregate home bias**.

study the impact home bias induced by social interactions on assets price. In the same way, it would be also interesting to consider social interactions on the more restricted level of the cities or on the broader level of continents.

References

[1] Adler, M. B., and B. Dumas, 1983, "International Portfolio Choice and Corporation Finance: A Synthesis", *Journal of Finance*, 38, 3, 925-984

[2] Ahearne, A. G., W. L. Griever, and F. E. Warnock, 2001, "Information costs and home bias: An analysis of U.S. holdings of foreign equities", Federal Reserve Board, International Finance Division, Working Paper 691 (Updated), Washington, D.C.

[3] Banerjee, A. V., 1992, "A simple Model of Herd Behavior", *Quarterly Journal of Economics*, 107, p. 797-818.

[4] Baxter, M., and U. J. Jermann, 1997, "The International Diversification Puzzle Is Worse Than You Think", *American Economic Review*, 87 (1), pp. 170-80.

[5] Baxter, M., U. J. Jermann, et R. G. King,1997, "Nontraded Goods, Nontraded Factors, and Non-Diversification", *Journal of International Economics.*

[6] Becker, G., 1974, "A Theory of Social Interactions", *Journal of Political Economy*, Vol 82, No. 6, Nov-Dec, pp. 1063-1093.

[7] Becker, G., 1976, "The Economic Approach to Human Behavior", in *The Economic Approach to Human Behavior,* University of Chicago Press, pp. 1-13.

[8] Becker, G., 1981, "A Treatise on the Family", *Cambridge MA:* Cambridge University Press.

[9] Becker, G., 1993, "Nobel Lecture: The Economic Way of Looking at Behavior", *Journal of Political Economy*, Vol 1021, No. 3, pp. 385-409.

[10] Becker, G., et K. Murphy , 2000, "Social Economics", *Cambridge MA:* Harvard University Press.

[11] Becker, G., 1996, "Accounting for Tastes", *Cambridge MA:* Harvard UniversityBelknap Press/Harvard University Press.

[12] Benabou, T., 2000, "Self-Confidence and Social Interactions", *NBER Working Paper,* No. 7585..

[13] Benartzi, S., 2001, "Excessive Extrapolation and the Allocation of 401(h) accounts to Company Stock", *Journal of Finance*, 56, 1747-1764.

[14] Brennan, M. J., and H. H. Cao, 1997, "International Portfolio Investment Flows", *Journal of Finance,* 52, 1851-1880.

[15] Benartzi, S., 2001, "Excessive Extrapolation and the Allocation of 401(h) accounts to Company Stock", *Journal of Finance*, 56, 1747-1764.

[16] Benartzi, S., D. Kahneman and R. Thaler, 1999, "Optimism and Overconfidence in Asset Allocation Decision", *news.morningstar.com.*

[17] Benartzi, S., et R. Thaler, 2001, "Naive Diversification Strategies in Retirement Saving Plans", *American Economic Review*, 91, 97-98.

[18] Bertrand, M., E. Luttmer, and S. Mullainathan, 2000, "Network Effects and Welfare Cultures", Quarterly Journal of Economics, Vol. 115, Issue 3, pp. 1019-1055.

[19] Bikhchandani, S., D. Hirshleifer, et I. Welch, 1992, "A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades", Journal of Political Economy, vol. 100, pp. 992-1026.

[20] Bikhchandani, S., et S. Sharma, 2000, "Herd Behavior in Financial Markets: A Review", *IMF Working Paper* 00/48.

[21] Choe, H. B., Kho, and R. M. Stulz, 2001, "Do domestic investors have more valuable information about individual stocks than foreign investors? ", *NBER Working Paper* No. 8073, Cambridge, Ma.

[22] Cooper, I. A, and E. Kaplanis, 1994, "Home Bias in Equity Portfolios, Inflation Hedging, and International Capital Market Equilibrium", *Review of Financial Studies*, 7 (1), pp. 45-60.

[23] Coval, J. A., and T. J. Moskowitz, 1999, "Home bias at home: Local equity preference in domestic portfolios", *Journal of Finance,* 54, 2045-2073.

[24] Coval, J. A., and T. J. Moskowitz, 2001, "The geography of investment: Informed trading and asset prices", *Journal of Political Economy*, 109, 811-841.

[25] Covrig V. M., M. L. DeFond and M. Huang, 2007, "Home bias, Foreign Mutual Fund Holdings, and the Voluntary Adoption of International Accounting Standards", *Journal of Accounting Research,* 45, 1.

[26] Dahlquist, M., and G. Robertsson, 2001, "Direct foreign ownership, institutional investors, and firm characteristics", *Journal of Financial Economics*, 59, 413-440.

[27] Dahlquist, M., L. Pinkowitz, R. M. Stulz, and R. Williamson, 2002, "Corporate Governance and the Home Bias", *SIFR Research Report Series,* 11, Stockholm Institute for Financial Research.

[28] Eldor, R., D. Pines, and A. Shwarz, 1988, "Home Asset Preference and Productivity shocks", *Journal of International Economics*, 25, 165-176.

[29] Errunza, V., K. Hogan, and M. Hung, 1999, "Can the gains from international diversification be achieved without trading abroad? ", *Journal of Finance,* 54, 2075-2107.

[30] Foerster S., and A. Karolyi, 1999, "The effects of market segmentation and investor recognition on asset prices: evidence from foreign stocks listing in the U.S. ", *Journal of Finance,* 54, 981-1014.

[31] French, K. R., and J. M. Poterba, 1991, "International Diversification and International Equity Markets", *American Economic Review*, 81 (2), pp. 222-26.

[32] Friedrich, J., 1993, "Primary Error Detection and Minimization Strategies in Social Cognition: A Reinterpretation of Confirmation Bias phenomena", *Psychologist Review*, 100, pp. 298-319.

[33] Froot, K., and K. Rogoff, 1995, "Perspectives on PPP and Long-Run Real Exchange Rates", *in Grossman, Gene and Rogoff, Kenneth, eds. Handbook of international economics. Amsterdam: North Holland*, pp. 1647-1688.

[34] Glaeser, E., D. Laibson, and B. Sacerdote, 2000, "The Economic Approach to Social Capital", *Working Paper*, 7728, NBER.

[35] Glaeser, E., J.A. Scheinkman, and B. Sacerdote, 2003, "The Social Multiplier", *Journal of The European Economic Association*, MIT Press, vol 1, 345-353.

[36] Glaeser, E., and B. Sacerdote, 1999, "Why Is There More Crime in Cities?", *Journal of political Economy*, 107(6), 225-258

[37] Glaeser, E., and J. A. Scheinkman, 2002, "Non Market Interactions", *Advances in Economics and Econometrics: Theory and Applications,* Eight World Congress, M. Dewatripont, L. P. Hansen and S. Turnovsky (eds.), Cambridge University Press.

[38] Glaeser, E., and J. A. Scheinkman, 2001, “Measuring Social Interactions”, *Social Dynamics, S.* Dutlauf and P. Young, (eds.), MIT Press.

[39] Gehrig, T. P., 1993, “An Information Based Explanation of the Domestic Bias in International Equity Investment”, *Scandinavian Journal of Economics*, 95 (1), pp. 97-109.

[40] Graham J. R., C. R. Harvey and H. Huang, 2005, “Investor Competence, Trading Frequency and Home Bias”, *Working Paper*, Duke University, Durham.

[41] Grinblatt, M., and M. Keloharju, 2001, “How distance, language, and culture influence stockholdings and trades”, *Journal of Finance*, 56, 1053-1073.

[42] Hau, H., 2001, “Location matters”, Journal of Finance 56, 1959-1983.

[43] Heath, C., and A. Tversky 1991, “Preferences and Beliefs: Ambiguity and Competence in Choice Under Uncertainty”, *Journal of Risk and Uncertainty*, 4, 5-28.

[44] Heston, S. L., and K G. Roewenhorst, 1994, “Does Industrial Structure Explain the Benefits of International Diversification?”, *Journal of Financial Economics*, 36 (1), pp. 3-27.

[45] Henry, P., 2000, “Stock market liberalization, economic reform, and emerging market prices”, *Journal of Finance,* 55, 529-564.

[46] Hong H., J. D. Kubik, and J. C. Stein, 2004, “Social Interaction and Stock Market Participation”, *Journal of Finance*, 59, 137–163.

[47] Huberman, G., 2001, “Familiarity Breeds Investment”, *Review of Financial Studies*, 14, 659-680.

[48] Jacquillat, B., and B. H. Solnik, 1978, “Multinationals are Poor Tools for Diversification”, *Journal of Portfolio Management*, 4 (2), pp. 8-12.

[49] Jeske, K., 2001, “Equity Home Bias: Can Information Cost Explain the Puzzle?”, Federeal Reserve Bank of Atlanta Economic Review, 3rd Quarter, 86.

[50] Kahneman, D., and A. Tversky, 1979, “Prospect Theory: An Analysis of Decision Under Risk”, *Econometrica,* 47, 263-291.

[51] Kang, J.-K., and R. M. Stulz, October 1997, “Why Is There Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan”, *Journal of Financial Economics*, 46 (1), pp. 3-28.

[52] Karolyi, G. A., 2002, “Did the Asian financial crisis scare foreign investors out of Japan? “, *Pacific Basin Finance Journal*.

[53] Karolyi, G. A., and R. M. Stulz, 2001, “Are Financial Assets Priced Locally or Globally?” *in G. Constantinides, M. Harris and R. Stulz, eds, Handbook of the Economics of Finance* (North Holland).

[54] Karolyi, A., 1998, “Why do companies list shares abroad?: A survey of the evidence and its managerial implications”, Financial Markets, Institutions, and Instruments 7, *Blackwell Publishers*, Boston.

[55] Kilka, M., and M. Weber 2000, “Home Bias in International Stock Return Expectations”, *Journal of Psychology and Financial Markets*, 1, 3, 176-192.

[56] Lewis, K. K, 1999, “Trying to explain home bias in equities and consumption”, *Journal of Economic Literature* 37, 571-608.

[57] Li, K., 2004, “Confidence in the Familiar: An International Perspective”, *Journal of Finance and Quantitative Analysis,* 39, 47-68.

[58] Low, A., 1993, “Essays on Asymmetric Information in International Finance”, *The Underson School at UCLA.*

[59] Markowitz, H. M, 1952, “Portfolio Selection”, *Journal of Finance*, vol 7, 1, p. 77-91.

[60] Manski, C.F., 2000, “Economic Analysis of Social Interactions”, NBER Working Paper 7580.

[61] Manski, C., F., 1993, “Identification of endogenous social effects: The Reflection Problem”, *Review of Economic Studies*, 60, 3, 531-542.

[62] Maug, E. and N. Naik, 1996, “Herding and Delegated Portfolio Management”, *London Business School* mimeo.

[63] Miller, D., 1999, “The market reaction to international cross-listing: evidence from depositary receipts”, *Journal of Financial Economics,* 51, 103-123.

[64] Orléan, A., 2001, “Comprendre les foules spéculatives: Mimétisme informationnel, autoréférentiel et normatif”, Crises Financières, Economica, chapter 4, 105-128.

[65] Pinkowitz, L., R. Stulz, and R. Williamson, 2001, “Corporate control and the home bias”, *working paper*, The Ohio State University.

[66] Rowland, P. F., and L. Tesar, 1998, “Multinationals and the gains from International Diversification”, *NBER Working Paper,* 7400.

[67] Richards A., 1999, “Idiosyncratic Risk: An Empirical Analysis with Implications for the Risk of Relative-Value Trading Strategy”, *IMF Working Paper* WP/99/148.

[68] Scharfstein, D. et J. Stein , 1990, “Herd Behavior and Investment”, *American Economic Review*, 80, 465-479.

[69] Shiller, R. J., F. Kon-Ya, and Y. Tsutsui, 1996, “Why did the Nikkei crash? Expanding the scope of expectations data collection”, *Review of Economics and Statistics,* 78, 156-164.

[70] Solnik, B., 2007, “Equity Home Bias and Regret: An International Equilibrium Model”, *HEC Paris, Departement Finance et Economie.*

[71] Solnik, B., 1996, International Investments, *addison Wesley,* Reading.

[72] Solnik, B., May 1974a, "The International Pricing of Risk: An Empirical Investigation of the World Capital Market Structure", *Journal of Finance*, 29 (2), pp. 365-78.

[73] Solnik, B., August 1974b, "An Equilibrium Model of the International Capital Market", *Journal of Economic Theory,* 8 (4), pp. 500-24.

[74] Strong N, and X. Xu, 1999, "Understanding the Equity Home Bias: Evidence from Survey Data", *Review of Economics and Statistics,* 85, May 2003.

[75] Stulz, R. M., September 1981a "On the Effects of Barriers to International Investment", *Journal of Finance*, 36 (4), pp. 923-34.

[76] Stulz, R. M., December 1981b, "A Model of International Asset Pricing", *Journal of Financial Economics*, 9 (4), pp. 383-406.

[77] Stulz, R. M., 1983, "The demand for foreign bonds", *Journal of International Economics*, 26, 271-289

[78] Stulz, R. M., 1994, "International Portfolio Choice and Asset Pricing: An Integrative Survey", *Working Paper* No. 4645.

[79] Stulz, R. M., and W. Wasserfallen, 1995, "Foreign equity investment restrictions, capital flight, and shareholder wealth maximization: Theory and evidence", *Review of Financial Studies* 8, 1019-1057.

[80] Stulz, R. M., 1999, "International portfolio flows and security markets, in International Capital Flows", *M. Feldstein ed., University Chicago Press*, 257-293.

[81] Shore, S. H., and J. S. White, 2002, "External Habit formation and the home bias puzzle", *Working Paper Series,* 2002.

[82] Strong, N.C., and X. Xu, 2003, "Understanding the Equity Home Bias: Evidence From Survey Data", *Review of Economics and Statistcs*, 85(2), 307-312.

[83] Swedberg, V. 1990, "Economics and Sociology", *Princeton University Press.*

[84] Tversky, A., and D. Kahneman, 1992, "Advances in Prospect Theory: Cumulative Representation of Uncertainty", *Journal of Risk and Uncertainty,* 5, 297-323.

[85] Tesar L., and I. Werner, 1995, "Home Bias and High Turnover", *Journal of International Money and Finance*, 14 (4), pp. 467-92.

[86] Tesar L., 1993, "International Risk Sharing and Non-Traded Goods", *Journal of International Economics*, 31, pp. 55-78.

[87] Welch, I., 2000, "Herding Among Security Analysts", *Journal of Financial Economics*, 58 (3), 369-396.

[88] Welch, I., 1992, "Sequential Sales, Learning and Cascades", *Journal of Finance Economics*, 47, 695-732.