

Equity Home Bias: A Disappearing Phenomenon?

By Amir A. Amadi*

(Job Market Paper)

ABSTRACT

The presence of home bias in equity portfolios has been a focus of the international finance literature for the past couple of decades. Recent developments and data collections, however, offer some insight into understanding the equity home bias phenomenon. This paper first demonstrates that there has been a distinct reduction in equity home bias in recent years. It then examines if any of the prominent theoretical explanations or recent developments such as free trade and globalization, the advent of the internet, and the rise of emerging markets and mutual fund investment have affected the increase in foreign diversification. The empirical analysis produces some interesting results. It demonstrates that the rise of the internet and mutual fund investment have indeed affected the changes in foreign diversification, supporting an information-asymmetries explanation. The results also indicate that other factors such as market size, which intuitively might be expected to affect foreign diversification, are insignificant.

JEL CODE: F30; G11

KEY WORDS: International Portfolio Diversification; Equity Home Bias

* Amir Andrew Amadi, Department of Economics, University of California, Davis, CA, 95616, USA. Email address: aamadi@ucdavis.edu. The first draft of this paper was written in October 2, 2003, and was first submitted to SSRN on May 5, 2004. I would like to thank Paul Bergin for his help and insight.

1. Introduction

According to traditional financial theory¹, an average investor should only hold domestic assets in his or her portfolio in proportion to their country's share of world capitalization. In reality, domestic assets make up a disproportionately large part of the average investor's total asset holdings. This lack of international portfolio diversification is commonly referred to as equity home bias, and has puzzled economists over the past several decades.

In recent years, however, equity home bias has notably decreased. As Table 1 demonstrates, from 1986 to 2001, international diversification has increased in almost every country. Examining the trends more closely in Figure 1 and 2, one can see that there have been noticeable changes in diversification, indicating a distinct upward trend. Specifically, Figure 1 shows a group of countries² whose relative foreign holdings have increased gradually in recent years. On the other hand, Figure 2 shows a group of nations³ whose foreign portfolio compositions have increased dramatically during the late Nineties. The figures together confirm Table 1's assertion that there has been an increase in diversification experienced broadly by many nations. These intriguing equity home bias trends are quite novel. Most of the prevailing literature⁴ has examined the lack of diversification, but has not studied the trends in diversification over recent years, per se. Having documented this upward movement in foreign diversification, this study attempts to examine the factors involved in shaping these trends.

¹ Sharpe (1964) and Linter (1965).

² Countries include Germany, Sweden, and the United Kingdom.

³ Countries include Austria, Denmark, Finland, Italy, New Zealand, South Africa, and Spain. Also some might argue that this increase in diversification might be do to the increased investment in the US market. However data from the IMF's Coordination Portfolio Investment Survey shows that the share of US equity with respect to all foreign equity did not increase dramatically from 1997 to 2001 for most of these nations.

⁴ French and Poterba (1993) and Werner and Tesar (1993).

The Nineties saw many changes in equity markets and the larger global environment. These included the advent of the internet, the increase in trade flows and free trade development, as well as an increase in emerging markets and mutual fund investment; these were all major world developments. The internet has made access to information that was previously quite difficult or cumbersome to obtain, remarkably easy. Emerging markets have presented new opportunities for investment. Increased trade flows might have increased the willingness to invest abroad, while mutual funds could have caused investors to indirectly diversify internationally with their increasing foreign composition. Each of these variables might have made a significant impact on international diversification, and therefore would certainly warrant examination.

When examining equity home bias and its causes, not only is it important to look at the factors just mentioned, but to also examine other possible variables presented in the theoretical and empirical literature. These factors include the local market's share of world capitalization, market return differences, and the share of foreign equity listed in the domestic market. The details of the possible effects and motivations of all of the factors mentioned will be discussed more thoroughly later. From the empirical specification this paper then attempts to determine the significance of each of these relevant factors in influencing international portfolio diversification. This way, a more comprehensive analysis of the determinants of foreign diversification is performed⁵.

The next section presents a literature review on equity home bias. It includes articles on both the theoretical explanations and the empirical examinations of equity home bias. Section 3 discusses the dependent variable and the dataset in detail, while

⁵ This is not to say that numerous variables were added haphazardly. As stated previously, only variable with great relevance and empirical support are included.

Section 4 presents empirical specifications for testing the factors mentioned earlier. The results are presented in Section 5, while Section 6 briefly examines US mutual fund holdings specifically. The conclusion is presented in the final section.

2. Literature Review

International portfolio diversification and the home bias puzzle have received considerable attention recently. As stated earlier, finance theory states that it is beneficial for investors to diversify their portfolio internationally. Shapiro (1999) plots annualized monthly returns of portfolios consisting of different percentages of American and non-American equities against the monthly standard deviations of the portfolios as a measure of risk. Using data from 1970-1996, Shapiro shows that the optimal portfolio consists of at least a 40% investment in the non-American markets index and a 60% investment in the US market index. Although his findings are not absolute, they do provide further evidence supporting financial theory.

Having shown the benefit of international diversification both theoretically and empirically, economists then studied actual portfolio holdings. French and Poterba (1991) presented the first notable paper on the home bias phenomenon. In their article, the authors examined the portfolio holdings of 6 major countries in 1989. They found that in the United States, investors were investing 92.3 percent domestically; Japan 95.7 percent; United Kingdom 92 percent; et cetera. This was highly disproportionate compared to the theoretical predictions. Other authors observed similar phenomena. For example, Werner and Tesar (1998), using a different data set, observed a significant home bias for 13 nations from 1987-1996. This came to be referred to as the equity home bias puzzle.

There have been several theoretical explanations offered as to the causes of home bias, including the role of non-traded goods, explicit trading costs, exchange rate risk, and information asymmetries. Although all of these theories were initially presented as potential explanations, only the last explanation, that of information asymmetries, has found notable empirical support and has received most of the attention in recent years. According to this theory domestic investors have less information about foreign markets, and due to this lack of information, they hesitate to diversify internationally.

A notable theoretical paper on information asymmetries and equity home bias is that of Gehring (1993). He introduces a noisy rational expectations model where, even in equilibrium, investors remain incompletely informed. Due to this incomplete information regarding foreign markets, Gehring (1993) shows that a domestic bias develops. Specifically the variance of the error in the foreign risky asset's return becomes greater than that of the domestic asset's return, which then causes investors to exhibit a home bias in equilibrium.

Related to this concept of information asymmetries is a paper by Brennen and Cao (1997), which develops a rational expectations equilibrium model based on the presence of information lags between domestic and foreign agents. They basically take a more indirect approach, arguing that because of informational lags, domestic agents are trend followers, investing in foreign markets when their contemporaneous returns are positive. In a similar light, Bohn and Tesar (1996) argue that a significant factor in determining US equity investment in foreign markets is the concept of return chasing. Specifically, they contend that US investors tend to acquire stocks in a particular market when the returns of those markets are high rather than selling off "winning stocks" to

maintain balanced portfolio weights, as the theory might suggest. Through their empirical analysis they show that “in most of the large equity markets, US net purchases are significantly positively correlated with local capital gains and excess returns.” (Bohn and Tesar 79) Therefore this concept of trend following or return chasing has been shown to be possibly influential in affecting foreign diversification.

There have also been several other empirical studies on the effects of information asymmetries and other factors on international portfolio diversification. Grinblatt and Keloharju (2001) examine the behavior of Finnish and Swedish investors in relation to Finnish and Swedish firms operating in Finland. Their empirical evidence suggests that “investors simultaneously exhibit a preference for nearby firms and for same language and same-culture firms.” (Grinblatt and Keloharju 1071) Huberman (2001) performs a similar study, but in terms of investor behavior toward Regional Bell Operating Company (RBOC) in the United States. He examines data on RBOC customers and investors, and finds that RBOC investors tend to be its customers and observe a geographical bias for RBOC investment. Finally Coval and Moskowitz (1999) examine 1995 holdings data on the largest US money managers. They find “evidence for a geographic proximity preference” (Coval and Moskowitz 5), that is not justified by the equity returns, risk, and other related factors. As a whole these studies basically conclude that investors tend to invest in that which they are more familiar, and hence in that which they have more information.

Somewhat related to the topic of equity home bias is a paper by Lane and Milesi-Ferretti (2003). These authors examine the trend in foreign asset holdings in general. More specifically they examine the effects of a number of factors on their dependent

variable of foreign equity and FDI holdings over GDP. These factors include a measure for capital account liberalization, per capita GDP, stock market capitalization over GDP and trade flows over GDP. Their findings suggest that trade flows, per capita GDP, and especially stock market capitalization⁶ play important roles in determining their dependent variable.

However, because they are examining foreign asset holdings over GDP and not equity home bias (foreign equity holdings over stock market capitalization), their finding could be ambiguous. Specifically, a lot of the growth their dependent variable exhibits might be coming from a rise in value rather by a rise in actual holdings. This would then lead to ambiguous results. For example, if investors employed a buy and hold strategy or at least kept a similar portfolio during the Nineties, the value of their foreign assets would have increased dramatically. The stock market capitalization of most countries increased rapidly in the Nineties as well. Therefore both the dependent variable and the stock market capitalization variables would have both increased dramatically, but this would not have meant that the rise of one led to the rise of the other. Hence their specification could potentially lead to the stock market capitalization being a falsely significant determinant of their dependent variable.

This paper is examining the trends in international portfolio diversification and the equity home bias puzzle and not foreign asset holdings in general. It is also studying several different factors involved in determining equity home bias specifically. For example, this study attempts to examine the effect of information asymmetries more directly than the literature just discussed. As stated earlier, the advent of the internet certainly has played a major role in supplying more information to investors. With

⁶ It has a t-statistic of 18.3, which more than doubles the fit of the regression (0.41 to 0.89).

hundreds of financial websites providing comprehensive information on foreign markets, equity, and firms, investors have vast amounts of information at their disposal. Previously it would have been quite difficult or perhaps impossible to have obtained such information. This is not to say that the internet by itself has necessarily directly caused a change in diversification. However, the internet might be proxying for information in general, and the ease of obtaining and the awareness of such information. Therefore it would be very interesting to examine its effect on international diversification. Also, with reference to the trend followers argument, this paper takes a more pragmatic approach by examining what effects foreign market returns have on home bias when they are outperforming local markets, not just when their returns are positive.

This study also examines other relevant factors which might not have been presented in the theoretical literature. Emerging markets have noticeably grown over recent years. The appearance of these new markets could have certainly lured investors. The increase in mutual fund investment could have also certainly played a role in reducing home bias. By investing in mutual funds, agents might have automatically invested in international equity without having actively sought to do so. Having collected new data on mutual fund investment, this paper attempts to study its effects on foreign diversification. The Nineties also saw an increase in trade and globalization. Maybe this new sense of a more global environment has caused investors to examine foreign markets more eagerly. Whether these trade flows have resulted in more information becoming available to investors, or just giving them an unobservable sense of globalization is up for debate. Nevertheless it is quite interesting to examine the effects of trade flows on international diversification. This factor is also studied in the Lane and Milesi-Ferretti

(2003) article, discussed earlier. Therefore, by examining all of these potentially relevant factors, this paper provides a new and comprehensive empirical study on international portfolio diversification.

3. Measurements, Data, and Trends

In looking at international portfolio diversification and equity home bias, the dependent variable is constructed in the following manner:

$$(1) \quad FD_{it} = \frac{FA_{it}}{MCAP_{it} + FA_{it} - FL_{it}}, \text{ for country } i \text{ at year } t.$$

That is the foreign diversification (FD) of a particular country is equal to the foreign equity assets (FA) held by that country divided by the sum of its stock market capitalization (MCAP) and its foreign equity assets (FA) adjusted for foreign equity liabilities (FL). This detailed measure gives an accurate picture of the foreign composition of a country's national portfolio, and adjusts for value fluctuations.⁷

It is also important to discuss the data used to calculate the dependent variable. The foreign equity holdings data come from the International Financial Statistics database, which is compiled by the International Monetary Fund. There have sometimes been concerns about the accuracy of equity holdings data with respect to representing true holdings. However this might not be such a concern in this case, and there are several reasons why this dataset is quite useful. First, for the most part, the IFS dataset is compiled using the best available data. For example, with reference to US holdings, some studies⁸ point to the US Treasury Department's comprehensive surveys as an accurate and credible data source. They point out that information gathered is very

⁷ By dividing by the stock market capitalization and foreign assets, this dampens the effect of fluctuations in values.

⁸ Ahearne, Alan G., Grier, William L., and Francis E. Warnock (2004).

detailed and is subject to extensive analysis and editing. Also, they point to the fact that the data is determined using both commercial and respondent data, where reporting is mandatory. The IFS dataset, for example, uses this survey data for the United States. The data for other countries, like the United Kingdom, Japan, and Canada come from national institutions and statistical agencies, which have also been used in other reputable studies of international diversification⁹. Secondly, the database is consistent in its sources and measurements of equity holdings within a country. Therefore this dataset would provide reasonably accurate approximations of changes in equity holdings over time. Finally, the database is quite vast. It contains equity holdings data for more than twenty countries over twenty-two years.¹⁰ No other study has come close to utilizing such an expansive dataset to examine equity home bias specifically. The use of this database is another factor that profoundly separates this study from the existing literature. A complete list of data sources and ranges is presented in the data appendix. In addition summary statistics for the variables are presented in Table 2.

4. Empirical Specification

Attempting to explain the trends mentioned previously, this study examines several factors that could have influenced international diversification. There are several details regarding the empirical analysis that are important to note. First, the inclusion of mutual funds reduces the dataset by more than half. Though still a reasonably large

⁹ Werner and Tesar (1998).

¹⁰ Countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hungary, Israel, Italy, Japan, Netherlands, New Zealand, Peru, Portugal, South Africa, Spain, Sweden, Switzerland, United Kingdom, and United States. Years include 1980-2001, although the time period is shorter for some countries.

dataset,¹¹ it warrants separate analysis. Therefore separate regressions are run when mutual funds are included. Secondly, each regression is run with a country fixed effects intercept and panel adjusted standard errors, unless otherwise noted.¹² Also, the data is first differenced to take into account non-stationarities. Since the data is constructed over a relatively long time period, and since it is examining the effects of changes in the independent variables on the dependent variable over time, non-stationarity is an issue. More generally, the data show strong trends, which were indicated in Figures 1 and 2. It is safer to treat it as non-stationary than to ignore such strong persistence in the data. Other papers have cited similar concerns regarding the equity holdings data,¹³ thus first-differencing the data seems appropriate. However, for comparison, this study also presents the results without first-differencing and attempts to adjust for time trends using a second specification.

The main empirical specification is:

$$(2) \quad FD_{it} = a_i + B_1(SWCAP_{it}) + B_2(RTNDIFF_{it}) + B_3(PFFL_{it}) + B_4(EMCAP_t) + B_5(Openness_{it}) + B_6(Internet_{it}) + B_7(MFCAP_{it}) + e_{it}, \text{ for country } i \text{ in year } t.$$

The first independent variable is SWCAP, which is the country's market share of world capitalization. This variable is included to test financial theory. As stated in the introduction, according to the ICAPM, investors should diversify according to their country's share of world capitalization. Accordingly this should be one of the most, if not the most, relevant factor in an investor's decision. If correct, this coefficient should be close to negative one, indicating that a one percent increase in the investor's country's

¹¹ Includes only annual Austria, Belgium, Denmark, France, Germany, Italy, Spain, Sweden, Switzerland, the United Kingdom and the United States from 1992-2001.

¹² Separate regressions were run using OLS with robust standard errors, instead of time fixed-effects. However the results were not vastly different, and therefore do not warrant presentation.

¹³ Lane and Milesi-Ferretti (2003).

share of world capitalization would result in a one percent decrease in foreign diversification.

The second coefficient, RTNDIFF, is the difference between the annual return of world index in the local country's market index¹⁴. Morgan Stanley creates a world index as well as individual country indexes that provide fairly accurate representations of market performance. Each index is adjusted for exchange rates, inflation, and dividend re-investment, which provides for accurate comparison. This variable is included to see if investors are "trend followers" or "return chasers". Again, that is when investors increase their foreign holdings when the foreign market is outperforming the local market. As stated earlier, this will be a pragmatic test of Brennan and Cao's (1997) theoretical argument, which examined the relationship between equity flows and contemporaneous market returns.

The percent share of foreign firms listed in the domestic market, PFFL, is equal to the number of foreign firms listed over the total firms listed in the domestic market. Although there hasn't been a significant movement in the percentage of foreign firms listed, nevertheless it would still be important to account for this variable. Certainly foreign firms listing their shares in the domestic market would make such foreign equity more accessible to local investors. Also Ahearne, Grier, and Warnock (2004), in their empirical study of US foreign equity holdings, show this factor to be a significant determinant of equity home bias. Therefore if a greater amount of foreign firms are listed in the local market, one might then expect an increase in foreign diversification.

The three variables mentioned above are included mostly as "controls." That is to say that they do not necessarily exhibit certain characteristics that would lead one to

¹⁴ Specifically it is equal to the local market minus the world market return.

believe that they might have played important roles in recent years. Specifically, looking broadly at the data, these variables have not shown significant movement in past decades to justify the movements in equity home bias. Nevertheless it is important to include these variables as they have strong theoretical or empirical support.

The first variable of particular interest is that of the percent share of imports and exports to GDP, Openness¹⁵. As stated previously this variable can be a representative measure of globalization and a general willingness to invest abroad. With the increase in free trade agreements, the influence of the World Trade Organization, and the current findings of the Lane and Milesi-Ferretti (2003) article, this coefficient could certainly have an influence on international diversification.

The second variable of particular interest, Internet, is that of the percent of internet users in the total population. Today an American investor can easily find information on French, Italian, and Japanese firms on the internet without painstakingly looking through newspapers or requesting costly documents from research agencies. As stated earlier this might be a reasonable test for the information asymmetries hypothesis. That is, the internet by itself might not be the factor driving greater diversification, however it might provide a reasonable measure of changes in the information availability, communication, and awareness that can foster greater diversification. As more information becomes available on the internet, the percentage of internet users can, therefore, be a rough but useful proxy for information.

Another coefficient of interest is EMCAP, the percentage share of emerging markets in world capitalization. Over the past decade tremendous amounts of capital have poured into emerging and recently liberalized financial markets. In 1982, the

¹⁵ More specifically, $Openness = 0.5(Exports + Imports)/GDP$.

International Finance Corporation identified emerging markets as accounting for 2.5% of world capitalization, or \$67 billion. By 1999, emerging markets accounted for 8.5% of world capitalization, or \$3000 billion. Several articles have surveyed this trend.¹⁶ With these new opportunities for foreign investment, investors who might have otherwise left these markets unnoticed would now be much more inclined to invest in them. It would be worthwhile, therefore, to see if the rise of emerging markets has played a role in the reduction of equity home bias.

Finally, this study looks at the effects of mutual funds on international diversification. The mutual fund industry has grown substantially over past decades. For example, in 1981 mutual funds accounted for 9.9% of the US market capitalization, by 2001 they accounted for over 21% of market capitalization. With many mutual funds gaining a more foreign scope, investors might be indirectly diversifying internationally by increasing their investments in these funds. This would certainly warrant an empirical examination.

The variable, MFCAP, represents the percentage share of mutual fund capitalization. This is just the total value of all equity mutual funds divided by market capitalization. Again, dividing the variable by market capitalization helps normalize the variable in a proper way, adjusting for a possible erroneous growth in value instead of holdings. By examining the latter four coefficients, as well as controlling for the variables mentioned earlier, this specification hopes to account for the recent trends in equity home bias.

¹⁶ Tesar and Werner (1998), Bekaert and Harvey (2002), and Brennan and Cao (1997).

As stated previously, estimations are run with the variables not being first differenced. Due to the concerns of trending variables and persistence in the data, time trends are included in the specification. This modified estimating equation is as follows:

$$(3) \quad FD_{it} = a_i + \alpha_0 t + \alpha_1 (t^2) + B_1(SWCAP_{it}) + B_2(RTNDIFF_{it}) + B_3(PFFL_{it}) + B_4(EMCAP_t) + B_5(Openness_{it}) + B_6(Internet_{it}) + B_7(MFCAP_{it}) + e_{it},$$

for country i in year t .

Here a linear time trend (t) and a cubic time trend (t^2) are added and analyzed separately. That is either α_0 equals zero or α_1 equals zero (this will be further clarified in the following section). The cubic trend is added because some of the variables such as the Internet, exhibit a non-linear trend, particularly in the Nineties. By adding these time trends, it attempts to dampen their effects on other variables.

5. Results

It is important to note that all variables are expressed in percentages, making their interpretation more convenient. In each case the control variables are presented first, after which the rest of the variables are added individually. As indicated earlier, a whole new set of regressions are run with the inclusion of mutual funds, due to the significant reduction in the dataset. Running similar regressions for the new dataset provides a good robustness check, examining if the same relationships hold for a narrower length of time¹⁷. Also, when the regressions were first run, the Hausman test indicated that for some of the estimations random-effects might be more appropriate. For greater

¹⁷ As referenced previously, the mutual fund dataset contains data from 1992-2001.

consistency, the fixed-effects regression results are presented in this table. Also when random-effects were used, the results were relatively indistinguishable.¹⁸

The results of the main specification for the broader dataset, which does not include mutual funds, are presented in Table 3. The first “control” variable (the percent of world capitalization (SWCAP)) turns out to be insignificant. However its t-statistic is not that far from the 10% threshold and turns out to be significant when all variables are added. The sign is also correctly negative. That is, if an investor’s local market’s share of world capitalization increases, then the investor would decrease his or her foreign investments. Its insignificance might suggest that investors, on average, do not follow financial theory as closely as one would expect. This result is not entirely unexpected given that the current diversification positions are far below their theoretical expectations. Also with the myriad of other factors influencing investors, one would not expect investors to follow traditional financial theory as closely.

The difference between the local and world market annual returns (RTNDIFF), on the other hand, is highly significant. The sign is correctly negative indicating that investors might indeed be trend followers or return chasers, which means they are more likely to invest in foreign markets when their local market underperforms the global market. This also confirms the results of Brennan and Cao (1997) and Bohn and Tesar (1996). However the coefficient is relatively small, only constituting a 0.04% change. That is, investors increase their foreign diversification by only 0.04% when the global market outperforms the local market by one percent.

The next regressor, PFFL, seems to have an insignificant effect on the overall foreign diversification of countries. Though this might seem strange, it might not be

¹⁸ The results for the random-effects regressions were run separately, but are not shown.

unrealistic. There has not been a tremendous movement in this percentage over time. Likewise cross-sectionally, there is a polar division in the data, with several markets having higher percentages while the great majority of markets having a percentage close to zero. Also the Ahearne, Grier, Warnock (2004) paper found this factor to have a significant impact on the composition of US foreign diversification, not on the overall diversification. These three factors would make the insignificant result seem to be a reasonable conclusion. The three variables combined are presented in the first column, and together result in an R squared of only approximately 0.14.

When adding Openness, it appears the goods trade does not influence foreign diversification, as the coefficient is insignificant. This might run contrary to Lane and Milesi-Ferretti (2003) findings, although they are examining a different dependent variable. Therefore one can possibly conclude that trade flows might not have an impact on foreign diversification or might not be a good measure for an increasing willingness to invest internationally, though further research is warranted.

The next coefficient, that of the percentage of internet users (Internet) is in fact highly significant. The results suggest that a one percent increase in the percentage of internet users, would lead to a 0.4% increase in diversification. At first glance this coefficient might seem rather large, but this result might not be so unusual. Some might argue that the Internet has caused a generally greater willingness to invest, and not necessarily a willingness to invest in foreign equity in particular. However, as mentioned earlier, the dependent variable measures the percentage of foreign holdings relative to total holdings, not the amount of foreign holdings. Consequently a greater willingness to invest in general should not affect this percentage. Another argument might be that the

internet might be proxying for some type of time trend, although the variables are first differenced. This argument would not hold true either. Different countries experienced different upswings in internet usage. For example, the United States started experiencing an upswing in the early Nineties, Western Europe in the mid-Nineties, and Southern Europe in the late Nineties. These profound differences could not represent a common time-trend. Also the inclusion of the Openness variable should dampen globalization trends as well.

The Internet has had a tremendous impact on the world at large, and equity markets in general. Vast amounts of information are now available to investors and this could have easily influenced their behavior. Again the internet variable can be thought of as a rough proxy for information and not necessarily a direct measure of all information available to investors. Thus the result might provide reasonable support for the information asymmetries hypothesis.

The final variable added is that of the percentage share of emerging markets (EMCAP). The results suggest that it also plays an important role in determining equity home bias. The sign of the coefficient being positive is correct, indicating that a one percent increase in the share of emerging markets causes, on average, a 0.3% increase in international diversification. Again this would be a reasonable result. As stated earlier, emerging markets have grown tremendously over the past decade. This growth has presented new opportunities for foreign investment, and these new opportunities could have certainly lured many investors.

By adding these variables, the fit of the regression nearly doubles ($R^2 = .22$). The findings shed some light as to the influence of these factors on the equity home bias

trend. They suggest that emerging markets, the internet, and to a lesser extent market returns, play an important role in determining foreign diversification. Also, it seems that trade flows have no profound effect on equity holdings over time.

The results of the main specification for the narrower dataset, which includes data on mutual funds, are shown in Table 4. The “control” variables account for a relatively similar R^2 (0.14), and similar results are reached. The percent market share of capitalization (SMCAP) again has no significant effect, except again when all the variables are added, but still maintains a correct negative sign and a relatively higher t-statistic. The return difference (RTNDIFF) statistic is still significant and negative, while the percent foreign firms listed (PFFL) remains insignificant.

The same results are obtained when adding the other variables as well. The percent trade to GDP (Openness) is insignificant, while the percent internet users (Internet) is still highly significant. The effects of emerging markets (EMCAP), though, are not as significant in this regression. However it does maintain a higher t-statistic and turns out to be significant when incorporating mutual funds. This might be due to the fact that a smaller dataset is used.

The main variable of interest, which is that of the percent capitalization of mutual funds, does turn out highly significant. According to the results, a one percent increase in the share of mutual funds causes investors to increase their diversification by approximately 0.41%. Given that the mutual fund industry has grown tremendously over the past two decades, most mutual funds now contain a notable share of foreign equity, with the possible exception of American funds. Because of this, as agents increase their

investments in mutual funds they would be indirectly increasing their foreign diversification through the composition of these funds.

As one can see, Tables 3 and 4 provide evidence that the internet, mutual funds, and to a lesser extent market returns and emerging markets, have all have played a significant role in shaping foreign diversification over the past two decades. These results are quite intriguing because it is the first time that some of these factors have been tested, and have shown a significant impact. It is important to note that although these factors do not explain the movements in equity home bias completely, they do shed some light on the factors involved. With almost all economic analysis, it is extremely difficult to account for every aspect of investor behavior. Certainly there might be other factors involved but it is still interesting to understand the effects of these measurable variables.

Furthermore the two tables provide support for the robustness of the dataset. First, when new variables are added to each of the regressions, the original variables maintain their signs and significance. Secondly, even though the second set of regressions were run using only the latter half of the first dataset; it still came to similar conclusions. This would certainly provide further evidence that these factors might have indeed played a significant role in determining foreign equity holdings.

As noted earlier, regressions were run with variables examined in levels and not first differenced, as presented in the alternative specification which includes time effects. The results for this specification are presented in a similar fashion in Tables 3 and 4, with Table 5 displaying the results for the broader dataset and Table 6 displaying the results of the narrower dataset that includes mutual funds. One can see that in both tables, the fit of the regression improves greatly ($R=0.64-0.85$). However the results are not as consistent

as when the data was first differenced. A few variables become significant or insignificant when adding other variables or when moving from Table 5 to Table 6.

The coefficient on trade, Openness, initially becomes highly significant and positive in both tables. According to the results, a one percent increase in the goods trade would result in a 0.3% to 1% increase in diversification. This would certainly follow Lane and Milesi-Ferretti's (2003) result that increases in trade would increase the willingness to invest abroad, and would then affect equity home bias also. However, it seems that the variable is actually proxying for some type of trend, which is why it becomes less and less significant when more variables are added, and becomes insignificant when the time trends are added.

The return difference variable, RTDIFF, is significant when the entire dataset is used (Table Seven), but becomes insignificant when only the mutual fund dataset is used (Table Eight). This would suggest that when examining levels, return differences were not as significant with respect to foreign diversification in the Nineties, in the European nations mostly. Likewise, the emerging markets variable exhibits the same behavior, being insignificant in the smaller dataset. Furthermore, it seems that this variable might also be proxying for some sort of time trends, as it becomes insignificant when the time trends are added as well.

The internet and the mutual funds variables do maintain their significantly positive influence, even with this rather strong transformation. The internet coefficient remains between 0.35 and 0.39, indicating that a one percent increase in internet users results in approximately a 0.35 to 0.39 percent increase in international diversification. The mutual funds coefficient increases to 0.86, indicating that a one percent increase in

the mutual funds share of capitalization results in a 0.86 increase in foreign diversification.

Finally, it can be argued that the inclusion of per capita GDP and market restrictions might be warranted. GDP per capita might provide a good measure for a country's development and correct for any variables, such as internet usage, that might be erroneously capturing this development effect. As it turns out, the inclusion of this variable did not have a major impact on the results, when it was included in the regression in Table 7¹⁹. With regards to market restrictions, there is really not a reasonable method by which to test this factor. The dependent variable measures the foreign diversification of a country overall, but it does not break that data down by destination country, and thus there is not a way of discerning which market restrictions are relevant. As most of the data is composed of developed countries, however, market restrictions are not a major concern, especially since the early Nineties. Overall, the inclusion of these two factors does not, and should not, have a significant impact on the results.

6. US Mutual Fund Industry

Since the findings above indicate mutual fund investment to be a significant determinant of foreign diversification, further analysis is worthwhile. Due to data availability and interpretation issues, this paper will only focus on the US mutual fund industry. Two data sources offer useful insight into this industry: the Investment Company Institute Mutual Fund Fact Book and the Janus Mutual Fund Family Annual Reports. The Investment Company Institute Mutual Fund Fact Book compiles

¹⁹ Specifically a variable representing the log of per capita GDP, called GDPPCAP, replaced PFFL in all of the regressions.

information on more than 8,500 US based mutual funds. The fact book contains data on net assets and sales of mutual funds. Of particular interest are the sales of mutual funds, as net asset positions are subject to tremendous value fluctuations. The ICI breaks equity funds into different classes based on investors' objectives. The classes include growth funds, income equity funds, sector funds and world equity funds. The world equity funds are defined as funds that are primarily invested in stocks of foreign companies and include emerging market, global, international, and regional funds.

Figure 3 displays the sales, less reinvested dividends, of world equity funds relative to all equity funds, from 1996-2002. Although this specific measure can only be constructed starting from 1996, it still gives a fairly good representation of investor behavior and preferences over the last several years. The figure demonstrates that the relative sales of world equity funds have generally increased during this time period. There is a small decrease in the measure between 1998 and 1999, but this is most probably attributed to the strong US market performance during those years. Remember, the regression results do indicate that return differences are a significant factor. Overall, though, the figure does seem to display an upward pattern, indicating a general rise in the relative sales of global-type funds. This should provide further support that mutual funds are a significant factor contributing to foreign diversification.

The Janus mutual fund family²⁰ is one of the top mutual fund families in the US with more than \$68 billion²¹ in assets. This family was specifically chosen because it is the only one that gives country-specific breakdown on all of its equity investment funds.

²⁰ The Janus equity investment fund family includes the Janus, Balanced, Enterprise, Equity Income, Global Life Sciences, Global Technology, Growth and Income, Mercury, Olympus, Overseas, Special Situations, Twenty, Venture, and the Worldwide Fund.

²¹ According to the 2002 investment funds annual report.

Unfortunately again the data is only available since 1995. Table 8 gives summary statistics for two variables. The first is the net asset position of non-US equity as a share of the combined total of all Janus equity, from 1995-2002. Although Janus is just one of many mutual fund families, this measure might arguably provide a rough approximation of the foreign diversification of the US mutual fund industry as a whole. The second variable in the table is the foreign diversification measure, discussed in Section 3, for the United States during the same time period. When examining the means of both of the variables²², one can see that Janus' relative foreign position is over twice that of the US as a whole. This significant difference is also true at their respective minimums. This observation is of particular interest because it could possibly provide further support for the information asymmetries hypothesis. Mutual fund managers have access to significant quantities of information and resources, and if they chose to have a relatively larger share of foreign equity than the national average, this could very well be the result of this increased access. Though this interpretation is difficult to prove formally, it might provide further support for the information based explanation, complementing the significance of the internet as previously mentioned.

7. Conclusion

The goal of this study is to document the recent trends in the overall equity home bias of different countries, and to attempt to explain these trends based on other recent related developments and factors. Based on the empirical findings, this study has been rather successful. The findings show that the internet, mutual funds, and to a lesser extent emerging markets and market returns, have all played a significant role in

²² The variable means are displayed, instead of a chart displaying all of the data points, because as previously stated, net asset positions vary greatly across years. Therefore, the average of the variables would represent a better approximation of the holdings.

determining a country's overall international portfolio diversification. Running the regression for a different time span does not produce significantly different results, nor does running different modifications. Also, when examining the data in levels, mutual funds and the internet still remain significant. Separate mutual fund data provide additional evidence for the role of mutual funds and information in shaping international diversification. Therefore, as emerging markets continue to develop, as information becomes more readily available to investors, and as agents invest more in mutual funds, this should continue to diminish the equity home bias puzzle. In conclusion, although there are many factors unaccounted for that contribute to equity home bias, this paper has documented some new and interesting variables affecting foreign diversification and its trends.

References

- Adler, Michael and Bernard Dumas. 1983. International Portfolio Choice and Corporate Finance: A Synthesis. *Journal of Finance* **38(3)**: 925-985
- Ahearne, Alan G., Grier, William L., and Francis E. Warnock. 2004. Information Costs and Home Bias: an Analysis of US Holdings of Foreign Equities. *Journal of International Economics* **62**: 313-336.
- Behaert, Geert, and Campbell R. Harvey. 2002. Research in Emerging Markets Finance: Looking to the Future. *Emerging Markets Review* **3**: 429-448.
- Bohn., H., and L. Tesar. 1996. U.S. equity investment in foreign markets: Portfolio rebalancing or return chasing? *American Economic Review Papers and Proceedings* **86(2)**: 77-81.
- Brennen, Michael J. and Henry H. Cao. 1997. International Portfolio Investment Flows. *The Journal of Finance* **52(5)**: 1851-1879.
- Coval, J. and T. Moskowitz. 1999. Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance* **54**: 2045–2073.
- French, Kenneth and James Poterba, 1991, "Investor Diversification and International Equity Markets," *American Economic Review*, **81**: 222-226.
- Gehring, Tomas, 1993, "An information Based Explanation of the Domestic Bias in International Equity Investment," *Scandinavian Journal of Economics*, **95(1)**: 97-109.
- Gould, Davis M. 1994. Immigrant Links to the Home Country: Empirical Implications for US Bilateral Trade Flows. *The Review of Economics and Statistics* **76(2)**: 302-316.

- Grinblatt, Mark and Matti Keloharju. 2001. How Distance, Language, and Culture Influence Stockholdings and Trades. *The Journal of Finance* **56(3)**: 1053-1074.
- Hsiao, Cheng. 2003. Analysis of Panel Data. *Cambridge, United Kingdom: Cambridge University Press*. 2ND Edition.
- Huberman, Gur. 2001. Familiarity Breeds Investment. *The Review of Financial Studies* **14(3)**: 659-680.
- Lane, Philip R. and Gian Maria Milesi-Ferretti. 2003. International Financial Integration. *International Monetary Fund Staff Papers* (special issue) **50**: 82-113.
- Lintner, John. 1965. The Valuation of Risk Assets and the Selection of Risky Assets in Stock Portfolios and Capital Budgets. *The Review of Economics and Statistics* **47(1)**: 13-37.
- Obstfeld, Maurice and Kenneth Rogoff. 1996. Foundations of International Macroeconomics. *Cambridge, Massachusetts: The MIT Press*.
- Portes, R., Oh, Y., and Rey. 2001. Information and Capital Flows: The Determinants of Transactions in Financial Assets. *European Economic Review Papers and Proceedings* **45(6)**: 783-96;
- Presenti, Paola and Eric Van Wincoop. 2002. Can Nontradables Generate Substantial Home Bias? *Journal of Money, Credit and Banking* **34(1)**: 25-49.
- Shapiro, Alan C. 1999. *Multinational Financial Management*. New York, New York: John Wiley & Sons.
- Sharpe, William F. 1964. Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk. *The Journal of Finance* **19(3)**: 425-442.

- Tesar, Linda L. 1993. International Risk-Sharing and Non-traded Goods *Journal of International Economics* **35**: 69-89.
- Tesar, Linda L. and Ingrid M. Werner. 1995. Home Bias and High Turnover. *Journal International Money and Finance* **14(4)**: 467-492.
- Tesar, Linda L. and Ingrid M. Werner. 1998. The Internationalization of Securities Markets Since the 1987 Crash. *Brookings-Wharton Papers in Financial Services*, 283-349.

Data Appendix

Foreign Equity Asset and Liabilities Holdings: The International Monetary Fund's International Financial Statistics (IFS) database. For the most part the IFS dataset is compiled using the best available data. The database is consistent in its sources and measurements of equity holdings within a country. Therefore this dataset provides reasonably accurate approximations of changes in equity holdings over time. The data is obtained from 1980-2001 for most countries. This dataset was discussed thoroughly in the data section.

Stock Market, World Market, and Emerging Market Capitalization: The Standard and Poors Global Stock Markets Fact book. Earlier data was obtained from the International Finance Corporation's Emerging Stock Markets Fact Book which was taken over by Standard and Poors. Data is available from 1980-2001 for all countries.

Local Market and World Market Return: Morgan Stanley Capital International (MSCI). Annual return in US Dollars adjusted for dividend re-investment. Data is available from 1980-2001 for almost all countries.

Number of Foreign Firms and Total Firms in Domestic Markets: International Federation of Stock Exchanges. Data obtained for all countries from 1980-2001.

Exports, Imports, GDP: World Bank Economic Indicators Database. All values measured in millions of US dollars. Data is available for all countries from 1980-2001.

Population: World Bank Economic Indicators Database. Values measured in millions. Data is available for all countries from 1980-2001.

Inflation: World Bank Economic Indicators Database. Values based on the annual percentage change of CPI. Data is available for all countries from 1980-2001.

Internet Users: International Telecommunications Union Yearbook Statistics. Values based on millions of users. Data obtain from census and survey data. Data obtained from all counties from 1992-2001.

Equity Mutual Fund Capitalization: Fédération Européenne des Fonds et Sociétés d'Investissement (FEFSI) Fact Book. Values based on millions of Euros, which were then converted to dollars. Data obtained for most European Countries from 1992-2001. Data also obtain form the Federal Reserve's Flow of Funds Account for the US from 1980-2001.

Figure 1

Countries that show a gradual increase in FD

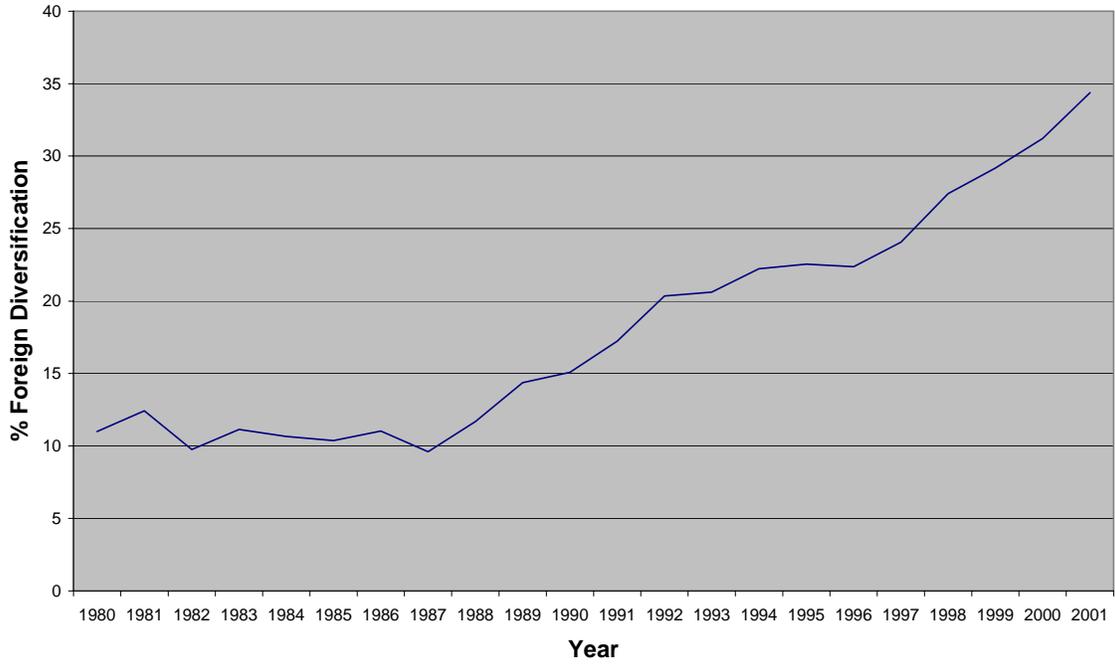


Figure 2

Countries that show a sudden increase in FD

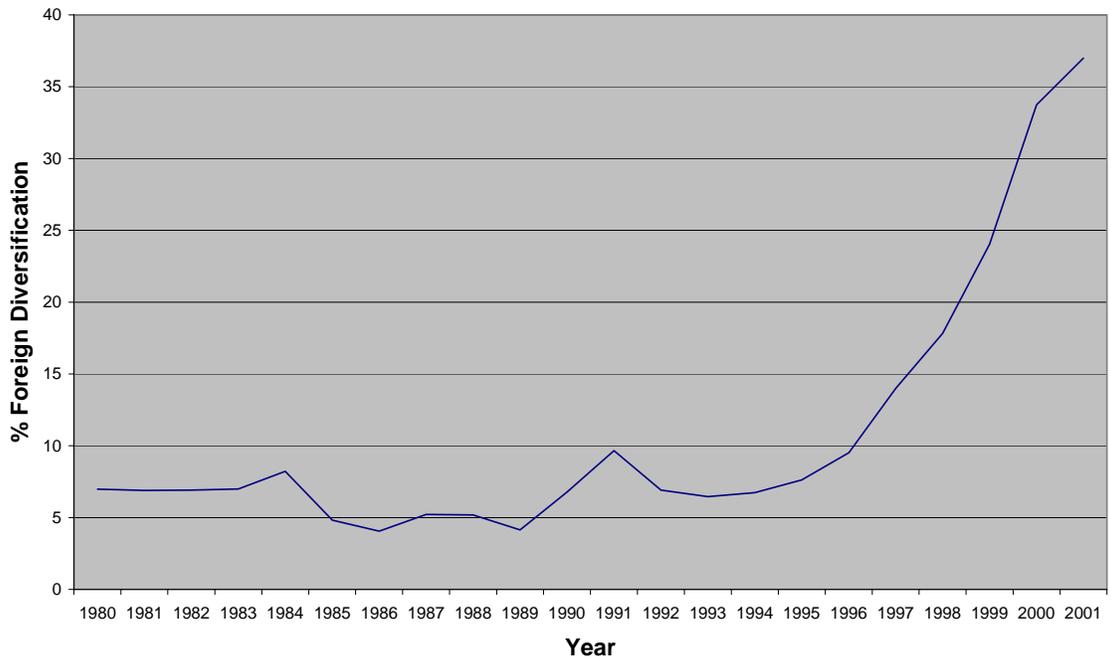


Figure 3

Global Type Mutual Fund Sales

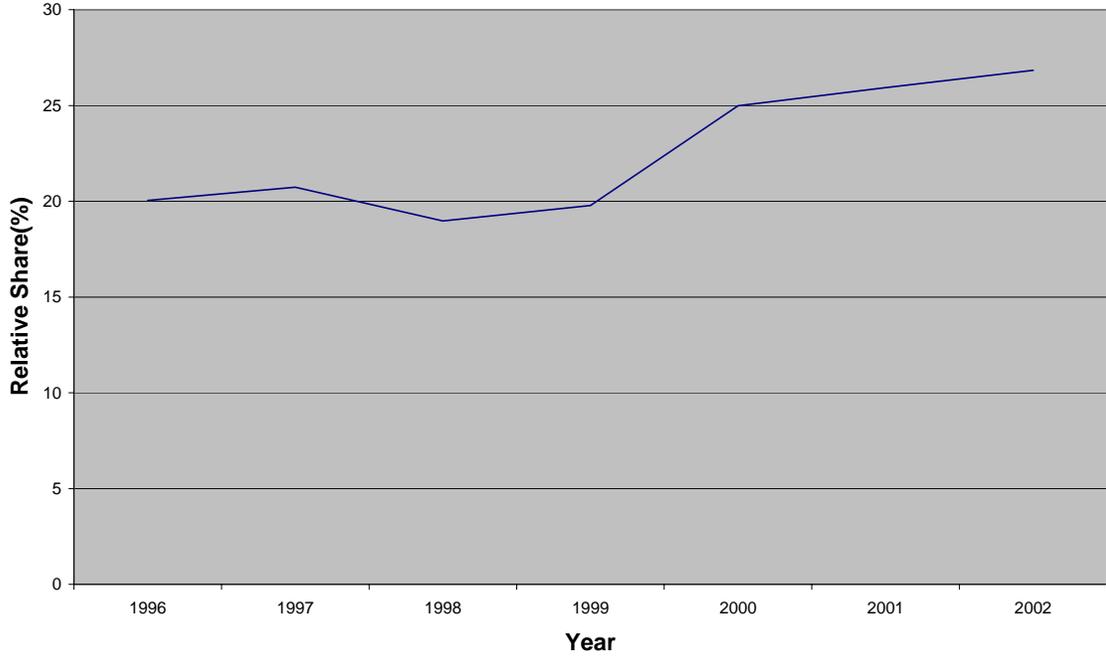


Table 1 : International Portfolio Diversification

Country	1986	2001
Australia	6.58	18.35
Austria	13.29	77.28
Belgium	24.39	42.32
Canada	7.16	16.01
Finland	0.04	24.41
Germany	8.39	39.65
Italy	5.36	32.75
Netherlands	28.02	57.43
Spain	1.06	14.04
Switzerland	33.67	55.36
United Kingdom	23.02	29.10
United States	2.87	11.30

This measure of international portfolio diversification is equal to the foreign equity assets held by the country divided by the sum of its stock market capitalization and foreign equity assets adjusted for its foreign equity liabilities. It is discussed in more detail in the text. All numbers are expressed in percentages.

Table 2 : Summary Statistics

Variable	N	Mean	Minimum	Maximum	Standard Deviation
FD	352	16.21	0.03	80.47	13.78
SWCAP	367	5.38	0.02	56.00	11.21
RTNDIFF	406	1.74	-65.02	135.56	24.94
EMCAP	484	6.61	2.45	12.46	3.26
Openness	481	30.71	0.26	84.67	14.05
PFFL	475	14.63	0	78.98	18.38
PCAPGDP	483	9.60	6.97	10.71	0.88
Internet	484	5.30	0	54.41	11.16
MFCAP	146	10.16	0.23	41.02	7.45

Summary Statistics are for the raw data set. FD represents the dependent variable of foreign diversification. SWCAP is the local market's share of world capitalization. RTNDIFF is the return difference between the local and global market index. PFFL is the percent of foreign firms listed in the domestic market. Internet is the percent of internet users in the local population. EMCAP is the emerging market's share of world capitalization. MFCAP is the mutual fund's share of the local market capitalization. Openness is the percentage share of trade in GDP. See text for specific definitions.

Table 3 : Panel Analysis of International Portfolio Diversification, 1980-2001

	(1)	(2)	(3)	(4)
SWCAP	-0.251 (-1.30)	-0.244 (-1.25)	-0.376 (-1.99)**	-0.344 (-1.82)*
RTNDIFF	-0.039 (-5.37)***	-0.040 (-5.47)***	-0.038 (-5.43)***	-0.040 (-5.64)***
PFFL	-0.010 (-0.18)	-0.009 (-0.15)	0.049 (0.88)	0.060 (1.06)
Openness		0.078 (0.76)	-0.043 (-0.42)	-0.015 (-0.14)
Internet			0.377 (5.11)***	0.399 (5.35)***
EMCAP				0.304 (1.77)*
Intercept	0.443 (0.49)	0.445 (0.48)	-0.457 (-0.51)	-0.582 (-0.65)
R Squared	0.139	0.143	0.216	0.224
N	310	306	306	306

The dependent variable of FD, is first differenced. Fixed effects panel estimation using data from 1980-2001. Fixed Effects t-statistics reported in parentheses (*=10% level, **=5% level, ***=1% level). See text for variable definitions.

Table 4 : Panel Analysis of International Portfolio Diversification, 1992-2001

	(1)	(2)	(3)	(4)	(5)
SWCAP	-0.470 (-1.06)	-0.484 (-1.08)	-0.689 (-1.60)	-0.576 (-1.32)	-0.729 (-2.06)**
RTNDIFF	-0.051 (-3.14)***	-0.051 (-3.10)***	-0.049 (-3.19)***	-0.050 (-3.26)***	-0.038 (-3.00)***
PFFL	0.034 (0.40)	0.036 (-0.42)	0.109 (1.31)	0.118 (1.41)	0.118 (1.76)*
Openness		0.217 (0.93)	0.034 (0.15)	0.117 (0.49)	0.132 (0.50)
Internet			0.457 (3.54)***	0.461 (3.57)***	0.426 (3.99)***
EMCAP				0.368 (1.29)	0.524 (2.23)**
MFCAP					0.445 (3.25)***
Intercept	1.021 (0.59)	0.996 (0.55)	-1.032 (-0.57)	-1.225 (-0.68)	-1.538 (-1.07)
R Squared	0.144	0.150	0.238	0.250	0.424
N	127	126	126	126	114

The dependent variable of FD, is first differenced. Fixed effects panel estimation using data from 1992-2001. Fixed effects t-statistics reported in parentheses (*=10% level, **=5% level, ***=1% level). See text for variable definitions.

Table 5 : Panel Analysis of International Portfolio Diversification, 1980-2001

	(1)	(2)	(3)	(4)	(5)	(6)
SWCAP	-0.069 (-0.35)	-0.104 (-0.61)	-0.219 (-1.46)	-0.142 (-0.98)	-0.111 (-0.78)	-0.151 (-1.07)
RTNDIFF	-0.032 (-1.64)*	-0.049 (-2.90)***	-0.045 (-3.10)***	-0.048 (-3.45)***	-0.045 (-3.24)***	-0.042 (-3.03)***
PFFL	-0.112 (-1.44)	0.055 (0.80)	0.047 (0.79)	0.028 (0.50)	-0.002 (-0.03)	0.005 (0.09)
Openness		1.098 (10.41)***	0.348 (2.91)***	0.309 (2.69)***	0.193 (1.63)*	0.148 (1.25)
Internet			0.398 (9.86)***	0.379 (9.72)***	0.256 (4.87)***	0.187 (3.07)***
EMCAP				0.601 (5.13)***	0.075 (0.039)	0.092 (0.54)
Time					0.513 (3.42)***	
Time Sq.						0.026 (4.06)***
Intercept	10.721 (-1.22)	1.151 (-0.11)	8.805 (0.1908)	2.301 (0.35)	1.162 (0.18)	5.315 (0.82)
R Sq.	0.642	0.742	0.804	0.820	0.827	0.829
N	329	326	326	326	306	306

The dependent variable is FD (**not first differenced**). Fixed effects panel estimation using data from 1980-2001. Fixed Effects t-statistics reported in parentheses (*=10% level, **=5% level, ***=1% level). See text for variable definitions.

Table 6 : Panel Analysis of International Portfolio Diversification, 1992-2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SWCAP	0.713 (1.35)	0.070 (0.14)	-0.835 (-1.31)	-0.775 (-1.51)	-1.310 (-2.74) ^{***}	-1.315 (-2.75) ^{***}	-1.315 (-2.74) ^{***}
RTNDIFF	-0.029 (-0.75)	-0.011 (-0.33)	-0.007 (-0.22)	-0.006 (-0.21)	-0.005 (-0.18)	-0.006 (0.21)	0.005 (0.19)
PFFL	-0.472 (-3.68) ^{***}	-0.018 (-1.52)	-0.087 (-1.05)	-0.083 (-0.76)	-0.066 (-0.66)	-0.061 (-0.60)	-0.064 (-0.64)
Openness		1.321 (7.02) ^{***}	0.579 (2.41) ^{**}	0.615 (2.46) ^{**}	0.148 (0.71)	0.235 (0.87)	0.200 (0.73)
Internet			0.364 (4.46) ^{***}	0.375 (4.45) ^{***}	0.353 (4.61) ^{***}	0.401 (4.06) ^{***}	0.385 (3.64) ^{***}
EMCAP				0.261 (0.57)	0.634 (1.49)	0.558 (1.28)	0.589 (1.34)
MFCAP					0.855 (4.88) ^{***}	0.884 (4.92) ^{***}	0.870 (4.86) ^{***}
Time						-0.425 (-0.77)	
Time Sq.							-0.007 (-0.43)
Intercept	-13.445 (-0.59)	-5.155 (-0.25)	34.022 (1.64)	28.265 (1.22)	40.431 (1.90) [*]	46.207 (2.05) ^{**}	41.847 (1.94) [*]
R Sq.	0.682	0.780	0.814	0.815	0.848	0.849	0.849
N	126	125	125	125	125	125	125

The dependent variable is FD (**not first differenced**). Fixed effects panel estimation using data from 1980-2001. Fixed Effects t-statistics reported in parentheses (*=10% level, **=5% level, ***=1% level). See text for variable definitions.

Table 7 : Panel Analysis of International Portfolio Diversification, 1992-2001

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SWCAP	-0.872 (-1.85)*	-0.527 (-1.08)	-0.986 (-2.10)**	-0.946 (-1.96)	-1.419 (-3.09)***	-1.426 (-3.10)***	-1.426 (-3.09)***
RTNDIFF	-0.011 (-0.31)	-0.010 (-0.31)	-0.010 (-0.33)	-0.010 (-0.31)	-0.002 (-0.01)	-0.002 (0.07)	0.001 (0.03)
PCAPGDP	84.909 (7.31)***	-38.444 (2.26)	-5.556 (-0.29)	-3.369 (-0.17)	-4.599 (-0.25)	6.750 (0.27)	0.502 (0.02)
Openness		0.927809 (3.62)***	0.545 (2.13)**	0.555 (2.15)**	0.086 (0.33)	0.134 (0.49)	0.108 (0.39)
Internet			0.401 (4.23)***	0.401 (4.22)***	0.383 (4.36)***	0.411 (4.19)***	0.398 (3.74)***
EMCAP				0.178 (0.37)	0.481 (1.08)	0.466 (1.04)	0.476 (1.06)
MFCAP					0.796 (4.49)***	0.825 (4.51)***	0.807 (4.41)***
Time						-0.501 (-0.65)	
Time Sq.							-0.007 (-0.26)
Intercept	-823.616 (-719)***	-372.098 (-2.23)**	96.006 (0.50)	69.994 (0.34)	93.880 (0.50)	-15.112 (-0.06)	43.124 (0.16)
R Sq.	0.762	0.786	0.816	0.816	0.845	0.845	0.845
N	129	127	126	125	124	123	123

The dependent variable is FD (**not first differenced**). Fixed effects panel estimation using data from 1980-2001. Fixed Effects t-statistics reported in parentheses (*=10% level, **=5% level, ***=1% level). See text for variable definitions.

Table 8: Mutual Fund Variables Summary Statistics

Variable	N	Mean	Minimum	Maximum	Standard Deviation
Janus FD	7	25.88	21.73	34.66	4.23
US FD	7	11.44	10.44	12.09	0.62

Summary Statistics are for the raw data set, which contains annual data from 1995-2002. Janus FD represents the foreign diversification of all of Janus' equity investment funds. Specifically it is the share of the net non-US equity assets with respect to all of the equity assets. US FD represents the dependent variable of foreign diversification for the United States. See text for specific definitions.