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United States Equity Mutual Funds and International Diversification

A Thesis in Economics
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Abstract

This paper examines the United States equity mutual funds to understand the existence of home bias in their portfolios through institutional and behavioral factors. This home bias contradicts the Modern Portfolio Theory, which attempts to maximize portfolio expected return for a given amount of portfolio risk or equivalently minimize risk for a given level of expected return, by bringing a variation in the kind of assets included in the portfolio. Thus, I argue that the home bias keeps mutual fund portfolios from the benefits that international diversification brings with it. For this, I have collected data of top performing domestic and global mutual funds through Morning Star and Bloomberg that allows me to look into their performance and risk pattern from 2005-2014. The results show domestic equity mutual funds acquiring higher returns accompanied by higher volatility in most time period, but the global funds have outperformed them in the times of financial crisis and during the most recent years. Thus, through research on available financial literature and data analysis I emphasize the importance of international diversification that would lower non-systematic risks in equity mutual fund portfolios and allow them to perform better in times of domestic financial crisis.

JEL Classifications: C12, G01, G11,

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I. Introduction:

Investment is primarily driven by the aim of creating profits. In finance, it starts with purchasing an asset to either garner an income from it or to obtain profit from selling it at a higher price in the future. There are different investment vehicles that enable people to purchase assets. These include individual securities (i.e. a bond or a stock), options, futures, gold, real estate, exchange-traded funds, foreign exchange (currency), index funds and mutual funds. A mutual fund is a basket of stocks and bonds, and buying it allows one to pool money with other investors to pay a money manager to select securities and structure them according to their investment objectives. When one buys shares of a mutual fund, the person is adding his/her money to a pool of money contributed by many investors. This pool of money is managed by professional investment managers who invest it in stocks, bonds, real estate or other assets as described in the fund's prospectus. Here, the contributors of the pooled money own shares of the mutual fund, which represent a proportionate share of ownership of the assets owned by the fund.

Although mutual funds have been around for quite some time, they were able to capture public attention after hitting record highs in the 1980s and 90s by offering great returns for the investors. They do remain comparatively newer investment instrument, however, the breadth of ownership has risen tremendously, with the proportion of U.S. households owning mutual funds growing from 6 percent in 1980 to 27 percent in 1992 and 50 percent in 2002[1]. At the turn of the 21st century, the number of mutual funds in the United States exceeded the number of securities listed on the New York Stock

Exchange[2]. Currently, with $15 trillion in assets, the U.S. mutual fund industry remained the largest in the world at year-end 2013[3]. Total net assets increased by nearly $2 trillion from the level at year-end 2012, boosted primarily by growth in equity fund assets. Also, net new cash flow into all types of mutual funds totaled $167 billion in 2013 due to a rise in investment in mutual funds[4]. Today, the U.S. mutual fund market, with $15 trillion in assets under management at year-end 2013, remains the largest in the world, accounting for half of the $30 trillion in mutual fund assets worldwide[5]. This growing popularity of mutual funds has to do a lot with the advantages associated with it. Mutual funds provide access to professionally managed portfolios. In addition to that, they offer both foreign and domestic investment opportunities that may not otherwise be directly accessible to individual investors. Mutual funds happen to be one of the best avenues to invest for all types of people, including those who want to invest a small amount of money and prefer different choices of purchasing methods and fee structures. Moreover, through mutual funds, investors can have an expert take investment decisions for them, rather than taking them individually, and proportionately participate on the gains or losses of the fund.

The other advantage of mutual funds is that they come in a range of varieties for the investors to choose according to their investing style. Based in asset classes, there are three varieties of mutual funds. First are the fixed- income funds that are mostly comprised of bonds and primarily invest in government and corporate debt. Second are the money market funds, which consist of short-term debt instrument, mostly U.S. Treasury Bills. The final ones are equity funds, which represent the largest category of mutual funds and exclusively invest in stocks. Now, within these classes, mutual funds

are further diversified based on the size and kinds of securities they invest in. There are balanced funds that are comprised of both fixed income securities and equities, some specialty funds that include sector funds, regional funds, and ethical (socially-responsible) funds.

The growing importance of mutual funds has also increased its popularity in the literature. When it comes to mutual funds research, a number of people have tried to explain and evaluate mutual fund performances. Studies by Brown and Goetzmann (1995) and Malkiel (1995) have tested the persistence of mutual fund total, i.e. the tendency of the fund's price to continue moving on an upward or downward direction, by labeling funds losers and winners based on their one year total returns. Through their data analysis they conclude that the performance of mutual funds relative to its risk persists but that persistence is mostly due to funds that lag the S&P 500. There was a consistency in loser-loser pairs rather than winner-winner pairs, where the persistence was seen in funds with prices that continued moving on a downward direction. Therefore, the implication of their results for investors is that the persistence phenomenon is a useful indicator of which funds to avoid. Similarly, Zheng (1999) has explored the smart money effect in her study by analyzing a sample of 1,826 equity mutual funds during the period 1970 to 1993 and found that the short-term performance of funds that experience positive new money flow is significantly better than those that experience negative new money flow. Here, funds receiving more money were performing significantly better than the others. In addition to that, studies also consider fund attributes such as size, age, fees, trading activity, flows, and past returns as potential determinants of the fund

performance. Chen, Hong, Huang, and Kubik (2004) investigate the effect of scale on the performance of a fund. They establish that controlling for its size, a fund's return does not deteriorate with the size of the family that it belongs to, indicating that scale need not be bad for performance depending on how the fund is organized. However, fund returns acquired from 1970-1999, both before and after fees and expenses, decline with fund size. This association is most pronounced among funds that have to invest in small and illiquid stocks, suggesting that these adverse scale effects are related to liquidity, i.e. the rate at which the stocks can be bought and sold. Hence, they conclude stating an inverse relation between fund size and fund performance, but also denote that this relationship hugely depends on the liquidity of the fund. Here, it is important to note that almost all of these studies focus on the U.S. market as historical data is easily available to collect and analyze.

The primary focus of this paper is on the U.S equity mutual funds that invest mainly on stocks and some amount on cash. Within the equity class, there are specific funds that are comprised of certain size of companies, namely; large, medium, and small. The size of the company is based on its market capitalization. Similarly, equity mutual funds also differ based on their investment style- namely, value, blend, and growth. Equity mutual funds are also comprised of international/ foreign funds that invest outside the home country. An international fund does not necessarily concentrate on any single country, but it does not invest in securities from the country in which it operates. Funds that invest in both domestic and international securities are referred to as global funds and thus, significantly differ from international funds. These equity funds are by far the

largest form of the mutual fund industry especially in more developed countries such as the United States and therefore, have a huge effect on overall performance and popularity of the industry by having a direct relationship with the stock market of a nation.

Within the equity mutual funds category, international and global mutual funds, however, cover a small proportion and are relatively new in the mutual fund industry. Since the 1980s and 90s decades, domestic funds have mostly exhibited higher returns than the international and global funds, which have highly skewed mutual fund portfolios towards U.S. equities. A huge home bias can be seen both in terms of number of domestic funds and the amount of U.S. securities in global funds. However, with the 2008 financial shock and other recent corporate governance and financial scandals, the importance of international and global funds has emerged. This phenomenon is primarily being created due to the diversification advantages that the international funds and global funds bring with themselves. Like all mutual funds, international and global equity funds can potentially invest in a large number of securities, providing a cost-effective way to own shares in many different companies. However, unlike domestic equity funds, which invest primarily in U.S. companies, international equity funds primarily invest in companies outside of the U.S. This characteristic offers investors multiple layers of diversification, which includes geographical, currency, and sector choices. This highly reduces the chances of the performance of a single equity or instability in a single country negatively impacting the performance of the entire portfolio. While the ability of a mutual fund portfolio manager to increase returns of the portfolio through successful prediction of future security prices is important for the performance of the fund, it is also

equally important for the manager to minimize the amount of risk exposure of the U.S. stocks portfolios. Hence, the low correlation between the domestic and foreign stocks, which mainly arises due to different business cycles of nations occurring during different time frames, play a big role in risk management.

This paper takes a look at the past 10 years in the U.S equity mutual fund industry and the relative benefits and costs of international diversification. With increasing size and ownership of mutual funds, the aspect of international diversification becomes hugely important as mutual fund managers continue to search for higher returns and lower risk on any level. Historically, international markets have often experienced different economic cycles than U.S. markets and even when the U.S. economy has slowed, other economies, at times, have continued to grow[6]. Therefore, I argue that, broadening investments into a variety of foreign markets may prove profitable in the long term, and would allow investors the opportunity to capitalize on the economic growth and widespread prosperity of several economies, especially the emerging markets that exhibit high rate of economic growth compared to other nations. Moreover, by investing outside the United States, internationally diversified funds can potentially capitalize on different economic cycles occurring in different countries at different times.

The focus of the paper remains on the performance of the U.S. equity mutual funds and I aim to suggest international diversification of portfolios to improve the fund performance, both in terms of returns and risk, especially in times of crisis. Here, international diversification is suggested for mutual funds to overcome their home bias in order to respond well to both domestic and global shocks. The paper will only be talking

about the U.S. equity mutual funds given their size and effect on the mutual fund industry. In addition to that, the equity mutual funds happen to be the most sensitive section when it comes to international diversification, management expertise and information availability. Therefore, the effect of international diversification is most clear on U.S. equity mutual funds. Through this research paper, I aim to test my hypothesis that the optimal portfolios for U.S. equity mutual funds contain both domestic and international securities, and the industry needs to overcome its home bias to protect itself from domestic financial shocks.

The rest of the paper is structured as follows. Section II puts forward my underlying arguments related to the U.S. equity mutual fund industry. These arguments that heavily talk about the home bias in equity portfolios, are built up by extensive research on available financial literature. These works not only highlight the tendency for the U.S. mutual fund managers to invest in a large amount of domestic equities, but also point out the prevalence of home bias in other nations in the world. Here, investors from all over the world tend to be biased toward investing in their own domestic equities. Thus, I look into factors that lead to home bias to further understand the prevalence of this phenomenon in equity portfolios. Section III focuses on the benefits of international diversification to explain why home bias is a pressing issue. The benefits are looked through the lenses of returns and risks associated with the equity mutual funds. Section IV is the methodology section, which introduces my dataset of domestic and global equity mutual funds collected through Morning Star and Bloomberg, and includes my data analysis that comprises the commutation of returns, alphas and betas of individual

funds. Section V presents my empirical result from my data analysis, where through histogram figures and charts, I provided a picture of risk and return patterns of equity mutual funds. Finally, Section VI concludes my paper by pitching my international diversification suggestions with my empirical results, and acknowledging the risks associated with it.

II. Arguments:

1. 'Equity home bias puzzle'

Investors in the United States have increasingly diversified their portfolios towards equity mutual funds that invest significantly or primarily in foreign markets. Over the past 10 years, world equity funds received cumulative inflows of $626 billion, while domestic equity mutual funds experienced outflows totaling $487 billion over the same period[7]. In 2013, while world equity funds received the bulk ($142 billion) of the net new cash to equity mutual funds, domestic equity funds received $18 billion, their first inflow after seven consecutive years of outflows[8]. Also, with higher interest rates and a stronger U.S. dollar, equity mutual funds that specialize in emerging markets attracted $33 billion in new cash in 2013[9]. The strong demand for world equity funds over the past decade also likely reflects the high returns that have been realized in overseas markets. In addition to that, both international and domestic stocks have returned an average of 8 percent annually over the past 10 years, where, between 2002 and 2012, international stocks, on average, performed better than domestic stocks.

However, despite the growing popularity of international securities, there still exists home bias in the investment style of the U.S. equity mutual funds. The home bias in equity portfolios was first documented by French and Poterba (1991), where they examined the portfolio holdings of 6 major countries in 1989, and found that in the U.S., the investors were investing 92.3 percent domestically; Japan 95.7 percent; United Kingdom 92 percent, et cetera. Similarly, Werner and Tesar (1998) did a similar study using a different data set and observed home bias for 13 nations between the periods of 1987-1996. These studies gave rise to 'equity home bias puzzle' in the literature, where home bias was not only an issue in the U.S., but was actually significantly observed all over the world.

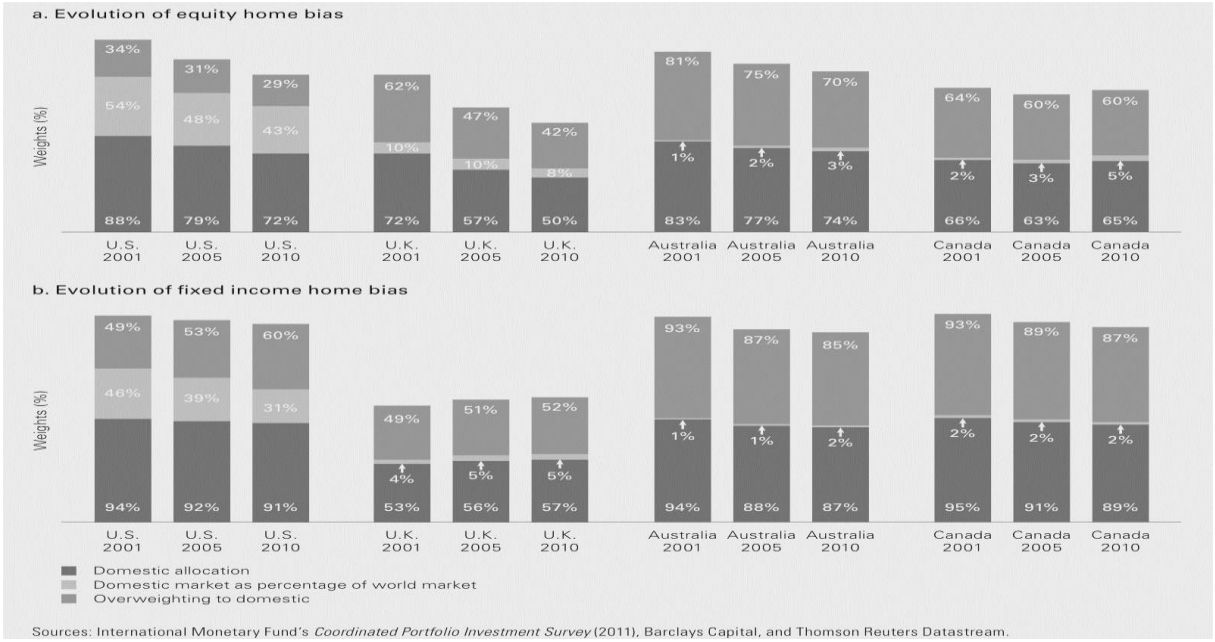

Figure 1: Trends in home bias
Source: IMF, Barclays Capital, and Thomson Reuters data stream

Figure 1 exhibits the home bias trend in different countries. While home bias in equities has significantly persisted in the U.S. over the years, the phenomenon can clearly

be seen in other nations as well. I present similar views in my paper, and my argument of the U.S. equity mutual funds being home biased is based on two major findings in the U.S. mutual funds statistics. Here, home equity bias in the U.S. occurs due to the larger size and numbers of U.S equity funds relative to the rest of the world and due to the disproportionate allocation of U.S. equities in U.S. based and managed global equity funds.

Mutual funds that invest primarily in the shares of corporations based in the United States are by far the largest type of equity mutual fund. These domestic equity funds held more than 85 percent of the assets of all equity mutual funds at the end of 1999[10]. International equity funds, which invest primarily in the shares of non-U.S. companies, account for the remainder. Today, equity funds make up 52 percent of U.S. mutual fund assets.

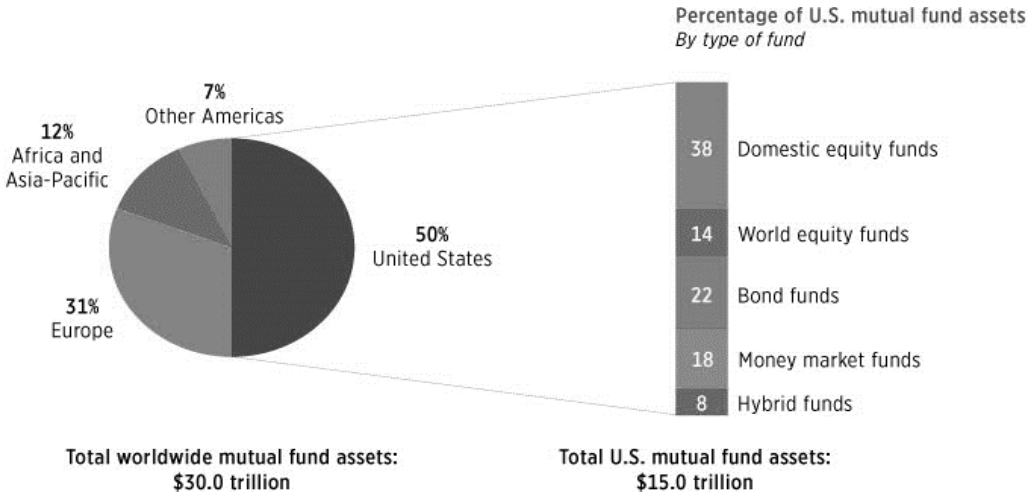

Figure 2: Percentage of the U.S. mutual fund assets
Source: International Investment Funds Association

Figure 2 demonstrates the regional exposure of the U.S mutual funds based on their assets, where the U.S. funds are clearly the dominating group. In addition to that, we

can see that within the huge mutual fund industry based in the U.S., the majority (38%) of it are domestic equity funds and a small portion (14%) belongs to world equity funds. As of December 2014, the total net assets of equity mutual funds in the United States is $8316.9 billion, where domestic equity holds $6237.6 billion and the world equity sector holds $2079.3 billion[11]. Here, the domestic equity sector is comprised of 3238 mutual funds and the world equity sectors happens to be comprised of 1404 mutual funds[12]. Moreover, the size of U.S. domestic equity is almost three times larger than the world equity funds, where the estimated net flow (2015) for the domestic equity fund is $3534 million and mere $704 million for world equity funds.

In addition to that, when we look in global funds that are defined as being comprised of equities being traded worldwide, we can clearly see the disproportionate portfolio holdings. Here, the proportion of the U.S. equities is considerably higher than foreign equities. As of the end of 2013, the global equity fund asset allocation consists of 80 percent U.S. equity, 15 percent non-U.S. equity, and 5 percent private equity[13]. The funds not only show a significant preference to the U.S. domestic equities, but even within the small allocation for the non-U.S. equity, mutual fund managers neglect certain countries, e.g. emerging markets. The regional exposure in the holdings of global equity funds is led by North America with 57.2 percent, followed by Europe with 19 percent and Pacific Ex Japan with 11.6 percent[14]. Equities from emerging markets, held in global funds, is significantly lower with 7.2 percent of Indian and Chinese equities and 4.4 percent of Latin American equities[15].

2. Why the bias?

A portion of literature on mutual funds is focused on understanding the equity home bias of mutual funds, where portfolio managers share confidence towards their domestic equities. The managers overweight familiar securities at the expense of the less known foreign securities. Researchers suggest explanations for home bias based on institutional factors, investor behavior, and desire to hedge specific sources of risk. In this section, I will be looking into both institutional and behavioral explanations provided for the existence of home in the U.S. equity funds.

a) Institutional factors

One of the institutional factors that could explain home bias in the U.S. equity funds is the barriers to capital flows created by higher costs of transacting and taxes in foreign securities. The way transaction costs act as a barrier to international investment is by lowering the returns acquired by investing in foreign equities. Here, transaction costs and expenses incurred during buying and selling of foreign equities can be more than domestic equities. Foreign nations have a smaller market in comparison to the U.S., and in smaller markets transaction costs such as the fees, broker's commissions, and taxes often are higher than in the U.S.[16]. In smaller markets, investors can also be required to pay a premium to purchase shares of popular foreign companies. In addition to that, while investing abroad, we are susceptible to unexpected taxes, such as withholding taxes on dividends. Italy, for example, takes 20% of whatever proceeds a non-resident makes from selling his/her stock and Spain withholds slightly more, 21%, of such gains[17]. In 1998,

for example, non-U.S. equity mutual funds had a median expense ratio, what investors pay for operating expenses and management fees as a percentage of their total investment, of 1.78 percent, compared with 1.31 percent for general U.S. equity funds, according to the Securities and Exchange Commission[18]. Similarly, a study conducted in 2001 by a London consulting firm, Fitzrovia International PLC, showed that 464 U.S. funds domiciled in offshore centers had an average total expense ratio of 2.14 percent, which is too high to be considered as a good investment for most individuals.

S.N.	**Country**	**Transaction Fee per trade**	
		Online	**Representative-Assisted**
1	United States	$7.95	$12.95
2	Australia	$25.06	$54.82
3	Canada	$15.27	$56.26
4	Denmark	$24.54	$64.42
5	Japan	$25.29	$67.45
6	Mexico	$24.21	$64.56
7	South Africa	$19.41	$51.77
8	United Kingdom	$13.90	$46.34

Table 1: Fidelity transaction fees, Year 2013
Source: Fidelity Investments

Table 1 accounts the transaction fees charged by Fidelity Investments, one of the leading financial services corporation in the U.S, on foreign stocks. Here, trading U.S. equities is significantly cheaper than the international stocks even when taxes are not incorporated into the calculations.

Transaction costs that include commissions and taxes on foreign equities have been mentioned in the literature in number of places. The consumption and portfolio choice model developed by Rowland (1999) shows that as the magnitude of transaction cost increase, the rate of portfolio diversification decreases. By using a comprehensive dataset of bilateral cross-country foreign equity portfolio holdings for different measures of transaction costs for 36 countries, Rowland argues that as the costs increase, active portfolio reallocation decreases and is replaced by passive portfolio reallocation containing cheaper domestic stocks. This implies that mutual fund managers might underweight those countries where the transaction costs are high.

Other institutional factors that contribute to home bias in the U.S. equity mutual funds are the exchange rate risk and inflation. When exchange rate ratios fail to match the price level ratios of two countries, the currency risk that leads to this failure of purchasing power parity keeps mutual fund managers from investing globally. The exchange rate between a country's currency and the U.S. dollar fluctuates constantly. This fluctuation can impact the dollar value of an investment, even if the equity price remains unchanged. Foreign companies trade and pay dividends in the currency of their local market. In addition to that, the dividends received through investment on foreign equities need to be converted into U.S dollars. During such a scenario, if the foreign currency weakens compared to the U.S. dollar, the returns drop as the foreign earnings translate into fewer dollars. Investments in foreign markets are exposed to fluctuations in foreign exchange rates and thus, investment at a national level is considered as the best protection against deviation from purchasing power risks and exchange risks.

Similarly, mutual fund managers are induced to hold portfolios that are designed to hedge inflation risk to avoid returns from getting devalued by future inflation. Inflation risk is associated with emerging markets and nations where social, economic, and political factors remain unstable. Such instabilities affect foreign market returns through fluctuations in price levels and explains the small proportion of the U.S. equity fund portfolio allocation for nations susceptible to inflation risk. Thus, the home bias could be clarified as domestic equities providing a hedge against inflation risk for mutual fund managers.

In this way, institutional factors act as barriers for foreign investments. However, the role they play in creating home bias in the U.S. equity mutual funds may not be as significant as it seems to be.

Firstly, transaction costs do make foreign equities costlier for fund managers, but when expected returns are higher in foreign countries, the transaction costs are clearly overlooked by the portfolio managers. This explains the high turnover ratios in foreign equity portfolios, which indicates that equities in foreign funds are more frequently bought and sold than in domestic fund. For instance, Tesar and Werner (1995) do not consider cross-border costs and transaction costs as driving forces in limiting foreign ownership. Their research highlights that the turnover rate on foreign equity portfolios is much higher than on domestic equity portfolios, which suggests lower transaction costs of foreign securities. If transaction costs acted like a significant barrier to international investments, higher transaction costs on foreign transaction could be expected to lead to lower turnover rates in overseas components of portfolios than on domestic components.

But, the observation is the opposite; portfolio turnover rates are higher in foreign than in domestic portfolios. Similarly, Amadi and Bergin (2008) argue that the turnover rates tend to appear high for foreign equity portfolios due to the investment activities of investors who have already taken the plunge into foreign markets. Therefore, international diversification is not as costly as it is assumed to be, and even the difference in foreign and domestic tax burdens, in relation to investing in foreign equities, are not huge enough to cause a highly noticeable home bias in the U.S. equity mutual funds.

Secondly, although currency movements tend to be unpredictable and can be large, they have historically been uncorrelated to movements in stock prices[19]. For example, during the 25-year period ending in December 2010, the foreign-exchange movements of major foreign currencies had only a 0.16 correlation with the local currency returns of foreign stocks[20]. Here, the prices of both foreign stocks and U.S. stocks have had little correlation to fluctuations in the U.S. dollar, leading currency exposure to result in lower correlations between U.S. and foreign stocks. Therefore, while the impact of currency fluctuations on foreign investments can be felt during short terms, over the long run, the impact is quite negligible. A study conducted by Cooper and Kaplanis (1994) tests whether the home bias in equity portfolios is caused by investors trying to hedge inflation risk. Here, they argue that this could only be true if the investors are much more risk averse than they assert to be. In addition to that, Fidora, Fratzscher, and Thimann (2006) looked at the impact of exchange rate volatility and inflation on equity home bias and concluded that these risk only have a pronounced effects on assets with low volatility i.e. bonds in local currency returns. They place this argument based on

their study, which shows that the elimination of exchange rate volatility would reduce home bias in bonds (low return volatility) by 60%, but only reduce home bias in equities (high return volatility) by 20%.

Thus, although institutional factors like transaction costs, tax withholds, exchange rate fluctuations, and inflation risk matter in understanding the home bias in equities, they cannot fully explain the observed massiveness with which the phenomenon exists in the U.S equity mutual funds. Here, they also fail to singlehandedly justify the missed gains from international diversification.

b) Behavioral factors

Now, let me look into behavioral factors where investor choices play a role in creating home bias in U.S. equity mutual funds. Home bias in equities is not only seen in the U.S., but all over the world and this phenomenon arises from the related confidence shared by funds managers towards their home economies. While domestic institutional managers all over the world have shown a distinct preference for domestic multinational firms, they also favor the stocks of foreign countries that are geographically and culturally closer, and whose equity markets are more correlated with their domestic equity markets. For instance, French and Poterba (1991) assert that lack of diversification appears to be the result of investor choices, rather than institutional constraints. They argue that investors remain optimistic about domestic markets and instead expect a lower percentage average return on foreign securities. This statistical uncertainty associated with the estimation of expected returns in equity markets makes it difficult for investors

to learn that expected returns in domestic markets are not always systematically higher than the foreign ones. They provide similar arguments related to risks associated with foreign markets and argue that these risks are amplified by managers when they do not know much about the foreign markets.

Similarly, Strong and Xu (2003) use certain investment behaviors such as herding and disposition effects to explain the optimism towards home equities shared by global managers. Here, managers tend to analyze the same group of stocks and trade in the same direction. In addition to that, they buy similar stocks after they have performed well in the market. Thus, equity fund managers lean towards exhibiting "herd" behavior, buying and selling similar stocks at the same time, and act like "momentum investors", where they select stocks based on past returns[21]. Also, Graham, Harvey and Huang (2005) argue that investors who feel competent, trade more and therefore, should have a more internationally diversified portfolios. However, equity fund managers tend to feel more competent in their own market and share relative optimism towards home equities, leading them to concentrate on a small number of countries with which they are presumably familiar with[22]. Here, such behavioral factors like herding and profound optimism towards home equities primarily arises from the problem of information asymmetries in financial markets.

Mostly, foreign markets and the stocks issued by foreign companies are not as widely followed by financial analysts and researchers due to limited amount of resources available to them for information gathering. Since investors tend to make decision based on information available to them, the abundance amount of information on the U.S.

economy and its stock market leads them to invest more in home equities. Therefore, information asymmetries stem from the cost of acquiring information in unknown markets and securities that have never been traded before. The cost of acquiring information can easily be understood if we simply compare factors like picking up a local newspaper for domestic markets versus setting up information channels in foreign countries. Also, the cost increases as the speed of acquiring foreign market information becomes important. This explains why most foreign securities in the U.S equity global funds are ones that have been traded numerous amount of times, as investors tend to be more well-informed about such securities. In addition to that, information asymmetries tend to intensify investor herding behavior. Investors might start following investing patterns of other investors when they realize that they are better informed than them[23]. An example of this type of herding behavior is provided by what is called the 'informational cascades', where Hirshleifer and Welch (1992) argue that people form their beliefs using information obtained by observing the behavior or opinions of others.

Information asymmetries have shown empirical success in the literature while trying to explain the home bias in the U.S equity funds. For instance, Faruqee, Li, and Yan (2004) estimate an augmented gravity model of equity holdings and find that one of the variables that performs remarkably well is information asymmetry as a proxy for by distance. Portes and Rey (2005) carry out a similar study where they represent information asymmetries in the form of telephone traffic between countries, foreign bank branches in a country, and the number of overlapping hours in equity trading markets in their research. Here, all of these variables prove to have a strong direct relationship with

cross-border equity flows. Similarly, Barber and Odean (2008) argue that institutional investors tend to trade only a small subset of equities, generally those they already own. This explains why international mutual fund managers overweight large firms, those that trade the most and are more known among investors. In addition to that, international and domestic fund managers both reveal a preference for securities of global firms, institutions that are themselves internationally diversified so that they do not have to spend significant amount of time and money on acquiring foreign equities for the purpose of diversifying their portfolios.

Other factors such as geographical distance, language, and culture also significantly affect investor behavior. Studies have shown that as cultural distance between the investors and their stock holdings increases, institutions trade with lower frequency. Portfolios from culturally distant countries invest less abroad and underweight culturally distant target markets. Therefore, trading frequency and cultural distance are negatively related due to increasing difficulty of interpreting investment environments in culturally distant foreign markets[24]. Grinblatt and Keloharju (2001), for example find that information asymmetries may be present, even between neighboring and fairly culturally similar nations, with Finnish investors displaying a strong preference for Finnish firms over Swedish firms and vice versa. Similarly, Anderson, Fedenia, Hirschey, and Skiba (2010) investigate whether culturally- rooted behaviors condition portfolio allocations, specially home-country bias and diversification across foreign markets. . Specifically, they look at the global equity holdings of some 25,000 institutional portfolios from over 60 countries, which in turn are invested across more than 80 countries. They find that in

their empirical models for home bias and foreign diversification, culture significantly affects portfolio allocations, where culture distance is positively related to home bias, and culturally distant target markets tend to be underweighted in equity portfolios. Moreover, culture impacts the decision making process that leads fund managers to invest in nations culturally similar to their home country. One reason for this could be managers avoiding the perceived uncertainty of some foreign equities arising from the degree of how familiar the managers are with the nation's economic variables. Here, the familiarity is affected by the ability of the managers to understand and explain market performances in the foreign nations, which is then affected by language and cultural characteristics of the nation. For instance, Amadi (2004) reports that low levels of foreign equity allocations by institutional investors where factors such as common language, trade, and immigration links affect foreign investment.

Moreover, the perceived differences in languages, geographical distance and cost of acquiring information might lead equity fund managers to hesitate to incorporate international equities in their portfolios. Since the availability of information greatly differs from one national market to another, it becomes extremely hard to translate it into familiar standards for comparison purpose[25]. As a result, fund managers invest primarily in domestic assets and allow informational asymmetries to play an important role in maintaining bias towards domestic assets. Heath and Tversky (1991), for instance, show that, between two identical games with the same probability, economic agents consider the game that they know less about as the most risky one. So, as mutual fund managers have less access to information about foreign securities with higher costs for gathering

information on them, the bias toward domestic equity starts arising in their equity portfolios.

Therefore, acknowledging that the communication between countries is now instantaneous and that increasing globalization has solved the issue of distance and language would keep us from fully explaining home bias in the U.S equity mutual funds. Thus, it is important to explore why such behavioral factors immensely intensify home bias. Here, one thing that allows investor behavior to have a significant effect on U.S. equity funds is the lack of use of quantitative models in portfolio allocation. The organization of a fund and the managerial supervision affects foreign investments in mutual funds. Given such a scenario, few global managers regularly allow quantitative models to play a major role in asset allocation. Instead of designing and using a standard optimization model for portfolio construction, managers usually depend on auxiliary assumptions and historical returns while choosing securities. Both the assumptions that are based on available information, and the historical returns, which is largely absent for less know securities, limit international diversification of equity mutual funds.

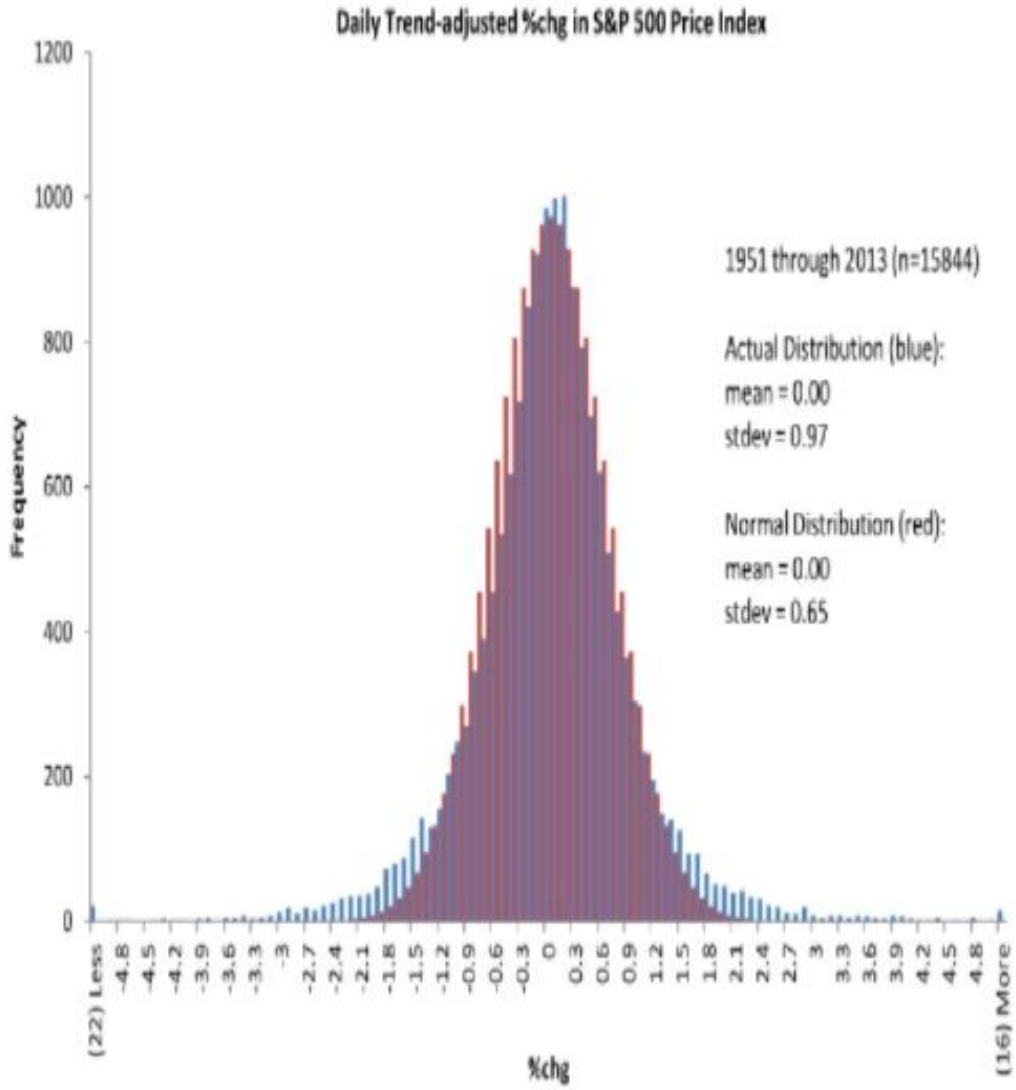

Figure 3: S&P 500 Price Index
Source: American Enterprise Institute

It is also important to realize that North American market returns arguably follow a certain pattern of normal distribution[26]. For instance, figure 3 illustrates the daily Standard and Poor's 500 stock price change for each day the markets were open during the years 1951 to 2013. The resulting series of trend-adjusted daily stock price changes since 1951 traces a bell curve, which makes calculating means of different variables

easier. Foreign securities, especially emerging market securities, on the other hand, cannot be valued using the same type of mean-variance analysis. Also, because these markets are undergoing constant changes, it is almost impossible to utilize historical information in order to draw proper correlations between events and returns. Therefore, new quantitative models that incorporate market changes could be developed to study foreign markets effectively so that international securities are included more on mutual fund portfolios.

However, within the literature, very few studies focus on quantitative asset allocation models for mutual funds and rather heavily talk about managerial style. There are few research works that explore the lack of use of quantitative models in mutual fund portfolio allocation. For instance, Huberman (2001) shows that people often ignore the principles of portfolio theory and invest in on what they are familiar with. Black and Litterman (1992) discuss the importance of mathematical models for mutual fund portfolio construction and point out the ignorance of these models by fund managers. They talk about introducing a global CAPM equilibrium in models to provide neutral starting points for estimating the set of expected returns needed to drive portfolio optimization. Similarly, Didier, Rigobon, and Schmukler (2010) use the mean-variance strategy to achieve better risk-adjusted returns by broadening asset allocation, including foreign securities. They argue that unexploited gains in mutual funds from international diversification mainly exist due to the organizational aspects of the fund, where portfolio construction is driven through behavioral factors instead of quantitative mathematical models.

III. International diversification

The reason I explored home bias has to do with the fact that it keeps the U.S. equity mutual funds from greatest diversification benefits. The supporters for investing primarily in domestic markets believe that given the size and dominance of the U.S. economy, it only makes financial sense to invest in domestic market for consistency in the returns. Here, the U.S. currently being the leading economy in world happens to be a fact, but the idea of garnering consistence returns primarily through domestic investment does not hold true. This is because the U.S market like any other market in the world is susceptible to economic shocks. The biggest examples of this is the financial shock of 2008. During such domestic crisis, funds focusing on U.S. equities would be susceptible to huge losses. Internationally diversified mutual fund equity portfolios, on the other hand, could be exposed to similar magnitude of losses only in times of a global crisis that would affect every single nation with the same magnitude. Such a global financial crisis is less likely to take place in comparison to internal domestic financial as the global crisis occurs in different nations in varied periods of time.

This is why a significant amount of research on home bias in equity mutual funds stems from the possible advantages that international diversification might bring with it, where scholars are trying to understand the existence of home bias even when there are benefits associated with international diversification. Such studies explore the pros and cons of international diversification where the advantages mainly revolve around higher returns and lower risks. Here, the international investment helps to raise the return with a given risk and/ or helps lower the risk with a given rate of return. This happens because

more profitable investment avenues exist in different parts of the world and at the same time, the inter-country dissimilarities reduce the risk. Odier and Solnik (1993) explore the benefits of international diversification in relation to enhanced return potential from investing on international companies that may be growing faster than their U.S. counterparts. They also argue that while the international markets in general seem more volatile, including them in our mutual fund portfolios would actually lower the overall volatility of our portfolio.

However, scholars also point out risks associated with international diversification. These risks include political or economic instability in foreign countries and fluctuating foreign exchange rates. Here, Solnik (1974) acknowledges the institutional risks through the gap between the currency hedged and un-hedged curves, but still asserts that it is better to diversify internationally than to hold only U.S. stocks. This is because, it is clear that the gain from having independence of returns due to holding securities of different countries in a portfolio more than offsets any institutional risk that this implies, even when not hedging. Similarly, Yuan (2004) asserts that diversification is the most important tool to lower non- systematic risk, i.e. company- or industry-specific hazard that is inherent in each investment, by investing in variety of financial assets. The key here is to invest in assets that are not correlated to one another, assets that are not influenced by similar factors and do not function the same way. Under such a scenario, geographic diversification would generate superior risk-adjusted returns for mutual fund managers by reducing overall portfolio risk while capturing some of the

higher rates of return offered by the international market, especially the emerging markets of Asia and Latin America with higher rate of economic growth.

Hence, through my paper, I aim to show that international diversification is the most important tool to lower non-systematic risk and to allow U.S. equity mutual funds to perform better in times of crisis. Here, non-systematic risk is the type of uncertainty that comes with the company or industry you invest in. For example, news that is specific to a small number of stocks, such as a sudden strike by the employees of a company you have shares in, is considered to be non-systematic risk. Whereas systematic risk, also known as market risk, is the uncertainty inherent to the entire market or entire market segment. Also referred to as volatility, systematic risk consists of the day-to-day fluctuations in a stock's price. Non-systematic risk, unlike the systematic risk can only be lowered through diversification and my argument of international diversification acting as a tool to improve the performance of equity mutual funds by lowering non-systematic risk is based on two major findings.

The first is that the lack of correlation between U.S. equity market and the foreign equity markets would lower the risk in fund portfolios. Foreign markets are not correlated with U.S markets because every nation runs on business cycles occurring in different points in time, where different political and economic policies, unique to every nation, determine the performance of a nation’s economy. Here, the idea of correlation is important for portfolio construction because low correlation means that different external factors will not be able to affect every equity holding in the portfolio. Thus, the low correlation between U.S. and international markets limits mutual fund portfolios’

exposure to non-systematic risk, company or industry specific risks that is inherent in every investment. Also, this low correlation between the two markets prove even more advantageous during the periods of domestic economic shocks, where the relatively better performance of foreign markets will limit losses in global fund portfolios.

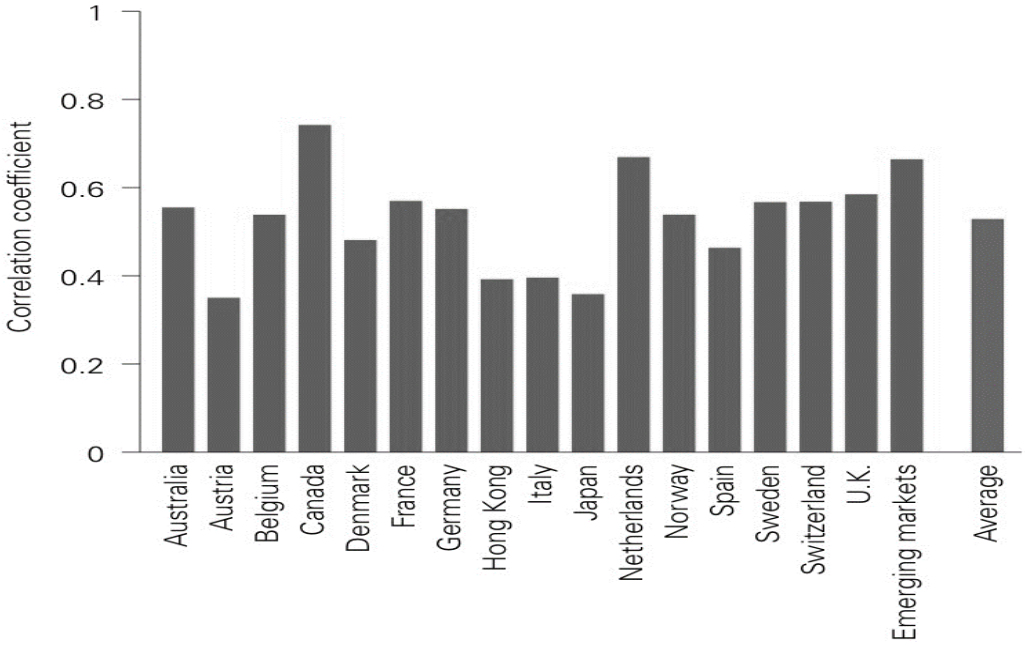

Figure 4: Correlation of yearly returns in foreign equity markets with the U.S. equity markets (1988-2013)
Source: Vanguard Research

Figure 4 shows that the correlation of U.S. equity market varies across different nations. This variation further increases diversification benefits in mutual fund portfolios. Therefore, the U.S. equity fund managers should realize the diversification benefit from investing globally because the equity markets in other developed economies are less-than-perfectly correlated with the U.S. equity market[27]. With such low and differing correlation, a diversified equity mutual fund portfolio will reduce risk by offsetting losses from some equities with the gains from other equities.

	Total return	Total return volatility	Return/ volatility
International stocks	11.19	16.69	0.67
U.S. stocks	10.72	15.36	0.70
Global equity portfolio	10.55	14.38	0.73

Figure 5: The performance characteristics of equity portfolios (yearly returns 1970-2005)
Source: Vanguard Research

Similarly, a diversified portfolio not only contains merits of lower non-systematic risk from international equities but also has the lower volatility characteristics that domestic equities bring with themselves. For instance, Figure 5 shows that although international stocks have historically posted a higher average return than U.S. stocks, the return, however, is accompanied with higher volatility. However, when U.S. and international stocks are combined in a global portfolio, the result has been often projected lower average volatility and higher risk adjusted returns[28]. Therefore, the higher volatility risks of international equities are counterbalanced by the domestic equities.

The second finding is that it makes more sense to hold a portfolio that is diversified across a number of countries since it is nearly impossible to predict which market will be a top performer in a given year. It is rare to find any single market that has consistently performed among the top global stock markets and holding international stocks would allow fund managers to capture returns from highest performing markets. Therefore, the independent movement of global markets, which react to factors such as different domestic monetary and fiscal policy cycles, provides considerable

diversification benefits when held in combination with the U.S. investments. Thus, global diversification could be an opportunity to participate in whichever regional market is outperforming.

In addition to that, U.S. equities are mainly exposed to U.S. economic and market forces, while stocks based outside of the United States are not exposed to similar forces. Therefore, these differing economies and markets produce returns that can vary from those of U.S. stocks. Here, the lack of correlation between the U.S. market and international markets not only caters to lowering non-systematic risk in portfolios, but also increases the possibility of capturing returns from different markets.

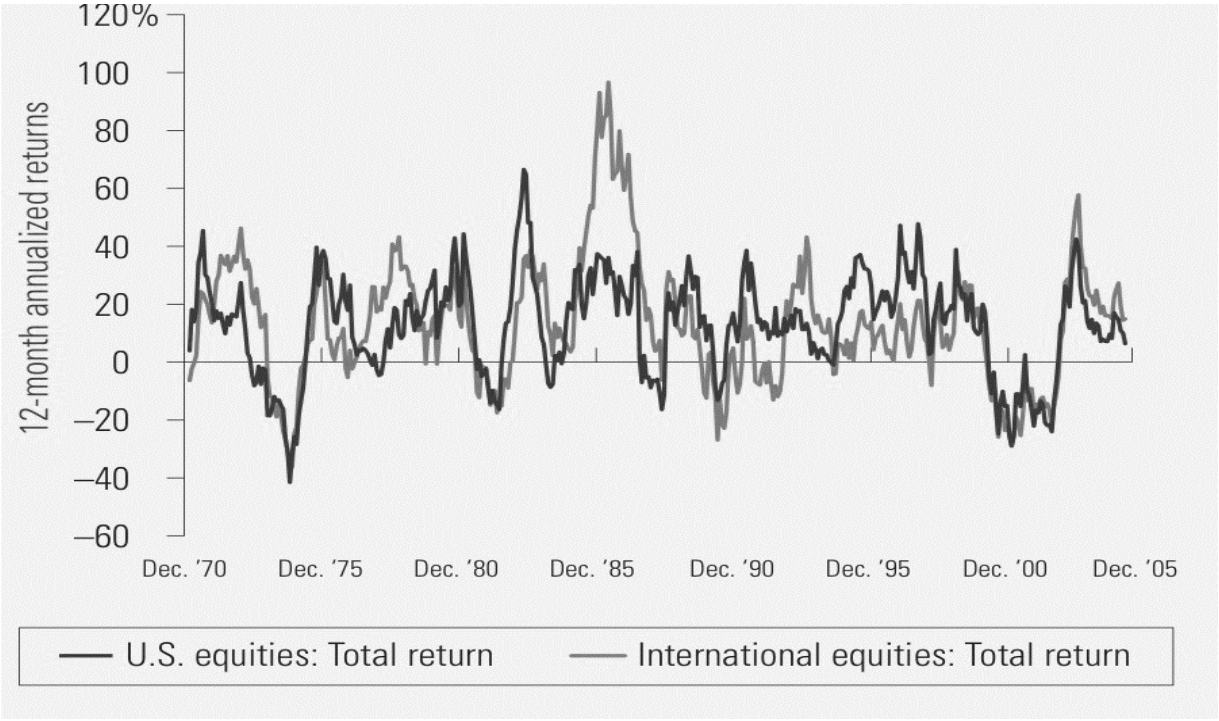

Figure 6: Short-term yearly returns for the U.S and international equity portfolios (1970-2005)
Source: Vanguard Research

Figure 6 shows the alternating patterns of outperformance of U.S. and international stock markets. For example, in the mid-1980s, exposure to international equities would have allowed a U.S. investor to participate in the outperformance of those equities. This tells us that there is a high dispersion of equity returns all over the world. In addition to that, non-U.S. and emerging market equities are considered to have relatively low-valuation in comparison to their long term averages in the last ten years[29]. This exhibits possibility of high growth in the prices of such undervalued international equities. Also, it is important to realize that individual investors in the U.S hold multiple mutual funds with the aim of diversifying their investments, however, top performing mutual funds in the U.S. hold similar securities[30]. Hence, holding multiple mutual funds acts like holding more amount of the same fund; therefore, introduction of foreign securities can cater not only to mutual fund portfolio diversification, but also to a variation of mutual funds available to us.

Moreover, it is important for a mutual fund portfolio manager to not only increase returns on the portfolio through successful prediction of future security prices, but also to minimize the amount of risk exposure of the fund portfolio. Here, since differences exist in levels of economic growth among various countries, international portfolio diversification can be used as a means of reducing risk and capturing unexpected returns. For instance, the 1990s witnessed an explosion of international portfolio investment, especially among emerging markets, where mutual fund companies such as Janus and Templeton achieved phenomenal rates of return on their investments during the mid to late 1990s[31]. Therefore, while performances of these mutual funds over the long haul

vary, it is still true that diversification reduces risk at a given level of return. Here, given the inherent institutional and behavioral barriers to international investment, fund managers have not fully captured the benefits of international diversification. Therefore, a vastly expanded opportunity set combined with the benefits of diversification suggests that a proper allocation to international stocks should be implemented in the U.S. equity mutual funds.

IV. Methodology:

1. Dataset

In the process of figuring out the exact nature of the study, the data sets used became one of the most important factor. The most widely used mutual fund databases in the recent times is Morningstar. Morningstar is well known among a large segment of individual investors as the de facto standard for mutual fund information. It accounts for information primarily derived from the annual reports submitted by the mutual fund companies. Through Morningstar, a dataset of 1235 equity mutual funds was accumulated for my paper. These mutual funds included domestic, global, and foreign equity mutual funds that were further divided under different categories based on their investment style. The dataset included the annual returns and the risk measures for each fund that ranged for 10 years. Table 2 provides a snapshot of the dataset compiled through Morningstar.

Total Number	1235
Global	528
Domestic	234
Foreign	437
Categories	- Energy Equity - Equity Precious Metals - Global Large-Cap Value Equity - Global Long Short Equity - Europe Long Short Equity - Europe Stock, India Equity - Japan Stock - Latin American Stock - Long Short Equity - Long Only Equity - US LargeCap Growth Equity - US SmallCap Equity - World Stock
Time Span	2004-2014 (Annual)
Returns	YTD Returns, 1 year, 3 years, 5 years, 10 years Returns
Risk	Beta, Standard Deviation

Table 2: Morningstar mutual fund data

2. Sample Selection

The sample selection was based on several screening factors. First was the type of mutual fund, where the foreign funds were eliminated from the dataset. This is because foreign funds contain purely international stocks. The study, however, is focusing on the nature of domestic funds and suggesting an optimal mutual fund portfolio with both domestic and foreign stocks allocations, portfolios that somehow resembles global fund portfolios that include both national and international equities.

After excluding the foreign funds, funds with lowest returns in the last 10 years were eliminated. This was done to tackle the problem of disappearances of mutual funds,

where funds going out of business due to extremely low returns were being dropped out. This was causing incomplete information in the dataset. Hence, the dataset was filtered based on the highest 10 years returns, which resulted to a set of 100 mutual funds with 50 domestic funds and 50 global funds.

3. Analyses of the Sample

After the dataset was compiled, the first step in analysis was calculation of averages, standard deviation, and median of the returns and risk measures for both domestic and global funds. Table 3 and Table 4 show the results.

		Returns				
		1 Yr	3 yrs	5 yrs	10 yrs	YTD
Domestic Equity Mutual Funds	Average	9.19 %	19.94%	15.57%	10.62%	-0.67%
	Median	9.21%	19.86%	15.56%	10.47%	-0.64%
	Standard Deviation	0.04	0.03	0.02	0.01	0.02
Global Equity Mutual Funds	Average	2.32%	14.54%	9.78%	6.43%	0.52%
	Median	2.12%	13.95%	10.01%	5.92%	0.77%
	Standard Deviation	0.04	0.03	0.29	0.02	0.01

Table 3: Annual Returns of Domestic and Global equity mutual funds (2004-2014)

		Risk	
		Beta	Standard deviation
Domestic Equity Mutual Funds	Average	1.02	12.11
	Median	1.06	12.00
	Standard Deviation	0.15	2.09
Global Equity Mutual Funds	Average	1.00	11.27
	Median	1.02	11.2
	Standard Deviation	0.16	1.49

Table 4: Risk- levels exhibited by Domestic and Global equity mutual funds (2004-2014)

The statistics from Table 3 illustrate higher returns for domestic funds and lower returns for the global funds. The returns for domestic equity mutual funds consistently have a higher average returns for 1, 3, 5, and 10 years periods in comparison to the global equity mutual funds. Similarly, they exhibit a higher medians and lower standard deviations for the same values. The higher average and median values indicate better returns for the domestic funds and lower standard deviation establishes the reliability of the data. On the other hand, the low average and median values for the global funds indicate their lower performance.

Similarly, the statistics for Table 4 illustrate higher beta and standard deviation values for the domestic funds. Hence, the domestic funds are more volatile than the global funds given the higher beta and standard deviation values. The domestic funds, in comparison

to global funds, indicate a higher averages, medians, and standard deviation values for all the risk metrics. This tells us that the domestic funds are more exposed to systematic risk than the global ones.

Moreover, given the dataset analysis, the domestic funds indicate better returns than the global funds, but tend to be more risky as well. This result of higher returns contradicts my arguments and discourages international diversification of U.S. equity mutual funds. However, it remains incapable of fully exploring my hypothesis, which primarily supports an encouragement of international diversification to protect mutual funds from domestic financial shocks. The aforementioned dataset analysis provides a bigger picture of mutual funds' performance, but does not allow me to look closely into the periods of domestic shocks. Hence, I collected more data, which included monthly returns for top performing domestic and global equity mutual funds. As Morningstar does not contain monthly data on mutual funds, I switched my database to Bloomberg. The Bloomberg Terminal allowed me to extract monthly price values and 30-day volatility values for both domestic and global funds. Using the price values, I then calculated the monthly returns for the fund, i.e. Returns = (new price – old price)/ old price. Figure 6 provide a snapshot of the calculated returns over the period of 2005-2014. These average returns state the average of total monthly returns (summation of individual fund returns) for a given month. Similarly, figure 8 shows the pattern for average 30-day volatility of total monthly volatility (summation of individual fund's 30-day volatility) for a given month.

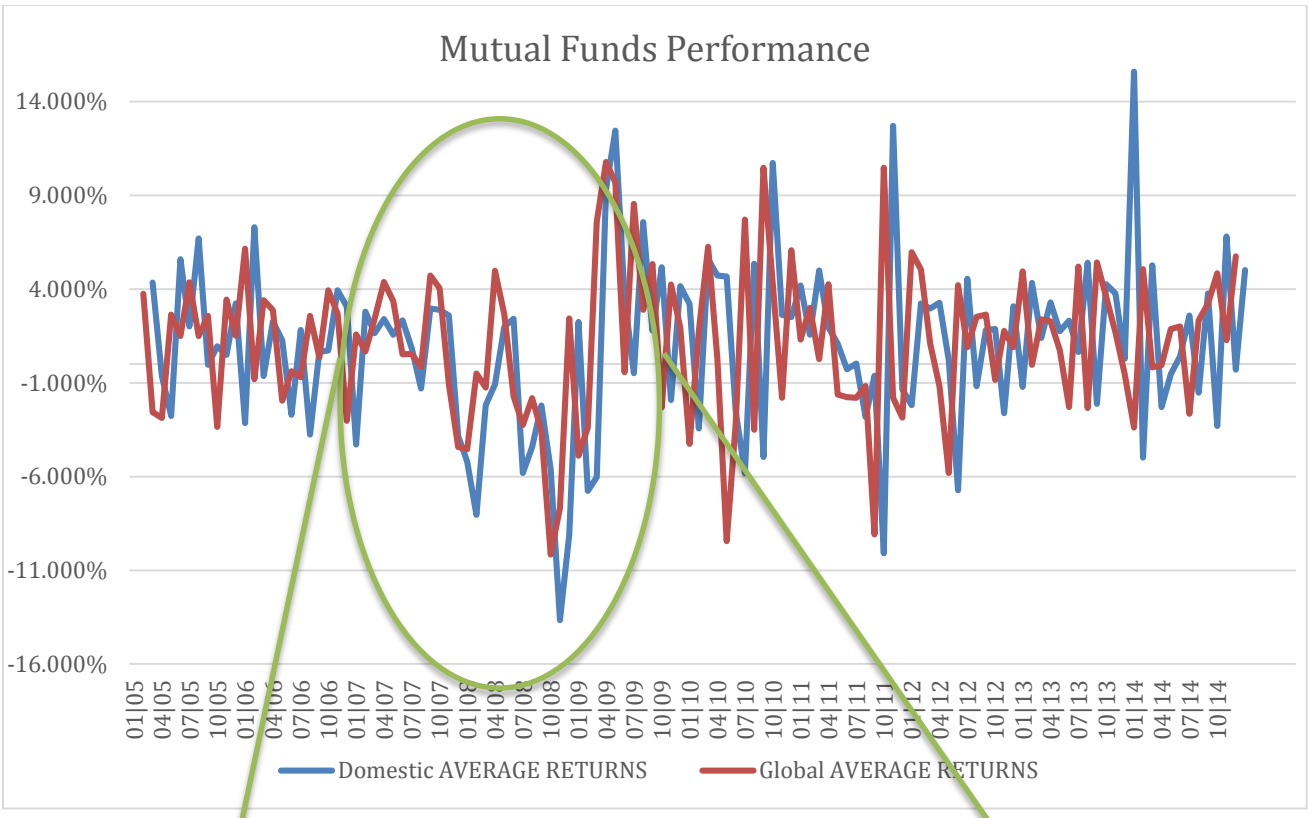

Figure 6: Monthly total average returns (2005-2014)

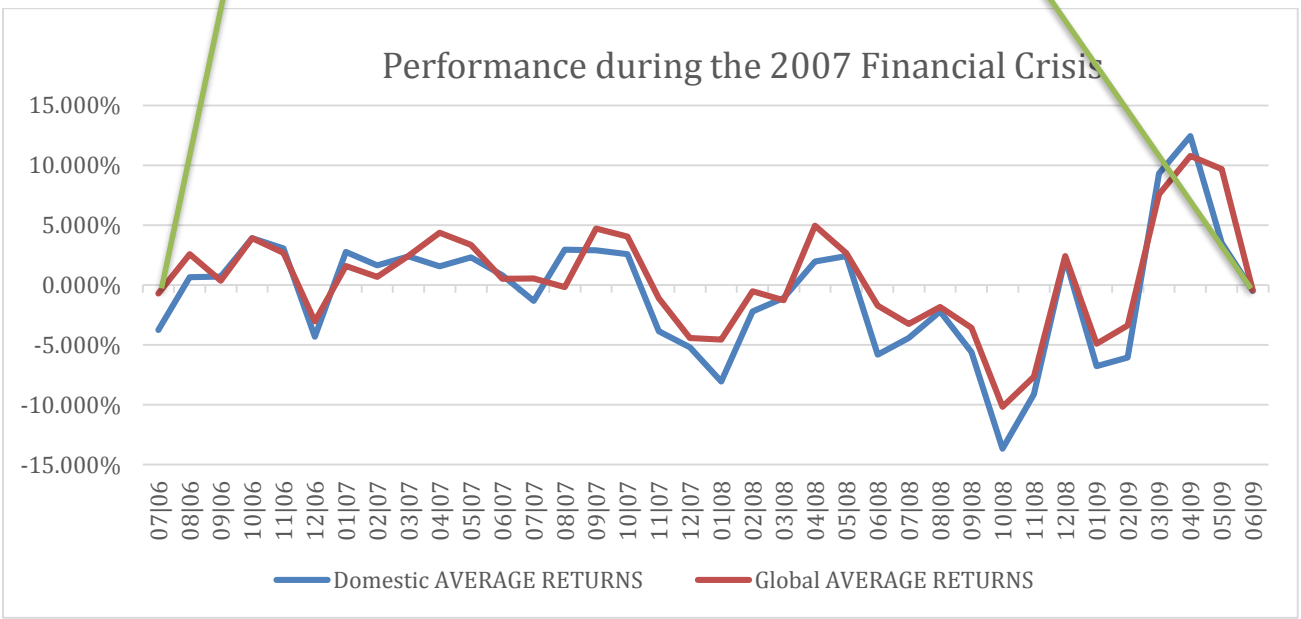

Figure 7: Monthly total average returns (mid 2006- mid 2009)

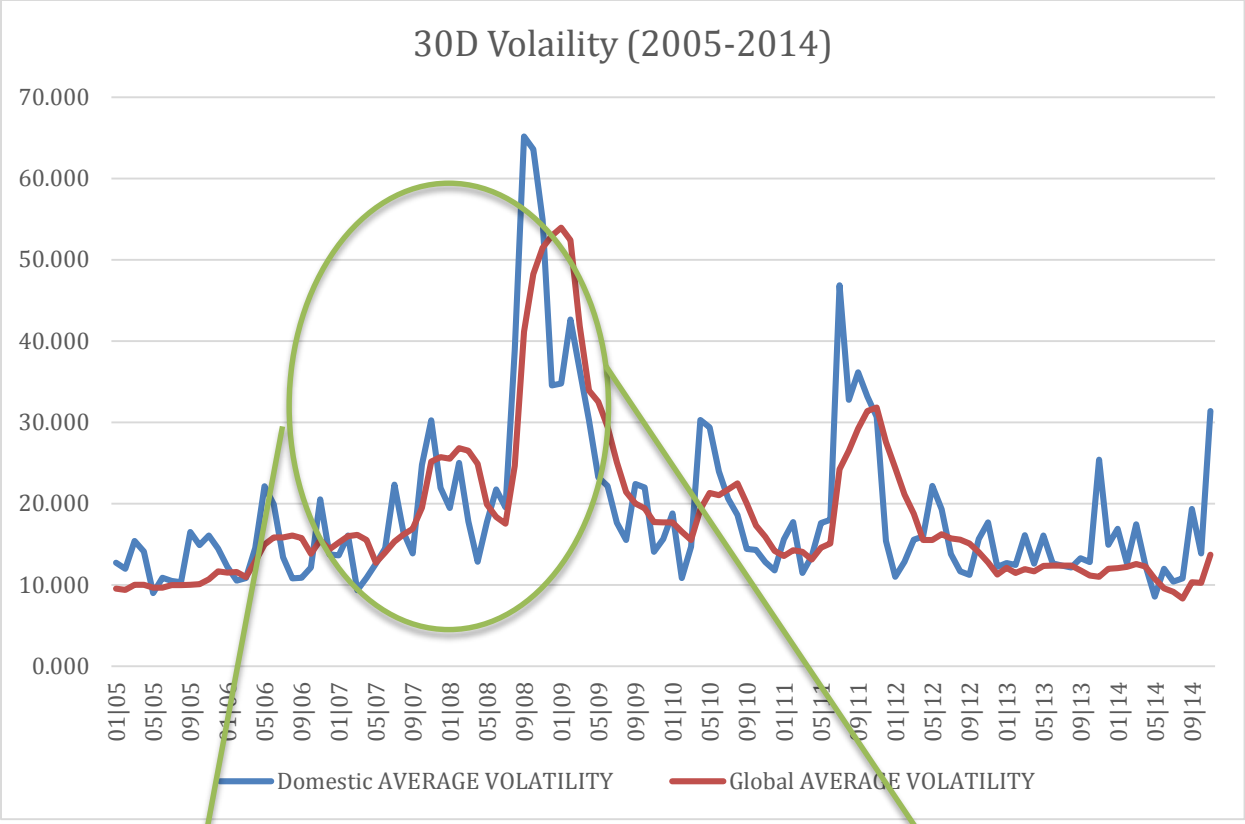

Figure 8: 30-Day Average Volatility (2005-2014)

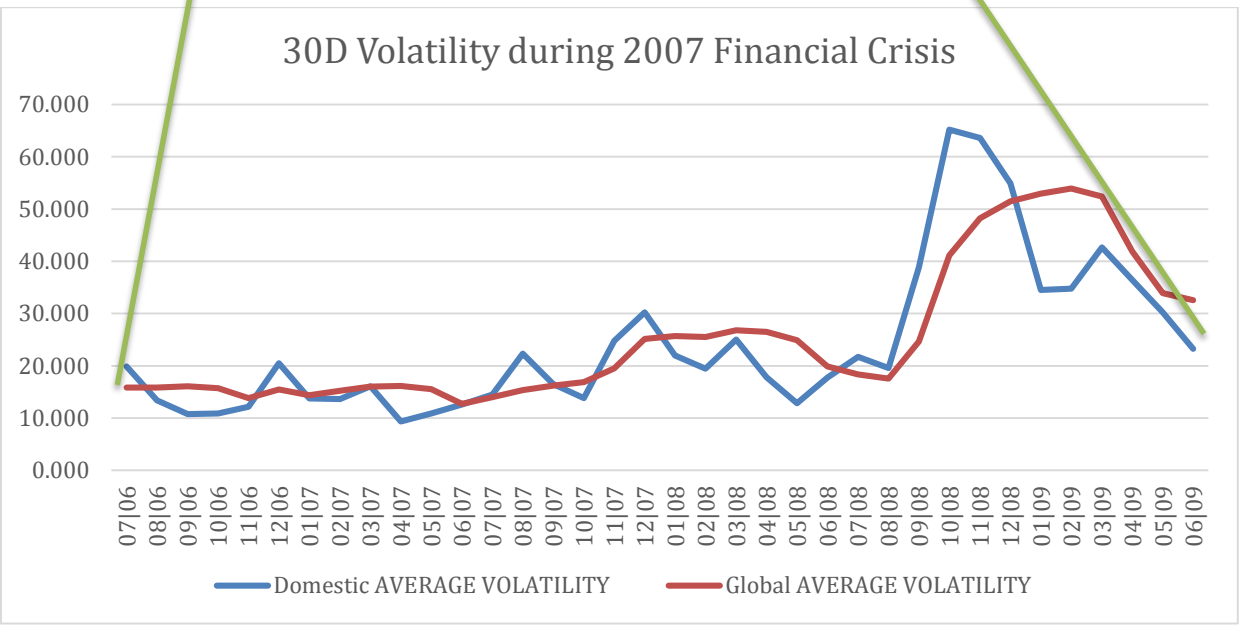

Figure 9: 30-Day Average Volatility (mid 2006- mid 2009)

The results for computed monthly returns indicate a better performance by domestic funds especially during the periods of 2005 and 2013 onwards. However, during the period of crisis (Figure 7), global funds have consistently performed better than the domestic funds. Similarly, if we look into the volatilities of the funds, both figure 8 and figure 9 show smoother curves for global funds; indicating that there is less fluctuation in the prices of the global equity mutual funds in comparison to U.S. domestic equity mutual funds.

V. Empirical Results:

After getting an overall picture of returns and risk patterns for the domestic and global equity mutual funds, the next step was to compute and analyze the empirical results. The monthly prices for the mutual funds not only helped in acquiring returns for the funds (as shown in Result Table 1), but also helped in calculating the beta and alpha **(α)** values for them. The beta of a fund measures the systematic risk the fund is exposed to and tells how volatile the fund is in comparison to the market. Alpha, on the other hand, shows excess return of the fund relative to the return of the market. This tells us whether or not the fund has outperformed the market, and if yes, by what percentage.

The calculation of beta and alpha values were conducted by using the Capital Asset Pricing Model (CAPM), since both the values happen to be CAPM parameters. The formula used for the computation of betas and alphas is given below:

$$\mathbf{RET_i = \alpha_i + \beta_i\, RET_i^M + u_i}$$

RET_i = Expected returns of asset i; α_i= Alpha value; β= beta value; RET_i^M= expected market returns; u= non-systematic risk or diversifiable risk.

Here, the market returns (RET_i^M) were calculated by collecting monthly prices of relative index benchmarks. In order to compare domestic equity mutual funds to the market, the monthly returns for S&P 500 index were calculated through the changes in their monthly prices from 2005-2014. Similarly, the monthly returns for iShares S&P Global 100 index (2005-2014) were calculated for the global equity mutual funds.

Then, the values of alpha and beta were acquired by running a regression using the individual fund's monthly returns (RET_i) and the appropriate index's monthly returns (RET_i^M). The regression plots a Security Characteristic Line (SCL), which is again based on the CAPM formula, where beta happens to be the slope and alpha happens to be the intercept of the regression line. After repeating the process for every domestic and global equity fund in the sample, the average betas and alphas for each fund were calculated (as shown in Result Tables 2 and 3).

Finally, the values were sorted according to different time periods and histogram calculation was conducted to understand the patterns of fund returns and risk in respective time periods. The results are shown below:

RETURNS	Average		Median		Standard Deviation	
	U.S. Funds	Global Funds	U.S. Funds	Global Funds	U.S. Funds	Global Funds
1 year (2013-14)	1.76%	1.82%	1.34%	2.85%	0.06	0.07
3 years (2012-14)	28.09%	30.51%	27.95%	27.55%	0.16	0.15
5 years (2010-14)	61.26%	48.35%	57.42%	43.61%	0.24	0.26
Max (2005-14)	71.06%	51.10%	75.01%	43.13%	0.33	0.41
Recession (mid 2006-mid 2009)	-37.17%	-31.48%	-37.37%	-32.28%	0.12	0.10

Table 5: Returns U.S. domestic equity mutual funds

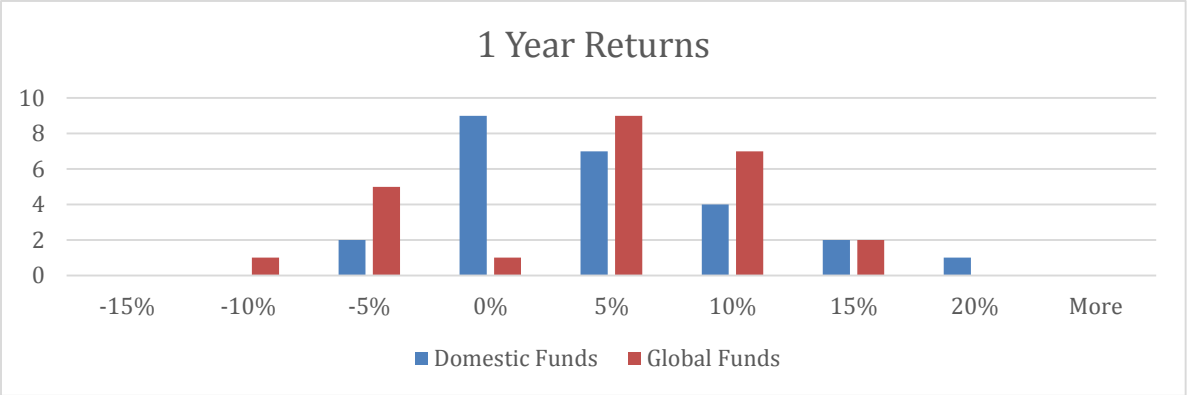

Figure 10: 1 year returns (2013-2014)

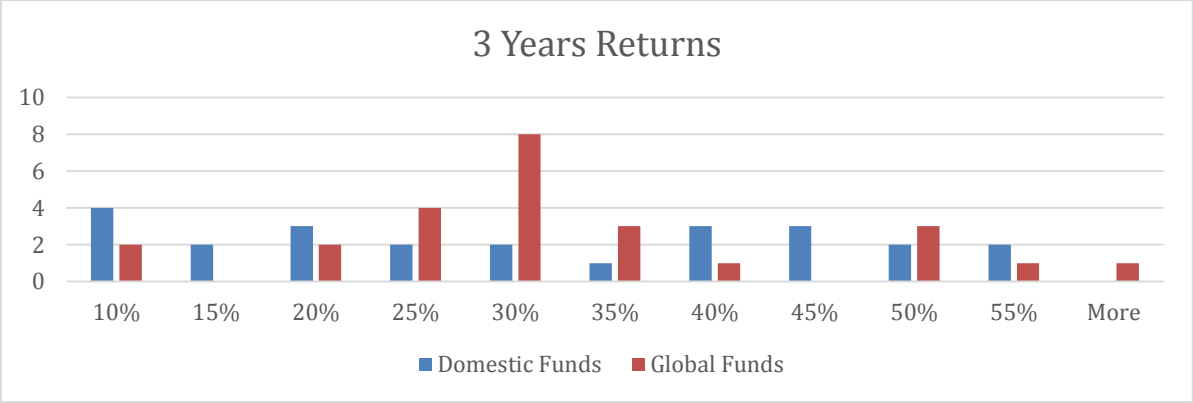

Figure 11: 3 year returns (2012-2014)

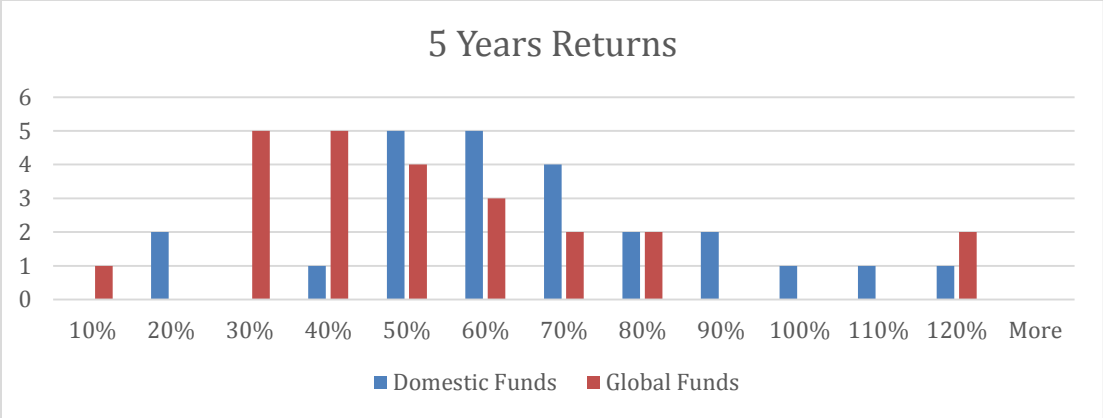

Figure 12: 5 year returns (2010-2014)

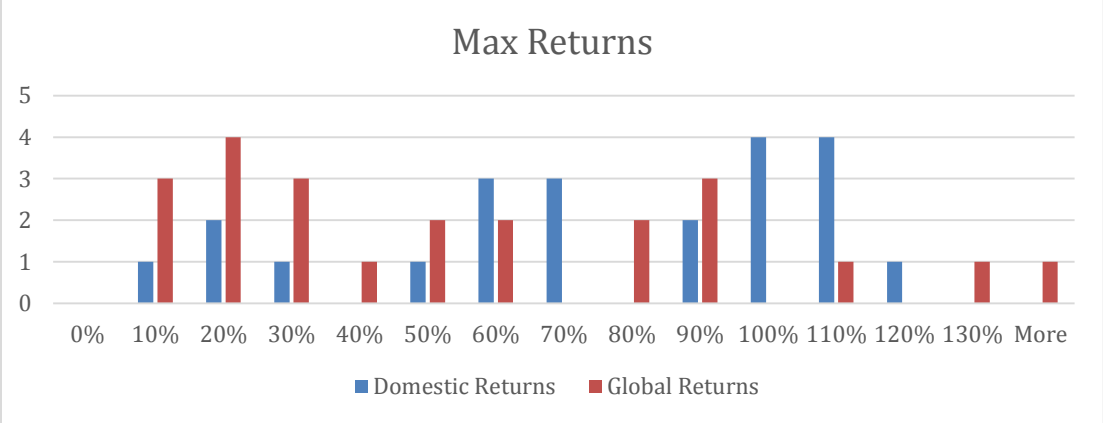

Figure 13: Maximum year returns (2005-2014)

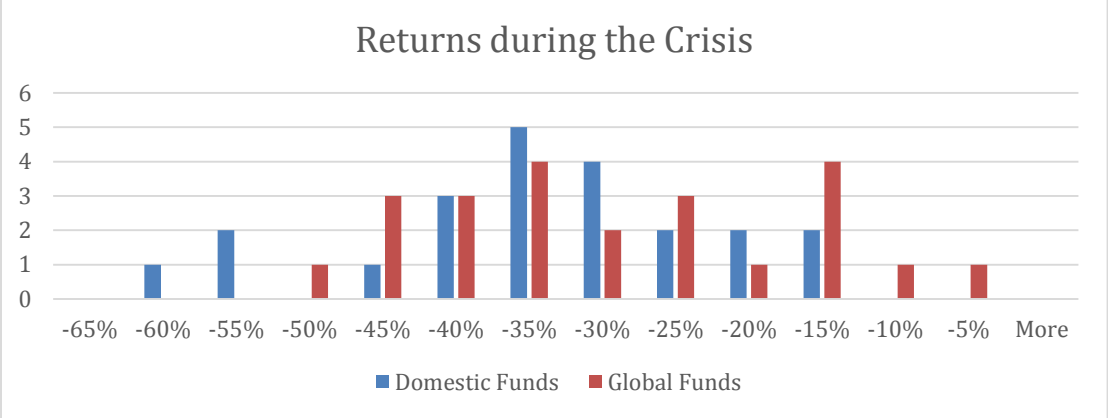

Figure 14: Returns during the financial crisis (mid 2006-mid 2009.)

If we look at the average and median values for the monthly returns for the mutual funds, performance remains divided during different time periods. The global funds have been performing slightly better than the domestic funds in the recent years where the average value of monthly returns for 1 year for the global funds is higher by 0.6% and for 3 years, they have been performing better by 2.42%. The 1 year median value for global funds exceeds the value for domestic fund by 1.51%. This tells us that, overall, global funds have acquired slightly higher monthly returns during 2012-2014. This can be observed at the frequency charts for the same time periods, where most domestic funds have witnessed returns between 0%-5% monthly returns during 2013-2014. For the same time period most global funds witnessed 5%-10% monthly returns. Similarly, during 2012-2014 most domestic funds experienced 10% monthly returns and few witnessed 40%-45% monthly returns. Most global funds, on the other hand, experienced 30%, 35%, and 50% monthly returns for the same time period.

However, domestic funds witnessed significantly higher returns during 5 years and 2005-2014 time period. On average domestic funds performed better than global funds by 12.91% during 2010-2014, and by 19.96% during 2005-2014. Also, the median values for domestic funds exceeded by 13.81% and 31.88% respectively. Hence, the domestic mutual funds, overall, acquired higher monthly returns during 2005-2014. This could be seen in the frequency graph as well, where most domestic fund experience returns between 50%-70% and global funds experienced between 30%-50% during 2010-2014. Similarly, during 2005-2014, most domestic funds garnered returns between 100%-110%, whereas global funds were between 20%-30% and 80%-90%.

However, if we specifically look into the periods of financial crisis, i.e. mid 2006-mind 2009, global funds are once again performing better than the domestic funds. Here, the average values for global funds exceeded domestic funds by 5.69%, and the median values exceeded by 5.09%. If we look at the frequency table, most domestic funds witness negative returns of 40%-30%, whereas global funds witnessed negative returns around 35% and 15%.

Now, if we look into the standard deviation values for the fund monthly returns in different time periods, the return values of domestic funds for 1 year, 3 years, and crisis time periods remain more volatile than global funds. However, global funds' return values for 5 years, and maximum time periods are more volatile than the domestic fund return values.

Similar mathematical calculations were conducted for the beta and alpha values for the funds and the results are as follows.

RISK (Beta)	**Average**		**Median**		**Standard Deviation**	
	U.S. Funds	**Global Funds**	**U.S. Funds**	**Global Funds**	**U.S. Funds**	**Global Funds**
1 year (2013-14)	1.25	0.90	1.30	0.85	0.230	0.193
3 years (2012-14)	1.12	0.94	1.14	0.95	0.121	0.108
5 years (2010-14)	1.11	0.92	1.12	0.95	0.139	0.109
Max (2005-14)	1.13	0.97	1.13	0.99	0.153	0.100
Recession (mid 2006-mid 2009)	1.14	0.87	1.07	0.95	0.290	0.329

Table 6: Beta Values

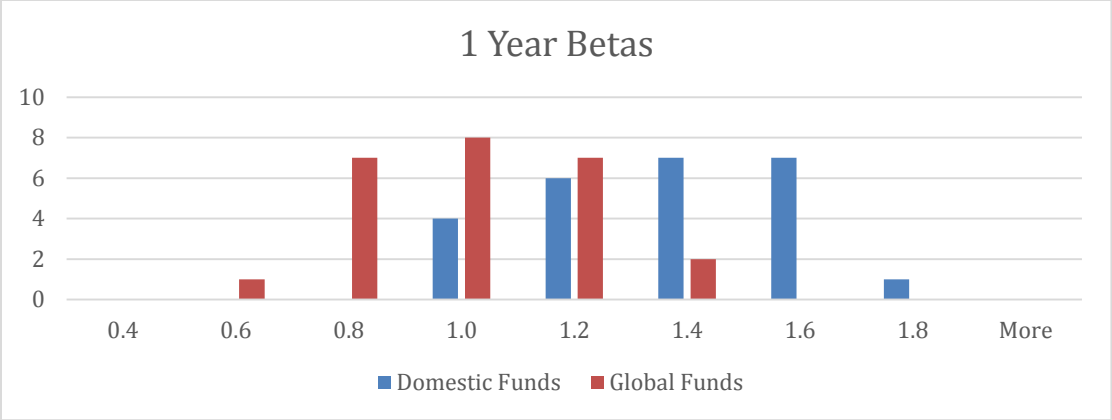

Figure 15: 1 year beta values (2013-2014)

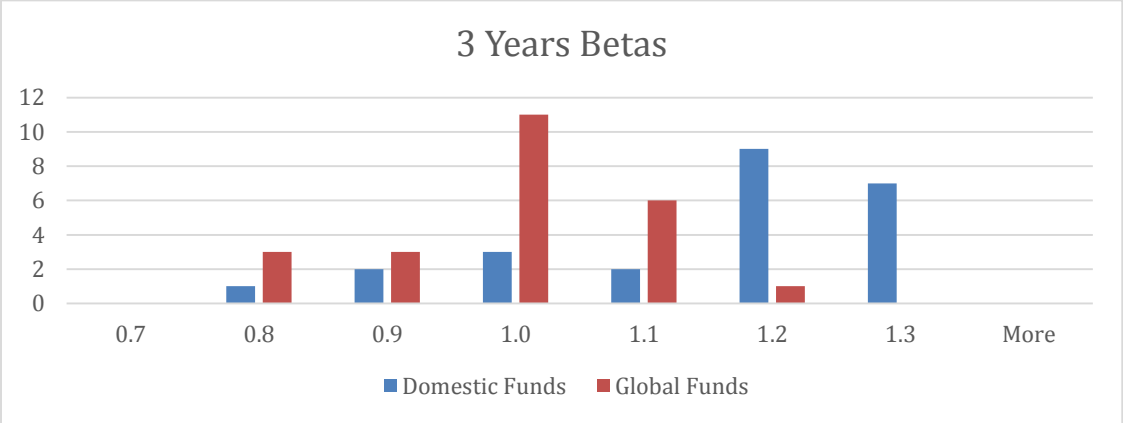

Figure 16: 3 years beta values (2012-2014)

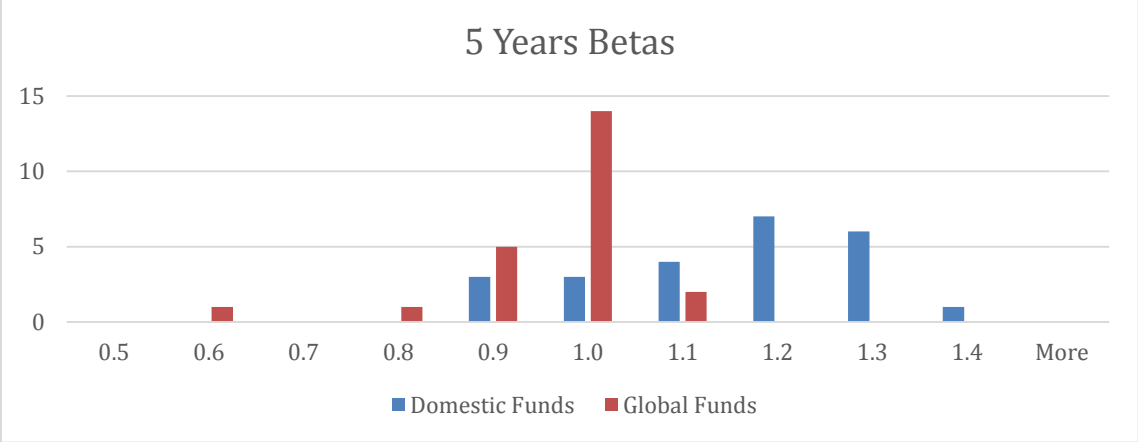

Figure 17: 5 years beta values (2010-2014)

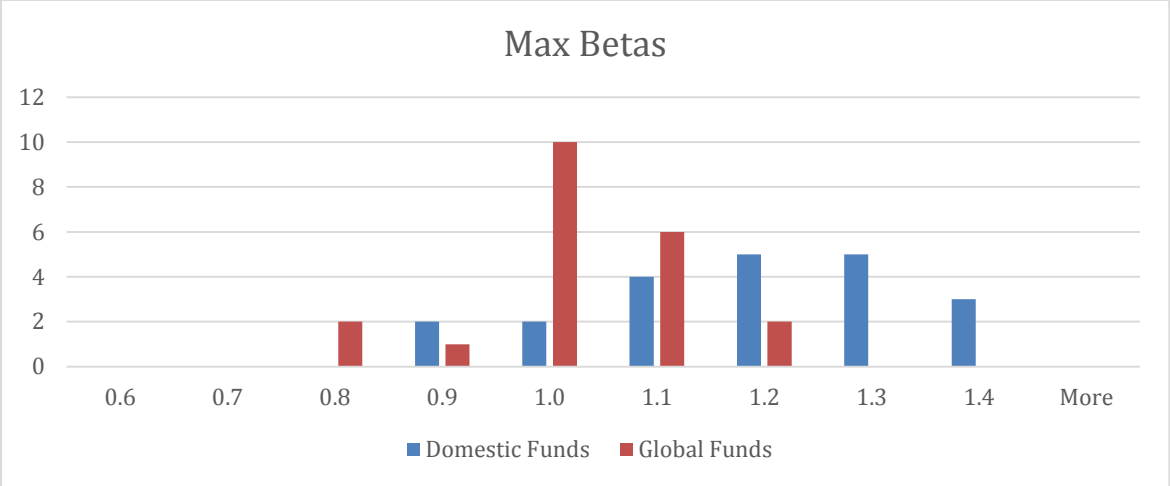

Figure 18: Maximum year beta values (2005-2014)

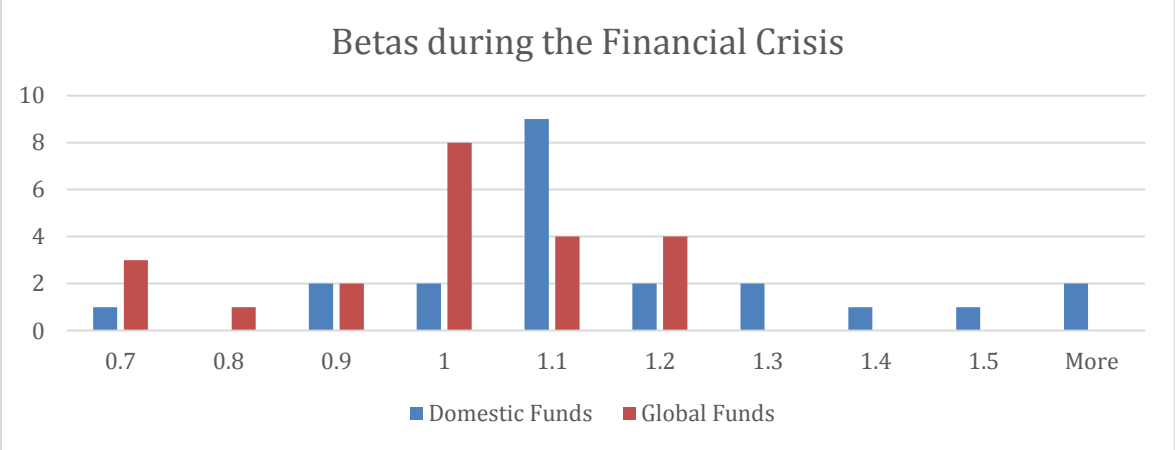

Figure 19: Beta values during the financial crisis (mid 2006- mid 2009)

The Beta values for the mutual finds show a clearer pattern than the returns for the funds. Given the average and median values, the global funds have consistently been less volatile than the domestic funds. The average values for domestic funds exceed he global funds by 0.35, 0.18, 0.19, 0.16, and 0.27 for 1 year, 3 years, 5years, 2005-2014, and during 2007 financial crisis time periods respectively. If we look into the frequency tables, most domestic funds have beta values around 1.4-1.6 for 1 year, 1.2-1.3 for 3

years, 1.2-1.3 for 5 years, 1.2-1.4 for 2005-2014, and 1.1-1.5 for mid2006-mid 2009 time periods. On the other hand, most global funds had .8, 1, .9, 1.1, and 1.2 beta values for the respective time periods. These values indicate that, at any given point of time with a given return, domestic funds are exposed to more systematic risk than the global funds.

Now, let us look at the results for alpha values.

RISK (Alpha)	Average		Median		Standard Deviation	
	U.S. Funds	Global Funds	U.S. Funds	Global Funds	U.S. Funds	Global Funds
1 year (2013-14)	-0.009	-0.001	-0.013	0.0002	0.024	0.005
3 years (2012-14)	-0.006	0.001	-0.009	0.001	0.011	0.003
5 years (2010-14)	-0.003	0.002	-0.006	0.002	0.013	0.003
Max (2005-14)	0.001	0.001	-0.001	0.0003	0.009	0.002
Recession (mid 2006-mid 2009)	-0.004	-0.003	-0.003	-0.002	0.006	0.005

Table 7: Alpha Values

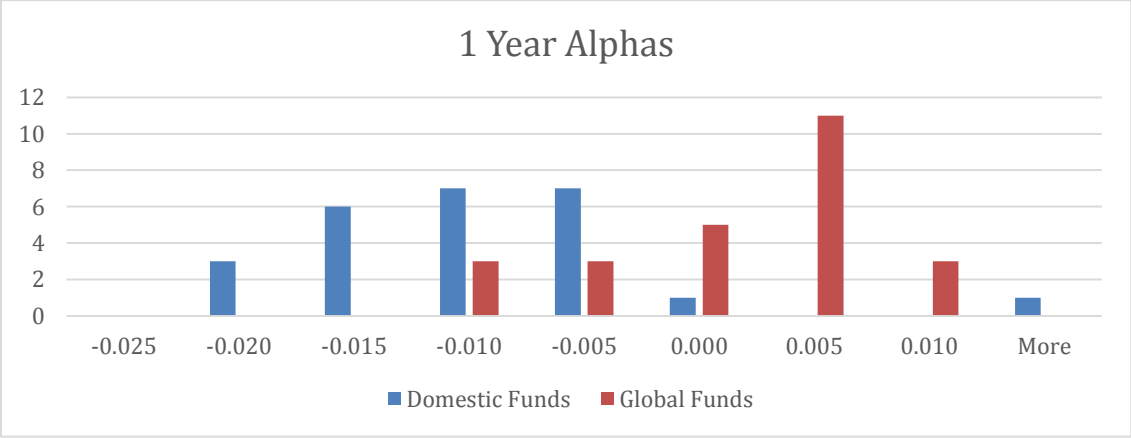

Figure 20: 1 year alpha values (2013-2014)

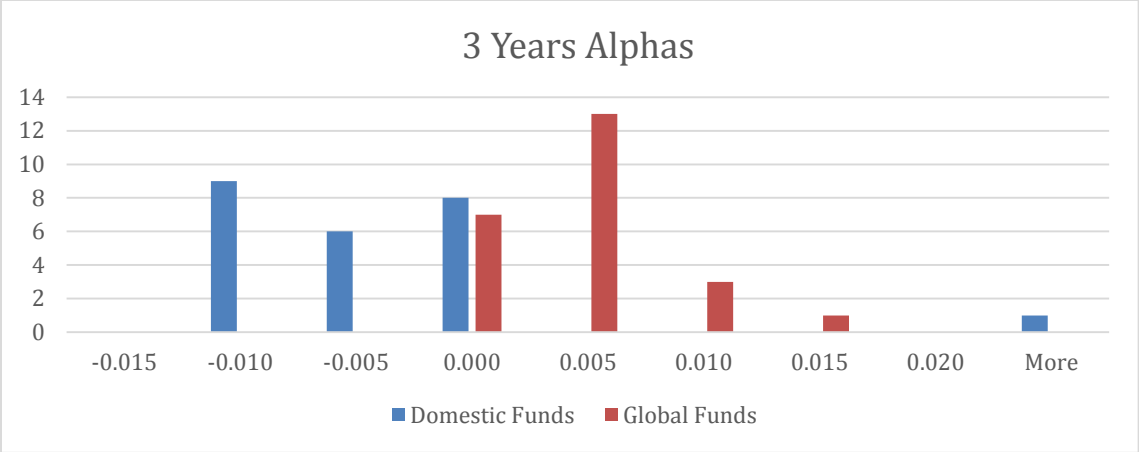

Figure 21: 3 year alpha values (2012-2014)

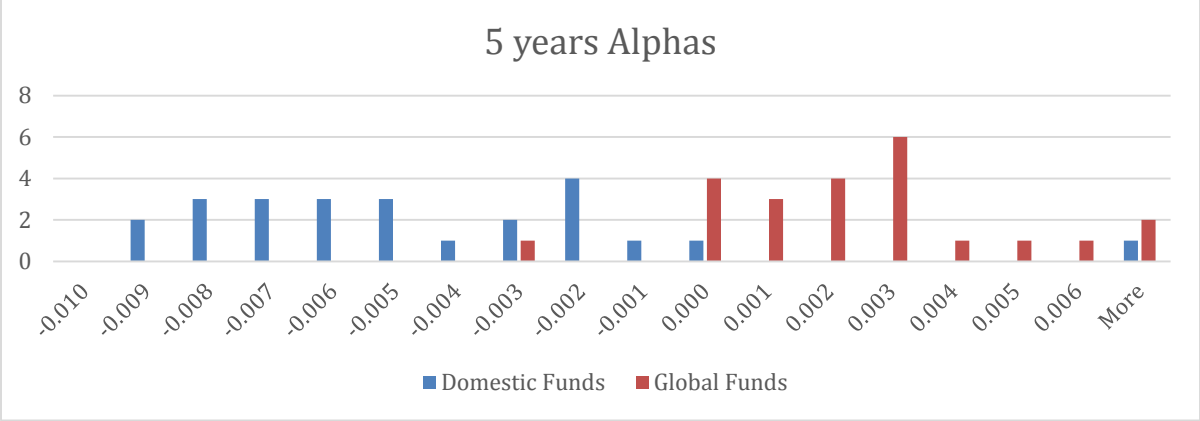

Figure 21: 5 years alpha values (2010-2014)

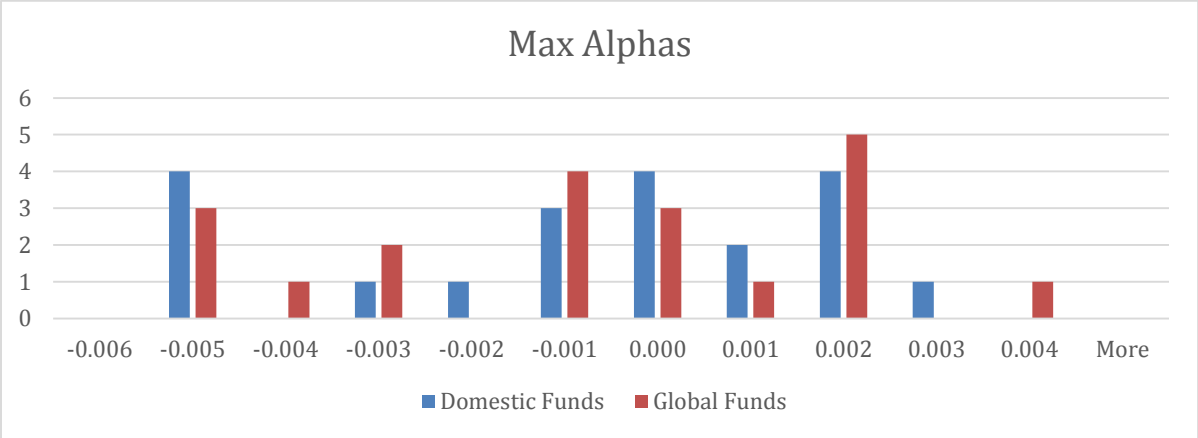

Figure 22: Maximum year alpha values (2006-2014)

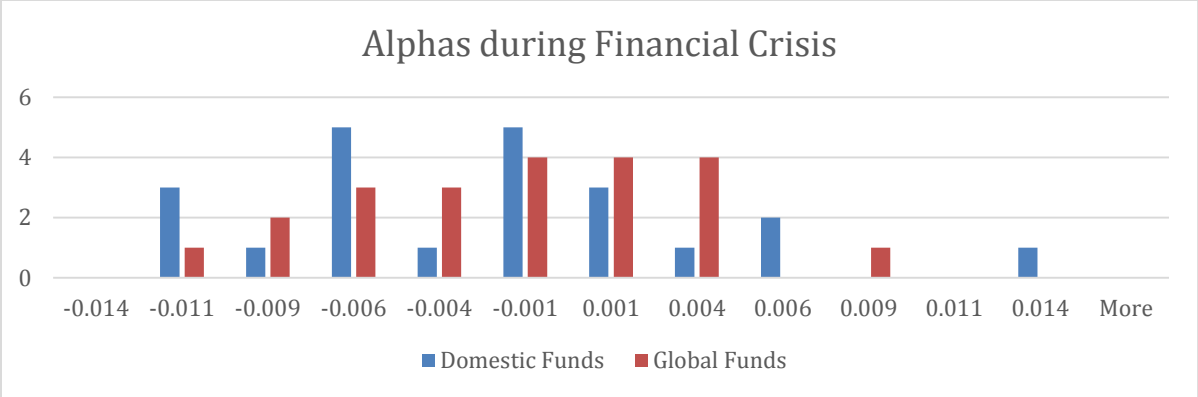

Figure 23: Alpha values during financial crisis (mid 2006-mid 2009)

Like the beta values, the alpha values of the mutual funds also indicate a clearer pattern. In comparison to the domestic funds, the global funds have outperformed the market with higher percentage (if alpha>0 the fund has witnessed better performance than the market index). The domestic funds performed poorly during 1 year, 3 years, and financial crisis periods by performing 0.9%, 0.6% and 0.4% lower than the S&P500 market index on average. For the same years, the global funds performed 0.1%, 0.1%, and 0.3% lower than iShares S&P Global 100 market index on average. Although both kind of funds performed lower than the market index, the global funds performed better than the domestic funds. In the 5 years period, while the domestic fund performed 0.3% lower than the market, the global fund outperformed the market by 0.2% on average. However, in 2005-2014 time period both types of funds outperformed the market by 0.1% on average. Similarly, the median values for the funds indicate a better performance by the global funds in comparison to the domestic funds. Here, the global funds have consistently outperformed the market by 0.02%, 1%, 2%, and 0.03% during 1 year, 3 years, 5 years, and maximum years' time-periods respectively. Whereas for the same

time periods, domestic funds have performed lower than the market index by 1.3%, 0.9%, 0.6%, and 0.1%. During the time of financial crisis, both type of funds have performed lower than the market index. However, the global funds have slightly performed better than the domestic funds, where it performed lower than the market index by 0.2% and the domestic funds performed lower than the market index by 0.3%. The frequency charts show a similar pattern. Here, most domestic funds have alpha values around -0.009, -0.006, -0.003, 0.01, and -0.004 for 1 year, 3 years, 5 years, maximum years, and during the financial crisis respectively. For the same time periods, the most global funds had alpha values around -0.001, -0.001, 0.002, 0.001, and -0.003 respectively.

VI. Conclusion:

This paper covers the recent empirical findings and theoretical reasoning for the home bias- the fact that managers overinvest in domestic stocks, in the U.S equity mutual fund industry. The provided explanations for the equity home bias are both institutional and behavioral factors. However, information asymmetries and behavioral biases do a better job in explaining the observed home bias. Here, the other proposed explanations seem to fail empirically in literature to explain the actual portfolio choices of investors. But, the challenge with this could be measuring the behavioral factors as psychological constructs, which are central to behavioral approach, are difficult to measure and to distinguish. Hence, after establishing that behavioral factors are central to the home bias phenomenon, it is important to seek ways to measure it to successfully understand its impact on home bias.

Several explanations for home bias have been brought forward throughout the paper, and the main reason as to why home bias in equity mutual funds is given such an importance is because it keeps the funds from the advantages of international diversification. Diversification is the only way to mitigate the non-systematic risks in a portfolio, and given the low correlation and varying economic cycles of different nations, international diversification plays a key role in keeping the entire equity fund portfolios from getting affected by a single factor. The only thing one needs to worry about, going forward, is the increasing correlation between nations. The correlation between foreign and domestic markets is increasing over time. Therefore, the idea of increased returns and decreased risk may not work with internationally diversified portfolios in future. Under such a scenario, the diversification of portfolios will have to be based on the characteristics of individual equity rather than just basing it on which country it originates from.

The advantages of international diversification could be seen in the empirical results of this paper. While the domestic funds had higher returns on longer time periods, the global funds have comparatively been doing better in past few years. In addition to that, if we take a closer look at the data, the global funds have performed better than domestic funds in the times of crisis. The observed performance is not only based on the returns, but also on the alpha values of the funds. Here, global funds have outperformed the market index more frequently than the domestic funds, especially during the financial crisis period. This supports the idea of diversifying portfolios across geographical boundaries to shield it from risks incurred during domestic financial crises.

One of the biggest advantages of international diversification is the lowering of non-systematic risk in portfolios. While the paper uses literature to provide facts for this argument, the empirical results show that international diversification would also help in lowering systematic risk in equity mutual fund portfolios. The systematic risk of portfolios is calculated through beta values and these values have consistently been lower for the global funds. Hence, the empirical results and extant research help in suggesting international diversification to mitigate both systematic and non-systematic risk in portfolios. In conclusion, the findings in this paper has a relevance in the discussion of ongoing home bias phenomenon in equity mutual funds as the empirical results establish the lowering of risk through international diversification.

NOTES

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APPENDIX

U.S. Domestic Mutual Funds	RETURNS				
	1 year	3 years	5 years	Max	Recession
TWHIX Equity	-5.882%	11.734%	56.383%	99.830%	-26.849%
HFMDX Equity	11.842%	47.476%	105.721%	87.940%	-44.553%
FOCPX Equity	1.337%	35.145%	85.758%	111.164%	-44.045%
TWGTX Equity	-3.448%	6.780%	40.520%	99.736%	-43.535%
SMVTX Equity	3.010%	31.508%	37.865%	13.328%	-60.176%
CPOAX Equity	-3.496%	21.610%	65.649%	101.938%	-39.889%
BMEAX Equity	-3.818%	9.091%	19.448%	69.195%	-24.021%
NVOAX Equity	-1.378%	6.017%	18.769%	57.254%	-32.403%
VHIAX Equity	7.180%	54.752%	110.735%	103.437%	-18.109%
NEAGX Equity	4.898%	46.609%	96.825%	91.857%	-29.762%
WEMMX Equity	2.628%	43.765%	76.844%	57.412%	-39.102%
HFCSX Equity	6.264%	42.299%	68.924%	64.831%	-39.015%
PGOFX Equity	-4.442%	20.091%	57.783%	47.941%	-37.141%
RBCGX Equity	-4.552%	6.003%	40.776%	95.810%	-19.057%
JAENX Equity	6.960%	38.379%	89.806%	104.457%	-32.065%
PRBLX Equity	15.236%	51.039%	72.415%	66.626%	-37.608%
DMCVX Equity	-0.025%	39.463%	50.995%	27.144%	-33.323%
AMANX Equity	11.526%	43.552%	68.254%	101.778%	-24.368%
JAVTX Equity	3.289%	17.030%	57.067%	15.573%	-55.931%
PARNX Equity	7.512%	26.619%	42.997%	58.608%	-33.473%
TSELX Equity	-3.818%	13.811%	48.498%	NA	NA
STCSX Equity	-3.811%	16.303%	43.811%	6.537%	-55.608%
BUFTX Equity	0.150%	29.282%	62.866%	80.832%	-47.739%
DMCRX Equity	2.273%	NA	NA	NA	NA
DBMAX Equity	-5.323%	15.789%	51.587%	NA	NA

Global Mutual Funds	RETURNS				
	1 year	3 years	5 years	Max	Recession
HLMGX Equity	5.966%	31.899%	50.942%	70.707%	-23.030%
TWGGX Equity	-2.335%	32.466%	56.342%	55.282%	-31.534%
FWWFX Equity	-7.775%	22.865%	47.195%	38.000%	-35.228%
GICPX Equity	1.511%	22.637%	71.453%	82.566%	-17.335%
JORNX Equity	9.091%	25.961%	39.419%	105.491%	-9.239%
DGSNX Equity	0.950%	53.615%	113.337%	121.308%	-41.161%
PGROX Equity	8.349%	27.987%	49.958%	88.137%	-19.800%
KGDAX Equity	-8.556%	17.701%	30.514%	18.962%	-36.373%
SGQAX Equity	2.949%	31.022%	40.029%	12.160%	-47.337%
GABOX Equity	2.198%	27.063%	51.890%	78.677%	-16.475%
PORTX Equity	-7.167%	28.531%	27.478%	48.090%	-10.142%
PEQUX Equity	6.092%	46.882%	65.410%	55.623%	-28.885%
JGVAX Equity	1.678%	16.653%	24.687%	4.065%	-32.278%
CFIPX Equity	11.177%	47.398%	65.776%	28.322%	-42.264%
GAPAX Equity	8.011%	38.765%	47.551%	28.300%	-43.097%
EADIX Equity	2.162%	20.510%	24.206%	1.898%	-36.236%
SERAX Equity	3.517%	26.383%	32.483%	10.411%	-45.700%
SEQAX Equity	4.830%	27.553%	35.240%	8.470%	-45.219%
CNGLX Equity	-6.235%	7.350%	9.045%	23.404%	-29.353%
DBISX Equity	5.119%	27.383%	29.339%	13.245%	-52.170%
IWIRX Equity	13.182%	77.731%	115.873%	156.992%	-17.228%
WAGTX Equity	-8.224%	20.778%	74.029%	82.040%	-28.184%
MDGCX Equity	-10.163%	9.695%	27.399%	43.125%	-35.876%
USWGX Equity	6.201%	45.771%	NA	NA	NA
TVFVX Equity	2.846%	28.168%	30.707%	NA	NA

Result Table 1: Monthly Average Returns

U.S. Domestic Mutual Funds	RISK (Beta)				
	1 year	3 years	5 years	Max	Recession
TWHIX Equity	1.610	1.224	1.180	1.161	1.812
HFMDX Equity	1.536	1.042	1.006	1.025	1.069
FOCPX Equity	1.453	1.266	1.209	1.239	1.034
TWGTX Equity	1.432	1.098	1.119	1.047	1.041
SMVTX Equity	1.420	1.115	1.229	1.222	0.908
CPOAX Equity	1.197	1.274	1.104	1.101	1.491
BMEAX Equity	0.814	1.092	1.049	1.099	1.322
NVOAX Equity	1.388	1.163	0.828	NA	1.073
VHIAX Equity	1.346	1.207	1.192	1.108	1.034
NEAGX Equity	0.849	1.139	1.280	1.133	1.073
WEMMX Equity	0.893	0.955	0.969	0.924	0.828
HFCSX Equity	1.431	0.899	0.998	1.099	0.934
PGOFX Equity	0.900	1.143	1.122	1.188	1.899
RBCGX Equity	1.363	1.231	1.239	0.803	1.084
JAENX Equity	1.069	0.953	0.976	1.231	1.212
PRBLX Equity	1.014	0.859	0.878	0.946	0.837
DMCVX Equity	1.304	1.160	1.334	1.256	1.147
AMANX Equity	1.176	0.924	0.871	0.845	0.675
JAVTX Equity	1.439	1.057	1.057	1.330	1.243
PARNX Equity	1.183	1.141	1.259	1.319	1.158
TSELX Equity	1.575	1.241	1.285	NA	NA
STCSX Equity	1.328	1.180	1.139	1.215	1.031
BUFTX Equity	1.087	1.222	1.142	1.356	1.084
DMCRX Equity	1.207	NA	NA	NA	NA
DBMAX Equity	1.268	1.178	1.063	NA	NA

Global Mutual Funds	RISK (Beta)				
	1 year	3 years	5 years	Max	Recession
HLMGX Equity	0.848	0.923	0.866	0.919	0.951
TWGGX Equity	1.092	0.985	0.966	0.969	0.956
FWWFX Equity	1.025	1.013	0.959	0.986	0.984
GICPX Equity	1.094	0.957	0.952	0.993	0.033
JORNX Equity	0.687	1.179	1.037	1.107	1.177
DGSNX Equity	0.541	0.874	0.995	1.112	1.156
PGROX Equity	1.182	0.940	0.820	0.817	0.804
KGDAX Equity	0.783	1.010	0.942	NA	0.134
SGQAX Equity	0.693	0.999	0.983	1.086	0.145
GABOX Equity	0.828	0.847	0.975	0.978	0.957
PORTX Equity	1.249	1.011	0.896	0.904	0.908
PEQUX Equity	0.822	0.980	1.012	1.048	1.089
JGVAX Equity	0.844	0.668	0.534	0.746	0.932
CFIPX Equity	0.705	0.884	0.924	0.931	0.897
GAPAX Equity	0.840	0.925	0.951	1.002	1.026
EADIX Equity	0.690	0.765	0.759	0.774	0.781
SERAX Equity	0.884	0.779	0.885	1.036	1.108
SEQAX Equity	0.853	0.977	0.905	0.919	0.910
CNGLX Equity	1.081	1.029	0.997	1.021	1.033
DBISX Equity	0.857	1.025	0.967	1.061	1.117
IWIRX Equity	0.692	0.900	0.993	NA	NA
WAGTX Equity	1.126	0.949	0.823	0.981	1.089
MDGCX Equity	1.216	1.099	0.998	0.987	0.936
USWGX Equity	1.016	NA	NA	NA	NA
TVFVX Equity	0.750	0.942	NA	NA	NA

Result Table 2: Monthly Average Beta values

U.S. Domestic Mutual Funds	RISK (Alpha)				
	1 year	3 years	5 years	Max	Recession
TWHIX Equity	-0.023	-0.013	-0.007	0.000	-0.007
HFMDX Equity	-0.008	-0.005	0.000	0.000	-0.010
FOCPX Equity	-0.012	-0.009	-0.005	0.001	-0.001
TWGTX Equity	-0.020	-0.014	-0.008	0.001	0.003
SMVTX Equity	-0.014	-0.008	-0.009	-0.005	-0.013
CPOAX Equity	-0.014	-0.011	-0.005	0.001	0.005
BMEAX Equity	0.103	0.044	0.057	0.036	0.013
NVOAX Equity	-0.019	-0.014	-0.007	NA	-0.002
VHIAX Equity	-0.010	-0.004	-0.003	0.001	0.004
NEAGX Equity	-0.005	-0.004	-0.004	-0.001	-0.003
WEMMX Equity	-0.010	-0.003	-0.002	-0.001	-0.009
HFCSX Equity	-0.013	-0.003	-0.004	-0.002	-0.007
PGOFX Equity	-0.013	-0.011	-0.006	-0.003	-0.007
RBCGX Equity	-0.020	-0.011	-0.007	0.003	0.000
JAENX Equity	-0.007	-0.004	-0.001	0.000	-0.001
PRBLX Equity	-0.002	-0.001	-0.002	-0.001	-0.006
DMCVX Equity	-0.015	-0.007	-0.009	-0.005	-0.003
AMANX Equity	-0.007	-0.004	-0.002	0.002	-0.001
JAVTX Equity	-0.016	-0.010	-0.005	-0.005	-0.013
PARNX Equity	-0.009	-0.009	-0.009	-0.003	-0.002
TSELX Equity	-0.023	-0.013	-0.009	NA	NA
STCSX Equity	-0.019	-0.012	-0.008	-0.006	-0.012
BUFTX Equity	-0.011	-0.009	-0.006	-0.001	-0.007
DMCRX Equity	-0.008	NA	NA	NA	NA
DBMAX Equity	-0.019	-0.012	-0.006	NA	NA

Global Mutual Funds	RISK (Alpha)				
	1 year	3 years	5 years	Max	Recession
HLMGX Equity	0.002	0.003	0.003	0.003	0.001
TWGGX Equity	-0.004	0.002	0.003	0.002	-0.002
FWWFX Equity	-0.007	0.000	0.002	0.000	-0.004
GICPX Equity	-0.001	0.000	0.002	0.003	0.003
JORNX Equity	0.006	0.001	0.001	0.004	0.007
DGSNX Equity	-0.001	0.008	0.008	0.004	-0.005
PGROX Equity	0.002	0.000	0.003	0.002	0.001
KGDAX Equity	-0.010	-0.004	0.000	NA	-0.003
SGQAX Equity	-0.001	0.002	0.001	-0.001	-0.007
GABOX Equity	0.000	0.002	0.002	0.003	0.002
PORTX Equity	-0.008	-0.002	0.000	0.002	0.003
PEQUX Equity	0.002	0.005	0.004	0.002	0.000
JGVAX Equity	0.001	0.000	0.002	-0.001	-0.004
CFIPX Equity	0.007	0.005	0.004	0.000	-0.010
GAPAX Equity	0.002	0.003	0.002	0.000	-0.007
EADIX Equity	0.000	0.000	0.000	-0.002	-0.005
SERAX Equity	0.001	0.001	0.000	-0.001	-0.007
SEQAX Equity	0.002	0.001	0.001	-0.002	-0.012
CNGLX Equity	-0.007	-0.004	-0.003	-0.001	-0.001
DBISX Equity	0.001	0.000	0.000	-0.004	-0.011
IWIRX Equity	0.010	0.011	0.009	NA	NA
WAGTX Equity	-0.011	0.000	0.005	0.004	0.000
MDGCX Equity	-0.010	-0.003	0.000	-0.001	-0.005
USWGX Equity	0.002	NA	NA	NA	NA
TVFVX Equity	0.000	0.003	NA	NA	NA

Result Table 3: Monthly Average Alpha Values

GLOSSARY

A) Alpha: It is measure of performance on a risk-adjusted basis. Alpha (**α)** takes the volatility (price risk) of a mutual fund and compares its risk-adjusted performance to a benchmark index. The excess return of the fund relative to the return of the benchmark index is a fund's alpha. This abnormal rate of return on a security or portfolio in excess of what would be predicted by an equilibrium model like the capital asset pricing model (CAPM).

B) Asset: Property owned by a person or company, regarded as having value and available to meet debts, commitments, or legacies.

C) Beta: In finance, the beta (β) of an investment is a measure of the risk arising from exposure to general market movements as opposed to idiosyncratic factors. The market portfolio of all investable assets has a beta of exactly 1. It is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Beta is used in the capital asset pricing model (CAPM), a model that calculates the expected return of an asset based on its beta and expected market returns.

D) Bonds: A bond is a debt investment in which an investor loans money to an entity (typically corporate or governmental) which borrows the funds for a defined period of time at a variable or fixed interest rate. Bonds are used by companies, municipalities, states and sovereign governments to raise money and finance a variety of projects and activities. Owners of bonds are debtholders, or creditors, of the issuer.

E) Capital appreciation: A rise in the value of an asset based on a rise in market price. Essentially, the capital that was invested in the security has increased in value, and the capital appreciation portion of the investment includes all of the market value exceeding the original investment or cost basis. Capital appreciation is one of the two main sources of investment returns, with the other being dividend or interest income.

F) Capital flows: The movement of money for the purpose of investment, trade or business production. Capital flows occur within corporations in the form of

investment capital and capital spending on operations and research & development. On a larger scale, governments direct capital flows from tax receipts into programs and operations, and through trade with other nations and currencies. Individual investors direct savings and investment capital into securities like stocks, bonds and mutual funds.

G) Purchasing Power Parity: An economic theory that estimates the amount of adjustment needed on the exchange rate between countries in order for the exchange to be equivalent to each currency's purchasing power.

H) Turnover Ratio: A measure of how frequently assets within a fund are bought and sold by the managers. Portfolio turnover is calculated by taking either the total amount of new securities purchased or the amount of securities sold - whichever is less - over a particular period, divided by the total net asset value (NAV) of the fund.

I) Portfolio: A grouping of financial assets such as stocks, bonds and cash equivalents, as well as their mutual, exchange-traded and closed-fund counterparts. Portfolios are held directly by investors and/or managed by financial professionals.

J) S&P 500: An index of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. The S&P 500 is designed to be a leading indicator of U.S. equities and is meant to reflect the risk/return characteristics of the large cap universe.

K) Standard deviation:
   1) A measure of the dispersion of a set of data from its mean. The more spread apart the data, the higher the deviation. Standard deviation is calculated as the square root of variance.
   2) In finance, standard deviation is applied to the annual rate of return of an investment to measure the investment's volatility. Standard deviation is also known as historical volatility and is used by investors as a gauge for the amount of expected volatility.