

Simultaneous Home Bias And Cross-Holding of Assets

Under Information Asymmetry

Investors worldwide hold most of their assets in terms of domestic assets. This phenomenon of home preference seems to co-exist with some degree of cross-holding of assets across countries. Traditional explanations of capital flows based either on interest rate differentials or on portfolio motives do not explain these facts. This paper offers a model based on information asymmetry between domestic residents and foreigners in order to accommodate these empirical observations. In other words, the paper reconciles empirical observation of the existence of home preference - alongside crossholdings - with theoretical predictions of diversification in agents' portfolios. The model elucidates how home preference behaves when a relevant variable - such as the rate of return - changes. These are then tested using panel data regression.

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Home bias/preference is the observed phenomenon that investors across countries hold most of their portfolios in domestic assets. Simply put, investors all over the world seem to display an overwhelming preference for domestic (home) assets over foreign assets. This is the established use of the term in the literature. According to Marianne Baxter, Urban Jermann and Robert King (1995), "there is substantial 'home bias' in investors' portfolios, that is: investors hold a disproportionate share of their portfolios in domestic assets". Similarly, Jun Kang and Rene Stulz (1995) state : "All the available data on ownership of shares shows that shares are mostly held by domestic residents, at least for large countries such as the U.S. and Japan. Several explanations have been suggested for this so-called home bias in portfolios, but so far no explanation seems to be generally accepted". This paper indicates that home preference is not confined to the U.S. and Japan. An alternative, and more rigorous approach might be to consider that home preference occurs only if domestic asset ownership exceeds some level that is predicted by a theoretical benchmark. It may be argued, based on this alternative definition, that home preference may not in reality exist, because efficient portfolios may be such that it is logical for investors to hold most of their portfolio in terms of domestic assets. However, established empirical evidence suggests that investors should widely diversify internationally in order to lower overall risk and improve returns on their portfolios¹. An overwhelming number of

¹ The logic for international diversification can be traced back to H. Markowitz's modern portfolio theory (1952) and the more recent CAPM model.

studies² have shown the benefits of diversification. The fact remains that investors do not diversify globally to the extent predicted by economists.

Home preference was brought to prominence in the literature in two path-breaking papers by French and Poterba (1990), (1991). I have followed their definition of home preference, which is the conventional usage. According to French and Poterba (1991), in 1989 domestic ownership of shares traded on the world's five largest stock markets were as follows: U.S. (92.2 %), Japan (95.7 %), U.K. (92 %), Germany (79 %) and France (89.4 %). French and Poterba also estimated that U.S. investors only held 6.2 % of their equity portfolio in terms of foreign assets (93.8 % home preference), Japanese had 1.9 % of their equity in foreign stocks (98.1 % home preference), and the British held 18 % of their equity in foreign stocks (82 % home preference)³ in 1989. Tesar and Werner (1992) examine home preference in Canada (93 %), Germany (88%), Japan (89%), U.K. (76%) and the U.S. (97%) for 1990 . Their findings support the results of French and Poterba. Past papers on home preference have not looked at the gradual evolution of home preference over the years, instead they have undertaken inter-country comparisons for a specific year. Similarly, in subsequent studies on the topic, figures that are cited to support the thesis that home preference exists are outdated. These studies assumed away the existence of home preference on the basis of, for example, data from 1989 presented by French and Poterba. Table 1 presents up-to-date time series data

² See Grubel (1968), Solnik (1974i,ii), Levy & Sarnat (1970), Rugman (1977), Solnik & Noetzlin (1982), Errunza (1983), Grauer & Hakansson (1987), Allen & MacDonald (1995).

³ Looking at investors' domestic equity holdings and foreign equity holdings is a simple and straightforward way of determining the level of home preference. They get their estimates by cumulating net purchases of equity by investors in each country, with adjustments for both stock market and exchange rate movements. Their estimates are based on data from the U.S. Treasury Bulletin.

on home preference in Finland, Germany, Malaysia⁴, South Africa, Spain, U.K., and the U.S. from 1984 to 1994⁵. The choice of this sample was guided by several considerations. I included three major developed economies because these have some of the highest market capitalizations in the world. I included three major emerging markets to contrast home preference there with the developed economies' figures. Finally, I picked Finland because it is a small country, with a small capital market and one would expect such countries to display either no home preference at all or at least very low levels of it. So, the choice of Finland would test this expectation.

Table 1 - Home Preference Over The Years Across Countries⁶.

Source: Author's calculations from OECD and IMF data.

Finland has had a very high but steady level of home preference. It has fallen from 100 % in 1984 to 98.5 % in 1994. In Germany, home preference declined by 17 % since 1985. Germany had the lowest level amongst the countries in our sample in 1994. In the U.K., the

⁴ Home preference data for Malaysia is from 1984 through 1991 due to the lack of more recent data for this country.

⁵ To determine the degree of home preference in corporate equity ownership, I used data from OECD Financial Statistics, Part I, Section 2, the IMF Balance of Payments Yearbook and Emerging Markets Factbook. The methodology was as follows; I took the sum of the value of domestic and foreign shares listed in the respective home country. This yielded the equity capitalization for a country in a given year. I then subtracted foreigners' holdings of these "home" shares but added home residents' equity holdings abroad. This gave me the total equity assets of home residents. All that remained to be done was to calculate the percentage of home residents' equity holdings abroad as a proportion of total equity assets, and to subtract this from one. Of course, implicitly, I do not consider the purchase of foreign firms' shares listed in the respective home country to be foreign investment. This may very well be erroneous especially in our discussion of home preference. An important note of caution with respect to this methodology involves the role of exchange rates. These fluctuations may significantly alter the U.S. dollar values of stock exchange capitalizations for all countries, other than the U.S. And again, another important caveat is that in some countries the value of foreign shares listed in these comprised a significant proportion of total stock exchange capitalization. The most important among these countries was the U.K..

⁶ 100 % home preference means investors of that country have no foreign equity assets at all.

phenomenon displayed an up and down movement since 1984. It has remained pretty steady and by 1994 stood at 77.9 %. Malaysia, an emerging market, displays strong preference for domestic equity according to the data. It has gradually increased from 94.5 % in 1994 to 99.24 % in 1991. South African investors continue to hold extremely insignificant amounts of foreign assets in their equity portfolios, about 0.5 %. Foreign holdings by domestic residents has increased slightly in Spain since 1985, but remained low at about 3 % in 1994. U.S. investors have reduced their equity home preference from 98.5 % to 93.57 % in 1994. Overall, the data shows that investors' behavior in developed countries in our sample, except for Finland, does meet our expectation that home preference should be lower in smaller countries⁷. For instance, the U.S. has very high home preference. U.K. and Germany show lower levels. Interestingly, the same expectation is not satisfied when one looks at emerging markets.

French and Poterba only looked at corporate equity⁸ ownership whereas I have included bonds as well in the estimation of home preference for the U.S., as shown in figure 1 below, in keeping with my definition of FPI⁹. This addition marginally increases the estimated level of home preference¹⁰ by about 3 %. So, the U.S. equity home preference level is lower

⁷ In terms of market capitalization.

⁸ For countries other than the U.S., I simply provide degree of home preference in corporate equity ownership. This is necessitated by the lack of sufficiently detailed data for many countries. Nevertheless, I believe that the questions that are raised with the available data will shed enough light for a meaningful discussion of home preference.

⁹ U.S. home preference in equity and bonds was calculated using data from OECD Financial Statistics, Part I, Section 2 to determine the value of the U.S. securities market and the IMF Balance of Payments Yearbook to determine the value of securities holdings by domestic and foreign investors. The methodology employed was akin to that used to compute equity home preference.

¹⁰ One may perhaps argue that home preference is legitimate when it comes to government bonds. If all government bonds are 'risk free', then, why hold different 'risk free' bonds (assuming the returns are the same) ? As noted earlier, the usual argument for claiming that government

than the figure calculated using bonds as well. Significantly, we do see a very gradual downward trend in home preference for the U.S. in both methods. Still, home preference appears to remain extremely high.

Figure 1 - Home Preference Over The Years In The U.S. (trillions US\$)

Source: Author's calculations based on data from the Federal Reserve Bulletin and IMF.

The numbers on top of the bars indicate the percentage of domestic assets out of total assets held privately in the US. In other words, the level of home preference in the U.S..

The declining level of the preference for domestic assets in the U.S. is also reflected, much more dramatically, in data for U.S. pension funds' (both corporate and government) holdings as illustrated in table 2.

Table 2 - Pension Funds' Home Preference in the U.S. from 1985 to 1997

Source: Money Market Directory. Data courtesy of Robert Cockrell at McGraw Hill.

It is interesting to note that the U.K., Australia and Luxembourg stand out in terms of the value of foreign stocks listed in their respective stockmarkets. For example, in the U.K., the largest of the three markets, in 1993 foreign stocks comprise more than two thirds of the total market capitalization as shown in table 3 below.

Table 3 - Composition of Securities Markets in Australia, Luxembourg and the U.K.

bonds are risk free is that governments may always tax more to pay a debt, but in practice governments are loath to overtax because of possible consequent political instability. Some Latin American countries have already defaulted twice on their debts this century; first in the 1930s and second in the 1980s. One may thus contend that the puzzle of home preference applies only to equity and commercial bonds. But, in practice, the national bonds of countries carry diverse degrees of risk, arising from the possibility of default. This is also reflected in the different investment grades that companies such as Moody's or Standard and Poor's assign to government bonds.

Source: Adapted from OECD Financial Statistics Monthly, Part I, 2 February 1997.

As is clearly evident from this table, foreign listings in the above countries' securities markets is very significant. And yet, table 1 suggests that U.K. investors have a high level of home preference. However, the figures in table 1 do not include the existence of foreign shares listed domestically. Hence, in practice, home preference in the U.K. may well be much less significant¹¹. Other countries do not have comparably large foreign listings in their stockmarkets so, the calculations for home preference in other countries is likely to be more accurate. In the U.S., for instance, the value of foreign listings makes up about 5 % of total market capitalization.

Explanations for Home Preference and Their Weaknesses

Explanations for home preference may be divided into two categories. The first category consists of arguments that reject the notion that home preference in fact exists. Indirect diversification by investors may offset the equity proportion cited and the improper accounting of investors' assets may bias the data toward suggesting home bias.

Indirect diversification through the purchase of MNC stocks is one explanation of the home preference phenomenon. If one accepts the premise that investors gain through international diversification, then a possible avenue for them to do so is by buying the stocks of MNCs. The idea is that because MNCs have international operations and sales, MNC shares

¹¹ Table 3 depicts 1993 data. I also researched 1989 data comparable to that in table 3 and found that the state of affairs was similar to 1993 numbers above. In comparing 1989 data to 1993 data for the U.K., I thought this was important because in 1987 the City (the London financial district; the term is often used as synonymous with the London Stock Exchange) had undertaken various changes to make itself more efficient and competitive. The effect of the so-called Big Bang in the City may have shown up (I speculated) after some time, i.e. in the 1993 data, rather than in just two years, in the form of greater foreign listings, for instance. I did not find this to be the case.

will behave similarly to foreign shares and they will afford similar opportunities. Investors may buy MNC shares overwhelmingly especially if there exist greater impediments or costs to international portfolio capital flows than to capital flows via direct investment by firms¹².

Tamir Agmon and Donald Lessard (1977) studied the share price behavior of U.S. multinational firms from 1960 to 1974 and found that as the proportion of international sales out of total sales increased, share prices of these multinationals showed increasing sensitivity to international shocks. Their data comprised a sample of two hundred and seventeen MNCs, based in the U.S. They argued that individual investors themselves diversified by recognizing corporate international diversification. Agmon and Lessard also pointed out to the dominance of FDI outflows from the U.S. over FDI inflows and FPI inflows over FPI outflows. They suggested that because U.S. capital markets are open and efficient, foreigners invest in the U.S. through portfolio flows but U.S. residents only invest abroad indirectly through MNCs¹³. However, Agmon and Lessard overlook the fact that the U.S. comprises a very large chunk of the world capital market, so foreigners should indeed typically hold sizable U.S. assets in their optimal portfolios. In fact, they do not. Indeed, it appears that a preference for home assets is also exhibited by investors in numerous other countries and is not simply a U.S. phenomenon.

B. Jacquillat and B. Solnik (1978) found that their results contradicted the Agmon and Lessard study. In their study, spanning 1966 through 1974 and comprising twenty-three U.S.

¹² Razin, Sadka and Yuen (1996) make the pertinent point that FDI flows are inherently less risky than FPI flows since in the former capital is accompanied by the transfer of managerial and other skills.

¹³ If one extends this line of thinking then, in countries that do not have many MNCs home preference should not exist. But the argument can not apply to countries other than the U.S. because there is FPI in the U.S..

and forty European MNCs, they found that MNC stocks are correlated with their respective national indices and thus behave much like domestic stocks. They concluded that MNC shares do not provide international diversification. Senschak and Beedles (1980) also looked at whether indirect diversification yielded similar benefits to investors as direct international diversification (direct purchase of foreign shares). The results of this study supported the earlier Jacquillat and Solnik findings.

M. Baxter and U. Jermann (1995) have suggested that home preference may have been observed because of the improper accounting of investors' portfolio assets. Indeed, French and Poterba had measured home preference in equity assets alone. Baxter and Jermann point out that human capital is often the largest component of wealth across countries. Human capital is not internationally traded however. Baxter and Jermann suggest that the inclusion of human capital to account for observed portfolios should lead to an even larger divergence between the observed and optimal portfolios. They find that far from providing an explanation for home preference, their model (which incorporates human capital) predicts that there should exist a preference for foreign assets. They come to this conclusion because the inclusion of human capital implies that domestic residents should hold a short position in domestic stocks. The logic is that the return to human capital is highly correlated with domestic stock returns, so the domestic stock market may be used to hedge the risk associated with human capital which is non-tradable. The share of human capital in overall wealth - measured by labor's share in national income - is larger than any single country's share in the world equity market. Thus,

according to Baxter and Jermann, investors should hold negative positions in the marketable assets of their own country. They claim there should be no home preference whatsoever.

The second category of explanations for home preference accepts that home preference is a reality and attributes it either to factors of institutional origin or to factors stemming from investors' behavior. Exchange rate instability, political risk, small foreign securities markets, illiquid foreign securities markets, outright institutional barriers, taxation differentials among countries, transaction costs, information asymmetries between domestic and foreign investors, future tax obligations of investors, and insignificant gains from diversification comprise this second category of explanations for home preference. I elaborate on these explanations below.

The existence of exchange rate instability or currency risk is perhaps the most obvious explanation for home preference. An explanation for the for possible losses from parity movements is contained in the following scenario. For instance, an investor buys Pesos with dollars in order to purchase Mexican stocks. Later, the investor sells the stocks and receives Pesos which she promptly converts into dollars. There are two sources of loss in the exchange. First, the investor will incur transaction costs but these amounts are minimal for the large amounts that institutional investors handle. A second loss occurs with adverse parity changes (only if the Peso depreciates or is devalued) . The risk of adverse exchange rate movements is thus argued to deter investment. But, if the Peso appreciates, the investor gains from the exchange. Currency risk adds to the variance, *ceteris paribus*, though diversification tends to lower overall risk. It is uncertain which effect will dominate. In other words, market risk and currency risk may not necessarily be moving together. So, market risk and currency risk need

not be additive. That is to say that imperfect correlation between returns and currency swings may enable investors to diversify away exchange risk. As long as they are uncorrelated, there will still exist incentives to engage in FPI. For example, if the Peso depreciates, share prices of some firms may increase especially if they are export-oriented companies.

This example considers the parity between a developed country currency (US\$) and an emerging market currency (Peso). One might possibly argue that the parities amongst developed country currencies are more rigid. Certainly, the group of seven (G-7)¹⁴ countries' central banks have acted in concert to halt sudden shifts in parities in the past but there is no guarantee that they will in the future. Nonetheless, from this perspective, currency risk alone should not deter FPI and yet home preference is an empirical fact.

The Purchasing Power Parity (PPP)¹⁵ argument also implies that currency risk should have little effect on FPI. PPP theory simply says that spot exchange rates adjust to differences in price levels as expressed in equation (1.1) below.

$$(1.1) \quad P^i = EP^{i*}$$

where i refers to the i^{th} good, P is the domestic price level, and P^* is the foreign price level. Equation (1.1) is also the law of one price which states that arbitrage will eliminate price differences if trade in good i is unrestricted and we assume away any miscellaneous costs, such as transportation costs. More generally,

¹⁴ G-7 member countries were the U.S., U.K., Canada, France, Germany, Italy and Japan. Recently, Russia joined this group. Now, it is called G-8.

¹⁵ PPP theory is the subject of ongoing controversy. It is generally believed to hold in the long run, though in practical terms there is no agreement as to what length of time this is. Nevertheless, PPP theory is an important insight. An amusing and informative account is given by Pakko and Pollard (1996).

$$(1.2) \quad E = \frac{P}{P^*}$$

where $P =$ and similarly for F^* , for n traded goods with equal weight assumed for price. Equation (1.2) is referred to as absolute PPP. A weaker version is called relative PPP. If PPP holds, Gustav Cassell (1916) argued that currencies should adjust ever closer to the exchange rate which equalizes the prices of an identical basket of goods in each country and that the underlying exchange rate will not deviate from the long run exchange rate for long. In other words, the real exchange rate should be fixed.

However, PPP theory is criticized on several grounds. First, an identical basket of goods may not exist. Second, many goods are not traded internationally. Third, this theory may apply only in the long run but not in the short run. Thus, in the short run the actual rate may differ significantly from the PPP rate. Though all these remain legitimate criticisms of PPP theory, they do not reduce PPP theory's value as a benchmark¹⁶. If one assumes, somewhat unrealistically, that investors are international consumers, then any losses incurred due to swings in currency parities is made up through cheaper foreign goods¹⁷. Moreover, in the short run, currency risk may be alleviated through proper hedging, that is either through contracting to sell foreign currency at a given rate in the future in proportion to the foreign securities in the portfolio or by borrowing foreign currency in the foreign market and selling it and getting domestic currency which is put in domestic bonds¹⁸, or in numerous other ways.

¹⁶ The Economist publishes, annually, a Big Mac index to determine whether currencies are overvalued or undervalued against the US dollar.

¹⁷ One may argue that institutional investors are not consumers, for instance.

¹⁸ The first method of hedging described above thus eliminates currency risk, but of course creates another pitfall. The contract may not be honored if the other party defaults.

Foreign investors also face a certain degree of political risk. Risk of expropriation is the most obvious hazard of this type. Besides expropriation, impediments to capital repatriation (institutional barriers that are imposed in the future that prevent or limit the return of capital involving both income and even principal repatriation), after the investment is made, may also be imposed. It seems unlikely that home preference might be explained by investors' perceptions of political risk nowadays, especially for foreign investment among developed economies. In other countries, political risk persists but, on the whole, a general worldwide liberalization trend has rendered this type of risk as less probable in the eyes of foreign investors.

Investors may also avoid greater foreign investment if foreign capital markets are too small. For example, in 1985 the U.S. stockmarket capitalization made up almost exactly half the world market's capitalization. By 1994, the U.S. made up one third of the world total (about seventeen percent less than in 1985), even though the U.S. capital market had more than doubled in value¹⁹. The lower U.S. share of the world capital market was due to the more than a three times increase in the value of the world capital market. From 1985 to 1994, emerging markets share of the world also rose from approximately four percent to fourteen percent as shown below. There are three main factors, apart from 'natural growth', why the rest of the world has become more significant in terms of capitalization as illustrated in figure 2 below.

¹⁹ A discrepancy exists between similar types of data provided in IFC and OECD publications. For instance, according to OECD data, NYSE capitalization stood at about \$7 trillion in 1994. IFC lists it as \$5.1 trillion. IFC only presents the value of equity listings. The OECD figure includes bonds as well. At any rate, OECD breaks it down by domestic and foreign firms listed in NYSE; they comprised US\$ 6.8 and US\$ 0.258 trillion respectively. Interestingly, the value of foreign firms listed in the NYSE makes up about 5% of the total.

First and foremost, the Thatcher government in the U.K. popularized the sale of government run and owned enterprises in the 1980s privatization schemes. These schemes were extremely popular with policymakers in many countries for two reasons. Primarily because privatization was a revenue raiser and second it would, ideally, turn the privatized enterprises into paragons of efficiency while stemming the drain on the treasury by loss-makers²⁰. Thus, privatization led to massive offerings to the public, increasing stock exchange capitalizations as well as the number of companies listed on them. Another reason why the rest of the world capitalization outside the U.S. grew is that many indebted countries joined schemes to convert debt into equity. Debt to equity conversion schemes were advertised under the name of the Brady plan. Creditors acquiesced given the choice between default by debtors or some possibility of eventual payment. Thirdly, the U.S. dollar was strong in 1985 but relatively weak in 1994 and this was reflected in foreign companies' U.S. dollar valuations, so that the share of U.S. markets fell. Nevertheless, it is fair to state that foreign investment opportunities for U.S. investors are greater than ever before.

Figure 2 - Stock Exchange Capitalization 1985 to 1994 (trillions US\$)

Source: Based on data from the Emerging Markets Factbook, 1995.

A corollary to the notion that foreign capital markets are too small is the contention that foreign securities markets are illiquid. The broad definition of liquidity is the ease with which an asset can be converted to cash. A narrower definition of liquidity is that it is a measure of how easily an asset may be converted into cash without loss of value. Liquidity decreases if the

²⁰ No matter that while profit making state enterprises were easily sold off, the loss-making ones were often very hard to sell and continued to be a drain on treasuries.

volume traded in a market is relatively small. The idea is that foreign capital markets may be too concentrated or low in transaction volume²¹. The degree of liquidity in a market may be measured by looking at turnover ratios²². The turnover ratios for various markets in 1993 is presented in table 4 below.

Table 4 - Market liquidity in various countries in 1993.

Source: Emerging Markets Factbook, 1995.

Another way of comparing the liquidity of foreign markets with the U.S. is by simply looking at the value of shares traded. Most strikingly, the U.S. made up 61 % of the world total for the value of shares traded in 1985. The emerging markets' share in 1985 was a mere 3 %. By 1994, the value of shares traded in the U.S. had tripled but now accounted for 37.4 % of the world total. The emerging markets accounted for another 17 %.

Figure 3 - Value Traded in Securities Markets 1985 to 1994 (trillions US\$)

Source: Based on data from the Emerging Markets Factbook, 1995.

Clearly, the 1980s view of foreign capital markets being too illiquid as measured above had some validity. This argument is less convincing now as is evident from figure 3.

Another obvious explanation for home preference is the presence of institutional barriers such as capital controls. While capital controls were widespread prior to the 1980s, these

²¹ Perhaps the Japanese stock market may not have had a 'depth' comparable to the U.S. market. The number of firms listed may be few - though of high capitalization (Japan is the second largest market in terms of capitalization in the world). Thus, Japan may not afford possibilities for diversification to the degree that its market capitalization ranking would imply.

²² The turnover ratio is calculated by taking the total value of shares traded during a given period and dividing it by the average market capitalization for the same period. Source: Emerging Markets Factbook, 1995.

impediments have now largely disappeared among the developed economies. Many LDCs have also relaxed capital controls. Gooptu (1993) provides a helpful appendix comprising a comparison of the ease of foreign investment (direct and portfolio) in twenty seven developing countries on the basis of institutional and regulatory structures that exist in those countries²³.

French and Poterba (1990) examine foreign equity holdings in the U.S. and Japanese markets over an 18 year period from 1970 to 1988. This study is especially relevant since, according to French and Poterba, New York and Tokyo in 1988 were the world's largest equity markets, and combined, represent more than two-thirds of the global equity portfolio²⁴. Their data show that while foreign holdings of U.S. equities have increased pretty continuously from 3.9 % in 1970 to 7.8 % in 1988, the same has not been true of foreign holdings of Japanese equities. Juro Teranishi²⁵ (1985) reports that after about 1975, the financial markets in Japan were rapidly deregulated. He also writes that capital outflows were discouraged or prohibited from 1973 to 1976 and from 1979 to 1980. These restrictions were vastly relaxed during the first half of 1980s. Nevertheless, the pattern of foreign holdings of Japanese equities from 1970 to 1988 display characteristics of - to borrow a term from physics - harmonic motion. The foreign share of Japanese equities, near 5 % at the beginning of 1970s, declined to 2.7 % in 1978, then rebounded so that by 1983, 8.8 % of the Tokyo market was held by foreign investors. The late 1980s were once again a period of net foreign selling, however, with

²³ Unfortunately, this appendix does not disclose the dates of the latest regulatory changes that led to the present rules.

²⁴ U.S. and Japan were still the largest two securities markets in 1994. The two countries' share of global capitalization was about 57 % in 1994.

²⁵ J. Teranishi gives an account of the Japanese experience with respect to financial regulations during the period after the second world war.

foreign ownership halving -from 8.8 % to 4.1 % - between 1983 and 1987. French and Poterba suggest that this pattern of both rising and declining cross-border equity investment casts doubt on theories of imperfect diversification that focus on inertia or structural impediments.

Taxation differentials are regarded as another possible cause for home preference. Numerous countries impose some kind of dividend or capital gains tax. However, treaties also often ensure that these taxes can be credited against taxes in the investor's home country. Many countries have reduced or done away with withholding taxes altogether in a bid to attract foreign capital.

Transaction costs are also seen as a possible culprit for the lack of international diversification by investors. In this context, transaction costs are defined narrowly as the specific costs of buying and selling in foreign transactions; forexample, brokerage fees and taxes. The argument is that to engage in foreign investment may involve higher transaction costs than domestically. And yet, the empirical evidence suggests that transaction costs are not overwhelming or decisive. Tesar and Werner (1992) conclude that the relatively high turnover rates (the large amount of buying and selling) on foreign investments suggest that investors frequently adjust the composition and the size of their international portfolios, even though they find that much of this activity has little impact on net investment positions.

In other words, the high volume of gross investment tends to negate the possibility that higher transaction costs are to blame for the low level of net foreign investment. It is conceivable that the cost of trading may be lower, say in the U.S., because it is a more liquid market than

elsewhere. But, though this may direct all investors towards the most liquid market, it should not mean that all investors invest in their domestic market.

Information asymmetries are among the most plausible arguments for explaining home preference. Informational efficiency concerns may affect the optimal allocation to foreign investment. This is the much shared idea that foreign investors do not have access to the same information about the host country as its citizens. Domestic residents may enjoy greater access to otherwise unavailable information because of a small market, cultural or linguistic barriers, old-boy networks, lack of sufficient legal safeguards to prevent insider trading, and the slow or opaque dissemination of information. It is well known that accounting standards are often different in different countries, making financial information from foreign firms hard to contrast with domestic firms' accounts²⁶. There may also exist a greater degree of the principal-agent problem in engaging in FPI than what exists in domestic investment. Here we consider the principals as the investors and the agents as the sources of information about investment opportunities. While domestic investment also involves an intermediary, investors may not need to call on outside sources to the same extent as with foreign investment, thus heightening the information asymmetry. In effect, with foreign investment, an investor may be dependent on a specific source for all information, which source may be unreliable. In short, the potential agency cost, based on the principal-agent problem, may contribute to home preference. Gordon and Bovenberg (1994) developed a model of capital flows based on the existence of information asymmetries between countries. In their model they have two countries, say Foreign (F) and

²⁶ The stringent accounting standards in the U.S. often deter foreign companies from seeking a listing in the U.S..

Home (H). They assume that the rate of return is higher in (H) than in (F). Their model suggests that an investor from (H) should not own any foreign equity whatsoever since the available return abroad must be less than at home²⁷. This is the international economics explanation for capital flows discussed earlier. Foreigners, on the other hand, should hold their country's entire capital stock because (H) investors will not buy any (F) assets, and some amount of international (H) assets. However, foreigners have less information than home country residents. Therefore, they consistently overpay for (H) assets. Gordon and Bovenberg's use of the term information asymmetry is very much in the sense that George Akerlof (1970) used it. The model I develop also incorporates information asymmetry but not, strictly speaking, in the sense that they use. Information asymmetry is explored in more detail later in the paper.

On the other hand, Tesar and Werner suggest that the high volume of cross-border flows and high rate of turnover on foreign equity investment relative to domestic equity markets imply that incomplete information is not an important deterrent.

Future tax obligations have been suggested to play a role in the determination of home preference. Constance Smith (1996) states that when a government issues bonds, that informs domestic residents of possible future tax obligations²⁸, along the lines of the Ricardian equivalence hypothesis. According to Smith, domestic residents therefore opt to hold domestic assets disproportionately because it is precisely these assets which move in tandem with future

²⁷ This model is driven by the assumption that capital flows occur due to interest rate differences.

²⁸ An increased issuance of bonds will add to a country's interest burden - and hence taxes - in future years. A detailed explanation of the Ricardian Equivalence hypothesis is provided by Olivier Blanchard and Stanley Fischer (1993). In brief, this hypothesis suggests that agents will anticipate higher (future) taxes as a result of increased government borrowing, and therefore will adjust their behavior accordingly.

tax obligations. Since foreign asset returns do not necessarily correlate to future tax obligations of domestic residents, this group displays a preference for home assets and specifically a preference for domestic bonds. Smith argues that this could explain the preference for domestic bonds²⁹. But, the same logic does not apply to home preference in equity.

In a similar vein, home preference in bonds may be especially relevant with respect to large institutional investors such as pension funds. Pension funds pay their members at regular intervals, and so may be forced to keep assets that are readily convertible to meet these obligations or to keep assets that covary with these obligations³⁰. This implies domestic bonds should be held vastly by pension funds, rather than equity regardless of source.

Insignificant gains from international diversification may be yet another cause of the home preference shown by investors. Harold Cole and Maurice Obstfeld (1991) estimate that the welfare gains from international risk pooling in order to smooth national consumption are small, at least for developed economies. They argue that because any benefits from diversification are so minute, even minor obstacles to international asset trade can make these gains disappear. Cole and Obstfeld reiterate an old argument made by A. Cairncross (1975). Cairncross had stated that one would expect there to be outward foreign investment to the countries that the home country trades with when the home country's terms of trade deteriorate

³¹. So, Cole and Obstfeld state that changes in international terms of trade can automatically

²⁹ In fact, a simple explanation of bond bias is that if we assume that bonds -with maturities equal to the planning horizons of investors - are a risk free asset, then why should investors want to hold more than one risk free assets in their portfolios since CAPM predicts that investors will hold a risk-free asset along with risky assets.

³⁰ Helmut Reisen (1997) discusses these issues in a recent OECD paper.

³¹ When terms of trade deteriorate, exports become more competitive and so may rise. This may lead to a current account improvement which would imply, by definition, a capital outflow.

pool national output risk given that growth of a country's exports depend inversely on that country's terms of trade. Of course, if terms of trade furnish perfect insurance against output shocks, then there would not be any gains whatsoever from international diversification.

Although consumption-based models, such as the one Cole and Obstfeld employ, predict small gains, partial equilibrium models looking at stock returns suggest that there are large gains to be had from diversification.

Home Preference Explanation Chosen Here

This paper points to information asymmetries faced by investors to explain the high degree of home preference observed. This does not mean by any means that information imperfections are the sole cause of the preference shown by investors worldwide. Grains of truth are likely to lie in all of these theories. Nevertheless, imperfect information is extremely important in explaining home preference simply by the virtue of the investors' repeated statements that they will show greater caution and even reluctance when entering or planning to enter foreign markets. As tangible institutional impediments to foreign portfolio investment have been dismantled and financial markets globally have become more integrated, more and more attention has focused on intangible causes for home preference such as investors' behavior.

In this spirit, the next section presents a model based on information asymmetries between domestic investors and foreign investors. This model does not prove (nor does it purport to) the existence of home preference or cross-holdings among countries³², it merely depicts these phenomena in a formal two country, dual period model. The model contributes to

³² At any rate, empirical documentation of home preference and cross-holdings has been affirmed.

the literature because while there exist models that show either home preference or cross-holdings, no one, to my knowledge, has yet explained both of these phenomena in the context of a single model with the use of imperfect information. Furthermore, in the process of developing this model, I do obtain some unexpected comparative statics results that might shed new light on these phenomena. These results are then tested empirically using econometric analysis later in the paper.

Background To The Model

Roger Gordon and Lans Bovenberg (1994) developed a model of foreign investment based on asymmetric information³³ that in part explained the observed phenomenon of home preference. However, the Gordon and Bovenberg model did not depict cross-holdings of assets. Robert Kolb (1992) states that information asymmetry is a condition that arises when one party has information superior to another's. A different way of thinking about this is the concept of insiders and outsiders. The insiders are privy to information that the outsiders are not. Alternately, the two parties may possess different sets of information. R. Morris (1986) suggests that imperfect information arises in the context of a situation where there are buyers and sellers, be it in the insurance market, credit market or in the job market, for example. Mattesini Fabrizio (1993) states that the problem of asymmetric information can arise in many different situations. For instance, it arises when shareholders must rely on managers to produce profits for their corporation. Jean Dermine (1996) uses the concept of asymmetric information to deal with the banking market and the potential need to protect consumers of financial

³³ They used the concept of asymmetric information developed by George Akerlof (1970). For Akerlof, asymmetric information simply meant that sellers may have knowledge that buyers do not possess. Much of the literature on information asymmetry stemmed from Akerlof's landmark paper. A more sophisticated version of this theory states that though buyers may be able to overcome this asymmetry, it is too costly for them actually to do so.

services. In this instance, depositors have imperfect information about the solvency of their banks. As these citations show, the concerns about the existence of imperfect information has therefore permeated many situations where there are two parties, not necessarily buyers and sellers. In the model here, there are two parties, domestic residents and foreigners. The domestic residents are more familiar with their country's economy, firms and the returns on assets (of their country) than they are with assets abroad; thus domestic residents are more likely to earn higher expected returns at home than abroad. The problem of investors' lack of familiarity with foreign assets is well documented. Adler and Dumas (1975) contended that investors may lack sufficient information to make correct decisions about foreign equities. Similarly, Solnik (1988) stated that investors are often unfamiliar with foreign cultures and markets. By definition, foreigners have more information about their own securities. The model in this paper depicts, in a setting of information asymmetry (though, strictly speaking, not quite in the sense that Akerlof used it), both home preference and cross-holdings with respect to foreign investment. It goes beyond the Gordon and Bovenberg paper which did not deal with cross-holdings. Cross-holding of assets between countries is an empirical fact. It must also be noted that Nils Hakansson (1970) solved for optimal consumption and investment levels for a class of utility functions of the form

$U(C_1, C_2, \dots) = U(C_1) + \alpha U(C_2, C_3, \dots)$ where α ranges between zero and one and C stands for consumption. For the utility functions he considers, either the relative risk aversion index or the absolute risk aversion index is positive for all positive levels of consumption. His maximization problem incorporates terms for both capital income (from x amount of capital invested) and

non-capital income (Y). He states that $(x+Y)$ is permanent income and because, in his model, this expression is proportional to consumption under certain conditions, the optimal consumption functions satisfy the permanent income hypothesis. He finds that under certain restrictive conditions the optimal mix of risky investments is dependent on the probability distribution of returns, the interest rate and the consumption function, but not on the level of wealth, non-capital income or the impatience to consume. Hakansson does not discuss the issues of home preference, cross-holdings or information asymmetry.

In sum, the data show that foreign investment does not simply flow to where it fetches the highest return. In reality, there are two way flows of capital between countries - and this is true of FPI as well as FDI. Beyond demonstrating home preference and cross-holdings - two most important aspects of FPI - in this model, the use of comparative statics exercises enables us to obtain several counter-intuitive results. The implications of these results are discussed and one result in particular is tested empirically.

The Model

A representative domestic individual investor may choose between two main types of assets, domestic and foreign. There exist two states of nature, a high state (with higher returns on assets) and a low state (with lower returns on assets). The occurrence of these states is subject to a specified probability distribution. These states solely differ in terms of the expected returns they proffer to the investor.

The consumption and income of the investor may be related to aggregate consumption and income by the common practice of normalizing population to 1. The individual has a

predetermined and thus certain first period income Y_1 . Consumption in the first period (C_1), - dependent on income in the first period - is also certain and is simply the difference between income that period and the amount invested in the two assets as shown below.

$$C_1 = Y_1 - (K_h + K_f)$$

In the first period, the second period income (Y_2) and hence the consumption (C_2) the investor will enjoy remains uncertain. Second period income and consumption are based on the investment in the two assets in the first period and their expected returns. The representative investor chooses the amount of investment in the domestic asset (K_h) and the foreign asset (K_f). Both domestic and foreign assets pay $(1+r)$ in the high state and $(1+r(1-\phi))$ in the low state³⁴.

Table 5 summarizes this information.

Table 5 - Domestic and Foreign Asset Returns

I assume that $p > q$ so that it is more likely that the domestic asset pays the high return.

This assumption is made on the grounds that due to information asymmetries domestic residents are more likely to earn higher expected returns at home than abroad. Presumably, domestic investors have access to more accurate information on domestic assets than foreigners. However, I assume that the returns on domestic and foreign assets are not correlated. Hence, the domestic investor has an incentive to diversify and hold foreign assets. Cross-holdings of assets are thus explained away. Another possible way of explaining cross-holding of assets is by considering the concept of second order stochastic dominance³⁵. In this chapter, I assumed that the probability of the domestic asset paying the h_i return is p and the probability for the foreign

³⁴ ϕ ensures that in the lo state the pay-off is lower than in the hi state; $0 < \phi < 1$.

³⁵ Josef Hadar and William Russell (1969), G. Hanoch and Haim Levy (1969) are two important papers that introduce this concept.

asset to pay the hi return is q and that p was greater than q. This meant that the return on the domestic asset stochastically dominated to the first order the return on the foreign asset. This simply means that one cumulative probability distribution yields unambiguously higher returns than another. Despite this, investors may still prefer a mixed portfolio to a purely domestic one. One method of demonstrating that investors will prefer to hold a mixture of domestic and foreign assets rather than a purely domestic portfolio is by demonstrating that the return of the mixed portfolio stochastically dominates to the second order the return on the domestic asset alone. This means that the cumulative probability distribution associated with the mixed portfolio could be unambiguously less risky than for a purely domestic one, and thus be preferred by investors. Unfortunately, the results of the exercises provided in the appendix do not support this idea. This suggests that a mixed portfolio may not be preferred under certain risk averse utility functions.

Consumption in the second period may turn out to be any one of the four combinations presented below. Each combination has a different probability of occurrence. For instance, the joint probability of both the domestic and the foreign asset paying the high return is pq.

$$\begin{aligned}
 C_2^{HH} &: K_h(1+r) + K_f(1+r) && \text{with probability } pq \\
 C_2^{HL} &: K_h(1+r) + K_f(1+r(1-\phi)) && \text{with probability } p(1-q) \\
 C_2^{LH} &: K_h(1+r(1-\phi)) + K_f(1+r) && \text{with probability } (1-p)q \\
 C_2^{LL} &: K_h(1+r(1-\phi)) + K_f(1+r(1-\phi)) && \text{with probability } (1-p)(1-q)
 \end{aligned}$$

Utility is a function of consumption and is expressed as
 $U = C^\alpha$ where $0 < \alpha < 1$.

As a direct result of the risk aversion parameter α , the utility function is concave. This power utility function is consistent with the assumption of decreasing absolute risk aversion and

also demonstrates constant relative risk aversion (the index is given by $-U''w/U'$) the measure of which is $1-\alpha$. These are commonly assumed to be reasonable approximations of investor behavior³⁶. I use this utility function in part to show the plausibility that diversification can result, when there is risk aversion, despite the higher probability of obtaining the higher return by investing at home only. Considerations of tractability are therefore important.

The representative individual maximizes the following expected lifetime utility

function with respect to K_h and K_f ,

(2.1)

$$\max (Y - K_h - K_f)^a + (C_2^{HH})^a pq + (C_2^{HL})^a p(1-q) + (C_2^{LH})^a (1-p)q + (C_2^{LL})^a (1-p)(1-q)$$

The first order conditions are

FOC: w.r.t. K_h ,

(2.2)

$$\begin{aligned} 0 = & -a(Y - K_h - K_f)^{a-1} + (1+r)a[(K_h + K_f)(1+r)]^{a-1}pq \\ & + (1+r)a\left[K_h(1+r) + K_f(1+r(1-\phi)) \right]^{a-1} p(1-q) \\ & + (1+r(1-\phi))a\left[K_h(1+r(1-\phi)) + K_f(1+r) \right]^{a-1} (1-p)q \\ & + (1+r(1-\phi))a\left[(K_h + K_f)(1+r(1-\phi)) \right]^{a-1} (1-p)(1-q) \end{aligned}$$

³⁶ According to Gordon Alexander and Jack Francis (1986), power utility functions are of particular interest because these are consistent with the assumption of decreasing absolute risk aversion and also have constant relative risk aversion. They cite Marshall Blume and Irwin Friend's (1975) study, based on IRS data for individual investors, which found that a constant relative risk aversion and decreasing absolute risk aversion was a reasonable approximation of investors' behavior. Further, a power function has positive marginal utility over all ranges in contrast to a quadratic function. Power utility functions or positive linear transformations (such as an isoelastic utility function) of these functions are extremely widely used in the literature, as obviously these are assumed to realistically describe investor or agent behavior. I also considered a log utility function. The results are the same as for the problem presented above. FOCs yield $C_{HL}/C_{LH} = p(1-q)/q(1-p) > 1$, implying $C_{HL} > C_{LH}$. So, $(1+r)K(1+r) + K[1+r(1-\phi)] > (1+r)K(1+r(1-\phi)) + K(1+r)$ where $\phi = K_f/K$. Simplifying yields $1/2 > \phi$ showing the plausibility of home preference.

FOC: w.r.t. K_f ,

(2.3)

$$\begin{aligned}
0 = & -a(Y - K_h - K_f)^{a-1} + (1+r)a[(K_h + K_f)(1+r)]^{a-1}pq \\
& + (1+r(1-\phi))a[K_h(1+r) + K_f(1+r(1-\phi))]^{a-1}p(1-q) \\
& + (1+r)a[K_h(1+r(1-\phi)) + K_f(1+r)]^{a-1}(1-p)q \\
& + (1+r(1-\phi))a[(K_h + K_f)(1+r(1-\phi))]^{a-1}(1-p)(1-q)
\end{aligned}$$

Let $R \equiv (1+r)$

$$\Xi \equiv (1+r(1-\phi))$$

$$\rho \equiv a-1,$$

The investor will equalize the marginal utility derived from the domestic asset to

the marginal utility derived from the foreign asset. So, setting the two FOC equal gives,

(2.4)

$$\begin{aligned}
R(K_h R + K_f R)^\rho pq + R(K_h R + K_f \Xi)^\rho p(1-q) + \Xi(K_h \Xi + K_f R)^\rho (1-p), \\
+ \Xi(K_h \Xi + K_f \Xi)^\rho (1-p)(1-q) \\
= R(K_h R + K_f R)^\rho pq + \Xi(K_h R + K_f \Xi)^\rho p(1-q) + R(K_h \Xi + K_f R)^\rho (1-p), \\
+ \Xi(K_h \Xi + K_f \Xi)^\rho (1-p)(1-q)
\end{aligned}$$

Some manipulation yields the main equation of the model,

$$\frac{K_h}{K_f} = \frac{\Pi^{\frac{1}{\rho}} R - \Xi}{R - \Pi^{\frac{1}{\rho}} \Xi} = \Psi \quad (2.5)$$

where $\Pi = \frac{(1-p)q}{p(1-q)}$

Equation (2.5) states that the ratio of domestic to foreign investment is equal to a fraction represented by Ψ . Home preference simply means that $K_h > K_f$. This is only possible if $\Psi > 1$ and this is the case if

$$\Pi^{\frac{1}{\rho}} R - \Xi > R - \Pi^{\frac{1}{\rho}} \Xi \quad (\text{assuming } R - \Pi^{\frac{1}{\rho}} \Xi > 0)$$

$$\begin{aligned} \Pi^{\frac{1}{p}}R - R &> -\Pi^{\frac{1}{p}}\Xi + \Xi \\ R\left(\Pi^{\frac{1}{p}} - 1\right) &> -\Xi\left(\Pi^{\frac{1}{p}} - 1\right) \end{aligned}$$

$$R > -\Xi \quad \text{if} \quad \Pi^{\frac{1}{p}} - 1 > 0 \Rightarrow \Pi^{\frac{1}{p}} > 1 \Rightarrow \Pi < 1 \quad \text{since} \quad \frac{1}{p} < 0$$

Comparative Statics Results

All the results indicate a negative relationship between Ψ and the parameters r , p , q , α , ϕ . Some of these results are counter-intuitive and therefore of special interest. The first derivative above is one such result. This tells us that as the rate of return r increases, home preference decreases. The intuition behind this result may be that as r rises, the difference (ϕr) between the hi return and the lo state return increases. This implies that variance is now higher. Thus, because the higher variance in turn implies higher risk in this simple model, investors are motivated to diversify further. ϕ is a function of returns and so, its inverse relationship to the level of home preference is similarly explained as above.

When p rises, there is a greater probability that the domestic hi state will occur. The same logic above will again apply. It is rather straightforward to explain the fourth derivative. As q rises, there is a greater chance that the foreign asset pays the high return, hence expected return to the foreign asset is higher, so home preference decreases. Finally, as risk aversion (α) increases, there is more reason for investors to diversify. Again, home preference decreases.

Empirical Test of the Model

One testable aspect of the model above is to examine whether in fact home preference decreases (increases) as the rate of return increases (decreases)³⁷. I examine this relationship for

³⁷ The rate of return is taken to be the difference between a country's real interest rate and the world real interest rate.

Germany, South Africa , Spain and the United Kingdom for the period 1984 through 1991.

Data availability necessitates that I employ panel data.

In this section, the basic framework that I employ is a regression model (using the fixed effects method) of the form:

$$Y_{it} = a_i + \beta' x_{it} + \varepsilon_{it}$$

In this case, there are four regressors in x_{it} and these are the relative real interest rate, plus three dummy variables (n countries minus one). The relative real interest rate was calculated by using the U.S. real interest rate as a proxy for the world real interest rate and then subtracting this from each countries' real interest rate. When the real interest rate of a country exceeded the world rate, the difference was positive. Otherwise, it was negative. The dummy variables are used to isolate country-specific factors. The dependent variable was a measure of home preference derived in our model - simply the ratio of domestic investment to foreign investment.

The regression results show a positive relationship between home preference and the relative return rate. So, the coefficient of r is positive and is significant at the 90 percent level. This result does not lend empirical support to the comparative statics result $\frac{\partial \Psi}{\partial r} < 0$. The usual tests for heteroskedasticity and autocorrelation were also conducted. The results of these tests showed that the regression was appropriate.

Conclusion

Both home preference and cross-holding of assets across countries is well documented. While several explanations of home preference may all have grains of truth within them, none are fully satisfactory. A model of information asymmetry may offer further insight into these

phenomena. Indeed, one particular comparative statics result was counter-intuitive and therefore of special interest. The model suggests that there is a negative relationship between the home preference parameter and interest rate. While the empirical tests here did not confirm this, the limitations on data availability prevented a more comprehensive analysis. Future papers may have access to more detailed data and thus be in a better position to test this relationship. It is also clear that future studies will have to continue to reconcile the existence of home preference with the predictions of theories on diversification.

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APPENDIX

Let $R_u = (1+r)$, $R_L = 1+(1-\phi)r$ where $0 < \phi < 1$

$$a = \frac{K_h}{K_h + K_f}$$

when $a = 1$, $K_f = 0$. This would imply a purely domestic portfolio. Given a certain mixed portfolio there are four possible outcomes:

R_u with probability pq

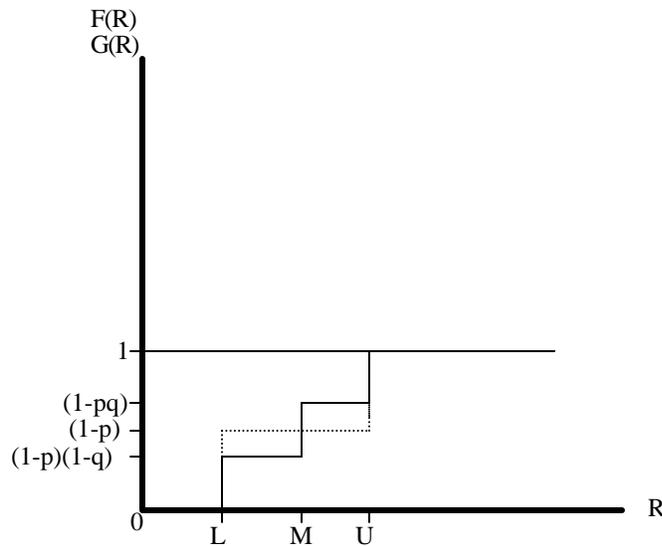
$R_m = aR_u + (1 - a)R_L$ with probability $p(1 - q)$

$R'_m = aR_L + (1 - a)R_u$ with $(1 - p)q$

R_L with $(1 - p)(1 - q)$

If the domestic assets comprises more than half the portfolio, then R_m is greater than R'_m . The reverse is true when domestic assets make up less than half the portfolio. R_m equals R'_m when the portfolio is evenly divided between foreign and domestic assets. Three cases must be compared to the situation when the portfolio is a purely domestic one.

Case I: $a = 0.5$



Let $G(R)$ be the cumulative probability distribution (cpd) for the mixed portfolio shown above with a solid line and $F(R)$ the cpd for the domestic asset only portfolio represented with dotted lines. $G(R)$ dominates $F(R)$ to the second order if,

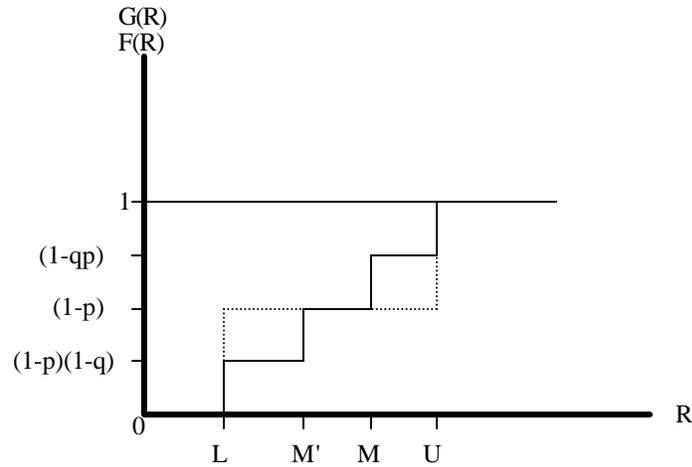
$$-\left[(1 - p) - (1 - p)(1 - q) \right] (M - L) + \left[1 - pq - (1 - p) \right] (U - M) \leq 0$$

Simplifying,

$$[p - q] \left(\frac{1}{2} \right) (U - L) \leq 0$$

Since $p > q$, second order dominance fails.

Case II: $a > 0.5$



$G(R)$ dominates $F(R)$ to the second order if

$$-\left[(1-p) - (1-p)(1-q) \right] [M' - L] + p(1-q)[U - M] \leq 0$$

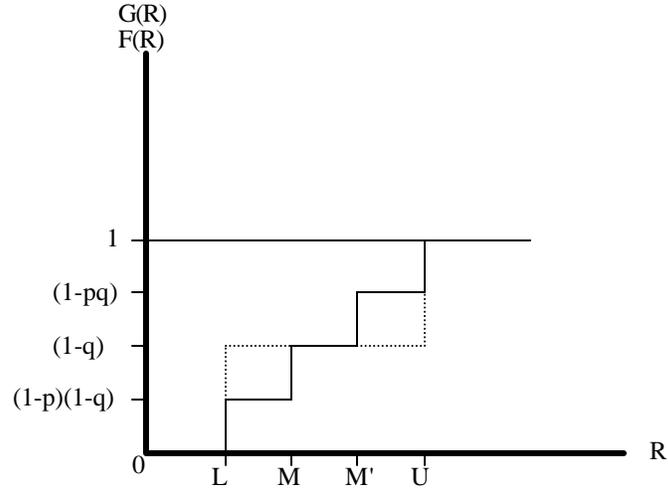
This yields

$$\left[-(1-p)q + p(1-q) \right] (1-a)(U-L) \leq 0$$

$$(p-q)(1-a)(U-L) \leq 0$$

This also does not hold.

Case III: $a < 0.5$



$G(R)$ stochastically dominates $F(R)$ to the second order if

$$-\left[(1-p) - (1-p)(1-q) \right] (M-L) + \left[(1-q) - (1-p) \right] (M'-M) + \left[1-pq - (1-p) \right] (U-M') \leq 0$$

$$-q(1-p)(M-L) + (p-q)(M'-M) + (p-pq)(U-M') \leq 0$$

but $M-L = a(U-L)$, $M'-M = (1-2a)(U-L)$, $U-M' = a(U-L)$

simplifying,

$$(p-q)(1-a)(U-L) \leq 0$$

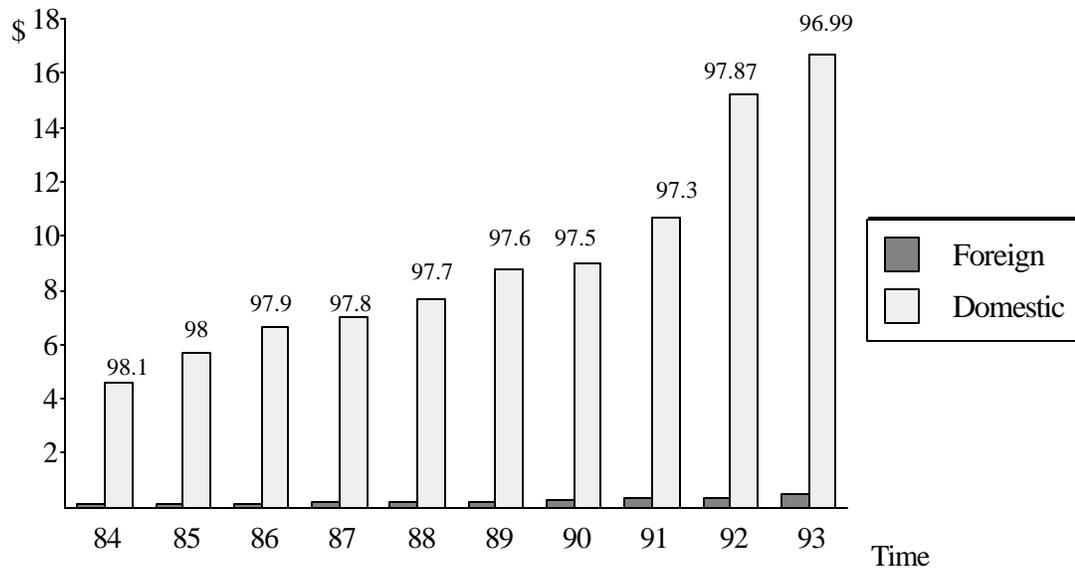
Therefore, $G(R)$ again does not dominate $F(R)$ to the second order.

Table 1 - Home Preference Over The Years Across Countries.

Country\ Year	84	85	86	87	88	89	90	91	92	93	94
Finland	100	100	99.95	99.89	99.9	99.65	99.1	99.25	98.76	98.49	98.5
Germany	87.6	92.23	91.15	88.72	85.53	86.1	86.4	84.7	75.33	77.11	75.2
Malaysia	94.53	97.7	97.75	98.1	98.34	99.03	99.16	99.24			
South Africa	99	99.25	99.51	99.53	99.52	99.8	99.79	99.78	99.72	99.76	99.95
Spain	92.3	98.4	98.9	98.77	98.81	98.82	98.38	98.37	97.24	97.63	97.34
U.K.	80.5	78.7	76.3	83.1	80.7	76.6	79.66	78.3	79	78.7	77.9
U.S.	98.5	98.16	97.5	97.18	96.79	96.4	96.28	95.97	95.86	94.12	93.57

Source: Author's calculations from OECD and IMF data.

Figure1 - Home Preference Over The Years In The U.S. (trillions US\$)



Source: Author's calculations based on data from the Federal Reserve Bulletin and IMF.

Table 2 - Pension Funds' Home Preference in the U.S. from 1985 to 1997

Year	85	86	87	88	89	90	91	92	93	94	95	96	97
Home Preference %	99.21	99.02	98.51	97.51	97.41	97.26	96.7	96.15	95.25	94.35	93.15	92.67	92.13

Source: Data courtesy of Robert Cockrell at McGraw Hill's Money Market Directory.

Table 3 - Composition of Securities Markets in Australia, Luxembourg and the U.K.

(in US\$ millions)

Country	Equity			Bonds		
	Domestic	Foreign	Total	Domestic	Foreign	Total
Australia	135 449	132 730	268 179	60 980	0	60 980
Lux.	10 347	146 348	156 695	1 538	866 641	868 180
U.K.	1 160 783	2 841 334	4 002 117	554 393	322 659	877 051

Source: Adapted from OECD Financial Statistics Monthly, Part I, 2 February 1997.

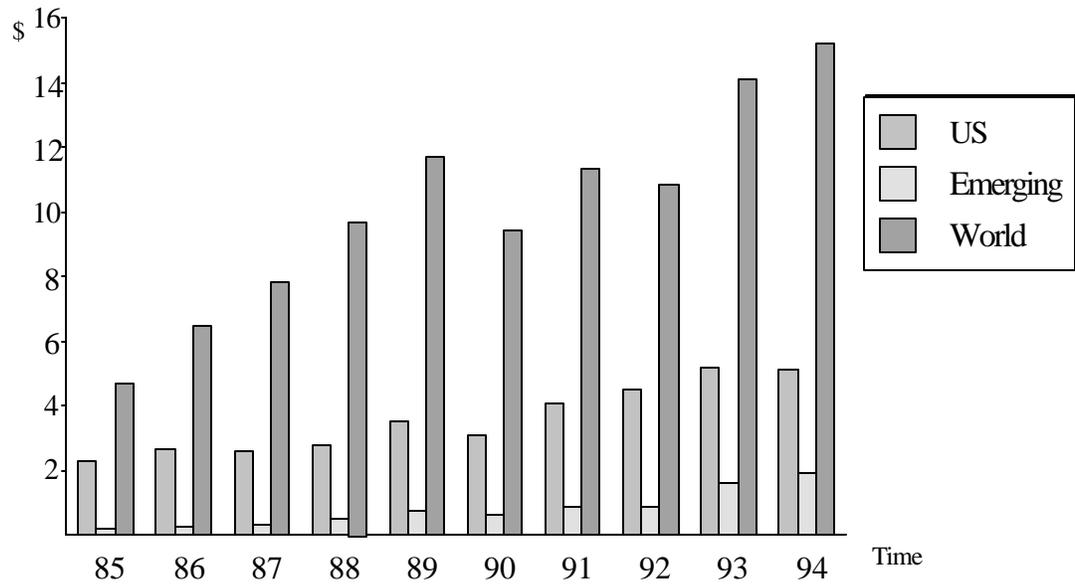


Figure 2 - Stock Exchange Capitalization 1985 to 1994 (trillions US\$)

Source: Based on data from the Emerging Markets Factbook, 1995.

Table 4 - Market liquidity in various countries in 1993.

Country	Canada	Finland	France	Ger.	Japan	Korea	Malaysia	South Africa	Spain	Switz.	UK	US
Turnover Ratio	0.43	0.33	0.38	0.65	0.32	1.43	0.68	0.06	0.39	0.62	0.37	0.67

Source: Based on data from the Emerging Markets Factbook, 1995.

Table 5 - Domestic and Foreign Asset Returns

States of Nature\Asset	Returns			
	Domestic	Probability	Foreign	Probability
Hi	$K_h(1+r)$	p	$K_f(1+r)$	q
Lo	$K_h(1+r(1-\phi))$	1-p	$K_f(1+r(1-\phi))$	1-q

