

# Home Bias

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## Abstract

This article discussed on, what we call, the home bias puzzle and international equity investment transactions, in which international security has less been invested in foreign countries After 1989, US and German foreign capital outflow have drastically increased, however. It is the background why this article focuses on these matters. Some changes might be happen in the international financial market. These developments in the world have important implications for us.

Key words; Home bias, international equity investment, capital

JEL Numbers; F4, G15, E21

## 1. Introduction

From the end of 1990, some strange things have been developed in the international finance. Institutional investors have changed investment strategy and invested more into foreign financial goods. These movements have some features. Institutional investors have a tendency to hold equity rather than bond. It was quite different from traditional movement of institutional investors. By the end of 1980, main channel of holding foreign equity was not equity but bond.

Institutional investors drastically expanded their investment strategy after 1989; they drastically strengthen foreign investment although they had less invested into foreign countries. Is it tendency or temporal? If tendency, what is the cause of this? What affect on the world economy?

In the economic literature, argument in terms of foreign security investment is further complicated. Indeed, economists don't pay any attention to such a recent enlargement of foreign equity investment, but less investment in foreign countries<sup>1</sup>.

Economists call this less investment as home bias or home bias puzzle, which means investors didn't invest in foreign countries rather than financial theory estimated. In other words, we cannot explain economically why real investors have a strategy to hold domestic equity so much.

My final goal in studying this topic is to focus on the recent tendency in international finance. Why do institutional investors have incentive to hold foreign equity in the last decade? What's implication to international macro economy and international financial market? As the first step of my studying, I should survey on home bias puzzle, because I can find some hint to focus on my study.

Lewis (1999) and Tesar (1995) survey related to this puzzle. Those surveys emphasized relationship between financial aspect and macro aspect, although equity puzzle can be investigated by the financial theory. More precisely speaking, equity home bias might have some links with trade structure or consumption. French and Poterba (1991) checked equity holding among developed nations (USA, Japan, UK, France, Germany, Canada) and estimated that domestic investors hold most of

their own country equity (USA 92.2%, Japan 95.7%, UK 92%, Germany 79%, France 89.4%). This fact is quite different from ideal figure, which was calculated on the standard financial theory<sup>2</sup>.

## 2. market and home bias

The approach to make clear the home bias can be divided into two directions. One is to focus on the market system which is related to the transaction cost or market restriction and so on, another is to focus on the macro economic factors which are related to the trade structure or consumption behavior. Firstly I want to pick up the arguments on the market and home bias. Tesar and Wernaer (1992) estimated transaction cost of bond and equity. They argue the home bias can be applied to the bond market. However bond market is less biased rather than equity market. It means transaction cost prevented from investing in the world equity market. Indeed, in terms of the cost per transaction, equity is higher, but usually, equity investment in the foreign countries is short term holding rather than domestic investment. As a result of this, total transaction cost of equity is much higher than bond investment<sup>3</sup>.

This finding was true until the end of 1980; transaction cost of equity investment has been drastically decreasing, however. For example, after 1990 world security investors don't require any transaction fee to invest in the world. Usual case is zero<sup>4</sup>. Hence recent home bias cannot be explained by the transaction cost.

Another view is market structure view, which might be related to the asymmetric information structure. French and Poterba (1991) seek for the reason of home bias which means investors prefer domestic equity to foreign equity. Behind their preference, they believe that they have much information on their domestic country rather than foreign country. It might be linked with culture and language gap.

This argument might be related to symmetric information problem in the international transaction. Gehrig (1993) and Kang and Stulz (1994) focus on home bias from the view of asymmetric information. These arguments supposed domestic investors are inferior to foreign investors in terms of information. This information gap might lead to the home bias because domestic investors hesitated to hold foreign equity. We cannot deny this information structure problem might be potential factors for home bias. However these arguments are very difficult to confirm empirically.

Brenna and Cao (1997) explained home bias on the asymmetric information hypothesis. They guessed that foreign investors faced on the information gap. They can get public information although domestic investors can use not only public information but also private information, because they might have their own channel to communicate with each other. If so, movement of foreign investors should be correlated to public information such as stock praise index. However, most empirical studies don't support this argument. Indeed these information approaches include some interesting points. Market information structure has a possibility to bring rent for agency that takes part in foreign security investment. It means foreign security investment have some potential risk to lead to agency problem as Lewis (1999) pointed out. Further more this potential risk might be related to recent institutional investor behaviors who rushed into Asian market at almost time and run out suddenly<sup>5</sup>.

Some economists study the Tax and Accounting system as the factor of home bias. Although developed nations try to introduce the world standard tax and account system, some developing countries are not enough to establish to trade financial goods conveniently or very restrictive to share the foreign equity. We can understand how tax affect on the foreign equity investment. By using CAPM, we define the objective function (utility function  $V$ )

$$V = V(E_t W_{t+1}, \text{Var}(W_{t+1}))$$

$$\text{Where } V_1 > 0, V_2 < 0$$

$W_t$  is real wealth at time  $t$ ,  $E_t$  is expectation operator, which means expectation at time  $t$ . We also define  $X_t = (X_{tf}, X_{th})$ ,  $X_{th}$  is the proportion of domestic equity to total equity,  $X_{tf}$  is the proportion of foreign equity to total, hence  $X_t$  should be 1. We also define the return of investment vector  $r_t = (r_h, r_f - T)$ ;  $r_h$  is return to invest in domestic equity,  $r_f - T$  is return to invest in foreign equity minus tax payment. We use  $E_t + W_{t+1} = W_t (1 + X_t' E_t r_{t+1})$  and  $\text{Var}(W_{t+1}) = W_t^2 \text{Var}(r_{t+1}) X_t$  to get F.O.C. with respect to  $X_t$ .

$$X_{tf} = (E_t r_{ft+1} - T - E_t r_{ht+1}) / \gamma (\text{Var}(r_h - r_f))^{-1} + (\delta_h^2 - \delta_{hf}) (\text{Var}(r_h - r_f))^{-1}$$

$\gamma$  is risk aversion and  $X_{tf}$  is optimal share of equity. This condition shows that if  $T$  (Tax) goes up, foreign investment will be discouraged and if  $\gamma$  goes up infinitely<sup>6</sup>, effect of Tax will be negligible. Restrictive Tax and different accounting system were serious for security trade at least before 1990. However developing nations have tendency to establish constitutional tax and accounting system to induce investment for foreigner. In other word, we have been toward deregulation. Hence it is thought that these factors also have less impact on the home bias gradually.

We should touch upon briefly the other some interesting arguments, which related to feature of the market or social system. Severson (1988) and Gonlub (1993) argued that non-tradable goods like human capital can be affected to the foreign security investment. He focuses on the Japanese home bias<sup>7</sup>. He proposed hypothesis which Japanese companies have a unique major to absorb economical shock, because they can use discriminately human capital and physical capital corresponding with the economical situation. They didn't need to diversify their financial portfolio. It is very interesting, because it proposed the hypothesis, which social system might have a role to absorb the economical shock. In Japanese case, workers guaranteed not only their job, but also salary profile which older workers can get good position and payment. Further more, Japanese mandatory social pension guaranteed income for old age. Hence, Japanese might have less incentive to take care their portfolio rationally. If so, it should be less or opposite correlation between physical capital and human capital, it is not fact in Japan<sup>8</sup>. Marianne Baxter and Jermann (1977) also focused on the human capital. Domestic investors don't have tendency to invest in foreign market, because human capital is correlated with domestic market rather than foreign market. Lewis (1999) rejected, because it should be opposite to diversify domestic shock.

Geert and Roewenhoerst (1994) investigated whether the multi national companies affect on the

international equity transaction, because many companies in the USA are multi-nations and domestic investors expected the same effect once they hold such companies in the domestic market. However, real equity value of these multi-nation companies is highly correlated with US equity index.

We should check the exchange effect on the equity transaction. Generally, Investors take care for foreign exchange volatility when they take international portfolio positions. Since at least, short-term purchasing power parity hypothesis (PPP) cannot be held, return of foreign investment will be affected by the exchange volatility. For example, the timing of US foreign equity expansion is corresponding to the time when the value of US dollar decreased drastically. In those days, Japanese YEN/US\$ recorded 79 yen/US\$. Hence risk premium of holding foreign currency drastically decreased for US investors. However, Ian Cooper and Evi Kaplanis (1994) showed that deviation of PPP couldn't explain the movement of foreign investment.

### 3. non-tradable goods and home bias

Another main approach to the home bias focuses on the macroeconomic links. Lewis (1999) emphasized the consumption smoothing and foreign equity investment and brings some important implications. Before focusing, it is worthwhile to explaining relationship between non-tradable goods and home bias. Many economists<sup>9</sup> argued that existence of non-tradable goods leads to the serious home bias. At least, a couple of economists seek for the cause as home bias although Lewis (1999) attacked these arguments.

For example Tesar (1993) used simple two countries model.

$$\text{MAX} \sum_{t=0}^{\infty} U(C_t, Z_t)$$

$X_t, Z_t$  are tradable consumption goods and non-tradable consumption goods which domestic country produced at time  $t$ . Hence People in this domestic country consume  $C_t$  and  $Z_t$  and get Utility  $U(C_t, Z_t)$  Like traditional way, suppose that people maximize sum of their utility from time 0 to time  $\infty$ . People also save the amount of residual which equals to the  $A-C-Z$ ; where  $A$  is their endowment at  $t = 0$ . Then we assume that people in this country will invest in domestic equity market ( $\omega$ ; the ratio of domestic equity to total equity) and in the foreign equity market ( $1 - \omega$ ; the ratio of foreign equity to total equity), where  $0 < \omega < 1$  holds. We will get return  $r$  if we invested in domestic,  $r^*$  otherwise.

Hence

$$A_{t+1} = (A_t - C_t - Z_t)[(1 + r)\omega + (1 + r^*)(1 - \omega)]$$

People will use money for future consumption by selling their equity. We should notice this model assumption. The reason why people try to invest equity is to acquire future claim of these holding companies. Generally speaking, we can distinguish the purposes of holding the equity. One is to get future income from companies and another is to get speculative gain by buying and selling based on the price volatility of equity. In this case, people will only invest to get future income.

By using this model, we can get bellman equation, which is

$$V(A_t) = \text{Max} \{U(C_t, Z_t) + (1 + \theta)^{-1} E(V(A_{t+1}))\}$$

Where  $\theta$  is discount rate

Differentiating this equation with respect to  $C_t$ , we can get FOC  $U(C_t, Z_t)V(A_t) = (1 + \theta)^{-1} E(U(C_{t+1}, Z_{t+1})[(1 + r)\omega + (1 + r^*)(1 - \omega)])$ . To image the implication of this result, We simply assume that people hold the same amount of equity ( $\omega = 0.5$ ) and increase domestic equity by the small amount of  $\varepsilon (> 0)$ . If home bias has some economical rationality,  $U_\varepsilon > U$  should be held<sup>10</sup>. By some calculations, we can get

$$\text{Cov}(X, Z) > \text{COV}(X^*, Z)$$

I omit subscription time  $t$  to make simple. This result shows if the covariance between domestic tradable goods and domestic non-tradable goods is higher than the covariance between tradable foreign goods and domestic non-tradable good, equity investment has bias to domestic equity.

What is the implication behind this result? In case where people in the domestic country consume the own county goods, domestic good will be affected by domestic consumers behavior. On the other hand, connection between foreign tradable goods and domestic non-tradable goods might be relatively weak, because foreign tradable goods will be affected not only by the domestic consumers, but also by foreign consumers. As the extremely case, in the losed economy where there is no trade between two nations domestic consumer behaviors will less impact on the foreign consumers. By using this model, we can find reason why home bias happened, because people have a tendency to consume their domestic well rather than foreign goods. In other words, people prefer their own country goods to foreign countries. As Kruguman (1991) shows us, it is extremely difficult to change the structure in which people wish to consume domestic goods more than foreign goods.

Figure 1

Trade/non	Canada	Germany	Italia	Japan	USA
Canada	0.356	0.633	0.533	0.304	0.809
Germany	0.173	0.688	0.631	0.181	0.502
Italia	0.277	0.399	0.824	-0.072	0.477
Japan	-0.062	0.642	0.505	0.37	0.413
USA	0.212	0.605	0.491	0.0547	0.853

Source;  
Tesar (1993)

It is the purpose that investors try to enjoy the share of future income. In this model, people can enjoy the growth of company, which was accelerated by their consumption. It means, since consumers contribute to the growth of companies through their consumption, they have incentive to gain the share of growth of domestic companies.

**Figure 1** shows covariance matrix among 5 countries (Canada Germany, Italia, Japan, USA).

Except Germany,  $\text{Cov}(X, Z)$  is  $\text{Cov}(X^*, Z)$ .

Can I apply to explain the status quo where foreign equity investment expanded drastically? After 1990, trade system has been liberalized through the establishment of GATT. Through this process, developing countries might have established to export primary consumption goods for USA.

Indeed, At least before 1970, US economy had feature, in which people live in relatively self-closed economy; US consumer mainly produce for US consumer and consumer their own product goods. However, after 1990, US consumers imported their consumption goods drastically. It might be related to the persistence against inflation due to the contribution of importing cheap consumer goods from developing nations. In such circumstances, US consumers might have incentive to invest into foreign countries because their consumption contributes to the growth of the companies in the developing nations.

Furthermore, Looking at the development of share of manufacture industry in the world, after 1990, gap of share of manufacture industry between other nations and USA has been expanded. It is mirror image where industrial structure in the USA drastically changed from manufacture industry to service industry. For example, US-Japan gap has expanded from 10% to 15%. Let's think extremely case; US industry changed their industrial structure where the share of service industry changed from 50% to 100%, foreign country remains their share of 50% manufacture industry and 50% service industry.  $\text{Var}(X^*, Z)$  will go up because people in the USA cannot help importing more manufacture goods. Behind this approach, trade structure or industrial structure changing might be implied.

Lewis (1999) criticized this approach, because the existence of non-tradable goods and tradable goods is not enough and sufficient condition to explain less investment into foreign markets from some reasons. (1) Non-tradable argument (NT argument) assumes domestic people can't consume foreign non-tradable goods. If we relaxed this condition, we lose the power to explain the home bias. Indeed we can invest in non-trade industry such as the financial companies and chain of domestic restaurants and so on. (2) NT argument set special utility function, which can be separated utility from tradable goods and non-tradable goods. However, it is not necessary true for domestic investors to hold 100% non-tradable domestic industry equity<sup>11</sup> under non-separated utility. (3) We should expanded to hold non-tradable foreign equity if we really want to diversify the risk of economical shocks, because variance between domestic industry equity and foreign non-tradable equity would be small.

#### **4. Consumption and home bias**

Lastly, recent articles focus on relationship between consumption bias and home bias. Bacus, Kehoe, Kydland (1992) showed us outputs are highly correlated across the counties than consumption. However it was strikingly disparity between theory and real fact.

We might call another puzzle such as "consumption bias" In the economic theory; consumption growth rate should be equal in the world if financial markets in the world are integrated. Because we can get financial resources to consume by selling their portfolio, even if we met the domestic shock and shortage of income by some shocks. In fact it isn't true.

What is the linkage between home bias and consumption bias? Should Consumption growth rate be equal in the world through diversifying equity? Is home bias one of cause of consumption puzzle? However, consumption puzzle might not necessarily correspond to the home bias puzzle. For example, under the well-integrated loan market or bond market, consumption bias will be disappeared although we can find home bias<sup>12</sup>. Otherwise, we will find only consumption bias under circumstances where we have completely integrated financial markets and so many non-listed companies or human capital. Lewis (1999) implicated both bias should be equal under some special hypothesis of economic structure; (1) non uncertainty, market completeness, (2) equity is traded on all output, in other words we can get all of future output claim by equity, (3) countries can be viewed as populated by the same representative agent. Lewis suggested special hypothesis could lead to the serious contradictions between empirical study and theory.

Lewis (1996) empirically checked whether the existence of non-tradable goods lead to the consumption bias or not? She completely denied this hypothesis<sup>13</sup>. Indeed Lewis suggested the non-tradable goods cannot explain those puzzle.

Cole and Obstfeld (1991) and Van Wincoop Eric (1994) and Lewis (2000) also argued the consumption bias. Their final purpose is to calculate the welfare gain by diversifying portfolio in the world. If small, it is nothing but the proof that we don't need to diversify our income. If big, we are still in the puzzle<sup>14</sup>. These calculations show us quite small<sup>15</sup>. Through these calculations, they found that result should depend on the database. If we used equity base return and volatility, welfare would be big, otherwise (consumption growth rate base), small. The cause of this disparity comes from the different variances (volatility) of two bases. Variance of consumption growth rate is smaller than return of equity. So we get some contradicted results. Indeed we supposed the economy should be constituted by the same agencies, which means representative consumers should be equal to the representative investors at the same time. Of course, it is quite different from real figure.

What is the implication of these arguments for our future study? Firstly, We are interested in the Lewis criticism against NT argument. She implicated NT argument theoretically contradicted to diversifying the risk, because we should invest in the non-tradable industry under diversification conditions. NT argument can explain recent development of the foreign equity investment, however. Our simple question is whether the optimization of consumption should be equal to the diversification of risk to absorb shock.

Second question is what means the disparity of consumption base and equity base. In my understanding, we have some reason to hold foreign equity from the view of equity investment, however, less reason to diversify from the view of consumption. Dose it mean gain by equity diversification is not equal to the gain by consumption diversification? It means the people who get the gain in equity should not be necessarily equal to the consumers. If so, Are there any economical conflicts between investors and consumers? Equity investment in foreign countries will bring us some unstable result (I am not sure what I should say). Indeed is it related to the some crisis of financial markets in the history?

本稿は (財) 日本証券奨学財団の研究助成を得て行われた研究成果の一部を報告するものである。

## Notes

- 1 World bank seeks for the cause of the recent outflow of USA. This article emphasized that low interest rate in the USA after 1990 led to big boom of equity investment not only to the domestic market but also to foreign market. Morgan (1992) focus on long term correlation between share of equity holding of labor age population and percentage of the labor age population to total.
- 2 French and Poterba estimated the net purchase of equity at the end of 1989.
- 3 Tesar and Wener (1992) explained turnover rate and transaction cost. The cost per one transaction of equity was higher than bond. But usually, equity investment in the foreign countries was short term holding rather than bond investment. So turnover rate of equity was high. As a result of this, total transaction cost of equity is much higher than bond investment.
- 4 You might not believe zero transaction. For example, Japanese big investors did not pay any transaction fee in domestic and foreign countries from the end of 1990s, because they can easily change their new intermediate agency if domestic agency requested some fee. Extremely case, Japanese investors used some technical transaction. They invested foreign fund, which was consisted of Japanese stock through UK agency. UK agency can trade Japanese stock without fee because UK government admitted no-fee transaction for UK agency. It means if some developed country admitted no fee transaction, automatically other country can trade no fee transaction. In other word, if one country experienced liberalization of finance, it might seriously affect on other country.
- 5 Further more this potential risk might be related to recent institutional investors behaviors who rushed into Asian market at short time and run out suddenly.
- 6 Hansen and Hodoick (1983) examined the case where the risk aversion should be huge value. It leads simple implication why home bias happened, because people afraid their risk to hold foreign equity and prevent from investing actively.
- 7 Knag, Jung-koo and Rene M. Stulz (1997) also explained in Japanese case. They tried to explain why international investors invested in Japan more than other Asian nations. By their argument, investors can get more information relative to the other Asian countries. We cannot deny, but we should notice other factors such as market impact. The transaction volume of these Asian nations is quite small to Japanese stock market. For example, if big pension fund invested in the small countries at one time, market price would be drastically up by this fund. Further more, Price would be drastically down if pension fund leave these market. Investors generally afraid whether their action would impact to the foreign market or not, what we call market impact, because of the market size. It means, more difficult fund can find to invest, the larger their fund would be. Since Japanese financial market is relatively larger than other nations, market impact would be small.
- 8 Generally speaking, part time job of women might contribute to adjust labor market in Japan after 1970.
- 9 Stockman and Dellas (1989), Baxter, Marianne Urban J Jermann and Robert G King (1998).
- 10  $U(C_t, Z_t)V(A_t) = (1 + \theta)^{-1} E(U(C_{t+1}, Z_{t+1}) [(1 + r) 0.5 + (1 + r^*) 0.5])$   
 $U_\epsilon(C_t, Z_t)V(A_t) = (1 + \theta)^{-1} E(U(C_{t+1}, Z_{t+1}) [(1 + r) (0.5 \epsilon) + (1 + r^*) (0.5 - \epsilon)])$
- 11 Obstfeld (1994) showed theoretical conclusion significantly depends on different utility function setting. For example, parameter of risk aversion and time discount rate will be affected to the home bias oppositely each other. However, we usually didn't set separately.
- 12 Lewis (1996) argued this argument should not be modified even if we have other international markets (Bond markets). Because (international) bond markets are more restricted rather than equity markets. It means that bond market cannot work well to diversify.
- 13 Lewis (1966) test as follows.  
 $\Delta C = \theta_1(T) + \theta_2(N) + \theta_3(L) + b(Y) + \mu$   
 C; consumption  
 T; time trend of GNP  
 N; non-tradable goods  
 L; leisure  
 Y; GNP (=non-tradable goods and tradable goods)  
 Firstly, Hypothesis  $b = 0$  should be accepted if we can diversify risk of shock. However, this hypothesis was rejected.

Secondly,  $\theta_1$ ,  $\theta_2$ ,  $\theta_3$  should be significant. However, surprisingly, degree of variability of  $\theta_1$ ,  $\theta_2$ ,  $\theta_3$  are also quite small. Hence empirical study suggested that non tradable goods cannot explain home consumption bias

- 14 Extremely speaking, financial transaction is meaningless for us! Liberalization of financial market is not useful! Off course, home bias should be rationally effective.
- 15 Obstfeld (1994) also found that welfare might be high if we consider the different deterministic trend of each country.

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