

Keeping Up with the Joneses and the Home Bias

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Abstract

We argue that when individuals care about their consumption relative to that of their neighbours, a home bias emerges, that is investors overweight domestic stocks in their portfolios. Domestic stocks are preferred because they also serve the objective of mimicking the economic fortunes and welfare of the investor's neighbours, countrymen, and social reference group. We also demonstrate that globalization mitigates the home bias, and derive a modified international CAPM.

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JEL classification: *F30, G11, G12, G15*

1. Introduction

Since Duesenberry (1949), economists recognise the fundamental habit of people to compare their economic welfare to that of their neighbours, peers, and social reference group. Individuals desire, first of all, to 'keep up with the Joneses', that is preferences are defined over relative consumption (the ratio of individual consumption to that of their neighbours).

The present study addresses the investment decisions of individuals, and especially their choice between domestic and foreign stocks. Investors wishing to keep up with their neighbours (their county residents, in our case) consider favourably investments in domestic stocks because those provide a better link to the local economy and to their countrymen economic welfare. According to this view, investors seek some correlation with their countrymen's future return and future consumption, i.e., to

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the future domestic labour income and to the future return of local businesses. Thus, to tie their future economic welfare with that of their neighbours, investors favour domestic stocks. The result is called a home bias – investors tilt their portfolio weights towards domestic stocks.

The home bias phenomenon puzzled many scholars before. Previous research such as French and Poterba (1991), Kang and Stulz (1997) and Lewis (1999) wonders how come so many investors ignore the proven benefits of international diversification. Our approach resolves this puzzle. In our model the home bias is a natural consequence of the desire of individuals to compare themselves and keep up with their neighbours.

Our model further predicts that globalisation (increased correlation between the consumption and preferences of different nationals) would mitigate the home bias. Another result is a new International CAPM model that is somewhat different from the traditional International CAPM.

The paper is organised as follows. Section 2 reviews the home bias evidence. Section 3 develops the model, and discusses its implications. Section 4 concludes.

2. The home bias enigma

The home bias enigma starts with the empirical observation that investors under-diversify. Despite the clear theoretical and empirical demonstrations that diversification can improve the risk-return tradeoffs of their portfolios, investors impose restrictions on diversification, that is do not diversify enough. Individual and professional investors prefer to hold, and tilt their portfolio weights towards, stocks of companies that are geographically close to them.

The home bias is a well-established phenomenon in international finance. French and Poterba (1991) document the strong tendency of investors in the USA, UK and Japan to hold domestic securities. According to French and Poterba (1991), at the end of 1989, domestic investment exceeded 90% in the USA and Japan, and 80% in Europe (UK, Germany and France). These domestic concentration levels appear excessive, given the existing opportunities for international diversification. Lewis (1999) reports that during 1970–96 the correlation between the monthly returns on the USA and EAFE (Europe, Australia and Far East) stock market indices was 0.48 only. This modest correlation implies an allocation of at least 40% of the US investors' portfolio to foreign stocks (see Lewis (1999) Table 2, p. 576). The actual US allocation to foreign stocks is 8% only – see Bohn and Tesar (1996), highlighting the strong home bias.

Lewis (1999) reviews several possible explanations for the home bias, and categorises these explanations into two groups: (1) hedging home risks with home equity, and (2) high diversification costs that exceed the diversification gain. The explanations based on hedging are not supported in empirical tests. Cooper and Kaplanis (1994) reject the proposition that investing domestically helps hedge against inflation risk. Baxter and Jermann (1997) show that in order to hedge against domestic human capital returns, investors should short (or decrease the portfolio weight invested in) domestic stocks. Lewis (1999) reports that holding stocks of multinational domestic firms cannot replace or substitute for international diversification because multinationals' returns usually move quite closely with their domestic market index.

The cost explanation for the home bias is more realistic. International diversification costs include international taxes, relatively high information costs (see Gehrig

(1993) and Kang and Stulz (1997)), relatively high transaction costs, and other barriers on trading equities. (For example, foreign stocks are more short sale constrained than domestic stocks).

Empirical research discounts the importance of diversification costs. Tesar and Werner (1995) observe the relatively high turnover rate of foreign equity held by domestic investors, and interpret it as evidence that the foreign transaction costs are not excessive or really deterring for investors. Lewis (1999) notes that although barriers to international investment have fallen dramatically, foreign ownership of shares remains extremely limited. Lewis (1999) also argues that difficulties in obtaining and interpreting information are not a convincing reason for the lack of diversification into developed countries. (For example, it cannot explain why US investors under-invest in the UK.)¹ Last, French and Poterba (1991) contend that for most investors there is little difference between the foreign and domestic tax burdens.

The above evidence suggests that the extra cost of international diversification is not cardinal. In contrast, the gains from international diversification can be enormous. Lewis (2000) estimates that the gain to an investor from international diversification can amount to 100% of her lifetime consumption. Clearly, international diversification gains exceed costs, implying that costs can, at best, explain only part of the home bias puzzle.

The current trend is to attribute the home bias to behavioural factors. One strand, Huberman (2001) for example, highlights the cognitive preference of individuals for the familiar as the source for the home bias. This avenue of pure cognitive explanations is intriguing.

The second strand attempts to rationalise the behavioural preference of home equities. Demarzo *et al.*, (2003) suggest (p. 1) that ‘...when there are scarce local resources, competition for these resources leads investors to care about their relative wealth in the community. As a result, rational risk averse investors have an incentive to herd and choose a portfolio similar to the rest of their community.’ We proceed this second strand by advancing another potential rational explanation. Specifically, we propose to modify the standard assumptions about investor preferences, and derive a model where the home bias emerges naturally.

3. The model

3.1. Economic setup

Assume that there are N assets in the economy with random returns R_i ($i = 1, \dots, N$), and a risk free asset (asset $N + 1$) that returns R_f . These assets are traded at time zero and pay off at time one. Investors can choose portfolio returns of the form

$$R_p = \sum_{i=1}^N c_i R_i + \left(1 - \sum_{i=1}^N c_i\right) R_f, \quad (1)$$

where c_i is the weight of asset i in the portfolio, and there are no restrictions on portfolio weights.

¹ However, the information issue is more complex. Coval and Markowitz (2001) propose that private information advantages about domestic stocks may lead to an overweight of domestic stocks in domestic portfolios.

The standard assumption, made in the CAPM literature, is that preferences are defined on the mean and variance of portfolio returns. We assume, instead, that investor A, the representative investor of country A, considers the mean and variance of

$$W_A(1 + R_{pA})/(1 + R_{rA}), \quad (2)$$

where W_A is the initial investment of agent A, and R_{rA} is the return of a reference portfolio that investor A and her countrymen care about. This reference portfolio may comprise primarily domestic stocks because it may be an instrument to track the labour and business income of other countrymen.

Equation (2) focuses on relative future return and consumption. The idea of modelling preferences using relative consumption was first introduced by Duesenberry (1949). More recently, it has been studied by Campbell and Cochrane (1999), who assume that preferences are defined on the ratio between the consumption and a weighted-average of aggregate past consumption of all investors (representing a consumption habit). Our style of preferences is a bit different from Campbell and Cochrane (1999), as we focus on relative future income and consumption.

Now, define

$$E_A = E[(1 + R_{pA})/(1 + R_{rA})], \quad (3)$$

$$\sigma_A = \sigma[(1 + R_{pA})/(1 + R_{rA})], \quad (4)$$

and assume that the investor's utility function, U_A , is linear in σ_A^2 and E_A . That is,

$$U_A(\sigma_A^2, E_A) = -\sigma_A^2 + 2k_A E_A, \quad (5)$$

where $1/k_A$ is the risk aversion of investor A. Note that because W_A is known, defining preferences on $(1 + R_{pA})/(1 + R_{rA})$, as we do in equation (5), yields equivalent results to defining preferences on $W_A(1 + R_{pA})/(1 + R_{rA})$. The only difference is a re-scale of the utility function.

3.2. Portfolio choice

Assume that R_{rA} and R_{pA} are close to zero. Then, we can use the approximation

$$(1 + R_{pA})/(1 + R_{rA}) \approx 1 + R_{pA} - R_{rA}. \quad (6)$$

Given the investor's mean variance utility function, equation (6) suggests that the investor wants to maximise the expected value and minimise the variance of $R_{pA} - R_{rA}$.

On reflection, the investor problem in a world with relative preferences is to determine the optimal deviation from R_{rA} , the reference portfolio. Obviously, if the investor chooses a portfolio $R_{pA} = R_{rA}$, i.e., to invest all wealth in the reference portfolio, she minimises the risk of her objective (specified in equation (6)). However, the investor may choose a different portfolio than the reference portfolio, because the expected value of her objective, and not only its risk, enter her utility function.

A simple solution to the investor's concerns about R_{rA} is to borrow and invest the proceeds in R_{rA} (i.e., hedge against R_{rA}). The chosen portfolio return is thus

$$R_{pA} = R_{rA} - R_f + R_{NH}, \quad (7)$$

where R_{NH} is the return on the non-hedging component of the investor's portfolio. Substituting equation (7) into (6) changes the investor's objective to

$$1 + R_{NH} - R_f. \quad (8)$$

The investor's problem has transformed into choosing a portfolio NH that maximises the expected excess return while minimising the excess return variance. This is the familiar and standard problem in mean variance analysis. Denote a portfolio on the efficient frontier of all assets (called also the Capital Market Line) as MV. Then, investor A would choose a non-hedging portfolio NH with a return of

$$R_{NH} = (1 - \alpha_A)R_f + \alpha_A R_{MV}, \quad (9)$$

where R_{MV} is the return on portfolio MV, and α_A is the proportion of portfolio MV in investor's A optimal portfolio.

Substituting equation (9) into (7), we obtain that the return of the optimal overall portfolio of investor A is given by

$$R_{PA} = R_{rA} - R_f + (1 - \alpha_A)R_f + \alpha_A R_{MV} = \alpha_A(R_{MV} - R_f) + R_{rA} \quad (10)$$

For utility functions with the special form assumed in (5), the optimal α_A can be computed explicitly (see the Appendix) and it is given by

$$\alpha_A = k_A G, \quad (11)$$

where

$$G = (E[R_{MV}] - R_f) / \text{var}[R_{MV}]. \quad (12)$$

Formulas similar to (10) hold for all other representative investors across the world. Foreign investors may differ from A in α and R_r . Differences in α , the proportion invested in the mean variance efficient portfolio MV, emanate from differences in risk aversion. The differences in R_r evolve because of differences across countries in the reference portfolio. Note however, that we assume that all world investors have homogeneous expectation. They agree and invest the non-hedging component of their portfolios in a combination of the 'world' risk free asset and portfolio MV – the 'world' mean variance efficient portfolio.

On reflection, equation (10) reminds the solution to the numeraire problem in international finance. Suppose that different investor groups (i.e., different countries) care about different numeraires. Then, according to the numeraire literature (Adler and Dumas (1983), for example), they should hold a combination of the world portfolio and a portfolio designed to mimic the numeraire. This is analogous to equation (10) where we propose to combine the 'world' mean variance efficient portfolio MV with a portfolio mimicking the country-specific numeraire (the domestic reference portfolio). A more general version of our model could also consider other investments such as investments in human capital, real estate and fixed-income instruments in an attempt to try to understand how the country numeraire (domestic reference portfolio) evolves endogenously. However, this task is beyond the scope of the present paper.

3.3. Equilibrium

If each investor k demands a portfolio return R_{pk} of the form of equation (10), then the aggregate demand portfolio return is

$$\sum_k (W_k / W) (\alpha_k (R_{MV} - R_f) + R_{rk}), \quad (13)$$

where W_k is the wealth of investor k in the world, and W is the aggregate wealth of investors in the world. On the other hand, the aggregate supply portfolio return is R_M , the value weighted return on the market portfolio of all world assets (including the risk-free asset), i.e.,

$$R_M = \sum_{i=1}^{N+1} w_i R_i \quad (14)$$

where w_i is the market value of security i divided by the total market value of all world's securities.

In equilibrium, the aggregate demand and aggregate supply portfolios are identical. Thus,

$$R_M = \alpha(R_{MV} - R_f) + R_r, \quad (15)$$

where $\alpha = \sum_k (W_k/W) \alpha_k$ reflects the world risk aversion, and $R_r = \sum_k (W_k/W) R_{rk}$ is the aggregate reference portfolio in the world. Rearranging equation (15) yields the following expression for R_{MV} :

$$R_{MV} = R_f + (R_M - R_r)/\alpha. \quad (16)$$

3.4. Home bias

Given equations (10) and (16), the portfolio return of investor A (the representative investor of country A) can be written as:

$$R_{pA} = (\alpha_A/\alpha)(R_M - R_r) + R_{rA}. \quad (17)$$

Now, suppose that the domestic reference portfolio is based on both a portfolio of domestic stocks, R_{dA} , and the world market portfolio, R_M , i.e.:

$$R_{rA} = \pi_{dA} R_{dA} + (1 - \pi_{dA}) R_M. \quad (18)$$

In equation (18) we assume that the investor perceives herself as part of the world, thus assigns in her reference portfolio a weight of $(1 - \pi_{dA})$ to the world market portfolio. More important, the investor has a local perspective and wishes to tie her portfolio returns to the specific fortunes of her domestic economy. This is best achieved by assigning a weight π_{dA} to a portfolio of domestic stocks.

It may be asked why cannot investors decide to set π_{dA} to zero so that no home bias exists and the advantages of international diversification are fully utilised. An equilibrium with $\pi_{dA} = 0$ for all investors is possible according to our model. Yet, it is not the currently prevailing equilibrium because of at least three reasons. First, the domestic portfolio return also reflects the component of domestic income that is uncorrelated with (and cannot be mimicked by) the world market portfolio. Investors with our style of preferences like to be correlated with their neighbours; thus reliance on the return of domestic stocks helps them establish a stronger bond between their and their neighbours' wealth. Second, herding around home equities motivated by competition for local resources, as in Demarzo *et al.*, (2003), contributes to a positive π_{dA} . Third, given that in the past it was difficult to diversify internationally, many investors held and are endowed with home-biased portfolios. Thus, slow historic evolution also contributes to a positive π_{dA} .

Combining equations (17) and (18), we obtain

$$R_{pA} = (\alpha_A/\alpha)(R_M - R_r) + \pi_{dA} R_{dA} + (1 - \pi_{dA}) R_M. \quad (19)$$

Equation (19) can be used to examine investor A's total holding of domestic stocks. Domestic stocks are held not only because they appear in R_{dA} , the portfolio of domestic stocks that serves the purpose of 'keeping up with the Joneses'. The world market (R_M) and world reference (R_r) portfolios also include domestic stocks. If we denote:

x_{AM} – the weight of stocks from country A in the world market portfolio, and
 x_{AR} – the weight of stocks from country A in the world reference portfolio,

then, based on equation (19), x_{dA} , the total weight of domestic stocks in the portfolio of investor A, can be computed as:

$$x_{dA} = (\alpha_A/\alpha)(x_{AM} - x_{AR}) + \pi_{dA} + (1 - \pi_{dA})x_{AM}. \quad (20)$$

To derive (20) note that the coefficients of returns in equation (19) are portfolio weights, and that the marginal contribution of each portfolio to the total weight of domestic stocks in the investor's portfolio equals the portfolio weight times the proportion of that portfolio invested in domestic stocks. Rewriting equation (20) we obtain:

$$x_{dA} - x_{AM} = (\alpha_A/\alpha)(x_{AM} - x_{AR}) + \pi_{dA}(1 - x_{AM}). \quad (21)$$

The left-hand-side of equation (21) is the difference between domestic stocks' weight in the domestic investor's portfolio and domestic stocks' weight in the world market portfolio. The classic frictionless CAPM model suggests that investors choose stocks according to their weight in the world market portfolio. Hence, if the left-hand-side of (21) is positive a home bias (overweight of domestic stocks) emerges.

The first term on the right-hand-side of equation (21), $(\alpha_A/\alpha)(x_{AM} - x_{AR})$, is likely to be negligible because the proportion of domestic stocks in the world market portfolio (x_{AM}) and the proportion of domestic stocks in the world reference portfolio (x_{AR}) are most probably small and of similar magnitude. Thus, the existence of a home bias depends primarily on π_{dA} , the weight assigned to a portfolio of domestic stocks in the investor's reference portfolio (see equation (18)). We contend that because investors like to be correlated with their countrymen's wealth, π_{dA} should be positive and non-negligible. Hence, equation (21) suggests the existence of a home bias.

3.5. Extensions

First, it is apparent from equation (21) that if π_{dA} , the weight assigned to a portfolio of domestic stocks in the investor's reference portfolio, decreases, the home bias (overweight of domestic stocks) weakens. We propose that 'globalisation' curtails π_{dA} and the home bias. Globalisation is frequently a cultural process where individuals begin mimicking western standards, and put less weight on domestic identity and domestic resemblance. This investors' taste change reduces investors' local focus, hence π_{dA} decreases. Another feature of globalisation is large investments by foreign enterprises in the domestic economy. As a result, the domestic economy becomes more dependent on the global economic condition, which diminishes the idiosyncrasies or uniqueness of countries. When a country become less unique, the extra weight needed for tracking its unique economic condition diminishes – π_{dA} decreases.

Second, our model can be extended to explain other seemingly unrelated home bias phenomena. Empirical research has identified 'within country' and 'within firm' home

biases as well. For example, Coval and Moskowitz (1999) report that US money managers overweight in their clients' portfolios stocks of firms whose headquarters are geographically close to the money manager's office. Huberman (2001) finds that in almost every state of the US shareholders prefer (overweight in their portfolios) stocks of the local regional Bell company. Most perplexing, Benartzi (2001) documents that employees invest about a third of their retirement funds in their own company stocks. This within firm home bias cannot be attributed to discounts that employees receive from the company when investing in company stocks. Benartzi (2001) finds that about a quarter of the employees' discretionary funds are also invested in the company stocks.

Our relative preferences approach suggests that if the investor overweighs local-company stocks in her reference portfolio, so that her closer neighbours' future wealth could be better mimicked, a within-country home bias appears. Likewise, investors who wish to be correlated with their co-workers, can add or overweight the company's stock in their reference portfolio, which would generate a within firm home bias. Other studies (e.g. Huberman (2001) and Benartzi (2001)) offer some behavioural explanations for the within country and within firm home biases. We propose that our explanation, based on the investor's desire to 'keep up with the Joneses', is at least as plausible.

A third extension of our model is in the direction of international asset pricing. Recall, from section 3.3, that MV is the world's mean variance efficient portfolio. Given this, the standard mean variance mathematics implies that asset returns can be expressed as

$$E[R_i] - R_f = \lambda \text{cov}(R_{MV}, R_i), \quad (22)$$

where

$$\lambda = (E[R_{MV}] - R_f) / \text{var}(R_{MV}). \quad (23)$$

Equation (23) is similar to the classic CAPM except that here, the mean variance efficient portfolio MV replaces the market portfolio of risky assets. Substituting R_{MV} (from equation (16)) into the covariance term of equation (23) renders the following pricing formula

$$E[R_i] - R_f = (\lambda/\alpha) \text{cov}(R_M, R_i) - (\lambda/\alpha) \text{cov}(R_r, R_i). \quad (24)$$

Equation (24) is essentially a modified international CAPM model. It differs from the original international CAPM (see Solnik (1974), for example) because we assume preferences on relative consumption and the existence of domestic reference portfolios. The insight provided by equation (24) is that the expected return on an asset might be determined not only by its covariance with the world market portfolio, but also by the covariance of its return with R_r , the aggregate world reference portfolio. The aggregate reference portfolio represents the aggregate investors' demand generated by their desire to resemble their neighbours. According to our model, an asset that is broadly and relatively heavily used for 'keeping up with the Joneses' (has a large positive weight in the aggregate reference portfolio, or is strongly positively correlated with it), would have a markedly lower expected return (all other things equal). This is because if asset j serves frequently in the investors' reference portfolios, its demand and price would increase, and its expected return would decrease.

3.6. Testable implications²

The most unique testable implication of the model is that assets that are overweight in the domestic portfolio offer a lower expected return. This is generated by the excess domestic demand for these stocks. Previous models of international diversification typically highlight the information or transaction costs' motives and claim that some domestic assets are 'expensive' for foreigners to own. The lack of international demand causes a discount in these stock prices, leading to a higher expected return and an overweight in domestic portfolios. The key question is whether overweight is generated by excess demand for domestic investments, as is proposed by our model, or by the lack of demand by foreigners, as is suggested by various information and transaction costs models. Notably, the Demarzo *et al.*, (2003) model also proposes that excess demand of domestic investors is the key for the home bias. Hence, Demarzo *et al.* (2003) also predict lower expected returns for overweight domestic stocks.

Other testable propositions concern 'event studies' of exogenous shocks to the investor reference group. For example, when country boundaries change, the investor's reference portfolio should change as she sees herself now part of a new community. Such a prediction should apply to the undergoing European unification process, leading investors in Italy, for example, to increase their investments in Germany and France. Or, when the reference group shrinks, as in the breakdowns of Czechoslovakia and Yugoslavia, investors should increase their investments in domestic equities at the expense of investments in the separated-country equities. Finally, it is possible that a stock that lists on foreign markets, for example a European stock that lists on the Nasdaq, would increase its demand and price, as it becomes part of the American reference portfolio. American investors may buy a diversified portfolio of Nasdaq stocks for domestic hedging purposes, ignoring or unaware of the fact that some of the stocks are not domestic. Notably, all of the above event-type predictions are not unique to our 'keeping up with the Joneses' model. Nevertheless, their empirical testing can provide information on the empirical plausibility of our model.

4. Conclusion

In this study we offer a possible rational explanation for the home bias phenomena. The basic idea is that if investors care about their consumption relative to that of their neighbours, they would bias their portfolios in the direction of securities correlated with their neighbours' wealth. Since domestic employment, wealth and consumption are best reflected by the prices of domestic company shares, investment in domestic securities helps establish a stronger bond between the investor and her countrymen wealth. A home biased portfolio follows. Future research should examine the empirical merit of our model.

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² This section is based on the discussion of Ian Cooper at the European Financial Management Association Meetings.

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Appendix

Given the agent's utility function, specified in equation (5), we need to solve

$$\max\{U_A = -\text{var}(1 + R_{pA} - R_{rA}) + 2k_A E[1 + R_{pA} - R_{rA}]\}. \quad (\text{A1})$$

Substituting equation (10), $R_{pA} = \alpha_A(R_{MV} - R_f) + R_{rA}$, into equation (A1), transforms the problem into

$$\max\{U_A = -\alpha_A^2 \text{var}(R_{MV} - R_f) + 2\alpha_A k_A E(R_{MV} - R_f); \alpha_A \text{ is real}\}. \quad (\text{A2})$$

The only investor choice variable in the maximisation problem (A2) is α_A , the proportion invested in the mean variance efficient portfolio whose return is R_{MV} . All other variables in (A2) are pre-determined. Solving the maximisation problem, we obtain (from the first order conditions) that

$$\alpha_A = k_A G,$$

where

$$G = (E[R_{MV}] - R_f) / \text{var}[R_{MV}].$$

These are equations (11) and (12) in the text, respectively.