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30 August 2008

Online at <https://mpra.ub.uni-muenchen.de/26982/>

MPRA Paper No. 26982, posted 25 Nov 2010 04:13 UTC

**THE DETERMINANTS OF HOME BIAS PUZZLE IN EQUITY PORTFOLIO
INVESTMENT IN AUSTRALIA**

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Abstract

Over the past decades, there is an increased trend in the international financial integration as countries are removing and relaxing controls on cross-border investment. Capital can flow easily to the destination that offers higher returns as the results of decreasing obstacles to international investment. However, despite well documented gains from international diversification, investors continue to have a strong preference for domestic assets.

This paper characterizes the salient nature of the composition of the Australian equity portfolio investment. In addition, the paper investigates the determinants of the Australian investors' home bias in equity portfolio investment. Employing the disaggregated data for the holding of Australian investors abroad from the Coordinated Portfolio Investment Survey (CPIS) conducted by IMF for the year 1997, 2001, 2002, 2003, 2004 and 2005, we provide an insight into the causes of the home bias puzzle by empirically analysing the role of explicit barriers to international investment (capital controls and transaction costs) and implicit barriers (governance and information asymmetries).

JEL Classifications: E22, F15, F41

Keywords: home bias, portfolio equity investment, transaction costs, volatility, liquidity.

THE DETERMINANTS OF HOME BIAS PUZZLE IN EQUITY PORTFOLIO INVESTMENT IN AUSTRALIA

1. Introduction

There is an increased trend towards international financial integration as countries are removing and relaxing controls on cross-border investment. The potential benefits of international diversification have been acknowledged theoretically. Many papers suggest that the risk of an investment portfolio can be reduced by incorporating foreign equities (De Santis & Gerard 1997; Eldor, Pines & Schwartz 1988; Grauer & Hakansson 1987; Grubel 1968; Solnik 1974; Stulz 1997). However, despite well documented gains from international diversification, investors continue to have a strong preference for domestic assets. Various empirical studies challenge the assumption of international diversification yielding high returns. This phenomenon is dubbed as the home bias puzzle by financial economists, ie. actual share of foreign equity in equity portfolio is normally lower than predicted by a capital asset pricing model. Engel (2000) identifies that home bias in equity portfolio is one of the three “core puzzles” in international macroeconomics (why is so little diversification observed?).

The explanations provided for home bias in asset holdings is one of the least contentious empirical findings in international finance. The international capital asset pricing model (CAPM), based on traditional portfolio theory developed by Sharpe (1964) and Lintner (1965), predicts that mean-variance optimizing investors should hold the world market portfolio of risky assets. If the international CAPM (ICAPM) holds then the world market portfolio is an efficient portfolio and the proportion of the

wealth invested in a domestic equity market should be equal to its weight in the world market portfolio (Adler & Dumas 1983; Fama & French 1998; Karolyi & Stulz 2002; Solnik 1983). In an international setting, the optimal investment weights of a country according to ICAPM are given by the relative shares of domestic and foreign equities in the world market capitalization. Hence, under the assumptions of the classical model, the ICAPM provides the optimal portfolio weights which are the relative world market capitalization shares.

The recent surge in international integration appears to challenge the puzzle through both its global and regional components. Even though integration, technological and financial development appears to work consistently to erode the home bias issue, investors should diversify their equity holding to the optimal weights to achieve the benefits of international diversification, empirical facts suggest that there is still a large component of wealth of investors is invested in the domestic markets (Ahearne, Grier & Warnock 2004; Cooper & Kaplanis 1994a, 1994b, 1994c; French & Poterba 1991; Tesar & Werner 1995). As quoted in Cai & Warnock (2004), the share of foreign equities in U.S. portfolios is very low at only 15 percent, while the ICAPM would imply that investors, regardless of their domicile, should have a 44 percent weight on U.S. equities and a 56 percent weight on the equities of other countries as end of 2003. Using the same method, we estimate that the share of foreign equity in Australian equity portfolio is 17.28% and 16.76% while the optimal holding is 98.20% and 98.15% as end of 2003 and 2005 respectively.

There are many possible explanations for the home bias puzzle. The motive behind the puzzle is that investors are facing both explicit barriers and implicit barriers when

investing overseas. The paper will focus on these barriers as drivers of the home bias in Australian equity portfolio where a strong preference for domestic assets incurred.

Explicit barriers to international investment are those that are directly observable and quantifiable. For instance, a restriction on foreign exchange transactions is an explicit barrier to international investment. Explicit barriers to international investment have fallen over time because of, for instance, international tax accords and the removal of foreign exchange controls. However, there are still visible barriers to foreign investment, so that some home bias should still exist. French and Poterba (1991) and Cooper and Kaplanis (1994c) argue that explicit barriers to international investment are no longer large enough to explain the observed portfolio allocations of investors. They suggest that, to explain the home-bias puzzle, these barriers would have to be much larger than withholding taxes, which often are mentioned as the most significant observable deterrent to foreign investment. If barriers to international investment are the same across securities in a foreign country, foreign investors should tilt their portfolios toward securities that have a higher expected excess return (Stulz 1981). If explicit barriers differ across securities, foreign investors will prefer securities that have lower explicit barrier (Kang & Stulz 1997).

Implicit barriers to international investment, on the other hand, are not directly observable. As explicit barriers have fallen, researchers have put more emphasis on obstacles to foreign investment that cannot be identified from brokerage statements. The two main classes of such barriers are political risk differences between domestic and foreign investors and information asymmetries. Political risk differences arise if non-resident investors feel that there is some probability that they might have trouble

repatriating their holdings or that their holdings might be expropriated altogether, so that their expected return on foreign shares is lower than the expected return for residents. Information asymmetries are self explanatory.

The paper has strong implication for the international portfolio investment and portfolio allocation. As the increasing global international financial integration leads to an increase in the international capital mobility and international equity investment, investors can diversify their equity portfolio internationally at cheaper costs. The identification of the relevant markets frictions causing home bias shed further light into the futures geographical changes of portfolio allocation. The continuous process of international financial integration and the on-going demographic changes are likely lead to a change in the allocation of equity portfolio. It is important to understand about the effects of barriers and market frictions on capital mobility and home bias.

The extent of the home bias puzzle needed to be addressed to provide an insight into factors drive the deviation from the optimal international equity portfolio. If investors more generally already hold the optimal portfolio, then the diversification gains are achieved. However, the literature suggests that portfolios are not optimal and that the cost in terms of lower return and higher risk is large. Lewis (1999) argues that costs of home bias due to forgone gains from international diversification in the range of 20% to almost double of lifetime (permanent) consumption.

The remainder of this paper is structured as follows. Section two reviews the literature on the home bias puzzle. Section three introduces the model setting and data

description. Section four reports the empirical results. Finally, section five concludes the paper.

2. Literature Review

The home bias puzzle has been widely documented in the literature. The main drivers of home bias in international equity investment are explicit and implicit barriers to international investment. The prime targets are explicit barriers including transaction costs (fees, commissions and higher spreads) (Glassman & Riddick 2001; Tesar & Werner 1995; Warnock 2001) and capital controls (Black 1974; Errunza & Losq 1981; Stulz 1981). However, if investors care only about the mean and the variance of the real return of their invested wealth, and if barriers to international investment are gradually removed as many observers suggest, one would expect investors, as a first approximation, to hold the world market portfolio of stocks. However, the facts that investors continue to hold a large portion of domestic equities in their portfolio, even in times when most direct obstacles to foreign investment have disappeared (Baele, Pungulescu & Horst 2006). Important contributions focus on differences in the amount and quality of information between domestic and foreign stocks (Brennan & Cao 1997; Gehrig 1993; Hasan & Simaan 2000; Veldkamp & Nieuwerburgh 2005) on hedging of non-traded goods consumption as a motive for holding domestic securities (Adler & Dumas 1983; Cooper & Kaplanis 1994a; Stockman & Dellas 1989) and more recently on psychological or behavioral factors (Coval & Moskowitz 1999; Grinblatt & Keloharju 2000; Huberman 2001). Several explanations have been suggested for this so-called home bias in portfolios, but so far no explanation seems to be generally accepted or fully account for the observed home bias in international

financial markets (Ahearne, Grier & Warnock 2004; Baele, Pungulescu & Horst 2006).

Black (1974) and Stulz (1981) develop a two country capital market equilibrium model where there are barriers to cross border investment and these barriers can be considered as tax on net foreign investment. This tax represents various kinds of barriers to international investment such as direct controls on the import or export of capital, possibility of expropriation of foreign holdings, reserve requirements on bank deposits and other assets held by foreigners, restrictions on the fraction of business that is owned by foreigners. It may also include barriers due to information asymmetries i.e. unfamiliarity of residents of one country with the stock markets of other countries.

Cooper and Lessard (1981) develop an international capital market equilibrium model which allows for differential taxes on foreign investment depending on the country of investment and the origin of investor. They obtain unique solutions for taxes under extreme assumptions that taxes depend on the country of investment, or on the origin of investor. Merton (1987) introduces a model where investors hold stocks that they know. In this model, investors think that the risk of stocks they do not know is extremely high. Accordingly, the investors may overweight domestic stocks. Cooper and Kaplanis (1994a) find that hedging against inflation risk cannot explain the home bias.

A steadily growing literature has proposed several partly competing and partly complementary explanations for the cause of the home bias puzzle (Cooper & Kaplanis 1994a, 1994b, 1994c; French & Poterba 1991; Tesar & Werner 1995). An

important strand of this literature focuses on the effect of transaction and information costs on international portfolio positions, as e.g. in Cai and Warnock (2004), Portes and Rey (1999), Daude and Fratzscher (2006) and Fidora et al (2007). Shiller et al. (1991; 1996) provide some survey evidence consistent with the view that investors are more optimistic about their own market than are foreign investors. Frankel and Schmukler (1996; 2000) have examined an important aspect of portfolio investment in emerging markets, namely, possible informational asymmetry between domestic and international investors.

Moreover, departures from mean-variance optimization would suggest that investors might be tailoring their asset holdings to hedge against changes in variables that matter to them. Stulz (1981) argues that investors' desire to hedge against unanticipated changes in their consumption and investment opportunities might lead to a home bias.

There are several papers investigating the home bias puzzle employing the individual countries data set but due to data limitation, most of the papers focus on US data (Ahearne, Grier & Warnock 2004; Dahlquist et al. 2003). Papers employ other country data sets including: Kang & Stulz (1997) investigate the home bias in Japan employing the firm-level data. They found that the portfolio holdings of foreign investors do not follow the existing models which suggested the holdings are tilted towards stocks with high expected returns. This paper confirmed that there is a substantial home bias by foreign investors investing in Japan. French and Poterba (1991) argue that the holdings of Japanese investors in the US and the holdings of US investors in Japan can be explained if Japanese investors are substantially more

optimistic about the expected return of Japanese shares than are American investors. Dahlquist & Robertsson (2001) explored the puzzle in Sweden using the firm level data set of ownership and attributes of Swedish firms. They find that foreign investors allocate a disproportionately high share of their funds to large firms, as size might be a proxy for many underlying sources, including firm recognition. In addition, they conclude that market liquidity seems to be an important driving force for the preference. Kim & Wei (2002) examined the Korea market and considers the importance of the physical presence of investors in Korea.

However, not many authors examine the determinant of home bias in equity portfolio investment of Australian investors. This might be due to the problems that there are not adequate data on international holdings until the CPIS survey conducted by IMF. From this perspective, this paper fills the gap in investigating the puzzle employing the disaggregated data set on Australian equity holding.

3. Model and Data description

The first task is to how to measure home bias. In this paper, the home bias of Australian investors in equity investment against country i is measured as the deviation of the actual cross-border holdings from the optimal portfolio weight investors should invest in country i . Any meaningful explanation of the equity home bias requires a correct characterization of the benchmark optimal weights. We measure home bias under the assumptions of the classical model in home bias studies, the International CAPM (ICAPM), optimal portfolio holding in country i is given by the relative world market capitalization shares (Baele, Pungulescu & Horst 2006).

In this paper, we quantify the home bias of Australian investors against country i as the relative difference between the Australian actual (ACT_i) and optimal (OPT_i) equity investment in country i .

$$HB_i = 1 - ACT_i/OPT_i$$

The actual holding is the actual share of country i 's equity holding in the Australian portfolio. The holding which is calculated from the CPIS data¹. However, the CPIS does not report the amount of domestic security holding. Therefore, in order to derive the domestic component of Australian portfolio, we directly estimate it as the difference of Australian equity market capitalization and the aggregate foreign equity portfolio investment in Australia. The Australian equity market capitalization data are from the World Bank's World Development Indicator and the aggregate foreign equity portfolio investment in Australia is also reported by CPIS.

The optimal equity holding in country i is given by the International CAPM. Most studies have conveniently assumed that asset returns are well described by the International Capital Asset Pricing Model (ICAPM), in which case the benchmark weights are simply given by the proportion each country has in the global equity market portfolio (Fidora, Fratzsc & Thimann 2007) . Hence, the optimal holding is the share of country i in the world portfolio.

For a brief comparison, table 6.1 shows the share of Foreign Equity, Optimal Share and Home Bias in Australian Equity Portfolio in 1997 and 2005. A quick glance at this table it can be seen that Australian investors invest a large share of their equity portfolio in large markets of the US and UK. Another reason might be both US and

¹ The CPIS data are available for the following years: 1997, 2001, 2002, 2003, 2004 and 2005.

UK are English speaking country. The table also indicates that the deviation from the optimal share is smaller in 2005 than in 1997 where the Home Bias proxy is larger in most country.

Table 0-1 Share of Foreign Equity, Optimal Share and Home Bias in Australian Equity Portfolio in 1997 and 2005

Destination	Portfolio Share	Optimal Share	Home Bias	Portfolio Share	Optimal Share	Home Bias
		1997			2005	
Austria	0.000115	0.001110	0.896420	0.00017917	0.002895	0.938101
Belgium	0.000206	0.004255	0.951555		0.007494	
Brazil	0.000461	0.007937	0.941893		0.010876	
Canada	0.001154	0.017635	0.934586		0.033933	
Chile	0.000011	0.002238	0.994980		0.003126	
China	0.000127	0.006411	0.980184	0.00024312	0.017890	0.986411
Colombia		0.000607		0.00000722	0.001054	0.993154
Czech		0.000397		0.00001998	0.000879	0.977259
Denmark	0.000246	0.002913	0.915490		0.004080	
Finland	0.000343	0.002278	0.849268	0.00049797	0.004801	0.896267
France	0.003914	0.020951	0.813205		0.039183	
Germany	0.003843	0.025638	0.850123	0.00443670	0.027983	0.841452
Greece	0.000063	0.001061	0.940435		0.003323	
Hong Kong	0.002310	0.012841	0.820139	0.00203400	0.023056	0.911782
Hungary	0.000071	0.000465	0.847831		0.000746	
India	0.000144	0.003991	0.963862	0.00080656	0.012673	0.936356
Indonesia	0.000192	0.000904	0.787139	0.00009453	0.001866	0.949334
Ireland	0.000127	0.001534	0.917369		0.002615	
Israel	0.000030	0.001406	0.978515		0.002752	
Italy	0.002375	0.010708	0.778223		0.018289	
Japan	0.010178	0.068868	0.852210	0.01576152	0.108531	0.854774
Korea	0.000196	0.001431	0.863327	0.00231907	0.016456	0.859076
Luxembourg		0.001053		0.00007031	0.001174	0.940130
Malaysia	0.000364	0.002908	0.874878	0.00018742	0.004153	0.954870
Mexico	0.000344	0.004865	0.929325		0.005479	
Netherlands	0.002118	0.014562	0.854568	0.00985280	0.016670	0.408952
New Zealand	0.000245	0.000948	0.741683	0.00128048	0.000931	-0.375760
Norway	0.000295	0.002066	0.857282	0.00045748	0.004375	0.895443
Peru	0.000076	0.000546	0.860880	0.00000267	0.000825	0.996768
Philippines	0.000129	0.000974	0.867355		0.000920	
Poland		0.000972		0.00000507	0.002151	0.997642
Portugal	0.000150	0.001885	0.920512	0.00009710	0.001535	0.936732
Russia		0.001209			0.012570	
Singapore	0.000557	0.004748	0.882669	0.00117324	0.004773	0.754188
South Africa	0.000156	0.006367	0.975521		0.012956	
Spain	0.000875	0.015665	0.944168		0.021998	
Sweden	0.001306	0.010201	0.872015		0.009256	
Switzerland	0.003233	0.024615	0.868657		0.021507	
Thailand	0.000109	0.000916	0.881541	0.00023241	0.002831	0.917898
Turkey	0.000139	0.002164	0.935966	0.00005433	0.003701	0.985322
UK	0.014709	0.080061	0.816280	0.01363741	0.070074	0.805386
US	0.041374	0.469246	0.911829	0.09108298	0.389486	0.766146

The model is set up as follows:

$$HB_{i,t} = \alpha + \beta X_{i,t} + \varepsilon_{i,t}$$

where $HB_{i,t}$ is the measure of Australian home bias against country I at time t. $X_{i,t}$ is a vector of explanatory variables that considered as the determinants of the Australian investors home bias, which are explicit and implicit barriers to international equity investment considered as follows.

Explicit Barriers to international investment

Explicit barriers to international investment are directly observable and quantifiable. Black (1974), Stulz (1981), and Errunza and Losq (1981) suggested that the direct barriers to international investment are a main target for explanation of the home bias puzzle. In this paper, we consider two measures of direct barriers to international investment that might prevent investors from investing in optimal portfolio, which are transaction costs and capital controls.

Transaction Cost: (TRANS)

Traditionally, investors would invest in a country where the costs are minimized and would underweight high transaction cost countries' in their portfolios. Tesar & Werner (1995), Glassman and Riddick (2001), and Warnock & Cleaver (2002) documented that transaction costs are prime explanations for the home bias puzzle. However, results in Domowitz et al. (2001) suggest that transaction costs cannot explain the home bias U.S. equity portfolios. The paper from Warnock (Warnock 2001) tends to support this view.

Transaction costs are the total of the commissions, fees and market impact costs which are compiled by Elkins-McSherry Co, a firm that conducts cost studies for institutional traders and serves as a consultant to stock exchanges. Elkins-McSherry Co. receives trade data on all global trades by institutional traders and computes measures of trading costs. Market impact costs, or liquidity costs, are intended to measure the deviation of the transaction price from the price that would have prevailed had the trade not occurred. In practice, impact costs are measured as the deviation of the transaction price from day's average price. Further information on the transaction costs data is provided by Domowitz et al. (2001). This variable is expected to have a positive impact on HB.

Capital control (CONTROL)

Over the last decades, countries are trying to remove cross-border controls, relax restriction on capital movement. However, these controls are still expected to have an effect on cross-border investment that contributes to the phenomenon of home bias.

Empirical work on the effects of capital controls on portfolios has been hampered by the lack of a widely accepted cross-country measure of the intensity of capital controls (Ahearne, Grier & Warnock 2004). There are many measures of capital controls in the economics literature, but most are dummy variables based on restrictions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions; see the survey by Eichengreen (2001). In the finance literature, researchers have dated liberalizations, see for example, Bekaert and Harvey (2000), but provide no measure of the intensity of controls.

To address the issue that binary rule-based variable fails to distinguish between different types of control and in reviewing all of the available *de jure* measures of capital controls and based on the AREAER, Miniane (2004) develops a measure for 34 countries for the period from 1983 to 2000. This index offers substantial disaggregation between controls. However, this measure still has disadvantages including limited coverage and there is no distinction between controls on inflows and outflows. Following the methodology of Miniane (2004), a variable that proxy for the barrier to international investment is constructed. This measure is the average of the 14 sub-criteria from the IMF publication “Annual report on Exchange Restrictions and Exchange Arrangements”. This index is expected to have a positive impact on Australian investors’ home bias in portfolio equity investment against destination countries.

Implicit Barriers to International Investment

French and Poterba (1991) and Cooper and Kaplanis (1994) argue that explicit barriers to international investment are no longer large enough to explain the observed portfolio allocations of investors. If barriers to international investment are the same across securities in a foreign country, foreign investors should tilt their portfolios toward securities that have a higher expected excess return (Stulz 1981). If explicit barriers differ across securities, foreign investors will prefer securities that have lower explicit barrier. Implicit barriers to international investment are not directly observable and quantifiable.

Bilateral Trade between Australia and the country of concern (TRADE)

Merton (1987) argues that investors invest in the securities they know about. If investors behave this way, we would expect foreign investors to invest more in securities that are known abroad. Trade link can be considered as a factor of information cost in investing the home bias puzzle. Increasing trade link between a country with another can be considered as a reduction in the information cost as investors can get the information at a cheaper cost. For example, investors are better able to attain accounting and regulatory information on foreign markets through trade. On the other hand, investors may be inclined to hold the stocks of foreign companies with whose products they are most familiar. Indeed, there is an increasing recognition of the link between trade in goods and services and trade in assets. Hummels et al. (2001) and Yi (2003) examine the importance of trade growth and suggest that the striking growth in the trade share of output is one of the most important developments in the world economy. Increased trade openness is also one of major factors influencing globalization. According to Lane & Milesi-Ferretti (2003), trade openness may contribute to the increased international financial integration and the erosion of the home bias issue for several reasons. Firstly, trade in goods directly results in corresponding financial transactions such as trade credit, transportation costs and export insurance. Secondly, as stated by Obstfeld and Rogoff (2000), there is a close connection between the gains to international financial diversification and the extent of goods trade: trade costs create an international wedge between marginal rates of substitution and hence limit the gains to asset trade. Thirdly, goods trade and financial positions are jointly determined in some situations, as is often the case with FDI, given the importance of intra-firm intermediate trade. Finally, openness in goods markets may increase the willingness to conduct cross-border financial transactions, reducing financial home bias (a 'familiarity' effect) (Lane & Milesi-Ferretti 2003).

TRADE variable is the ratio of bilateral trade (import + export) between Australia and the destination countries to the destination country's GDP. This variable can be expected to have a negative impact on home bias. The data on imports and exports is taken from IMF's Direction of Trade Statistics and GDP data is from World Bank's World Development Indicators. The data on imports and exports is taken from IMF's Direction of Trade Statistics and GDP data is from World Bank's World Development Indicators. This variable is expected to have a negative impact on HB.

Governance Indicator (GOVERNANCE)

Quality of government is a very important factor that affects the portfolio investment. The quality of government indicators proxy for the role of information asymmetries that arise from differences in accounting standards, disclosure requirements and regulatory environments across countries. We employ the Kaufmann et al. (2003) governance indicator as an explanatory variable. The governance indicator is the average of the six-dimensions of governance including: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. This indicator ranges from -2.5 to 2.5 with higher scores corresponding to better outcomes. These legal indicators are expected to have a negative impact on HB.

Exchange Rate Volatility (VOLATILITY)

Recently, there is a trend to investigate the causal relationship between home bias and the foreign exchange rate volatility and uncertainty. The recent paper by Fidora et al. (Fidora, Fratzsc & Thimann 2007) focuses on the role of real exchange rate volatility

as a driver of home bias in portfolio holdings. This paper also incorporates the foreign exchange rate volatility as a driver of equity home bias.

Equity Market Liquidity (LIQUIDITY):

As foreign investors are disadvantaged against domestic investors in a market, therefore, it might be able to establish a link between the market liquidity and home bias. Australian investors will invest more in countries with higher degree of market liquidity (Domowitz, Glen & Madhavan 2001).

We use the ratio of value of stock traded to GDP to proxy for the liquidity of the equity market. Data are collected from the World Bank's World Development Indicators. This variable is expected to have a negative sign on HB.

Historical Risk-Adjusted Returns (REWRISK)

Another variable that is important is the role of historical risk-adjusted returns. If portfolio decisions are based partly on past returns, then investors might tend to underweight countries whose stock markets have performed poorly. To capture this type of momentum or 'returns-chasing' behavior as in Bohn and Tesar (1996) and Ahearne et al. (2004), we construct a reward-to-risk ratio, the mean monthly return over its standard deviation of the destination country. This is calculated as the ratio of the historical average of monthly returns of the MCSI (local country) index and standard deviation of returns over the preceding year. The data are obtained from DataStream. This variable is expected to have a negative impact on the HB.

Market size (SIZE):

Martin & Rey (2004) and Portes & Rey (2005) demonstrate the importance of size of economies for cross-border equity investment. We also include a proxy for the market size as an explanatory variable. This is the ratio of the destination market capitalization to the world capitalization. Data are collected from the World Bank's World Development Indicators. This variable is expected to have a negative impact on the HB.

There are also other information friction factors that are likely to affect home bias in equity portfolio.

Language (LANGUAGE)

This variable is equal to one when the destination country language is English or zero otherwise. Data are collected from the CIA World Factbook. The assumption is that Australian investors will be less biased against English speaking countries and expected to have a negative sign.

Distance from the Australian Capital (DISTANCE)

We also consider the distance from Australia capital to the capital city of trading partner country as an explanatory variable which is considered as explicit costs of information friction. Martin & Rey (2004) and Portes & Rey (2005) show that distance is a good proxy for information cost. Distance data are computed from www.indo.com/distance. This variable enters the regression in log form. This variable is expected to have a positive sign.

Telephone cost between Australia and the destination country (PHONE)

In this paper, we use the cost of 5 mins call from Australia to the destination country. Telephone cost data are from <http://www.phone-rate-calculator.com/>. This variable enters the regression in log form. This variable is expected to have a positive sign.

Dividend Imputation:

Australian tax law favours domestic over foreign stock holding. We assume this factor is constant over the estimated period.

4. Empirical Results

Figure 6.1 exhibits the share of Australian Equity Portfolio invested in Australia. The continuous line represents the actual holding while the dotted line represents optimal holding. It indicates that in 1997, about 91% of Australian equity portfolio is invested locally and gradually reduces to 83.24% in 2005, while the ratio of Australian market capitalization to the world market capitalization is about 1.15% in 1997 and 1.84% in 2005. According to the ICAPM, Australian investors leave out the gains from international diversification as they invest a large share of their equity portfolio domestically.

Figure 0-1 Share of Australian Equity Portfolio Invested Domestically

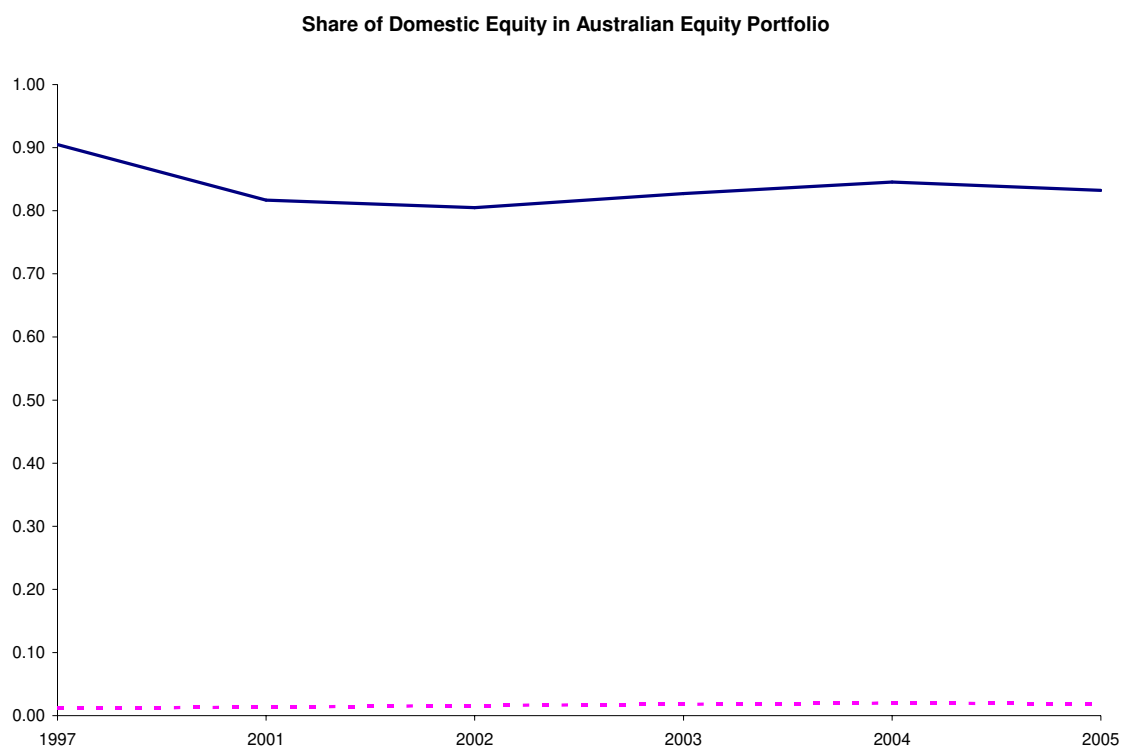


Figure 6.2 to 6.7 graphs Australian investors' home bias measure against 42 other foreign countries in the year 1997, 2001, 2002, 2003, 2004 and 2005 respectively. Of particular note is that in the year 2005, Australian investors overweight their investment in New Zealand according to the ICAMP. This might be due to the fact that New Zealand has close geographical proximity and close affinity in terms of culture, language, legal origin, regulatory environment etc. with Australia. Hence, Australian investors are better informed about New Zealand's investment scenario and overweight their equity investment in New Zealand.

Figure 0-2 Australian investors' home bias in 1997
 Australian Investors' Home Bias in 1997

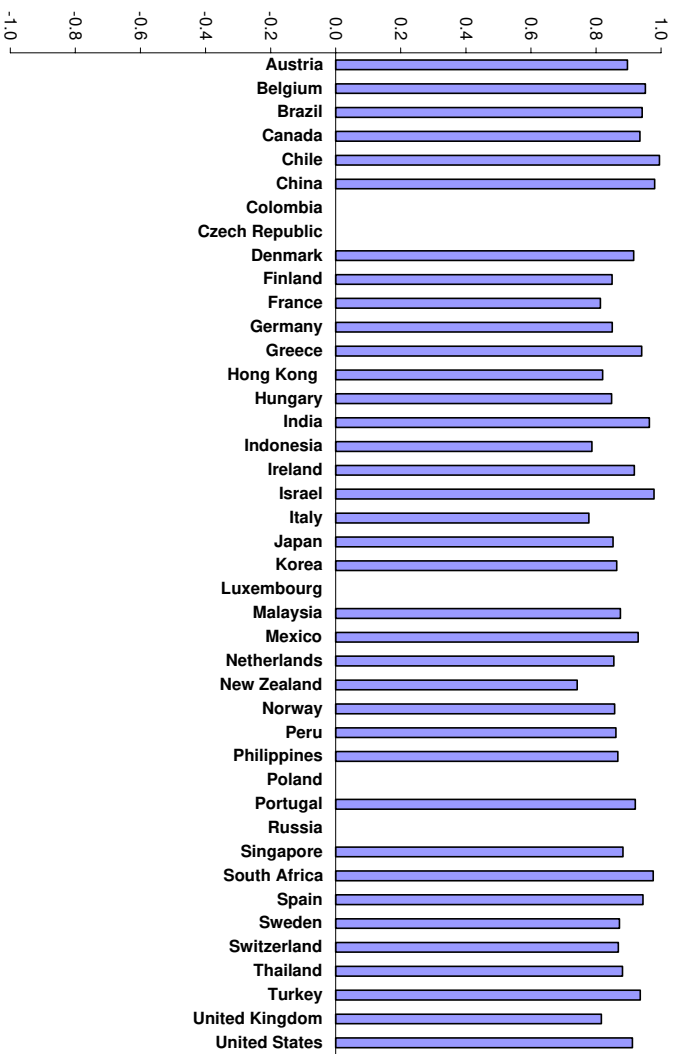


Figure 0-3 Australian investors' home bias in 2001
 Australian Investors' Home Bias in 2001

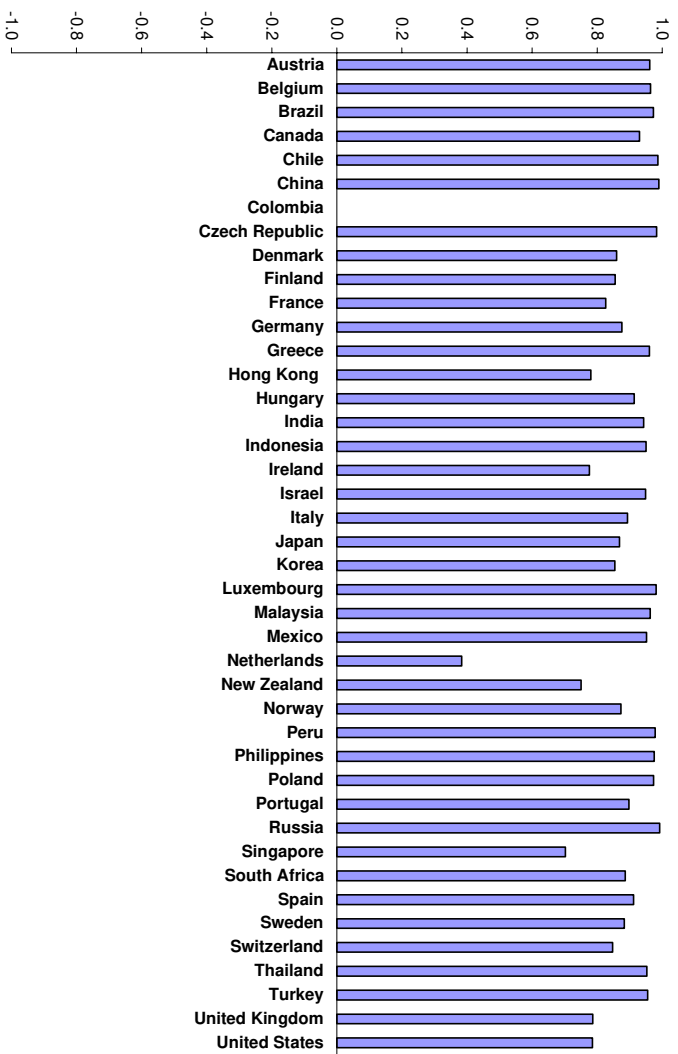


Figure 0-4 Australian investors' home bias in 2002
 Australian Investors' Home Bias in 2002

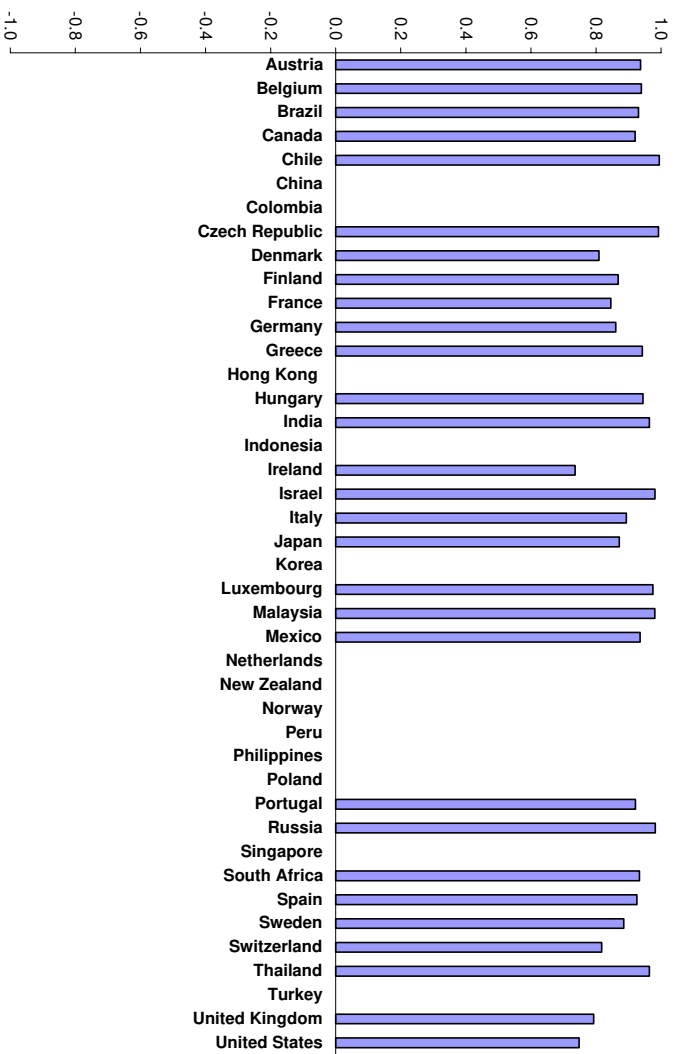


Figure 0-5 Australian investors' home bias in 2003
 Australian Investors' Home Bias in 2003

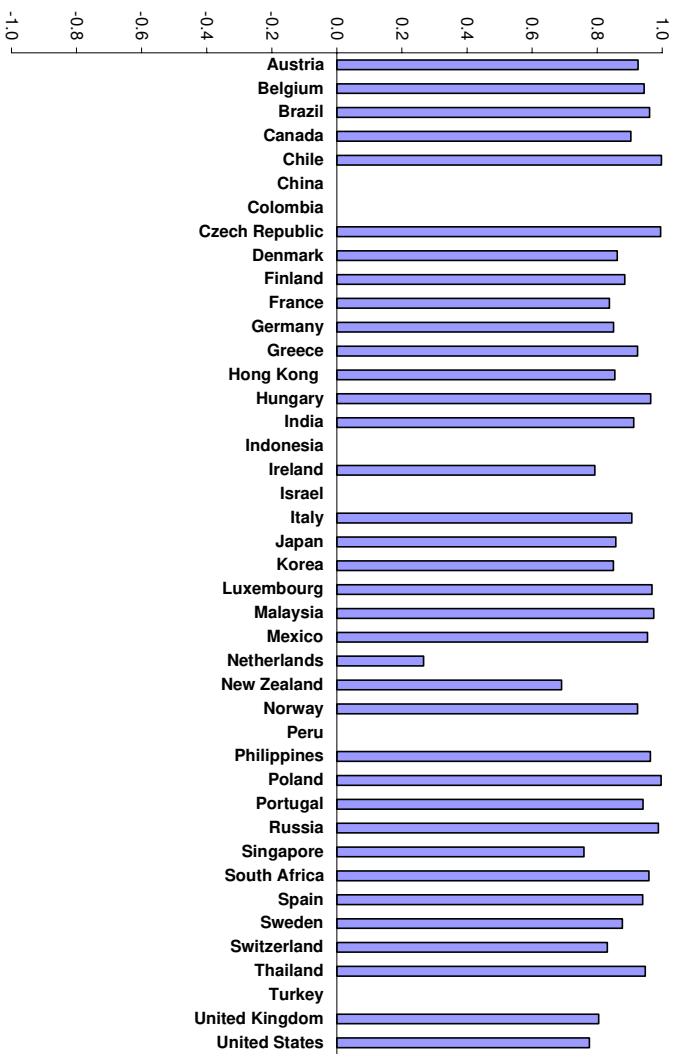
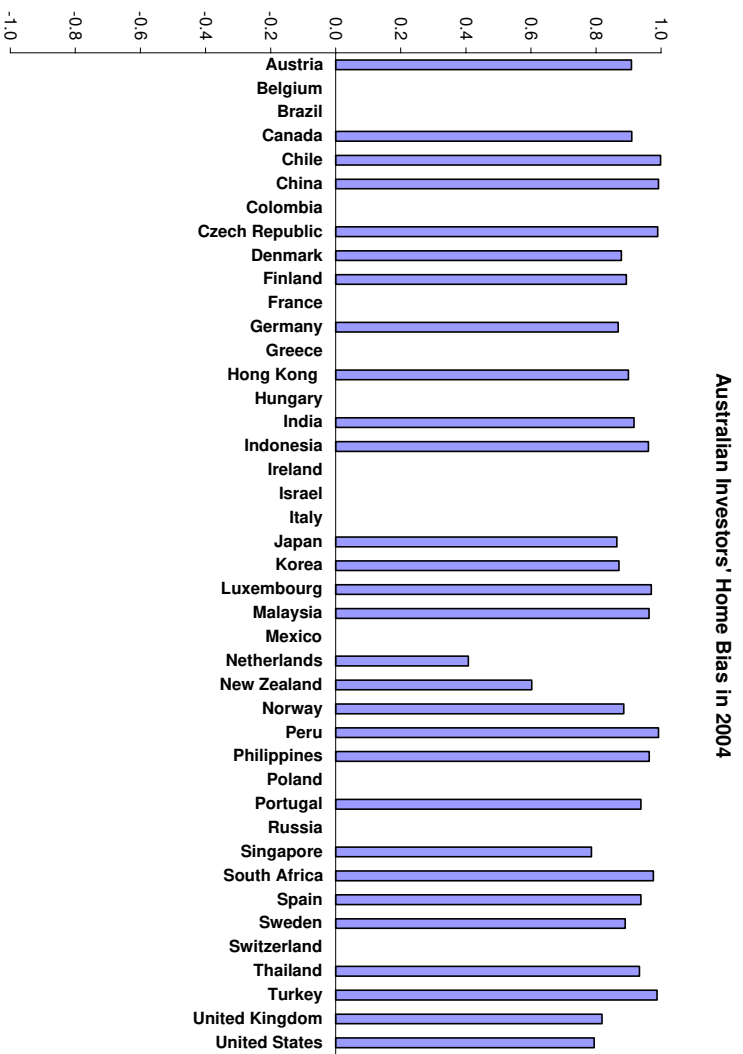
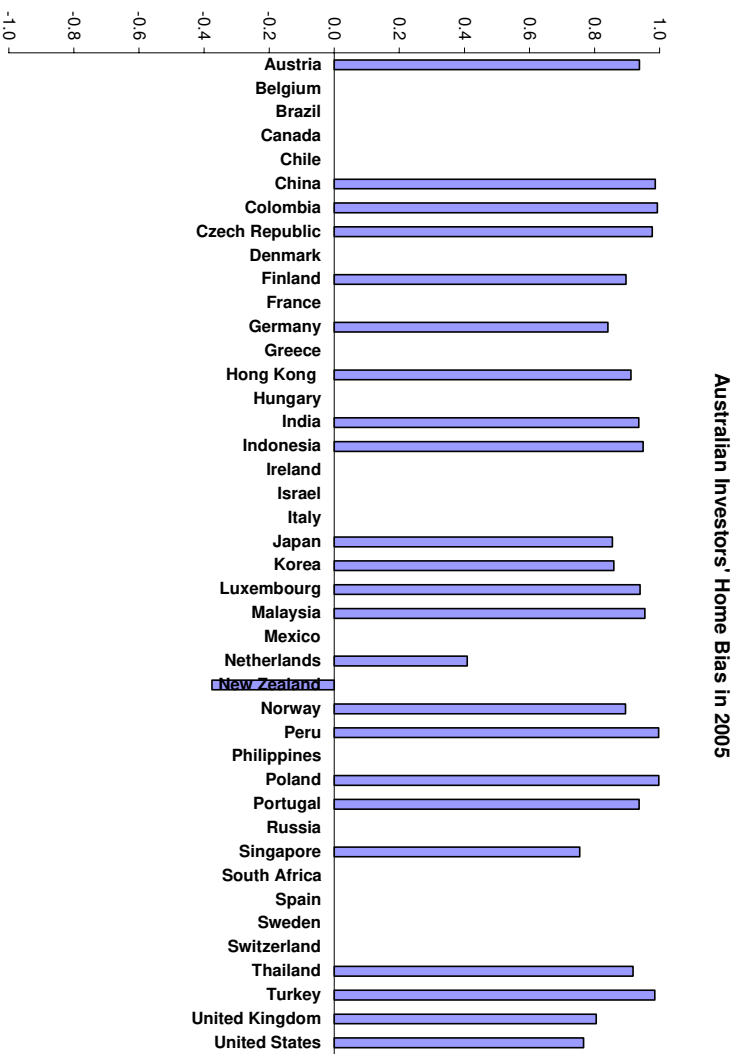


Figure 0-6 Australian investors' home bias in 2004



Australian Investors' Home Bias in 2004

Figure 0-7 Australian investors' home bias in 2005



Australian Investors' Home Bias in 2005

Table 6.2 presents the descriptive statistics for the Australian home bias measure against 42 countries. The mean of the home bias indicator is about 88.85 % in 1997, slightly increases to 89.08% in 2001, and 90.65% in 2002 but reduce considerably to 83.87% in 2005.

Table 0-2 Descriptive Statistics for Australian Investors' home bias

	<i>1997</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>
Mean	0.8884	0.8908	0.9065	0.8829	0.8894	0.8387
Median	0.8815	0.9137	0.9306	0.9184	0.9103	0.9271
Standard Deviation	0.0609	0.1106	0.0718	0.1292	0.1242	0.2869
Minimum	0.7417	0.3836	0.7355	0.2665	0.4073	-0.3758
Maximum	0.9950	0.9920	0.9946	0.9974	0.9983	0.9976

The research employs the panel least squares regression with White cross-section standard errors and covariance (degree of freedom corrected). As the dependent variable, BIAS are strictly lies between -1 and 1, we employ TOBIT as a robust check. As the Tobit estimator yields mostly similar results but a different way of explanation, we do not report the results here to conserve space.

Table 6.3 presents the panel data regression results for the whole period, 1997, 2001, 2002, 2003, 2004 and 2005. At first we allow for the regressions of the Bias and individual variable of interest and gradually pulling all variables together in a regression. Overall, the empirical results are consistent with the theory as most of the variables enter the regressions produces the expected sign.

Table 0-3 Panel Regressions for the year whole sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.822128*** (35.2153)	0.840846*** (65.0891)	0.912457*** (89.4848)	0.946891*** (65.2346)	0.823501*** (17.1515)	0.840456*** (23.7211)	0.814189*** (20.4975)	1.208909*** (12.9133)	1.264082*** (12.1923)
TRANS	0.001069*** (2.6677)				0.040442*** (2.9165)	0.023398*** (2.4372)	0.030841** (2.1877)	0.036014** (2.2698)	0.036179** (2.2568)
CONTROL		0.118872*** (4.4554)				0.053893*** (4.0292)	0.043279** (2.2676)	0.034464* (1.6946)	0.034113* (1.6939)
TRADE			-2.73946*** (-6.0504)		-2.652430** (-2.5049)	-1.330255 (-9.1692)	-1.111909 (-6.4049)	-1.902129 (-5.3109)	-1.948199 (-5.2689)
GOVENANCE				-0.06682*** (-5.6459)	0.049536*** (-5.8948)	0.022942*** (-4.0722)	0.021268*** (-4.2435)	0.017245*** (-4.8352)	0.021973*** (-3.7717)
VOLATILITY					0.000245*** (-3.7801)	0.000242*** (-3.0965)	0.000250*** (-3.3769)	0.000293*** (-4.0959)	0.000293*** (-4.0450)
SIZE					-0.077706 (-8.585)	0.006715 (0.0633)	0.056263 (0.4552)	0.063517 (0.5036)	0.063026 (0.4973)
LIQUIDITY					-0.000346 (-1.5129)	-0.000555** (-2.3686)	-0.000541** (-2.3343)	-0.000558** (-2.4330)	-0.000558** (-2.4216)
REWRISK					0.003682 (0.1458)	0.008714 (0.4741)	0.008799 (0.4618)	0.012219 (0.6568)	0.012603 (0.6732)
LANGUAGE							-0.024163 (-9.125)	-0.024792 (-9.510)	-0.026078 (-1.0201)
DISTANCE								0.043059*** (-3.0006)	0.045568*** (-3.1537)
PHONE									-0.011183* (-1.6604)
Obs	184	134	196	194	179	128	128	126	126
R-squared	0.037631	0.130726	0.158745	0.142383	0.319432	0.365021	0.369384	0.377351	0.377913

Note:

The dependent variable is HB, *, **, *** indicates significance at the 10%, 5% and 1% respectively, t-statistic is in parentheses.

Transaction costs and capital control variables enter the regression with positive signs and significance. This is consistent with the common findings that transaction costs and capital controls are important. However, the impact of transaction costs is much less than capital controls on portfolio equity bias as the magnitude of the transaction costs coefficients are much smaller than that of capital controls.

The result also confirms the link between the home bias phenomenon and trade. Increased bilateral trade helps to reduce Australian investors' equity portfolio home bias as the TRADE variable enters the regression with a negative sign and significance. This result is consistent with Obstfeld & Rogoff's (2000) claim. However, Ahearne et al. (2004) find a negative (but not significant) relationship between trade and home bias employing US data.

Another striking factor that drives Australian investors' home bias is the exchange rate volatility as volatility enters the regressions negatively and significantly at the 1% level. It seems that Australian investors are less biased against the countries of which the bilateral foreign exchange rates with Australia are more volatile.

The liquidity of foreign markets is also importance in explaining Australian home bias. Evidence suggests that Australian investors are investing more in countries with a higher degree of liquidity.

Market size is also important as the SIZE variable is not statistically significant in all regressions. The REWRISK variable, a measure of risk-adjusted return, is positive but insignificant. The binary LANGUAGE variable is negative, however, insignificant.

The DISTANCE between Australia and its trading partner variable is negatively related to BIAS and statistically significant at the 1% level. This indicates that Australian investors seem to underweight their portfolio towards countries with shorter distance, contrary to expectation.

5. Conclusion

Much work has been done in recent years on cross-border capital flows and explaining home bias. This paper makes an attempt to investigate the determinants of Australian investors' home bias puzzle employing bilateral cross-border equity portfolio investment aboard from the CPIS data set against 42 destination countries. This paper fills the gap in the literature concerning the home bias phenomenon of Australian equity portfolio investment. In addition, this advanced previous research by employing a longer time-span panel data set from CPIS and a number of potential variables considered in the literature as potential drivers of home bias.

Overall, the paper presents evidence of a decrease in Australia's home bias in equity portfolio investment from 1997 to 2005. Investigating the potential determinants of home bias, the paper has analysed a number of drivers of the home bias phenomenon focusing on transaction costs, cross-border capital controls, trade, governance and market size. There is evidence that capital controls and transaction costs are positive and statistically

significant factors driving the home bias of Australian equity portfolio investment. The result confirms the common belief that domestic investors underweight the benefits of international diversification by investing a large share of their equity portfolio domestically due to higher transaction costs overseas and the cross-border capital controls of the destination countries.

On the other hand, this paper did not incorporate the influence of dividend imputation.

The home bias lessens if the bilateral trade is higher. This implies that the bilateral trade alleviates certain information asymmetries in terms of familiarity with the financial and legal environment and cultural barriers of the trading partner countries. In addition, the results also suggest that Australian investors invest a higher share of their portfolio in countries with better institution and larger market size reducing the degree of home bias against those countries.

The paper has policy implications. From the perspectives of destination countries, to attract foreign investors investing in, capital control barriers should be dismantled for free mobility of capital and a greater degree of integration into the world capital markets. Furthermore, transaction costs are also other issues hindering foreign investors. The negative link between home bias and governance indicator indicates that foreign investors prefer to invest more in countries with better institution and legal environment, lower corruption and better accounting and disclosure standards.

References

- Adler, M. & Dumas, B. 1983, 'International Portfolio Choice and Corporation Finance: A Synthesis', *Journal of Finance*, vol. 38, no. 3, pp. 925-984.
- Ahearne, A.G., Grier, W.L. & Warnock, F.E. 2004, 'Information costs and home bias: an analysis of US holdings of foreign equities', *Journal of International Economics*, vol. 62, pp. 313-336.
- Baele, L., Pungulescu, C. & Horst, J.T. 2006, 'Model Uncertainty, Financial Markets Integration and the Home Bias Puzzle', *Journal of International Money and Finance*, vol. 26, no. 4, pp. 606-630.
- Bekaert, G. & Harvey, C.R. 2000, 'Foreign speculators and emerging equity markets', *Journal of Finance*, vol. 55, no. 2, pp. 565-613.
- Black, F. 1974, 'International capital market equilibrium with investment barriers', *Journal of Financial Economics*, vol. 1, pp. 337-352.
- Bohn, H. & Tesar, L.L. 1996, 'U.S. Equity Investment in Foreign Markets: Portfolio Rebalancing or Return Chasing?', *American Economic Review*, vol. 86, no. 2, pp. 77-81.
- Brennan, M.J. & Cao, H.H. 1997, 'International portfolio investment flows', *Journal of Finance*, vol. 52, no. 5, pp. 1851-1880.
- Cai, F. & Warnock, F.E. 2004, 'International diversification at home and abroad', *International Finance Discussion Papers - Board of Governors of the Federal Reserve System (U.S.)*, vol. 793.
- Cooper, I. & Kaplanis, E. 1994a, 'Home bias in equity portfolios, inflation hedging, and international capital market equilibrium', *Review of Financial Studies*, vol. 7, pp. 45-60.
- Cooper, I. & Kaplanis, E. 1994b, 'The Implications of the Home Bias in Equity Portfolios', *Business Strategy Review*, vol. 5, no. 2, pp. 41-53.
- Cooper, I. & Kaplanis, E. 1994c, 'What explains the home bias in portfolio investment?', *Review of Financial Studies*, vol. 7, pp. 45-60.
- Cooper, I. & Lessard, D.R. 1981, 'International Capital Market Equilibrium with Deadweight Costs to Foreign Investment'.
- Coval, J.D. & Moskowitz, T.J. 1999, 'Home bias at home: Local equity preference in domestic portfolios', *Journal of Finance*, vol. 54, pp. 2045-2073.
- Dahlquist, M., Pinkowitz, L., Stulz, R. & Williamson, R. 2003, 'Corporate Governance and Home Bias', *Journal of Financial and Quantitative Analysis*, vol. 38, no. 1, pp. 135-157.
- Dahlquist, M. & Robertsson, G. 2001, 'Direct foreign ownership, institutional investors, and firm characteristics', *Journal of Financial Economics*, vol. 59, pp. 413-440.
- Daude, C. & Fratzscher, M. 2006, 'The pecking order of international financial integration', *European Central Bank Working Paper No. 590*.
- De Santis, G. & Gerard, B. 1997, 'International Asset Pricing and Portfolio Diversification with Time-Varying Risk', *Journal of Finance*, vol. 52, no. 5, pp. 1881-1912.
- Domowitz, I., Glen, J. & Madhavan, A. 2001, 'Liquidity, Volatility, and Equity Trading Costs Across Countries and Over Time', *International Finance*, vol. 4, no. 2, pp. 221-255.

- Eichengreen, B. 2001, 'Capital account liberalization: What do cross-country studies tell us?', *The World Bank Economic Review*, vol. 15, no. 3, pp. 341-366.
- Eldor, R., Pines, D. & Schwartz, A. 1988, 'Home asset preference and productivity shocks', *Journal of International Economics*, vol. 25, no. 1-2, pp. 165-176.
- Engel, C. 2000, 'Comments on Obstfeld and Rogoff's "The six major puzzles in international macroeconomics: Is there a common cause?"', in B.S. Bernanke & K.S. Rogoff (eds), *NBER Macroeconomics Annual*.
- Errunza, V. & Losq, E. 1981, 'International asset pricing under mild segmentation: Theory and test', *Journal of Finance*, vol. 40, pp. 105-124.
- Fama, E.F. & French, K.R. 1998, 'Value versus growth: the international evidence', *Journal of Finance*, vol. 53, pp. 1975-1999.
- Fidora, M., Fratzsc, M. & Thimann, C. 2007, 'Home bias in global bond and equity markets - the role of real exchange rate volatility', *Journal of International Money and Finance*, vol. 26, no. 4, pp. 631-655.
- Frankel, J.A. & Schmukler, S.L. 1996, 'Country Fund Discounts, Asymmetric Information and the Mexican Crisis of 1994: Did Local Residents Turn Pessimistic Before International Investors?', *NBER Working Paper Series*, no. 5714.
- Frankel, J.A. & Schmukler, S.L. 2000, 'Country Funds and Asymmetric Information', *International Journal of Finance & Economics*, vol. 5, no. 3, pp. 177-195.
- French, K.R. & Poterba, J.M. 1991, 'Investor diversification and international equity markets', *American Economic Review*, vol. 81, pp. 222-226.
- Gehrig, T. 1993, 'An Information Based Explanation of the Domestic Bias in International Equity Investment', *Scandinavian Journal of Economics*, vol. 95, no. 1, pp. 97-109.
- Glassman, D.A. & Riddick, L.A. 2001, 'What causes home asset bias and how should it be measured?', *Journal of Empirical Finance*, vol. 8, pp. 35-54.
- Grauer, R.R. & Hakansson, N.H. 1987, 'Gains from International Diversification: 1968-85 Returns on Portfolios of Stocks and Bonds', *Journal of Finance*, vol. 42, no. 3, pp. 721-739.
- Grinblatt, M. & Keloharju, M. 2000, 'The investment behavior, and performance of various investor types: A study of finland's unique data set', *Journal of Financial Economics*, vol. 55, pp. 43-67.
- Grubel, H.G. 1968, 'Internationally Diversified Portfolios: Welfare Gains and Capital Flows', *American Economic Review*, vol. 58, no. 5, pp. 1299-1314.
- Hasan, I. & Simaan, Y. 2000, 'A Rational Explanation for home country bias', *Journal of International Money and Finance*, vol. 19, pp. 331-361.
- Huberman, G. 2001, 'Familiarity breeds investment', *Review of Financial Studies*, vol. 14, pp. 659-680.
- Hummels, D., Ishii, J. & Yi, K.-M. 2001, 'The nature and growth of vertical specialization in world trade', *Journal of International Economics*, vol. 54, no. 1, pp. 75-96.
- Kang, J.-K. & Stulz, R. 1997, 'Why is There Home Bias? An Analysis of Foreign Equity Ownership in Japan', *Journal of Financial Economics*, vol. 46, no. 1, pp. 3-28.
- Karolyi, G.A. & Stulz, R.M. 2002, 'Are financial assets priced locally or globally?', *Working Paper 8994, NBER*.

- Kaufmann, D., Kraay, A. & Zoido-Lobaton, P. 2003, 'Governance Matters III: Governance Indicators for 1996-2002', *The World Bank*.
- Kim, W. & Wei, S.-J. 2002, 'Foreign Portfolio Investors Before and During a Crisis', *Journal of International Economics*, vol. 56, pp. 77-96.
- Lane, P.R. & Milesi-Ferretti, G.M. 2003, 'International Financial Integration', *Institute for International Integration Studies Discussion Paper*.
- Lewis, K.K. 1999, 'Trying to explain home bias in equities and consumption', *Journal of Economic Literature*, vol. 37, pp. 571-608.
- Lintner, J. 1965, 'The valuation of risky assets and the selection of risky investment in stock portfolio and capital budgets', *Review of Economics and Statistics*, vol. 47, pp. 103-124.
- Martin, P. & Rey, H. 2004, 'Financial Super-Markets: Size Matters for Asset Trade', *Journal of International Economics*, vol. 64, no. 2, pp. 335-361.
- Merton, R. 1987, 'A simple model of capital market equilibrium with incomplete information', *Journal of Finance*, vol. 42, pp. 483-510.
- Miniane, J. 2004, 'A New Set of Measures on Capital Account Restrictions', *IMF Staff Papers*, vol. 51, no. 2, pp. 276-308.
- Obstfeld, M. & Rogoff, K. 2000, 'The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?', *NBER Working Paper Series*, vol. 7777.
- Portes, R. & Rey, H. 1999, 'The Determinants of Cross-Border Equity Flows', *Journal of International Economics*, vol. 65, no. 2, pp. 269-296.
- Portes, R. & Rey, H. 2005, 'The Determinants of Cross-Border Equity Flows', *Journal of International Economics*, vol. 65, no. 2, pp. 269-296.
- Sharpe, W. 1964, 'Capital asset prices: A theory of market equilibrium under the condition of risk', *Journal of Finance*, vol. 19, pp. 425-442.
- Shiller, R.J., Kon-Ya, F. & Tsutsui, Y. 1991, 'Investor behavior in the October 1987 stock market crash: The case of Japan', *Journal of the Japanese and International Economics* vol. 5, pp. 1-13.
- Shiller, R.J., Kon-Ya, F. & Tsutsui, Y. 1996, 'Why did the Nikkei crash? Expanding the scope of expectations data collections', *Review of Economics and Statistics*, vol. 78, no. 1, pp. 156-164.
- Solnik, B. 1983, 'International arbitrage pricing theory', *Journal of Finance*, vol. 38, pp. 500-524.
- Solnik, B.H. 1974, 'An equilibrium model of the international capital market', *Journal of Economic Theory*, vol. 8, no. 4, pp. 500-524.
- Stockman, A.C. & Dellas, H. 1989, 'International portfolio nondiversification and exchange rate variability', *Journal of International Economics*, vol. 26, pp. 271-289.
- Stulz, R. 1981, 'On the effects of barriers to international investment', *Journal of Finance*, vol. 36, pp. 923-934.
- Stulz, R.M. 1997, 'International Portfolio Flows and Security Markets', *Dice Center Working Paper - Ohio State University*, pp. 97-112.
- Tesar, L.L. & Werner, I. 1995, 'Home bias and high turnover', *Journal of International Money and Finance*, vol. 14, pp. 467-492.

- Veldkamp, L. & Nieuwerburgh, S.V. 2005, 'Information Immobility and the Home Bias Puzzle', *Society for Economic Dynamics, 2005 Meeting Papers*
- Warnock, F. & Cleaver, C. 2002, 'Financial centers and the geography of capital flows', *International Finance*, vol. 6, no. 1, pp. 27-59.
- Warnock, F.E. 2001, 'Home bias and high turnover reconsidered', *Working Paper*.
- Yi, K.M. 2003, 'Can Vertical Specialization Explain the Growth of World Trade?', *Journal of Political Economy*, vol. 111, no. 1, pp. 52-102.