"Is the home bias in equities and bonds declining in Europe?"

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Abstract

Finance theory suggests that investors should hold an internationally diversified portfolio. In practice, investors show a strong preference for domestic securities (equities and bonds). One of the explanations for this home bias is the existence of exchange rate risk. This paper tests whether the arrival of the euro has caused a decline in the home bias, and whether a possible decline is temporary or permanent. Our empirical findings suggest that the home bias has declined in Europe and that this decline is a permanent phenomenon. As expected, this decline is stronger in the EMU countries than in the non-EMU countries. We also find that EMU-based investors have switched from home to euro-area securities (regional bias). Finally, we test for the impact of institutional investors, as professional parties. Countries in which institutions manage a larger part of the financial assets exhibit larger international diversification.

Introduction

There is robust evidence across a large range of countries for the existence of a home bias in equity and bond investments (Chan, Covrig and Ng, 2005). This means that investors tend to overweight domestic assets in their investment portfolio, while this might not be optimal from a diversification point of view. The international capital asset pricing model (CAPM) suggests that investors should hold a globally diversified portfolio (Solnik, 2000). Global diversification should generate a better risk/return profile than domestic diversification, as the world capital market entails lower systematic risk than any domestic capital market. By eliminating idiosyncratic risk, investors would obtain a better return while decreasing risk. Estimates suggest that holding the optimal portfolio generates an extra return for European investors in the range of 2 to 3 percent per year (Schröder, 2003).

The international CAPM is derived under the assumption that capital markets are perfect, that is without any barriers. In practice, there are several barriers to international capital flows (Karolyi and Stulz, 2003). Traditional barriers include capital controls and trading costs. While capital controls have been abolished over the past three decades, cross-border trading costs are still higher than domestic trading costs in Europe. But cross-border trading costs are declining and are expected to converge towards the domestic level with further European integration. Next, barriers can be related to different expectations about stock returns, volatilities and covariances. In particular, investors can be more uncertain about the expected returns of foreign stock. An important risk in the cross-border setting is exchange rate risk.

The aim of this paper is to investigate the impact of the euro. The arrival of the euro in 1999 eliminated exchange rate risk in the euro area. This would reduce the home bias. The euro-effect can be measured by contrasting changes in the home bias in the EMU countries and non-EMU countries. To our knowledge, only one previous study (De Santis and Gérard, 2006) has investigated the direct impact by comparing the home bias 2 years prior to the introduction of the euro (1997) with the home bias 2 years after (2001). The research question in this paper is to investigate whether the euro-effect is temporary or permanent. We therefore compare the 1997 and 2001 data on the home bias with more recent 2004 data. Our findings indicate a strong decrease in the home bias confirming the results from De Santies and Gérard (2006). Moreover, our results suggest that the decline in equity and bond home bias is not a temporary phenomenon. To the contrary, the home bias has further decreased from 2001 to 2004 in the EMU region.

A second research question is whether European investors prefer European securities in their foreign securities portfolio in comparison to, for example, US securities. This effect is the regional bias. De Santis and Gérard (2006) find an increase in the regional bias for both the EMU and non-EMU countries. While our 2001 data confirm this finding, our more recent 2004 data indicate a strong increase in the regional bias for the EMU region and a small decrease for the non-EMU region. The latter results are in line with predictions from theory. The elimination of exchange rate risk induces EMU-based investors to switch from home to euro area securities. This effect is not expected for non-EMU based investors.

Several papers have investigated the determinants of the home bias (e.g. Lewis, 1999; Chan, Covrig and Ng, 2005). A relatively recent phenomenon is the emergence of institutional investors. The assets of

pension funds, life insurance companies and mutual funds in Europe have tripled from 44% of GDP in 1985 to 122% in 2004 (OECD). As professional parties, institutional investors may have better means to overcome the barriers to international investment. They employ, for example, analysts that can reduce the information asymmetries between investors and entrepreneurs. And as large parties they can negotiate lower tariffs for large (cross-border) deals. Our empirical results suggest that the relative size of the institutional sector has a negative and statistically significant effect on the home bias. Countries in which institutions manage a larger part of the financial assets exhibit larger international diversification.

The paper is organized as follows. Section 1 introduces the international capital asset pricing model. The international CAPM serves as theoretical benchmark for international diversification of investments. Next in section 2, we derive a measure for the home bias. Section 3 provides evidence on the home bias in European investments. In section 4, we conduct a regression analysis to explore which factors influence the size of the home bias. The last section concludes.

1. Portfolio theory

The international version of the Capital Asset Pricing Model (CAPM) suggests that investors should hold an internationally diversified portfolio (Solnik, 2000). The formal international CAPM model can be derived from the standard mean-variance framework modified to include foreign securities (Lewis, 1999). Suppose domestic investors have access to two risky assets, a domestic stock and a foreign stock. The domestic investor chooses the proportion of his wealth portfolio that he holds in foreign stocks, x (with $0 < x < 1$). The investor's objective is to increase the mean of wealth, $E(W_1)$, and decrease the variability of wealth, $\mathrm{var}(W_1)$. His objective function is given by

$$\max V = V(E(W_1), \mathrm{var}(W_1))$$

subject to $V_1 > 0$, $V_2 < 0$, (1)

where W_0 – current wealth, W_1 – next-period wealth, and E – the expected value conditional upon information known at time 0. V_1 is the partial directive of V with respect to the first term, and V_2 with respect to the second term. The one-period return is a combination of the foreign return earned on the fraction of foreign stocks, denoted by x, and the domestic return earned on the fraction of domestic stocks, denoted by (1-x), and is given by

$$W_1 = W_0(1 + x \cdot (r^f - r^h) + r^h), \qquad (2)$$

where r^f – foreign return, and r^h – domestic return. The variance of the one period return is given by

$$\mathrm{var}(W_1) = W_0^2 (x^2 \, \mathrm{var}(r^f - r^h) +$$
$$+ 2 \cdot x \cdot (\rho_{fh} \cdot \sigma_f \cdot \sigma_h - \sigma_h^2) + \sigma_h^2), \qquad (3)$$

where $\sigma_h^2 = \mathrm{var}(r^h)$ – the variance of the domestic stock return, $\sigma_f^2 = \mathrm{var}(r^f)$ – the variance of the foreign stock return to the domestic investor, and $\sigma_{fh} = \rho_{fh} \cdot \sigma_f \cdot \sigma_h = \mathrm{cov}(r^f, r^h)$ – the covariance between the domestic and foreign returns. The optimal fraction of foreign stock x^* can be calculated by deriving the first order condition of the objective function V. After re-arranging terms, the first order condition is given by

$$x^* = \frac{(r^f - r^h)/\gamma}{\mathrm{var}(r^f - r^h)} + \frac{\sigma_h^2 - \sigma_{fh}}{\mathrm{var}(r^f - r^h)}, \qquad (4)$$

where γ is the parameter of relative risk aversion $\dfrac{-2 \cdot V_2 \cdot W_0}{V_1}$. The interpretation of the demand function for foreign stock is straightforward. The first term on the right-hand side of equation (4) represents the demand arising from higher potential returns from the foreign stock. The lower is the risk aversion, γ, the greater the response of demand to higher expected returns. On the other hand, as γ increases, the importance of relative returns across countries declines. In the limiting case when γ equals infinity and investors are infinitely risk averse, the first term disappears and the demand for foreign stock reduces to the second term. The second term is the portfolio share that minimizes the variance of the wealth portfolio. This portfolio is illustrated by point B in Figure 1 below. Thus, in general, the demand for foreign stock depends on a combination of the risky portfolio share given by the first term and the minimum variance portfolio given by the second term.

The theory behind international diversification can be graphically explained with Figure 1. Figure 1 plots the mean and standard deviation of annualized monthly returns from January 1980 to December 2005 for two different equity portfolios. The first is the MSCI (Morgan Stanley Capital International) USA index, which is a proxy for the US stock market. The second is based on the MSCI Europe index, which is a proxy for the European stock market. Moving along the curve from 100 percent US stocks to 100 percent Euro-

pean stocks, the line plots the mean returns and standard deviations from holding an increasing proportion of European stocks. This is a simpli-

fied version of the so-called 'efficient frontier' and indicates the portfolio with the minimum standard deviation for a given return.
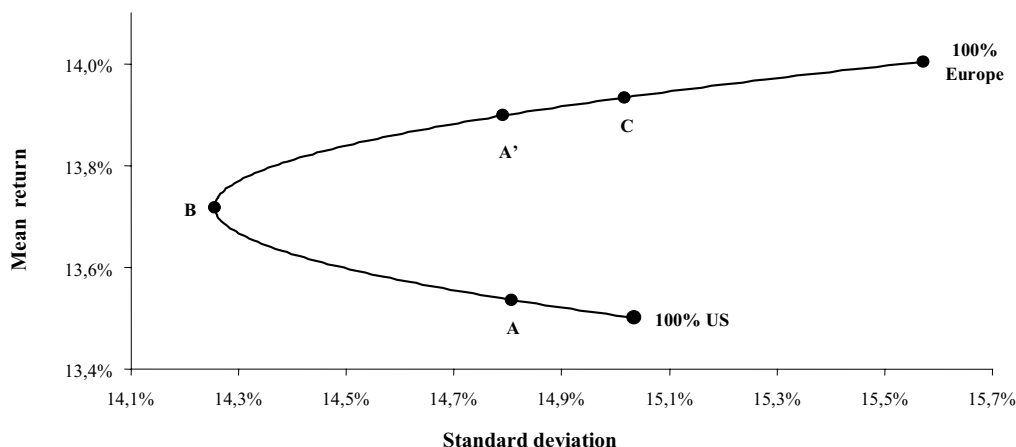
Note: This graph is based on returns from the MSCI USA Index and MSCI Europe Index over the period of 1980-2005.

Source: Datastream.

Fig. 1. The simplified efficient frontier for US and European equities

The mean of the MSCI USA is lower than portfolio C which has the same standard deviation but includes a fraction of European stocks. In fact as long as investors prefer higher returns and lower variance, the minimum variance portfolio at point B (with 40 percent European equity) must be preferable to the US portfolio alone. However, Section 3 below (see Table 1) points out that in a universe of European and US stocks, US investors hold only 7 percent of their equity portfolio in European stocks, which is indicated by point A. The equity home bias is the phenomenon that foreign equity holdings of domestic investors are below point B.

1.1. Gains from international diversification. When investors diversify their portfolio internationally following the international CAPM, they can generate an extra return. Lewis (1999) calculates that US investors can generate an extra return of about 50 basis points per year while also decreasing risk (moving to point B in Figure 1), or 80 basis points per year with no change in risk (moving to point A' in Figure 1). Empirical evidence concerning European investors shows an even stronger effect. Schröder (2003) finds that a British investor, holding the optimal portfolio of 80 percent non-domestic assets instead of a portfolio of 20 percent non-domestic assets, generates an extra return of 2.2 percent per year. A German investor, holding the optimal portfolio, generates an extra return of 3 percent per year. The excess return for European investors is larger than for US investors because the US market is very large and well-diversified, which provides less upside potential from investing in foreign markets.

By the same token, international diversification reduces the cost of capital (Stulz, 1999). The expected return that investors require for investing in equity to compensate them for the risk they bear generally falls. The result is a lower cost of capital for companies.

1.2. Barriers to international diversification. The international CAPM is derived under the assumption that capital markets are perfect. Perfect capital markets imply a world without any barriers. In practice, there are several barriers to international capital flows (Karolyi and Stulz, 2003). Traditional barriers include capital controls and trading costs. While capital controls have been abolished over the past three decades, cross-border trading costs are still higher than domestic trading costs in Europe (Giovannini, 2001). Next, barriers can be related to different expectations about stock returns, volatilities and covariances. In particular, investors can be more uncertain about the expected returns of foreign stock. An important risk in the cross-border setting is exchange rate risk. The degree of risk aversion is captured by γ in equation (4). Finally, barriers can emerge from differences in information between local and foreign investors. A new strand of literature is emerging under the name of 'corporate insider theory' (Stulz, 2005). This theory states that if it is optimal for insiders to have large ownership stakes in corporations in a specific country, it is not possible for the home bias towards that country to fall sharply as long as foreign investors are not corporate insiders. The existence of insider ownership thus limits the holdings of foreign investors.

What is the outlook for these barriers? Cross-border trading costs are declining and are expected to converge towards the domestic level with further European integration. Moreover, exchange rate risk is eliminated within the euro area. This would reduce the home bias, in particular in the euro area. Finally, the emergence of institutional investors may reduce the home bias. As professional parties, they may have better means to overcome the barriers to international investment. They employ, for example, analysts which can reduce the information asymmetries between investors and entrepreneurs. And as large parties they can negotiate lower tariffs for large (cross-border) deals. Section 3 produces some empirical evidence on the impact of institutional investors on the home bias.

2. Measuring the home bias

The observation that investors underweight foreign assets in their portfolio is known as the home bias. There is robust evidence across a large range of countries for the existence of the home bias (Chan, Covrig and Ng, 2005). This means that investors tend to overweight domestic assets in their investment portfolio, while this might not be optimal from a diversification point of view. Global diversification should generate a better risk/return profile than domestic diversification, as the world capital market entails lower systematic risk than any domestic capital market.

Global diversification applies to different degrees for various asset classes. Diversification via investments in foreign equity seems to be most applicable to institutional investors. Shocks to equity markets tend to be country specific, although downside market movements occur much more in parallel than upside ones (Solnik et al., 1996). After the introduction of the euro in 1999, shocks in the EMU region are more sector specific than country specific. Bond portfolios should be diversified because of credit risk. Investors hedge the exchange rate risk (and related interest rate risk) of their bond portfolio, while diversifying the credit risk of bonds among various countries. It is expected that investors diversify less within their bond portfolio than they do for their equity portfolio, as bonds markets are more globally integrated (especially between the euro area and other major bond markets), which makes international diversification less profitable.

Section 3 analyzes to which extent (institutional) investors in Europe diversify their investments geographically. By comparing the levels of the home bias from 1997 to 2004, we can analyze whether there is a decline in the home bias over time. To derive the home bias theoretically, the international CAPM is used. The optimal portfolio with no bias can be calculated under strict assumptions (Solnik, 2000). In the international setting, these assumptions include fully integrated capital markets and purchasing power parity. Fully integrated capital markets imply that investors can buy and sell securities in foreign markets without any restrictions or extra transaction costs. Purchasing power parity applies the long-run equilibrium exchange rates of currencies to equalize the currencies' purchasing power. It is based on the law of one price, which means that identical goods (including securities) in different markets must have only one price. When purchasing power parity holds, exchange rate risk is no longer relevant. If there are homogeneous expectations, all investors select the same optimal portfolio. Equilibrium in the international setting is achieved when all investors hold the world market portfolio in which each country portfolio is weighted by its market capitalization.

The equity home bias labelled EHB_i is measured as the difference between the relative weight of domestic equity in the portfolio of country i and the relative weight of country i in the total world market portfolio. The country portfolio is calculated as follows: domestic market capitalization plus foreign equity holdings minus foreign owners of domestic equity. The equity home bias is given by

$$EHB_i = 1 - \frac{Foreign\ Equity_i}{Foreign\ Equity\ to\ Total\ Market_i}, \qquad (5)$$

where $Foreign\ Equity_i$ − share of country i-th holdings of foreign equity in country i-th total equity portfolio (1 − share of domestic equity); $Foreign\ Equity\ to\ Total\ Market_i$ − the share of foreign equity in the world portfolio available to country i (1 − share of country i in the total market capitalization).

Equation (5) measures to which extent domestic equity is overweighed compared to foreign equity in the investment portfolio. From the international CAPM, the ratio is expected to be 0 as full geographical diversification (that is holding the world market portfolio) is beneficial. In other words, a country will have an EHB equal to 0 if investors show no preference for equity issued domestically. If domestic investors have a preference for domestic equity, the ratio will be between 0 and 1. Let us illustrate the home bias formula with an example. Country i investors allocate 15 percent of their portfolio to foreign equity, while the total world market portfolio comprises 75 percent of foreign equity and 25 percent of domestic equity. Country i investors thus only exploit international diversification to one-fifth (15/75) and thus have a home bias of four-

fifths. EHB_i is normalized to 1.0 if domestic investors invest 100 percent of their equity portfolio domestically. In a similar vein, the preference of investors for domestic debt securities can be measured. This home bias measure for bonds is labelled the bond home bias BHB_i.

Finally, the Regional Bias (RB) can be measured. The question is whether European investors show a preference for European securities in their foreign securities portfolio in comparison to US securities. Within the part of the investment portfolio which is invested in foreign equity and bonds, EU investors should, according to the ICAPM, show no preference for either European or US equities and bonds.

In a similar way as the analysis concerning the domestic home bias, we test whether European investors show a regional bias towards European equities and bonds. The regional bias for equities is given by

$$REB_i = 1 - \frac{US\ Equity}{US\ Equity\ to\ Foreign\ Market\ Portfolio_i}, (6)$$

where $US\ Equity_i$ – share of country i-th holdings of US equity in country i-th total foreign equity portfolio (1 – share of EU equity in foreign portfolio); $US\ Equity\ to\ Foreign\ Market\ Portfolio_i$ – share of US equity in the foreign equity portfolio which is available for country i. The available foreign portfolio for country i is total domestic market capitalization of EU and US minus domestic market capitalization of country i.

The foreign market portfolio differs per country. For example, as the UK comprises a large part of total EU equity, the foreign equity portfolio for the UK is smaller than for other countries. The same applies to the foreign bond portfolio. It is expected that the Regional Bond Bias is higher than the Regional Equity Bias for the EMU countries, because there is

no exchange rate (and interest rate risk) involved, and international diversification of bonds focuses primarily on credit risk.

3. Evidence on the home bias in European investment

Some recent empirical studies measure the development of the home bias in the EU-15 (De Santis and Gérard, 2006). Data concerning foreign equity and bond holdings are extracted from a country-level dataset of the IMF, the Coordinated Portfolio Investment Survey (CPIS). Luxembourg and Ireland are excluded from the database as they are outliers. These countries attract large amounts of foreign mutual fund investment due to favorable tax policies. For comparison reasons the US is added to the dataset. This results in a sample of 14 countries, which consists of EU-13 and the US. A proxy for the world market portfolio is the domestic market capitalization of the EU-13 and the US. In this way, we analyze to which extent the EU-13 countries and the US overweight domestic equity in their portfolio compared to foreign equity.

We start with an overview of the equity and bond market portfolios of the EU-13 countries and the US. To measure the impact of the euro in 1999, we take data 2 years before the introduction of the euro (1997) and 2 years after the introduction (2001). In addition, we take more recent data (2004) to investigate whether a possible euro-effect is temporary or more permanent. Tables 1 and 2 present the foreign holdings of both the equity and bond portfolios (only 1997 and 2004 data are presented to save on space). The total portfolio is calculated by adding the domestic holdings of foreign equity (bonds) to the domestic market capitalization minus the foreign holdings of domestic equities (bonds). The total equity (bond) market in this analysis consists only of EU-13 and US equities (bonds).

Table 1. Equity portfolio of EU-13 countries and the US (in bln EUR)

	Domestic market capitalization		Holdings of foreign equity		Foreign holdings of domestic equity		Total equity portfolio	
	1997	2004	1997	2004	1997	2004	1997	2004
Austria	33.9	64.6	6.2	23.2	5.8	15.6	34.3	72.2
Belgium	126.3	180.8	18.3	61.8	13.3	40.1	131.2	202.5
Denmark	85.3	114.2	14.5	33.3	12.7	17.7	87.2	129.8
Finland	66.7	135.2	1.9	24.5	19.8	61.3	48.8	98.4
France	615.3	1,147.0	53.2	213.4	134.8	290.8	533.7	1,069.7
Germany	750.8	878.8	118.1	184.6	115.0	218.3	753.9	845.1
Greece	30.7	89.7	0.4	2.5	3.5	11.0	27.6	81.2
Italy	313.8	580.9	30.2	81.7	65.3	117.3	278.7	545.3

Table 1 (cont.). Equity portfolio of EU-13 countries and the US (in bln EUR)

	Domestic market capitalization		Holdings of foreign equity		Foreign holdings of domestic equity		Total equity portfolio	
Netherlands	426.5	391.1	84.0	217.4	139.2	217.2	371.4	391.3
Portugal	35.4	48.2	1.6	6.6	8.8	11.9	28.2	43.0
Spain	264.4	692.1	11.7	44.4	57.3	117.0	218.7	619.4
Sweden	240.5	277.6	29.4	79.6	51.2	58.7	218.8	298.5
United Kingdom	1,819.7	2,116.9	260.9	347.6	234.8	494.6	1,845.9	1,969.8
United States	9,615.6	11,923.1	558.7	827.7	209.2	476.8	9,965.1	12,274.0

Note: Total equity portfolio is calculated by adding foreign holdings (in EU-13 and US) to the domestic market capitalization and subtracting foreign holdings (by EU-13 and US) of domestic equity.

Sources: FIBV, IMF Coordinated Portfolio Investment Survey (CPIS).

Table 2. Bond portfolio of EU-13 countries and the US (in bln EUR)

	Domestic market capitalization		Holdings of foreign equity		Foreign holdings of domestic equity		Total equity portfolio	
	1997	2004	1997	2004	1997	2004	1997	2004
Austria	119.7	166.1	26.7	116.6	12.8	99.7	133.6	183.0
Belgium	331.7	354.2	58.8	206.1	17.3	89.4	373.1	470.9
Denmark	236.4	342.7	16.3	60.2	23.2	49.4	229.5	353.4
Finland	67.9	90.2	5.0	59.3	19.0	39.9	53.9	109.6
France	1,069.0	1,545.1	131.7	704.0	46.0	348.5	1,154.7	1,900.7
Germany	1,578.6	1,648.8	143.9	544.9	226.6	580.3	1,495.9	1,613.4
Greece	85.9	162.6	1.7	17.2	12.9	107.5	74.7	72.3
Italy	1,331.7	1,732.3	61.6	275.0	97.1	480.3	1,296.2	1,527.1
Netherlands	275.9	508.1	89.2	362.6	52.7	422.0	312.3	448.8
Portugal	49.8	111.0	7.7	40.3	8.2	55.2	49.3	96.2
Spain	324.8	647.9	12.6	220.9	36.6	247.6	300.9	621.2
Sweden	218.1	228.9	12.7	55.9	36.9	65.8	193.9	218.9
United Kingdom	635.2	764.1	300.6	542.7	100.5	351.4	835.3	955.4
United States	10,773.1	13,985.2	166.6	286.4	199.9	555.0	10,739.8	13,716.6

Note: Total bond portfolio is calculated by adding foreign bond holdings (in EU-13 and US) to the amount of domestically issued bonds and subtracting foreign holdings (by EU-13 and US) of domestic bonds.

Sources: BIS, IMF Coordinated Portfolio Investment Survey (CPIS).

Table 3 gives an overview of the equity and bond home bias in 1997, 2001 and 2004. All countries see a sharp decline of the equity home bias from 1997 to 2001. Most countries also show a steady decrease of the home bias after 2001, though a number of countries (e.g., Austria, Denmark, Italy and Spain) see an increase in the home bias after 2001. The Netherlands has the lowest home bias in the sample with a value of 0.43 in 2004 and has also noticed the largest decline from 1997 to 2004. The South-European countries, Italy, Spain, Portugal and Greece, have the highest bias around 0.90. The equity home bias for the Anglo-Saxon countries, the UK and the US, has decreased a little from 1997 to 2004, but is still relatively high with 0.80 and 0.81 respectively.

Table 3. Development of the equity and bond home bias

	Equity home bias					Bond home bias				
	1997	2001	2004	Δ97-01	Δ97-04	1997	2001	2004	Δ97-01	Δ97-04
Austria	0.82	0.49	0.68	-0.33	-0.14	0.80	0.53	0.35	-0.27	-0.44
Belgium	0.86	0.73	0.69	-0.13	-0.17	0.84	0.63	0.56	-0.21	-0.28

Table 3 (cont.). Development of the equity and bond home bias

	Equity home bias					Bond home bias				
Denmark	0.83	0.65	0.74	-0.18	-0.09	0.93	0.88	0.83	-0.05	-0.10
Finland	0.96	0.86	0.75	-0.10	-0.21	0.91	0.56	0.45	-0.35	-0.45
France	0.90	0.85	0.79	-0.05	-0.11	0.88	0.70	0.59	-0.18	-0.28
Germany	0.83	0.77	0.77	-0.06	-0.06	0.89	0.75	0.62	-0.14	-0.27
Greece	0.99	0.99	0.97	0.00	-0.02	0.98	0.91	0.76	-0.06	-0.22
Italy	0.89	0.80	0.85	-0.09	-0.04	0.95	0.83	0.81	-0.12	-0.14
Netherlands	0.77	0.56	0.43	-0.21	-0.33	0.71	0.31	0.17	-0.40	-0.54
Portugal	0.94	0.89	0.85	-0.06	-0.10	0.84	0.62	0.58	-0.22	-0.27
Spain	0.95	0.89	0.93	-0.06	-0.02	0.96	0.76	0.63	-0.20	-0.33
Sweden	0.86	0.70	0.73	-0.16	-0.13	0.93	0.77	0.74	-0.17	-0.19
United Kingdom	0.84	0.80	0.80	-0.04	-0.04	0.61	0.49	0.38	-0.12	-0.23
United States	0.83	0.82	0.81	-0.01	-0.02	0.97	0.97	0.96	-0.00	-0.01
EU-13	0.85	0.78	0.78	-0.07	-0.07	0.86	0.69	0.60	-0.17	-0.26
EMU	0.86	0.79	0.77	-0.08	-0.09	0.88	0.71	0.61	-0.17	-0.27
Non-EMU	0.84	0.78	0.79	-0.06	-0.05	0.72	0.60	0.53	-0.12	-0.19

Note: EU-13, EMU and non-EMU are calculated as a weighted average.

Source: IMF Coordinated Portfolio Investment Survey (CPIS).

The weighted average bias for the EU-13 indicates a decline of 0.07 from 1997 to 2001, after which the bias remains stable at 0.78. It is interesting to see that the EU bias has decreased after the introduction of the euro, without a significant change of the US bias over this period. While the weighted average bias for the EMU countries was higher in 1997 than the bias of the non-EMU countries, the bias for the EMU countries has decreased with 0.09 from 1997 to 2004 in comparison with 0.05 for the non-EMU countries.

Table 3 also illustrates that the BHB has declined in all countries in the sample, and this reduction is in general larger than for the EHB. In 2004, the BHB is the lowest for the Netherlands with only 0.17, followed by Austria and the UK. Denmark, Sweden, Greece and Italy still exhibit a large BHB relative to the other EU countries. Compared to the EHB, the BHB is on average lower for the EU-13 countries. The weighted average BHB for the EU-13 is 0.60 in 2004, a reduction of 0.26 since 1997. The differences between the EU countries are larger for the BHB than for the EHB. The US has an exceptionally high BHB with 0.96. It can be concluded that US investors are very domestically focused within their long-term debt portfolios, and allocate only a small percentage of their bond portfolio to EU bonds. This is partly in line with theory. As the US economy is very large, there is more scope for US investors to diversify credit risk domestically without occurring exchange rate risk.

For the EU countries, the largest decline has taken place in the period from 1997 to 2001, which is related to the introduction of the euro. The BHB decrease from 1997 to 2004 is larger for the EMU countries (0.27) than for the non-EMU countries (0.19). The reported results for the EHB and BHB are largely in line with the findings of De Santis and Gérard (2006). They also find a decline in the home bias from 1997 to 2001 for the countries in the sample. However, our more recent data for 2004 show a stronger decline for both the EHB and BHB in the EMU region than the data for 2001, as reported by De Santis and Gérard (2006).

3.1. Regional bias. As illustrated above, all countries in the sample exhibit a home bias towards domestic equities and bonds. The percentage of foreign securities is thus underweighted compared to domestic securities. Within the portfolio of foreign securities of the 14 countries in the sample, a distinction can be made between investments in European and US securities. If the home bias puzzle is mainly a geographical phenomenon, this implies that within their foreign portfolio European investors overweight European securities. This is in line with the findings of Coval and Moskowitz (1999), who find that even within a country investors show a preference for local stocks.

Table 4 reports the output concerning the Regional Bias for equities and bonds. Investors in all Euro-

pean countries in the sample overweight European equities relative to US equities. This means that the home bias also persists on a regional level, as European investors invest a relatively larger part of their foreign portfolio within Europe. The weighted average Regional Equity Bias (REB) for the EU-13 has increased from 1997 to 2004. The split between the EMU and non-EMU countries identifies an interesting pattern. The REB has increased with 0.08 for the EMU countries, while the bias has declined with 0.09 for the non-EMU countries.

The Netherlands has the lowest REB of the EU-13 countries, with a value of only 0.11 in 2004, followed by Sweden and Greece (both 0.23). Denmark has noticed the largest absolute decline (0.19) from 1997 to 2004. Portugal, Spain, Belgium and France show a high preference for European equities in their foreign investment portfolio. It is remarkable that the bias of Portugal, Spain and France has increased strongly from 1997 to 2004. Investors in these countries have evidently moved to a euro area investment strategy and thereby reduced their foreign (US) equity holdings.

Table 4. Development of the regional equity and bond bias of European investors

	Regional bias towards EU-13 equities					Regional bias towards EU-13 bonds				
	1997	2001	2004	Δ97-01	Δ97-04	1997	2001	2004	Δ97-01	Δ97-04
Austria	0.53	0.50	0.56	-0.03	0.03	0.64	0.82	0.86	0.18	0.22
Belgium	0.70	0.71	0.76	0.01	0.06	0.66	0.81	0.91	0.15	0.25
Denmark	0.58	0.42	0.39	-0.16	-0.19	0.72	0.71	0.65	-0.01	-0.08
Finland	0.69	0.61	0.73	-0.08	0.04	0.73	0.86	0.90	0.13	0.17
France	0.48	0.59	0.74	0.11	0.25	0.72	0.77	0.80	0.05	0.09
Germany	0.55	0.59	0.62	0.05.	0.07	0.81	0.85	0.87	0.05	0.06
Greece	0.37	0.44	0.23	0.07	-0.14	0.49	0.62	0.81	0.13	0.32
Italy	0.53	0.48	0.52	-0.05	-0.01	0.57	0.75	0.75	0.18	0.18
Netherlands	0.25	0.26	0.11	0.01	-0.14	0.79	0.70	0.74	-0.19	-0.05
Portugal	0.33	0.65	0.80	0.32	0.47	0.54	0.84	0.85	0.30	0.31
Spain	0.33	0.72	0.73	0.39	0.39	0.83	0.87	0.83	0.03	0.00
Sweden	0.26	0.23	0.23	-0.03	-0.03	0.46	0.52	0.58	0.07	0.13
United Kingdom	0.47	0.53	0.38	0.07	-0.09	0.42	0.47	0.38	0.05	-0.04
EU-13	0.45	0.50	0.47	0.05	0.02	0.62	0.72	0.74	0.09	0.12
EMU	0.46	0.52	0.53	0.06	0.08	0.73	0.79	0.82	0.06	0.09
Non-EMU	0.45	0.48	0.36	0.03	-0.09	0.43	0.49	0.41	0.06	-0.02

Note: EU-13, EMU and non-EMU are calculated as a weighted average.

Source: IMF Coordinated Portfolio Investment Survey (CPIS).

Table 4 also reports the Regional Bond Bias (RBB) of European investors. The weighted average for the EU-13 countries has increased from 1997 to 2004. The increase in the RBB is driven by the EMU countries. The RBB has increased with 0.09 for the EMU countries and has declined with 0.02 for the non-EMU countries. The absolute value of the bias in 2004 is twice as large for the EMU countries (0.82 vs. 0.41). The UK has the lowest RBB, followed by Sweden and Denmark (which are all non-EMU countries). While the Netherlands had the lowest bias in all previous tables, its RBB is equal to the EU-13 weighted average, at 0.74. EMU countries such as Austria, Belgium and Finland (which have a low BHB) have noticed a large increase in the RBB towards values of around 0.90 in 2004. It can be concluded that for these countries the decline in the BHB is caused by a shift from domestic towards European bonds, and not to US bonds. These countries diversify the credit risk of the bond portfolio to a significant extent, but within the EU. The interest rate risk is hedged by investing primarily in European bonds, which have interest rates which are identical (EMU) or linked (non-EMU) to domestic rates. Moreover, exchange rate risk is largely eliminated.

Table 4 illustrates that the medium-term impact of the euro (from 1997 to 2004) differs from the short-term impact (from 1997 to 2001). While the regional bias for equities and bonds is increasing in the non-EMU countries in the short term, the regional bias is decreasing for the medium term in these countries. The difference between the EMU region (strong increase

in regional bias) and the non-EMU region (decrease in regional bias) is thus more pronounced over the medium term. In this way, our findings differ from De Santis and Gérard (2006), who report a short-term increase in the regional bias for the EMU as well as the non-EMU region.

3.2. Graphical illustration of the development of the home bias. The international diversification strategy of institutional investors is graphically illustrated in Figures 2 and 3. Data for 1997 and 2004 are compared for four economic regions: the US, the EU-13, the ten EMU countries and the three non-EMU countries within the EU-

13. Figures 2A and B illustrate that the decline in the home bias is larger for the EU than for the US. Within the EU-13 countries, the ten EMU countries notice on average a larger decline in the home bias than the three non-EMU countries.

The graphical results from Figure 2 can be linked to the development of the regional bias (RB) in the European regions (EU-13, EMU and Non-EMU). The graphs in Figure 2 show that countries in the EU have shifted from a country-based investing strategy, towards a sector-based strategy. This has resulted in a decline of the home bias. The change in the RB from 1997 to 2004 for these regions is illustrated in Figure 3.
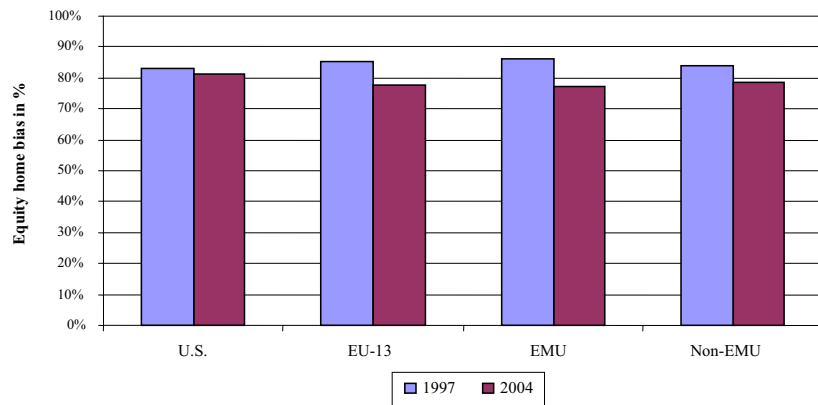

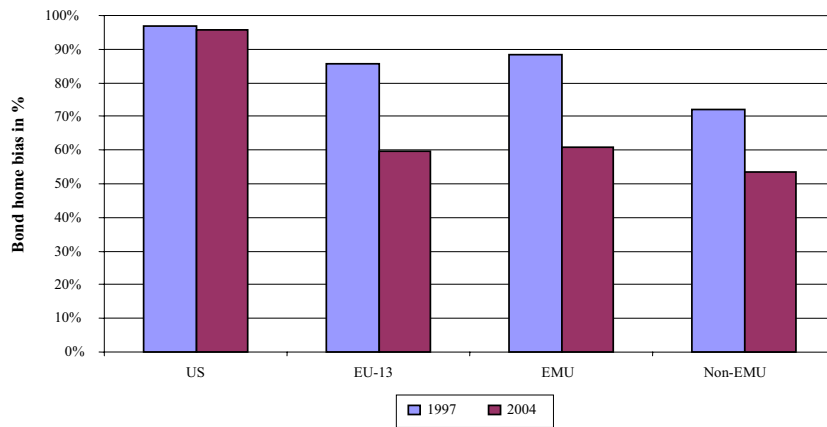**Fig. 2A. Equity home bias per region (1997 vs. 2004)**

Fig. 2B. Bond home bias per region (1997 vs. 2004)
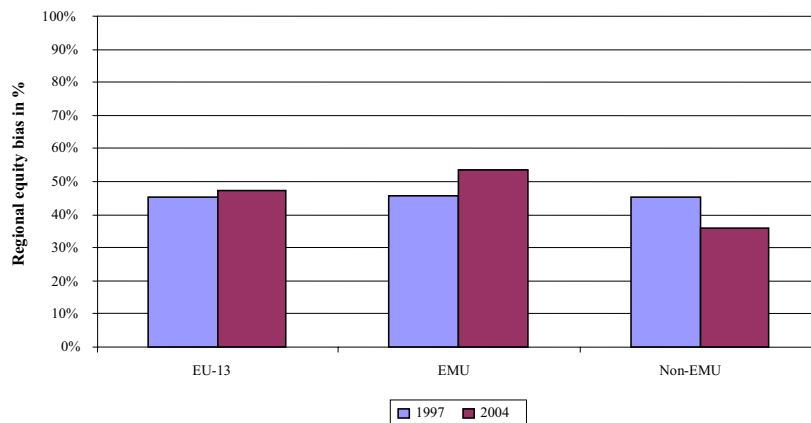

Fig. 3A. Regional equity bias per region (1997 vs. 2004)
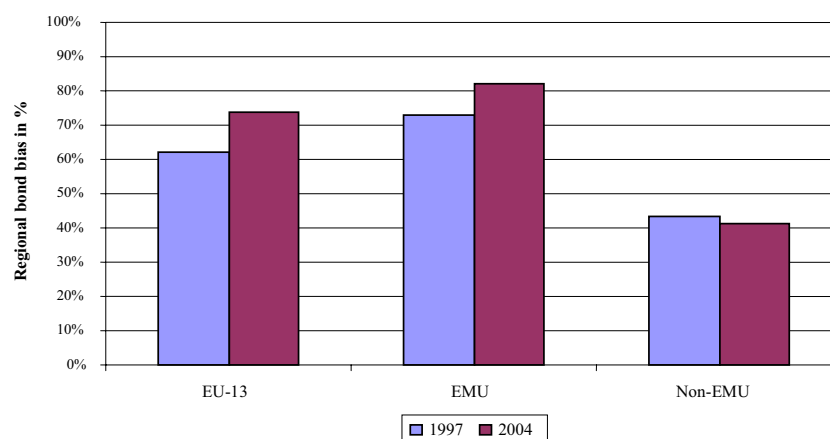
Fig. 3B. Regional bond bias per region (1997 vs. 2004)

While the equity and bond home bias in the EMU region has declined faster than in the non-EMU region, the reverse is true for the regional bias. In fact the regional bias has increased for both equity and bonds in the EMU region, but has decreased on average for the three non-EMU countries. These results are consistent with the theory of economic integration. Since the introduction of the euro in 1999, investors in the EMU countries have allocated a larger part of their portfolio in foreign assets than non-EMU countries and the US. At the same time, the regional bias of the EMU region has increased, as investors in EMU countries have invested their foreign assets mainly in their own economic region. This can be indicated as the 'EMU effect' as the euro caused a decrease of the home bias, but an increase of the regional bias. The regional bias decreased for the non-EMU region, which means that they partly shifted their foreign assets towards US assets compared to European assets.

4. Explaining the home bias

In this section, we conduct a regression analysis to explore which factors influence the size of the equity home bias. Both the traditional theory and the more recent corporate insider theory try to explain the home bias (see Section 1). In this analysis variables from both theories are used to explain the existence and persistence of the home bias in the equity portfolios of institutional investors in Europe. This regression analysis is not performed for the home bias in bond portfolios, due to a lack of data and theory concerning the explanation of this bias. As there are only developed countries in the sample, it is assumed that investment barriers and information differentials play a minor role.

The following explanatory variables are used in the analysis:

- *Export* – Export to GDP;

- *IIGDP* – assets of institutional investors to GDP;

- *Insider* – % of shares which are held by corporate insiders;

- *MCap* – Size of the domestic equity market to GDP.

Export to GDP: *Openness effect*. The ratio of total exports to GDP can be considered as a proxy for 'trade'. One would expect that investors in countries with a large export to GDP ratio have a lower need for international diversification, as the companies in these countries are already diversifying via their international business. However, this ratio could also be a proxy for the mindset of investors in a country, that is the openness of the specific country. If companies tend to do business abroad and diversify their business geographically, investors could act in the same manner. Export data are taken from Eurostat.

Assets of institutional investors to GDP: *Professionalism effect*. The size of the institutional sector could have a mitigating impact on the home bias (Davis and Steil, 2001). As institutional investors (pension funds, insurance companies and mutual funds) can be expected to invest in a sophisticated manner, they might exhibit a lower equity home bias than non-institutional investors. In a different context, Chan, Leung and Wang (2004) find that the Monday seasonal (that is the mean return on Monday is lower than on other weekdays) is related to the trading activities of less sophisticated individual investors. The Monday seasonal is stronger for stocks with low institutional holdings. Data on institutional investors are taken from OECD and Eurostat.

Insider ownership: *Insider effect*. The percentage of shares which is held by corporate insiders is estimated for the EU-13 and the US Insider ownership is expected to increase the home bias in two ways. First, domestic investors hold shares which foreign

investors cannot own. Second, domestic investors allocate a lower amount to foreign equity, as they have locked-up a part of their portfolio in domestic assets. It should be noted, however, that the theory concerning insider ownership is developed to explain the bias towards a country (Kho et al., 2006), but not necessarily the home bias of a country itself. Fraction of shares held by corporate insiders is obtained from Karolyi and Stulz (2003), Kho et al. (2006) and Stulz (2005).

Closely-held shares correspond to shares held by insiders. Insiders are considered to be officers, directors, and their immediate families, shares held in trusts, shares held by another corporation (except shares held in a fiduciary capacity by financial institutions), shares held by pension benefit plans, and shares held by individuals who hold 5% or more of the outstanding shares.

Domestic market cap to GDP: *Availability effect.* The size of the domestic stock market to GDP is a proxy for the relative size of the domestic market. It is expected that the home bias is higher in countries with a large relative size of the domestic stock market, which can be explained by the availability of domestic stocks for domestic investors. This means that investors tend to invest in domestic stocks if these stocks are more readily available. Domestic market capitalization data are obtained from FIBV and Eurostat.

4.1. Regression model. The regression analysis is done with a panel dataset consisting of the EU-13 countries and the US for the years 1997, 2002 and 2004. Via a panel regression this yields 42 observations. Data concerning insider ownership are not available for 2001 and 2003. A single-equation regression framework is used in order to estimate the relationship between the equity home bias and a set of explanatory variables for the sample of 14 countries. Table 5 summarizes the descriptive statistics for the variables which are used.

Table 5. Descriptive statistics of panel data (14 countries for 1997, 2002 and 2004)

Variable	Mean	Std. dev.	Min.	Max.	Obs.
Equity home bias	0.8053	0.1179	0.4324	0.9798	42
Export/GDP	0.3690	0.1803	0.0960	0.8380	42
Assets of international investors/GDP	0.9576	0.5149	0.2376	2.0128	42
Fraction of shares held by corporate insiders	0.3615	0.1555	0.0794	0.7518	42
Domestic market cap to GDP	0.6496	0.3440	0.1460	1.5530	42

The following equation describes the econometric specification employed:

$$EHB_i = \alpha + \beta \cdot Insider_i + \gamma \cdot Export_i + \delta \cdot IIGDP_i + \theta \cdot MCap_i + \varepsilon_i, \qquad (7)$$

where EHB_i – equity home bias for country i; α – constant; $Export_i$ – export to GDP for country i; $IIGDP$ – total assets of institutional investors to GDP for country i; $Insider_i$ – percentage of equity which is controlled by corporate insiders for country i; $MCap_i$ – domestic market capitalization to GDP for country i; ε_i – classical disturbance term.

The panel regression is estimated with fixed effects while accounting for heteroscedasticity by means of the White adjusted covariance matrix. Table 6 presents the regression results. The adjusted R-squared has a value of 0.69, which is reasonable, especially when one considers the fact that there are other (unobservable) factors which influence the home bias of a country. The F-statistic of the regression is significant at the 1 per cent level with a value of 16.25.

All explanatory variables have the signs which could be expected. Export to GDP has a significant negative effect on the home bias, which supports the theory that countries with relatively large trade volumes can be considered as more 'open' and have a lower bias due to the ´openness effect´. The domestic companies in these countries have significant exposure to the world market due to their level of international trade. However, investors in these countries are subject to a lower EHB, as they also tend to 'trade' (invest) internationally.

Table 6. Determinants of the Equity home bias (OLS regression)

Independent variables	Expected sign	Coefficient	*t*-value
Constant		0.915***	17.3
Export	+/-	-0.324***	3.9
Institutional investors	-	-0.146**	2.4
Insider	+	0.127	1.3
Market cap	+	0.159*	2.0
N		42	

Table 6 (cont.). Determinants of the Equity home bias (OLS regression)

Independent variables	Expected sign	Coefficient	*t*-value
Adj. R^2		0.69	
F-statistic		16.25	

Notes: OLS panel regression using EHB_i as the dependent variable. Data of 1997, 2002 and 2004 for the EU-13 and the US are used for this analysis. Period-specific fixed effects are included in the regression. ***, ** and * indicate statistical significance at the 1 percent, 5 percent and 10 percent levels, respectively.

The relative size of the institutional sector also has a negative and significant effect on the home bias. Countries in which institutions manage a larger part of the financial assets exhibit larger international diversification. Indeed, it can be assumed that institutional investors, as professional asset managers, are subject to a lower home bias than non-financial corporations or households. This is the so-called *'professionalism effect'*. Our finding is consistent with studies on the behavioral differences between professional and amateur investors after the weekend. Chan, Leung and Wang (2004) and Venezia and Shapira (2007) document that individual investors trade relatively more on Mondays and that the returns on Mondays are lower than those in other weekdays.

The relative size of the domestic stock market has a positive and significant effect on the home bias. Thus, investors are more domestically oriented if their domestic stock market is well developed. This could indicate that investors are subject to the *'availability effect'*, which means that investors are more eager to invest in domestic assets when these domestic assets are relatively better available. The share of corporate insiders is the only variable which is not significant, although it has its expected positive sign. This indicates that this theory might help to explain the home bias *towards* a country (as shown by Kho et al., 2006), but does not explain the home bias *within* a country.

Conclusions

Finance theory suggests that investors should aim for international diversification of their investment portfolio to maximize returns given a certain risk profile. Nevertheless, there is a strong home bias in equity and bond portfolios. One of the barriers for international investment is exchange rate risk. The main aim of this paper is to investigate the effect of the euro. Earlier studies have measured the euro-effect just before and after the introduction of the euro in 1999 (De Santis and Gérard, 2006). The contribution of this paper is to examine whether the effect is temporary or permanent. Our results are more pronounced than earlier findings. The decline in the equity home bias is quite similar when measured in 2001: an 8% decline for the EMU region from 1997 to 2001 and a 6% decline for the non-EMU region. Recent figures show a 9% decline for EMU-countries from 1997 to 2004 and only a 5% decline for non-EMU countries. The elimination of exchange rate risk following the introduction of the euro has thus led to a further decline of the home bias in the euro area.

The decline in the home bias is beneficial for investors and entrepreneurs. International diversification reduces idiosyncratic risk (Solnik, 2000). Investors generate a higher return with no change in risk. By the same token, international diversification reduces the cost of capital (Stulz, 1999). The expected return that investors require for investing in equity (or bonds) to compensate them for the risk they bear generally falls. The result is a lower cost of capital for companies. The arrival of the euro has improved the allocative efficiency of the economy.

A second major trend for investments in Europe is the emergence of institutional investors. The assets of pension funds, insurance companies and mutual funds have tripled from 44% of GDP in 1985 to 122% in 2004. The future outlook for institutional investment is positive. Both the demand side (growing investments by pension funds to cater for aging and by mutual funds to accommodate wealth accumulation of households) and the supply side (shift from bank financing to market financing via equity and bonds) point to future growth of institutional investment. This paper shows that the increasing professionalism of institutional investors (as compared to individual investors) has led to a decline in the home bias in Europe. This supports evidence from other studies (e.g., Chan, Leung and Wang, 2004) that trading patterns of institutional and individual investors differ and that institutional investors realize on average higher returns.

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