

Relative Optimism and the Home Bias Puzzle*

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Abstract

We study whether relative optimism leads to home bias in portfolio holdings by looking at two novel databases: a survey that includes expectations of identified professional asset management companies for equity, bonds, and currencies, and the International Monetary Fund portfolio holdings data for equity and bonds. We document that relative optimism for equity is persistent over the period 1997–2012, but relative optimism for bonds and currencies exhibits more time-series variation. Moreover, we show that relative optimism is an economically significant variable that helps explain home bias in portfolio holdings, not only for equity, but also for bonds.

JEL classification: G02, G15

1. Introduction

There is extensive evidence that investors' geographical locations influence their portfolio holdings and market expectations. A common finding is that investors do not hold the world market portfolio and have a bias toward domestic equity ("home bias"). A related strand of literature documents that domestic investors tend to be more bullish about their own equity market than foreign investors ("relative optimism"). Due to the limited availability of quality data to calculate the two measures for a large set of common countries over a long time period, past research has focused on either home bias for equity (see Cooper, Sercu and Vanpée (2013) for a recent review) or relative optimism for equity (e.g., Shiller, Kon-Ya, and Tsutsui, 1996; Kilka and Weber, 2000; Strong and Xu, 2003; Brennan *et al.*, 2005) and the link between these two has never been directly tested. In addition, the lack of data on other asset classes has prevented a formal empirical analysis of relative optimism for bonds and its relation to home bias in bond portfolio holdings.

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This article takes advantage of two newly available databases to formally test the link between differential expectations and the home bias in portfolio holdings for both equity and bonds. The first database is a monthly survey conducted by Investment & Pensions Europe (IPE). IPE is a leading European publication for institutional investors and those running pension funds. The non-anonymous survey details the monthly expectations of professional asset management companies from seventeen countries over an extended period (February 1997 to April 2012) and for multiple markets (i.e., equity, bonds, and currencies). The second database is the annual Coordinated Portfolio Investment Survey (CPIS) conducted by the International Monetary Fund (IMF) and covers both equity and bond portfolio holdings for IMF member countries over 12 years (the year 1997 and the 2001–11 period). Using these two databases, we measure relative optimism for equity, bonds, and currencies, and home bias in portfolio holdings in equity and bonds. We show that relative optimism is an economically significant variable that helps explain home bias in portfolio holdings, not only for equity, but also for bonds.

The home bias puzzle is one of the most pronounced patterns in international investment and remains a big challenge to portfolio theory. While a lot of different explanations have been proposed for the observed home bias, this article examines and tests one of the potentially more pertinent hypotheses: relative optimism of domestic investors leads to home bias in holdings. The challenge of the home bias literature is not so much to provide a plausible story (of which there are many), but to deliver evidence which is specific to a proposed hypothesis and cannot be easily explained by alternative hypotheses. The new survey evidence on investor views and relative optimism fulfills this criterion and holds the promise of empirical progress in our understanding of the home bias puzzle. In particular, the evidence for the correlation between changes in home bias and changes in the average investment views of funds from the IPE survey (as discussed in detail below) cannot be easily accounted for by the main alternative hypotheses based on institutional stories or other behavioral biases. Prior studies have conjectured that relative optimism is one potential explanation for equity home bias.¹ However, we are the first to provide direct empirical evidence linking these two for both equity and bonds. This feature of the article makes it original in the large literature on home bias explanations.

As a first step, we test whether relative optimism for equity, bonds, and currencies persists over the 16 years (February 1997 to April 2012). For each monthly observation of the IPE survey, we can identify the asset management company and its country of domicile. The survey includes individual data for 187 asset management companies based in Europe, the UK, the USA, and Japan. For each month and region/country, asset managers give their predictions on future movement of equity, bonds, and currencies.² In a simple means test, we compare investment views on a given market (e.g., Europe) averaged over all home managers (e.g., Europeans) with that averaged over all foreign managers (e.g., non-Europeans). Moreover, because we have data on individual managers, we also conduct

- 1 For example, [Strong and Xu \(2003\)](#) attempt to link relative optimism and equity home bias by looking at the simple correlations between the balance of bullish and bearish fund managers and intentions to buy and sell.
- 2 For equity and bonds, asset managers give their predictions on whether equity and bond prices in each of the four markets (i.e., Europe, the UK, the USA, and Japan) will rise, remain stable or drop over the coming 6–12 months. For currencies, asset managers give their predictions on whether currencies in each of the three markets (i.e., Europe, the UK, and Japan) will appreciate, remain stable or depreciate against the US dollar over the coming 6–12 months.

more powerful tests using a panel methodology that allows us to take into account the dispersion across managers in a region as well as time variation (as done in means tests).

We find that relative optimism is persistent and prevalent in equity markets. While prior studies (e.g., Shiller, Kon-Ya, and Tsutsui, 1996; Strong and Xu, 2003) show persistent relative optimism for equity in a particular market phase (i.e., the Japanese market crash of the early 1990s or a sustained worldwide bull market over 1995–2000), we document that relative optimism for equity is present in both bull and bear markets and remains evident over time, including the recent financial crisis period. However, relative optimism for bonds and currencies exhibits more time-series variation. Investors show both relative optimism and relative pessimism over time and we do not observe a persistent positive value of relative optimism for either bonds or currencies over our sample period.

Our main goal in this article is to link relative optimism to home bias in portfolio holdings. It has been repeatedly observed that equity portfolios in all countries are strongly biased toward domestic assets. As Cooper, Sercu, and Vanpée (2013) state, “the equity home bias is one of the strongest and most persistent empirical phenomena in finance” (p. 396) and “the puzzle remains unsolved” (p. 291). While less researched, home bias in bond portfolio holdings has also been documented (Ferreira and Miguel, 2011; Vanpée and De Moor, 2013). Numerous tentative explanations have been provided for the observed home bias in portfolio holdings (see Solnik and Zuo (2012) for a summary), such as information asymmetry (Hau, 2001; Edison and Warnock, 2004), explicit barriers to international investments (French and Poterba, 1991; Cooper and Kaplanis, 1994; Tesar and Werner, 1995), governance and investor protection (Gelos and Wei, 2005; Doidge, Karolyi, and Stulz, 2007; Kho, Stulz, and Warnock, 2009), past returns and betas (Tesar and Werner, 1995; Bohn and Tesar, 1996; Brennan and Cao, 1997), and economic development and market size (Bekaert and Wang, 2009). While various institutional investment constraints could explain underinvestment in emerging markets (Karolyi, 2015), these constraints are much less relevant among major developed markets.

Following French and Poterba (1991), many authors have stressed the importance of behavioral explanations of this home bias puzzle. The most common behavioral explanation of the home bias puzzle is based on familiarity bias (Huberman, 2001).³ Foreign stocks are deemed as more risky than domestic stocks simply because the companies are less known by investors. In equilibrium, this perceived risk differential induces a home bias. Several authors have relied on the concept of familiarity to model the home bias in holdings. Cao *et al.* (2011) model the fear of the unfamiliar using Gilboa–Schmeidler (1989) preferences. In Solnik and Zuo (2012), the fear of the unfamiliar is modeled in an equilibrium setting using a regret-theory formulation. Looking at international asset pricing, they find empirical support for a behavioral explanation of the observed home bias.⁴

Most behavioral explanations of the home bias have a risk underpinning. The fear of the unfamiliar makes investors reluctant to deviate from domestic assets. But relative optimism could also induce a home bias in portfolio holdings. Going back to the early mean-variance discussion of home bias in French and Poterba (1991), home bias in holdings could

3 Ackert *et al.* (2005) find experimental evidence that investors perceive themselves as more familiar with local securities and invest more in them. International evidence suggests that investors tilt their portfolios toward those stocks that are most closely related to them (Grinblatt and Keloharju, 2001; Massa and Simonov, 2006).

4 Other behavioral explanations for home bias include perceived competence (Graham, Harvey, and Huang, 2009) and “keeping up with the Joneses” (Gollier, 2004).

be caused by the perception of higher foreign risks but also by the perception of higher domestic returns (relative optimism). In a simple mean-variance framework with heterogeneous expectations, higher expected returns on domestic equity would lead to a home bias in portfolio holdings. We use a unique dataset covering a large set of countries over a long time period to shed light on this important issue. In addition, we test whether relative optimism for bonds can partly explain home bias in bond portfolio holdings.⁵

We calculate an estimate of relative optimism for equity, bonds, and currencies based on the difference between the aggregated expectations given by all home asset management companies and those given by all foreign asset management companies (see the formal definition of relative optimism in Section 2). We use this estimate of relative optimism to proxy for a country's differential expectations of future market returns. This approach is similar to relying on the analysts' consensus forecasts of earnings as a proxy for market expectations. We measure the extent of home bias for equity and bonds using the home bias ratio, calculated as one minus the ratio of the weights of foreign stocks in the investors' portfolio and in the world market portfolio (Kho, Stulz, and Warnock, 2009; Solnik and Zuo, 2012).

We find a significantly positive cross-country correlation between the extent of national relative optimism and home bias ratio for both equity and bonds. These results persist after we control for various other determinants of home bias (e.g., proximity as reflected in language and distance, capital controls, relative size of insurance corporations and pension funds, investor protection, past returns and betas, economic development and market size). In terms of economic significance, increasing the estimate of relative optimism for domestic equity (bonds) by its average magnitude translates into a four percentage point (one percentage point) increase in the equity (bond) home bias ratio. To get a more concrete idea of what these numbers mean, we take the example of the USA in 2011. *Ceteris paribus*, a decrease of four percentage points (one percentage point) in equity (bond) home bias ratio would imply a capital flow of about one-half trillion (a quarter trillion) US dollars from domestic to foreign equity (bond) investments.

Interestingly, while we only find limited evidence that institutional variables explain equity home bias for the developed countries that we study, institutional factors are important in explaining bond home bias. These different results between equity home bias and bond home bias suggest that it is important to look separately at equity and bond markets, and the general findings in one market cannot be readily extrapolated to the other.

One potential concern with this cross-sectional result is that the documented positive association between relative optimism and home bias could be driven by some omitted variables. To alleviate this concern, we explore the time-series variation in both relative optimism and home bias and conduct difference-in-differences tests. We find that an increase in relative optimism for equity/bonds leads to an increase in home bias in equity/bond portfolio holdings. In addition, we find that changes in home bias do not lead to subsequent changes in relative optimism. In sum, both the cross-sectional tests and the difference-in-differences tests suggest that relative optimism is an economically significant variable that helps explain home bias.

The remainder of the article is structured as follows. Section 2 details our data sources and defines the variables used. Section 3 tests the persistence of relative optimism for the various

5 Strictly speaking, we test whether investor views (either relative optimism or relative pessimism) affect their bond portfolio holdings since we do not observe a persistent positive value of relative optimism for bonds over our sample period.

asset classes. In Section 4, we test whether relative optimism for equity/bonds is linked to home bias in equity/bond portfolio holdings. The final section offers some conclusions.

2. Data

Our article combines survey data with portfolio holdings data from seventeen developed countries (listed in [Table I](#)) across four regions (i.e., Europe (ex-UK), the UK, the USA, and Japan). The survey data cover 183 months, February 1997 to April 2012. The portfolio holdings data cover 12 years, the year 1997 and the 2001–11 period.

2.1 IPE Survey Data

Our survey data come from IPE who publishes a monthly magazine for institutional investors. IPE's various outputs have been extensively used for asset manager selection by institutional investors and those running pension funds. At the end of every month, IPE collects from institutional investment managers their predictions on equity, bonds, and currencies for the coming 6–12 months. The sample period is from February 1997 to April 2012 for a total of 183 months. The IPE survey has not been previously used in academic research, and it offers several advantages compared with surveys used in past research. For example, IPE surveys asset management companies from multiple countries in a consistent way. It also reports expectations on the four regions, not only for equity, but also for bonds and currencies. Another benefit of this survey is that it reports expectations from each specific asset management company, not just as an average figure from a sample of respondents.⁶ Unlike other surveys which are usually anonymous and confidential, the IPE survey keeps track of the identities of the respondents and the responding asset managers are periodically evaluated (e.g., see [van Dijk and Geels, 2005, 2006](#)). Thus, the respondents have strong incentives to provide high-quality responses.⁷ It is also important to note that the investment view, publicly posted and used to evaluate the asset management company, represents the view of an institution, not that of a single person. Hence, it is less likely to be driven by idiosyncrasies as in other anonymous surveys. For these reasons, the IPE survey is of higher quality than other surveys and suits well the purpose of our study.

Overall, the survey data come from 187 different asset management companies, and contain 14,350 month/manager observations. For simplicity, the appellation “asset manager” or “manager” will refer to a surveyed asset management company. These asset management companies include many of the largest asset managers as well as several smaller ones. While IPE primarily provides service to institutional investors, such as pension funds and insurance companies, the asset management companies surveyed also offer mutual funds open to the general public. IPE assigns each asset management company to a base

6 The Merrill Lynch Fund Manager Survey, used by [Strong and Xu \(2003\)](#), only reports the investment views averaged over all managers based in the same region rather than the views of specific asset managers. Furthermore, Merrill Lynch discontinued in 2001 reporting the base-region of responding managers. Based on 50-month data (i.e., February 1997 to March 2001), we find a large positive correlation between the IPE data and the Merrill Lynch data. For example, the correlation is 67% between these two datasets for the balance of bull and bear UK managers regarding the US market. We are not aware of alternative surveys that could be used for the purpose of our study. Other surveys of market expectations tend to be confined to respondents in a single region.

7 [Goldberg and Crandall \(2013\)](#) summarize several key aspects on how anonymity in surveys impacts validity.

Table I. Number of responding asset management companies per base country

This table reports the total number of asset management companies responding to the IPE survey per base country over the sample period. Some asset management companies only report during part of the period or for some asset classes.

Country	No. of Asset Management Companies
Austria	5
Belgium	9
Denmark	4
Finland	1
France	15
Germany	27
Greece	2
Italy	3
Netherlands	10
Norway	3
Portugal	1
Spain	2
Sweden	2
Switzerland	23
UK	47
USA	30
Japan	3
Total	187

country (domicile), e.g., Threadneedle Investments is from the UK and Bank Degroof is from Belgium. The seventeen base countries covered in the survey are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, the USA, and Japan. As a first step, we group all (continental) European asset management companies into a single region called Europe.⁸ Hence we have four base regions for domicile of the asset management companies: Europe, the UK, the USA, and Japan. Later on, we conduct a more detailed investigation of European asset management companies by specific countries of domicile. The number of asset management companies per base country over the whole sample period is listed in Table I. Some asset management companies only report during part of the period or for some asset classes, and the number of respondents tends to be lower in the early years.

Even though the number of surveyed asset management companies seems small, their assets under management (AUM) are large. We collect from various sources the AUM of all the asset management companies reporting at the end of 2011, the last full year of the IPE survey.⁹ Their total funds under management are over 21.5 trillion US dollars. This number compares with a total stock (bond) market capitalization of 29.2 (78.0) trillion for the countries included in the IPE survey. Naturally, passive asset management companies such

⁸ We use the British tradition of equating “Europe” with continental Europe.

⁹ Data sources include “The World’s 500 Largest Asset Managers – Year end 2011” reported by the P&I/Towers Watson, “IPE Asset Management Leaders 2012” (based on AUM as of December 2011), and individual company websites. Except in rare cases, we do not have the breakdown of equity/bonds for AUM.

as BlackRock (iShares), Vanguard or State Street Global Advisors do not report market expectations under the IPE survey, and only active asset management companies do. Hence, we do capture a significant share of active asset management by all investors. The coverage depends on regions. The UK (AUM of 2.8 trillion) and Europe (AUM of 7.4 trillion) are particularly well covered as we get many of the largest institutions in the UK, France, Germany, the Netherlands, and Switzerland. In several smaller European countries, we only get the views from a few asset management companies but they can be dominant ones in their countries. As reported in Table 1, the number of institutions for Japan is small but two of them are among the top five Japanese asset management companies.¹⁰

Furthermore, such public views of respected investment specialists can serve as the basis for investment decisions by a larger set of investors, including retail investors, in a way similar to how forecasts by financial analysts can guide the stock selection of other investors. A common way of measuring the aggregate market's expectations of future earnings is to rely on the analysts' consensus forecasts of earnings as a proxy since they are deemed superior to other proxies (e.g., Fried and Givoly, 1982). Analogously, in the absence of better alternatives at the national level, we use the average national return expectations based on the IPE survey as a proxy for a country's expectations of future market returns. To the extent that such a proxy is imperfect, it will make it harder to detect the underlying relation between relative optimism and home bias, and work against us finding a significant relation.

Most asset management companies are large ones managing global portfolios of both equity and bonds, and they report their views on all asset classes. There are only a few smaller ones that are specialized asset management companies focusing on some asset classes and only report views on the asset class that they specialize in. Out of the 187 asset management companies in total, four of those do not report any view on equity, three do not report any view on bonds, and one does not report any view on currencies. While currencies are not used as an investment class by most asset management companies, views on currencies are relevant as they can affect the asset allocation to international bonds and equity. For simplicity of notations, we will also use the appellation "asset class" for currencies as views are formulated for regional equity, bonds, and currencies.

For each asset class (equity, bonds, and currencies), the markets covered are Europe, the UK, the USA, and Japan. Thus, an institution's view for a region-asset combination can easily be coded using a trinary system $\{+1, 0, -1\}$. The *investment view*, from an asset manager i , based in region j , about a region m and asset class k , at month t is denoted by:

$$v(i, j, m, k, t) = \begin{cases} +1 & \text{Bullish} \\ 0 & \text{Neutral} \\ -1 & \text{Bearish} \end{cases} \quad (1)$$

For each month t , we compute the average investment view given by all managers domiciled in a given region and call this quantity, the region-based view. Using averages helps control for differences in the numbers of asset managers across regions. Finally, we can get the overall investment view by taking the average over all regions. This number can be interpreted as the average view of the industry for a market at any point of time.

10 All tests conducted in the article yield similar results when we exclude those countries with few management companies.

Table II. Overall investment views for each market and asset class

The table reports the mean investment views and the standard deviation (in parentheses) for all managers in each asset class. This is the time-series average of the cross-sectional means. For each manager, the investment view is scored +1 (bullish), 0 (neutral), or -1 (bearish). The period is February 1997 to April 2012 (183 months).

	Europe	UK	USA	Japan
Equity	0.430 (0.205)	0.353 (0.249)	0.263 (0.416)	0.474 (0.170)
Bond	-0.243 (0.267)	-0.270 (0.271)	-0.270 (0.328)	-0.612 (0.197)
Currency	-0.114 (0.399)	0.034 (0.306)	0.000 (0.217)	0.082 (0.270)

In order to provide a sense of the investment view data, Table II gives the mean over time of the overall investment view per asset class for each market as well as its standard deviation (in parentheses). The first row of Table II shows that the mean investment view over the 1997–2012 period is positive for each regional equity market; the US market, however, has the largest standard deviation. As seen in the second row, investors have been, on average over the whole period, bearish on all bond markets (i.e., expecting a drop in bond prices, or rise in bond yields). The third row shows that on average over the whole period managers have been bearish about the euro, while bullish about the pound, the yen, and the dollar.¹¹

2.2 Measure of Relative Optimism

Just looking at raw investment views does not permit one to conclude whether managers are more or less optimistic about their own market. For example, it could easily be that European managers are simply very bullish about the equity asset class, not about European equity in particular. Their bullishness on European equity could be matched or even surpassed by bullishness about the US or Japanese equity. So we define a measure of rating by taking the difference of the view given by a manager i on a regional market m of asset class k and the average views given by the same manager i for all markets in the same asset class k . The net result is that our unit of analysis is a rating from asset manager i , based in region j , about a region m and asset class k , at month t :

$$\text{rat}(i, j, m, k, t) = v(i, j, m, k, t) - \frac{1}{\dim(M)} \sum_{m \in M} v(i, j, m, k, t). \quad (2)$$

A positive rating on one market implies that a manager is more optimistic about this market than he is about other regional markets in the same asset class. As with views, we

11 The euro was introduced at the end of 1998. While the euro is not the domestic currency of several European countries, those European countries which did not adopt the euro still tried to maintain a close link to the euro, the currency of their neighboring states and trading partners. From February 1997 to late 1998, IPE asked about views on the deutsche mark.

Table III. Relative optimism and home bias ratio per base region/country

For each base region/country, this table reports relative optimism averaged over the period from February 1997 to April 2012 (183 months) and home bias ratio averaged over the years 2001–11 (11 years). The first three columns (i.e., E_RO , B_RO , and C_RO) report the average relative optimism for equity, bonds, and currencies for each base region/country, and the last two columns (E_BIAS and B_BIAS) report the average equity and bond home bias ratio for each base region/country.

Region/Country	E_RO	B_RO	C_RO	E_BIAS	B_BIAS
Europe	0.097	-0.024	-0.061	0.579	0.605
UK	0.157	0.026	0.064	0.599	0.594
USA	0.103	0.067	0.104	0.697	0.917
Japan	0.340	0.030	0.225	0.850	0.811
Breakdown of European countries					
Austria	0.313	-0.070	-0.229	0.499	0.568
Belgium	0.114	-0.001	-0.108	0.458	0.505
Denmark	0.166	-0.005	0.053	0.570	0.815
Finland	0.157	-0.044	-0.457	0.594	0.464
France	0.096	0.017	-0.021	0.683	0.622
Germany	0.125	-0.128	-0.108	0.536	0.641
Greece	0.379	-0.186	-0.016	0.886	0.702
Italy	-0.040	0.144	-0.014	0.536	0.763
Netherlands	0.091	-0.059	-0.061	0.349	0.610
Norway	0.067	-0.042	-0.230	0.437	0.431
Portugal	0.027	0.009	0.196	0.529	0.537
Spain	0.051	-0.166	0.021	0.876	0.715
Sweden	0.133	-0.256	0.165	0.573	0.753
Switzerland	0.085	0.022	-0.060	0.583	0.340

can aggregate all managers from a given region of domicile to derive a region-based rating. Relative optimism implies that the rating of a given market is higher among home managers than among foreign managers. Hence the rating $rat(i, j, m, k, t)$ would be higher if manager i is based in the region of the market m ($j = m$) than if he is not ($j \neq m$). For example, a UK manager rating on the UK market should be high relative to a Japanese manager rating on the UK market. The estimate of relative optimism is based on the difference between the ratings on a given region averaged over all home managers (e.g., the USA) and that averaged over all foreign managers (i.e., non-USA). For each region j , asset class k , and month t , we calculate a relative optimism estimate. A positive (negative) value suggests that asset managers of region j exhibit relative optimism (pessimism) for its domestic asset k at month t . This definition of relative optimism follows [Strong and Xu \(2003\)](#) and does not entail whether domestic or foreign investors' views are more accurate.

The estimate of relative optimism averaged over the 1997–2012 period for each region/country is presented in the first three columns in [Table III](#). In the first four rows, we calculate the estimate of relative optimism for managers from each of the four regions (i.e., Europe, the UK, the USA, and Japan) averaged over February 1997 to April 2012. In the following rows, we also calculate a measure of relative optimism for each individual

European country. For each European country, the estimate of relative optimism is based on the difference between the ratings on a given region averaged over all home managers in that country (e.g., France) and those averaged over all non-European managers (i.e., the UK, the USA, and Japan). These estimates are similar to those reported in the first row of Table III except that now we focus on one European country each time.¹² In our expectation data, we have seventeen countries of domicile for asset managers (the UK, the USA, Japan, and fourteen European countries). Our sample of the seventeen countries comprises over 90% of the total market capitalization of developed markets. There are differences in relative optimism for equity (E_RO) across countries, but all measures are positive over the period except for Italy (-0.040). The three countries that exhibit the greatest degree of relative optimism for equity are Greece (0.379), Japan (0.340), and Austria (0.313). The relative optimism for bonds (B_RO) exhibits more heterogeneity: seven countries show relative optimism for domestic bonds and ten countries show relative pessimism for domestic bonds. The relative optimism for currencies (C_RO) exhibits a similar level of heterogeneity, with seven positive values and ten negative values.

We plot the (simple) mean monthly estimates of relative optimism across the seventeen countries over time from February 1997 to April 2012 in panel A of Figure 1. There is no apparent time trend for equity (E_RO), bonds (B_RO), or currencies (C_RO). Relative optimism for equity, bonds, and currencies exhibits both positive and negative values over the period.

2.3 Portfolio Holdings and Market Capitalization Data

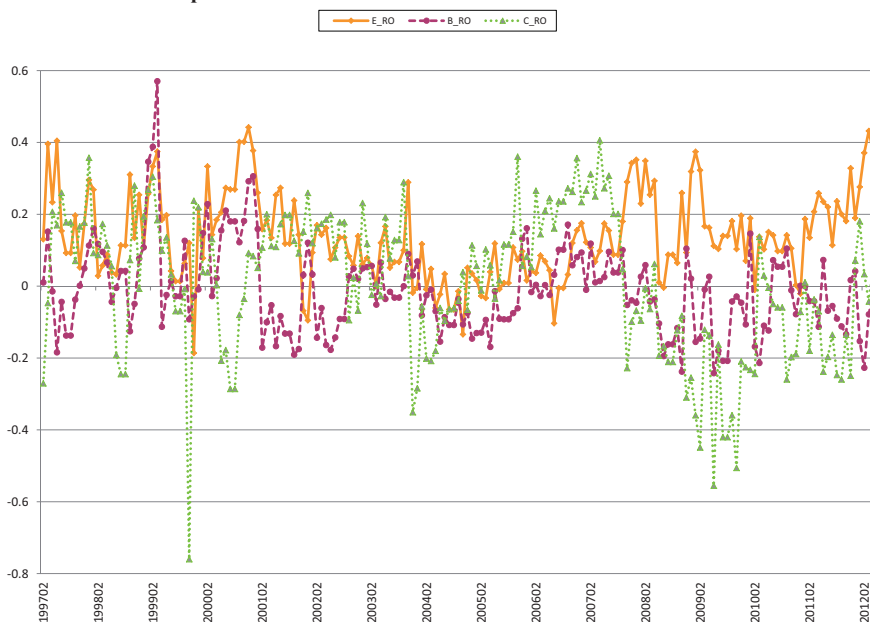
Our objective is to “explain” the national home bias, as attempted in other studies, not to model the portfolio holdings of a specific class of investors. In the absence of better alternatives, we use the differential national return expectations reported under the IPE survey as a proxy for the aggregate relative optimism at the national level. However, we can compute the aggregate home bias for each country since detailed data at the country level is available for portfolio holdings in equity and bonds.

The usual measure of home bias in equity portfolio holdings is the “home bias ratio” calculated as one minus the ratio of the weights of foreign stocks in the investors’ portfolio and in the world market portfolio (Kho, Stulz, and Warnock, 2009). According to a global CAPM (Black, 1974; Solnik, 1974; Sercu, 1980; Stulz, 1981a, 1981b; Adler and Dumas, 1983), mean-variance investors should hold a diversified portfolio of assets with world market capitalization weights. The home bias ratio measures deviations from this strategy. We define the home bias ratio for bonds in the same way (see also Vanpée and De Moor, 2013). We use data on portfolio holdings to compute a home bias ratio for each country. The IMF publishes an annual CPIS detailing equity and bond portfolio holdings by country of investment and country of investor’s residence.¹³ The first CPIS was conducted in 1997

12 All inferences remain unchanged when we estimate relative optimism toward each European country as the difference between the ratings on a given region averaged over all home managers in that country (e.g., France) and those averaged over all foreign managers (e.g., non-France).

13 One possible alternative is to use information on mutual fund holdings available from Thomson-Reuters or FactSet (for equity holdings) and from Lipper’s eMAXX database (for bond holdings). However, home bias measures based on such data suffer from problems: (1) portfolio holdings of other domestic investors (i.e., individual and other institutional investors) are omitted; and (2)

Panel A: Relative Optimism Time Trend



Panel B: Home Bias Time Trend

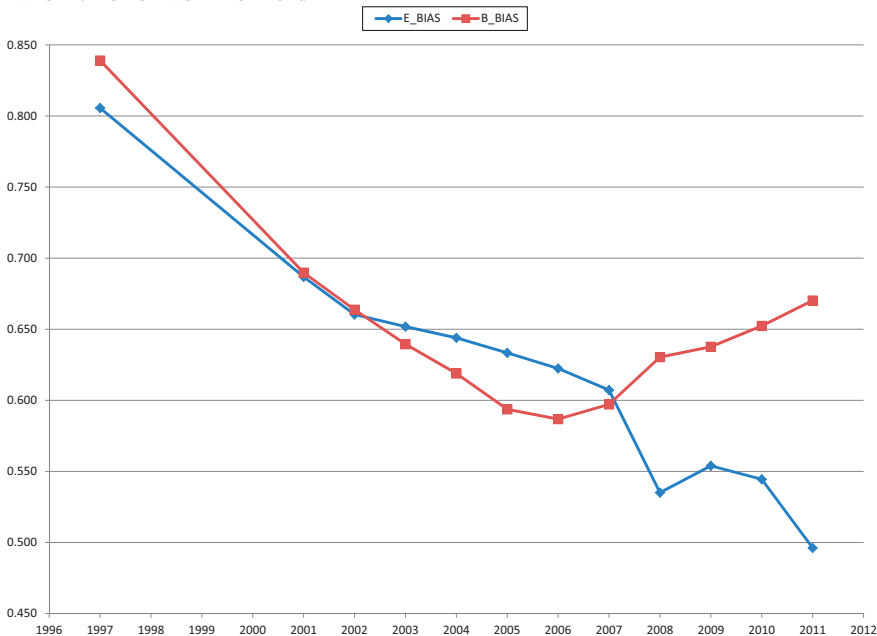


Figure 1. Time trend of relative optimism and home bias.

Panel A plots the (simple) mean relative optimism estimates for equity (E_{RO}), bonds (B_{RO}) and currencies (C_{RO}) across the seventeen countries over time from February 1997 to April 2012 (183 months). Panel B plots the (simple) mean equity and bond home bias ratios (E_{BIAS} and B_{BIAS}) across the seventeen countries over time for 1997 and from 2001 to 2011 (12 years).

for a limited number of countries. In our sample of countries, Germany, Greece, and Switzerland did not report in 1997. Since 2001, the CPIS has been undertaken on an annual basis and covers most IMF member countries. Hence, we have detailed annual data from 2001 to 2011.

The CPIS calls for data on holdings of securities at year-end, and provides detailed statistics on the geographical breakdown of foreign equity and bond holdings per country of origin and per country of investment. We compute the home bias ratio using CPIS portfolio holdings data, data on stock market capitalization from the World Federation of Exchanges and the World Bank, as well as bond market capitalization data from the Bank for International Settlements (BIS).¹⁴ All data are in US dollars and at year end. The CPIS provides detailed statistics on the total foreign investment from country i (F_i) and the amount of foreign investment to country i from investors of all other countries (EF_i). We infer the total (domestic plus foreign) portfolio holdings W_i of investors of country i by taking the national market capitalization (M_i), adding foreign investments from country i (F_i) and subtracting foreign investments to country i (EF_i): $W_i = M_i + F_i - EF_i$. Hence, the percentage of foreign holdings in portfolios of investors from country i is equal to F_i/W_i . The total world market capitalization is $W = \sum M_i$. We can compute the home bias ratio (HB) as:

$$\text{HB} = 1 - \frac{\% \text{ foreign portfolio investment}}{\% \text{ foreign market cap}} = 1 - \frac{F_i/W_i}{(W - M_i)/W}. \quad (3)$$

The home bias ratio would be zero in the absence of home bias, meaning that investors hold equity/bonds in proportion to their world market capitalization. The ratio would be one if no foreign assets were held (i.e., total home bias). For example, non-US equity markets represent some 67% of world market capitalization at the end of 2011, but US investors only hold an average of 25% in foreign stocks in their equity portfolios. The equity home bias ratio for US investors in 2011 is $1 - 25/67 = 63\%$.¹⁵

In the last two columns of Table III, we report the home bias ratio for each region/country averaged over the 2001–11 period. The first four rows show the average home bias ratio for the four regions. Note that the home bias ratio for Europe is the home bias ratio averaged over the fourteen European countries listed in the table. The average equity home bias ratio (E_BIAS) for 2001–11 ranges from 34.9% for the Netherlands, the least home-biased country, to 85% for Japan, 87.6% for Spain, and 88.6% for Greece. The average home bias ratio for the USA is 69.7%. Table III also gives the home bias ratio for bonds. The average bond home bias ratio (B_BIAS) for 2001–11 ranges from 34% for Switzerland to 81.1% for Japan, 81.5% for Denmark, and 91.7% for the USA. The equity/bond home

some foreign investors also hold domestic mutual funds. Hence, the data is not well suited for our focus on aggregate home bias at the country level.

- 14 In computing the bond portfolio holdings, we only include long-term debt securities. Short-term debt securities (with maturities of 1 year or less) include treasury bills, commercial paper, and bankers' acceptances. Including these instruments in bond portfolios yields quite similar results to those reported.
- 15 Our inferences are unchanged when we use alternative home bias measures discussed in Cooper, Sercu, and Vanpee (2013), for example, $(W - M_i)/W - F_i/W_i$.

bias ratio for each country is quite stable over time, with a slow downward trend.¹⁶ However, the cross-country dispersion is large.

We plot the (simple) mean home bias ratios over time from 1997 to 2011 in panel B of Figure 1. There is a negative time trend for both the equity home bias ratio (E_BIAS) and the bond home bias ratio (B_BIAS). For equity, the (simple) average home bias decreases from 80.6% in 1997 to 49.6% in 2011. We see an increase in equity home bias right after the financial crisis of 2008. But it decreases steadily afterwards. For bonds, the home bias decreases from 83.9% in 1997 to 58.7% in 2006; but since then, it increases steadily to 67% in 2011.

3. Persistence of Relative Optimism

As discussed in Section 2, the survey data allows us to calculate a monthly estimate of differential national expectations for each region and asset class, with a positive value indicating relative optimism and a negative value indicating relative pessimism. Before we explore how cross-sectional and time-series variation of relative optimism affects home bias in portfolio holdings, we test whether relative optimism for each region and asset class is persistent. We report a simple means test before introducing a more sophisticated panel data methodology.

3.1 Means Tests

In a simple means test, we compare the ratings on a given market (e.g. Europe) averaged over all home managers (e.g. Europeans) with that averaged over all foreign managers (e.g. non-Europeans). Table IV reports some descriptive statistics for the ratings of each market as well as a means test of relative optimism. We look at time-series means of cross-sectional averages *à la* Fama–MacBeth (1973). Each row corresponds to one market. For example, the top panel of the table gives the ratings for each of the four equity markets. For each market the table reports the means (over time) of the ratings of both home and foreign managers. The headings “Home Managers” and “Foreign Managers” refer to the market listed in the first column. For example, “Home Managers” are Europeans when referring to the European market and British when referring to the UK market. The next column gives the mean difference between home and foreign managers and a t -test from zero. As ratings are formulated for the next 12 months, time dependence in successive ratings increases standard errors. In the t -tests, standard errors are corrected for heteroskedasticity and clustering at the asset manager level.¹⁷

As can be seen in the top panel of Table IV, there is strong evidence of relative optimism in the case of equity markets. For example, European managers have a mean rating of 0.123 for Europe equity; they are more bullish on European equity than they are on other equity. Non-European managers have mean rating of 0.026 for European equity; they are also bullish about European equity, but less so than European managers. The difference in ratings between Europeans and non-Europeans (0.097) is significantly positive with a p -value of less than 1%. For all regions, the mean difference in ratings is positive; and

16 Currency movements affect the home bias ratio. For example, an appreciation of the US dollar relative to other currencies would tend to increase the reported US home bias ratio.

17 Strictly speaking, region-based ratings are not normally distributed as they are bounded by -1 and $+1$. But the distribution seems reasonably well approximated by a normal distribution, since the ratings are seldom close to the thresholds -1 or 1 . We performed some nonparametric tests with similar results. More powerful tests are reported in the next sub-section.

Table IV. Mean rating and difference tests by asset manager domicile for each asset class

For each asset class, this table reports the mean ratings for home and foreign managers, as well as a test of the difference in mean ratings (relative optimism). The period is February 1997 to April 2012 (183 months). In the *t*-tests, standard errors are corrected for heteroskedasticity and clustering at the asset manager level. ***, **, and * denote significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively.

Market	Mean rating		Test on difference	
	Home managers	Foreign managers	Relative optimism	<i>t</i> -stat
Equity				
Europe	0.123	0.026	0.097	2.86***
UK	0.092	-0.066	0.157	4.43***
USA	-0.040	-0.143	0.103	1.11
Japan	0.349	0.009	0.340	9.32***
Bond				
Europe	0.088	0.112	-0.024	-0.62
UK	0.099	0.073	0.026	1.05
USA	0.128	0.061	0.067	1.09
Japan	-0.239	-0.270	0.030	0.91
Currency				
Europe	-0.160	-0.099	-0.061	-0.99
UK	0.081	0.018	0.064	1.86*
USA	0.077	-0.027	0.104	1.29
Japan	0.250	0.025	0.225	1.04

except for the USA, it is statistically significant at the 1% level. A joint test over all regions indicates a significantly positive difference at the 1% level. American managers tend to be bearish about US equity over the period (mean rating of -0.040), but much less bearish than foreign managers (mean rating of -0.143). The relative optimism estimates, i.e., the differences in mean ratings given in Table IV, suggest that Japanese are the most optimistic (a relative optimism of 0.340), followed by British (0.157), Americans (0.103), and Europeans (0.097). It could be that the concept of Europe as a single home entity is not engrained in European asset managers despite the high level of European Union equity market, economic and regulatory integration.

The evidence on relative optimism in the case of bonds is much weaker. The mean difference in ratings is negative for Europe and positive for the UK, the USA, and Japan. For all regions, the difference is small and insignificant. A joint test finds no evidence of relative optimism or relative pessimism. These results suggest that unlike the case of equity, professional investors' views for bonds exhibit much more time-series variation. We do not observe persistent relative optimism for bonds over the whole period: some positive values are offset by negative ones in the means test and the average is not statistically different from zero.

The evidence on relative optimism for currencies is mixed. European managers appear to be more bearish on the euro than foreign managers are, but British, American, and Japanese managers are relatively optimistic about their own currencies; the relation is

significant at the 10% level for British managers. A joint test does not reject the hypothesis of no relative optimism for currencies.

In sum, we find that relative optimism for equity is persistent over the period 1997–2012, but relative optimism for bonds and currencies exhibits more time-series variation.

3.2 Panel Tests

Because we have data on individual managers we can conduct more powerful tests using a panel data methodology. Panel data tests allow us to take into account the dispersion across managers in a region as well as time variation (as done in means tests). We estimate:

$$\text{rat}(i, j, m, k, t) = \sum_m \alpha_m \times d(m) + \gamma \times \text{Dum}(j = m) + e(i, j, m, k, t), \quad (4)$$

where $d(m)$ is a dummy variable that takes the value of one if the investment rating is formulated for market m , zero otherwise. $\text{Dum}(j = m)$ is a dummy variable that takes the value of one if the investment rating is formulated for the asset manager's home market (region of domicile and of market are identical), and zero otherwise. This is our "relative-optimism" dummy. α_m and γ are coefficients and $e(i, j, m, k, t)$ is the error term.

We conduct the estimation separately for each asset class. We have four regions, so we have four coefficients α_m : α_{EU} , α_{UK} , α_{US} , α_{JA} . In other words, the α_m coefficients are constants that pick up the average rating of the market, while γ indicates whether persistent relative optimism is present in the rating. The sign and magnitude of the α s are not important in our test: α_m simply indicates the average rating of all the managers on a specific market m . They can be viewed as the decomposition of the constant term when we regress the managers' ratings on the relative-optimism dummy. Tests of persistence of relative optimism are performed on γ . If asset managers of the base region periodically exhibit both relative optimism and relative pessimism over time, then γ should be zero. If home managers tend to be persistently more optimistic about their domestic market than are foreign investors, then γ should be positive.

We use a weighted least squares regression where the weight is based on the inverse of the number of asset managers in each region.¹⁸ A weighted least squares regression controls for the differences in numbers of asset managers across regions. We estimate robust standard errors with clustering by asset manager as ratings by an asset manager are correlated over time. We include a time fixed effect for each month. We do not introduce manager fixed effects as differences among managers are precisely what we aim to capture in our regression. Results for the three asset classes are reported in Table V.

For equity markets, the α coefficients (equivalent to constants) have different signs and magnitudes, as could be expected. For example, the coefficient for the US market is negative as consistent with previous indications in Table IV: managers are on average bearish about the US equity market over the period. What is important is that the relative-optimism coefficient γ is positive for equity (0.179) and significant with a p -value below 0.001. This is in contrast to bond and currency markets, where the coefficients are slightly positive but

18 In Stata program, these weights are referred to as analytic weights (`aweight`s). Analytic weights are inversely proportional to the variance of an observation; that is, the variance of the j -th observation is assumed to be σ^2/w_j , where w_j is the weight. The observations represent averages and the weights are the number of elements that gave rise to the average.

Table V. Panel test with weighted least squares

This table reports the regression coefficients and standard errors (in parentheses) of Equation (4). We use a weighted least squares regression with year–month fixed effects and robust standard errors clustered by asset managers. The α s are constants picking up the overall mean rating of each regional market and γ is the relative-optimism coefficient. The weight is based on the inverse of the number of asset managers in each region. The period is from February 1997 to April 2012. The coefficient for relative optimism is in bold. ***, **, and * denote significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively.

	(1) Equity	(2) Bond	(3) Currency
α_{EU}	0.005 (0.025)	0.098*** (0.021)	-0.137* (0.059)
α_{UK}	-0.070*** (0.015)	0.074*** (0.015)	0.012 (0.040)
α_{US}	-0.164*** (0.062)	0.070*** (0.020)	-0.022 (0.060)
α_{JA}	0.050 (0.031)	-0.266*** (0.025)	0.061 (0.050)
γ	0.179*** (0.045)	0.024 (0.019)	0.086 (0.095)
Year–month FE	Yes	Yes	Yes
Observations	54,625	55,152	56,421
Adjusted R^2 (%)	5.7	10.5	1.1

insignificant. For bonds, γ is equal to 0.024 with a p -value of 0.222. For currencies, γ is equal to 0.086 with a p -value of 0.364.

We conduct a number of robustness checks. First, we use an ordinary least squares (OLS) regression without weighting. Hence, each asset manager is equally weighted.¹⁹ The relative-optimism coefficient γ is positive for equity (0.100) and significant with a p -value below 0.001. For bonds, γ is close to zero with a p -value of 0.984. For currencies, γ is equal to 0.028 with a p -value of 0.229. Results are also similar when we use the inverse of the number of asset managers per individual country as weight. Second, we replace the global relative-optimism dummy with a relative-optimism dummy for the base region of each manager. In other words, we now have four relative-optimism dummies, one for each region where a manager is based. The coefficient of each base-region dummy reflects the relative optimism of managers based in that region. All base-region coefficients are positive for equity markets, and three of them have p -values below 0.005. Persistent relative optimism seems to be present for managers from all regions; it is highest among Japanese and lowest among European managers. For bonds and currencies, base-region coefficients are almost all insignificant and have mixed signs.²⁰ Third, we use an ordered logistic regression to fit

19 We use a weighted least squares regression as the main specification because the OLS significance ignores the heteroskedasticity induced by varying numbers of asset managers and is thus not so reliable.

20 The only marginally significant one is the coefficient on the UK dummy for currencies (p -value = 0.065).

the model.²¹ This is a nonlinear model using a maximum likelihood technique where p -values are based on a Z -test. The conclusions remain identical. The relative-optimism coefficient is positive and highly significant with a p -value below 0.001 for equity. The coefficient is small, positive and insignificant for bonds, with a p -value of 0.344; it is positive and insignificant for currencies, with a p -value of 0.381. Fourth, we use the investment view $v(i, j, m, k, t)$ as left-hand side variable and introduce the manager's average investment view as explanatory variable. While this variable has a significant slope (near unity), the other parameters are mostly unaffected.

Our panel data tests are still some form of means test. The difference in the panel tests is that both the cross-sectional and time-series dispersions are taken into account, while previous research using mean data only takes time-series variation into account. Time-series variation in relative optimism is further studied below.

3.3 Influence of Time Period

Financial markets are becoming ever more integrated and many companies listed on stock exchanges have extensive international activities. Asset managers are increasingly global. Hence, we would expect national preference to have decreased, and possibly disappeared, in recent years. However, as panel A of Figure 1 shows, we do not see discernible time trends for relative optimism for equity, bonds, or currencies. We now check whether the findings of relative optimism are robust to the time period used. This test is important to ascertain that the mean effect is not caused by a few data points in a specific sub-period or market environment.

To test whether relative optimism for equity has diminished in recent years, we split our total time period into two sub-periods: February 1997 to December 2003 and January 2004 to April 2012. In unreported results, the relative-optimism coefficient is positive for equity and significant for both periods; if anything, it is higher in the most recent period. We also looked at the 2007–09 sub-period that covers the recent financial crisis; again relative optimism for equity is strongly present. In addition, we group the data into two subsamples: bull and bear equity market phases. Previous studies on relative optimism for equity have relied on data from particular market phases. Shiller, Kon-Ya, and Tsutsui (1996) study expectations during the Japanese market crash of the early 1990s. Strong and Xu (2003) cover a sustained worldwide bull market in equity (October 1995 to October 2000). Our longer time period allows us to test the robustness of the results and whether the same degree of relative optimism applies to bull and bear market phases.²² In unreported results, we find that the “relative-optimism” coefficients γ s for equity are positive for each market phase (0.155 and 0.231, respectively) and significant; both have p -values below 0.001. We also employ the ordered logistic regression method; the conclusions remain identical. The relative-optimism coefficient is positive and highly significant (p -value

21 Our rating variable is not normally distributed. There are a limited number of values that the variable can take and the numerical value that we assign to “bullish”, “neutral”, or “bearish” is ordinal. Our inferences are unchanged when we use an ordered probit regression instead.

22 There are seven distinct equity market phases in the period under study, where the equity market phases are based on the movement of the total return MSCI All World Index: February 1997 to March 2000 (bull), April 2000 to March 2003 (bear), April 2003 to October 2007 (bull), November 2007 to February 2009 (bear), March 2009 to April 2011 (bull), May 2011 to September 2011 (bear), and October 2011 to April 2012 (bull).

below 0.001) for both market phases. Thus, we have strong evidence of persistent relative optimism for equity both in bear and in bull equity markets.

We also split our 183-month period into 10 sub-periods of 18 months. In each sub-period, the relative optimism-coefficient for equity is positive and it is significant at the 5% level in eight out of the ten sub-periods.²³ There is indication of relative optimism for bonds in four sub-periods and relative optimism for currencies in two sub-periods.²⁴ Hence, there is some time variation in relative optimism, but relative optimism for domestic equity is a pervasive factor throughout the 16 years.

To summarize, we have strong evidence of persistent relative optimism for equity, which confirms previous findings, but relative optimism for bonds or currencies exhibits more time-series variation and does not show the same level of persistence as that for equity. The significance levels for equity suggest that the results are not simply driven by a few managers in each region. In the next section, we explore how cross-sectional and time-series variation of relative optimism for equity, bonds, and currencies affects home bias in equity and bond portfolio holdings.

4. Relative Optimism and Home Bias in Holdings

We now investigate whether equity/bond home bias in portfolio holdings is correlated with relative optimism for domestic equity/bonds. Since currency movements affect expected returns of international investments, we also examine whether relative optimism for domestic currencies affects home bias in portfolio holdings of equity and bonds.²⁵ In addition, we control for alternative explanations of home bias, including proximity as reflected in language and distance (Grinblatt and Keloharju, 2001; Bekaert and Wang, 2009; Cooper, Sercu, and Vanpée, 2013), explicit barriers to international investments (French and Poterba, 1991; Cooper and Kaplanis, 1994; Tesar and Werner, 1995), governance and investor protection (Gelos and Wei, 2005; Doidge, Karolyi, and Stulz, 2007; Kho, Stulz, and Warnock, 2009), past returns and betas (Tesar and Werner, 1995; Bohn and Tesar, 1996; Brennen and Cao, 1997), and economic development and market size (Bekaert and Wang, 2009). We conduct both cross-sectional tests and difference-in-differences tests. We also test the link between changes in home bias and subsequent changes in relative optimism.

4.1 Cross-Sectional Tests

4.1.1 Equity

We conduct cross-sectional tests using annual observations. We use a panel econometric method that includes all years and countries, with year fixed effects and robust standard

23 The two sub-periods with insignificant relative optimism for equity are July 2004 to December 2005 and January 2006 to June 2007.

24 The four sub-periods with significant relative optimism for bonds are February 1997 to June 1998, July 1998 to December 1999, January 2000 to June 2001, and January 2006 to June 2007. The two sub-periods with significant relative optimism for currencies are July 2001 to December 2002 and January 2006 to June 2007. Interestingly, over the period from January 2009 to June 2010, there exhibits relative pessimism for currencies (i.e., the γ coefficient is negative and significant at the 1% level).

25 Views on currencies are relevant for asset holdings only to the extent that currency risks are not hedged.

errors clustered at the country level. Year fixed effects are included in the regression to reduce the confounding effect of time trends as observed in Figure 1. First, we estimate the cross-country regression for equity:

$$E_BIAS_{it} = a + b \times E_RO_{it} + c \times C_RO_{it} + \Gamma \times Controls_{it} + e_{it}, \quad (5)$$

where E_BIAS_{it} , E_RO_{it} and C_RO_{it} are the equity home bias ratio and measures of relative optimism for equity and currencies observed for country i at year t . E_BIAS_{it} is measured at the end of year t , and E_RO_{it} and C_RO_{it} are December expectations of year t . We include the following control variables:

- i. *Proximity*: We use two proxies (DUMLANG and DISTANCE) based on some country pair measures. The first variable (DUMLANG) is based on a dummy variable, common language, which equals one if an origin–destination country pair shares a common national or official language, and zero otherwise. Data are obtained from the World Factbook 2012. The second variable (DISTANCE) is based on the distance between country capitals, measured in kilometers. Data on this variable are obtained from <http://users.nber.org/~wei/>. For each proxy, we use the average of the country pair measures (across 41 country pairs for which we have data) for each country since our variable of interest is at the country level. In terms of DUMLANG, the USA and the UK are ranked at the top since English is the most common language, while Japan, Denmark, Greece, and Norway are ranked at the bottom. Japan and the USA have much larger values of DISTANCE than the European neighboring countries (including the UK). We use the natural logarithm of DISTANCE in the regressions.
- ii. *Capital controls*: The 0–10 segmentation rating (SEG) is the percentage of capital controls levied as a share of the total number of capital controls listed multiplied by 10. Data are from the IMF Annual Report on Exchange Arrangements and Exchange Restrictions. These thirteen capital controls include two forms of restrictions, namely, barriers “to” (i.e., preventing foreigners from coming in) and barriers “from” (i.e., preventing domestic investment from flowing abroad). The segmentation rating measures the joint effect of both forms of restrictions.
- iii. *Relative size of insurance corporations and pension funds*: The relative size of insurance corporations and pension funds in the equity market (E_AUM) is measured as their equity AUM divided by the country’s total equity portfolio holdings. Data on equity AUM of institutional investors are obtained from OECD.Stat Extracts (<http://stats.oecd.org/>).²⁶
- iv. *Investor protection*: We use three proxies, the efficiency of the judicial system (EFFICIENCY) from La Porta *et al.* (1997), a dummy variable that equals one if the legal origin is common law, and zero otherwise (DUMLEGAL), and the principal component of the indices of disclosure requirements, liability standards, and anti-director rights (PROTECTION) from La Porta, Lopez-de-Silanes, and Shleifer (2006).
- v. *Past equity returns and betas*: We include the past 3-year equity return (E_RET3) and the equity beta based on 36 months of data (E_BETA). All results are similar when we use the past 1-year return or the beta based on 60 months of data. We use the total return stock market indices (in local currency) from Morgan Stanley Capital International (MSCI).

26 This variable is more important in the debt market. See discussions in Section 4.1.2.

- vi. *Economic development*: We use three variables, GDP per capita (GDPC), Real GDP growth (RGDP), and country credit rating (CREDIT). Data on GDP per capita and real GDP growth are obtained from the World Bank. We use the natural logarithm of GDPC in the regressions. Country credit rating is based on Standard & Poor's (S&P) ratings on long-term sovereign debt, obtained from S&P's website. We translate S&P long-term rating notations into a numeric score that ranges from 0 for D notation to 1 for AAA notation, so the rating is increasing in credit quality.
- vii. *Equity market size*: Size of the equity market (E_SIZE) is measured as equity market capitalization as a percentage of GDP. Data are obtained from the World Bank.

The first column of **Table VI** shows that the coefficient on E_RO is positive (0.175) and significant at the 5% level. This result indicates that the home bias ratio increases with the extent of relative optimism. The coefficient on C_RO is positive (0.065) but statistically insignificant. Column (1) also shows a positive and significant coefficient on $DISTANCE$, indicating that geographically distant countries (with larger values of $DISTANCE$) exhibit larger degrees of equity home bias. The other two statistically significant variables are $EFFICIENCY$ and E_SIZE : investors from a country with a more efficient judicial system and less developed equity market (relative to the size of the economy) tend to exhibit less home bias. The latter result could mean that they have fewer opportunities to diversify their portfolios locally. The insignificant coefficients on most of the institutional variables are consistent with prior research that explanations for equity home bias must be behavioral, not institutional (**French and Poterba, 1991**). In terms of economic significance, increasing the estimate of relative optimism for equity (E_RO) by its average magnitude (0.234) translates into a four percentage point increase in the equity home bias ratio (E_BIAS). To get a more concrete idea of what this number means, we take the example of the USA in 2011 where the home bias ratio is 62.5%. *Ceteris paribus*, a decrease of four percentage points in E_BIAS would imply a capital flow of about one-half trillion US dollars from domestic to foreign equity investments.

In theory, December expectations should affect year-end portfolio holdings, as tested above. However, in the presence of implementation delays (due to price-pressure considerations or administrative delays), year-end holdings can also reflect November expectations, and even October expectations. In column (2) of **Table VI**, we include December expectations and a few lags. Due to the high autocorrelation in the expectations, the lags are introduced as changes; that is, the December expectation minus the November expectation (i.e., ΔE_RO (Lag 1)), and the November expectation minus the October expectation (i.e., ΔE_RO (Lag 2)). The coefficient on E_RO remains positive and statistically significant at the 5% level. The coefficients on the lags are statistically insignificant. The coefficient on C_RO becomes statistically significant at the 10% level.

Overall, the results in the first two columns of this table suggest that the extent of a country's relative optimism for its domestic equity is positively associated with its equity home bias ratio. This positive relation between relative optimism for equity and equity home bias persists after we control for relative optimism for currencies, proximity, and various institutional variables.²⁷

27 **Table A1** of Appendix shows that our results are robust after excluding those countries that appear to be potential outliers based on the summary statistics in **Table III** (i.e., Greece, Japan, and Austria).

Table VI. Cross-sectional relation of home bias ratio and relative optimism

Columns (1) and (2) of this table report the regression coefficients and standard errors (in parentheses) of Equation (5). Columns (3) and (4) of this table report the regression coefficients and standard errors (in parentheses) of Equation (6). The period is from 2001 to 2011. We use a panel econometric method that includes all years and countries, with year fixed effects and robust standard errors clustered at the country level. ***, **, and * denote significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively.

	Dependent variable: E_BIAS		Dependent variable: B_BIAS		
	(1)	(2)	(3)	(4)	
E_RO	0.175** (0.066)	0.198** (0.069)	B_RO	0.054** (0.024)	0.073** (0.034)
ΔE_RO (Lag 1)		-0.065 (0.080)	ΔB_RO (Lag 1)		-0.022 (0.019)
ΔE_RO (Lag 2)		0.045 (0.030)	ΔB_RO (Lag 2)		0.008 (0.019)
C_RO	0.065 (0.039)	0.067* (0.037)	C_RO	0.048* (0.023)	0.048* (0.023)
DUMLANG	-0.546 (0.688)	-0.576 (0.679)	DUMLANG	-1.742*** (0.492)	-1.740*** (0.496)
DISTANCE	0.569*** (0.157)	0.584*** (0.161)	DISTANCE	-0.041 (0.084)	-0.047 (0.082)
SEG	0.011 (0.010)	0.011 (0.011)	SEG	0.028* (0.013)	0.028* (0.013)
E_AUM	-0.076 (0.159)	-0.070 (0.158)	B_AUM	0.253 (0.205)	0.250 (0.207)
EFFICIENCY	-0.058* (0.033)	-0.058* (0.033)	EFFICIENCY	-0.070*** (0.020)	-0.070*** (0.020)
DUMLEGAL	0.153 (0.184)	0.159 (0.183)	DUMLEGAL	0.498*** (0.115)	0.496*** (0.115)
PROTECTION	-0.240 (0.196)	-0.252 (0.196)	PROTECTION	-0.378*** (0.101)	-0.374*** (0.099)
E_RET3	0.048 (0.050)	0.047 (0.049)	B_RET3	-0.451*** (0.138)	-0.470*** (0.146)
E_BETA	0.025 (0.069)	0.019 (0.067)	B_BETA	-0.041 (0.044)	-0.041 (0.043)
GDPG	-0.027 (0.127)	-0.034 (0.123)	GDPG	0.066 (0.100)	0.064 (0.098)
RGDP	-0.624 (1.594)	-0.801 (1.624)	RGDP	-0.419 (0.518)	-0.420 (0.540)
CREDIT	0.192 (0.439)	0.219 (0.437)	CREDIT	0.482* (0.237)	0.503* (0.239)
E_SIZE	0.173** (0.068)	0.176** (0.071)	B_SIZE	0.161*** (0.036)	0.161*** (0.036)
Year FE	Yes	Yes	Year FE	Yes	Yes
Observations	158	158	Observations	152	152
Adjusted R^2 (%)	48.9	49.0	Adjusted R^2 (%)	66.2	65.9

Note that our goal in this study is to establish a significant cross-sectional relation between relative optimism and home bias. Hence, we draw inferences on economic significance based on the magnitude of the coefficient. We do not claim that relative optimism is a strong predictor for home bias in holdings in a time-series analysis. The adjusted R^2 suggests that the predicting power of relative optimism for home bias is somewhat small, which is expected given the imperfection of our relative optimism proxy and the fact that many other variables could be at play. However, it does not dismiss our claim that relative optimism is one statistically and economically important variable that partly explains home bias.

4.1.2 Bonds

We also examine the relation between relative optimism for a country's domestic bonds and its home bias in the bond portfolio holdings. We use the following model:

$$B_BIAS_{it} = a + b \times B_RO_{it} + c \times C_RO_{it} + \Gamma \times Controls_{it} + e_{it}, \quad (6)$$

where B_BIAS_{it} , B_RO_{it} and C_RO_{it} are the bond home bias ratio and measures of relative optimism for bonds and currencies observed for country i at year t . B_BIAS_{it} is measured at the end of year t , and B_RO_{it} and C_RO_{it} are December expectations of year t . We include the following control variables: DUMLANG, DISTANCE, SEG, B_AUM , EFFICIENCY, DUMLEGAL, PROTECTION, B_RET3 , B_BETA , GDPC, RGDP, CREDIT, and B_SIZE . The variables different from the control variables mentioned for equity are:

- i. *Relative size of insurance corporations and pension funds*: The relative size of insurance corporations and pension funds in the bond market (B_AUM) is measured as their bond AUM divided by the country's total bond portfolio holdings. Data on bond AUM of institutional investors are obtained from OECD.Stat Extracts (<http://stats.oecd.org/>). Insurance companies and pension funds are major bond investors and they face significant local regulations on the different types of products that they offer. All insurance companies practice asset liability matching which induces them to invest massively in local-currency bond. Governments impose various rules and regulations which constrain them to invest heavily in local government bonds and lead to home bias. However, direct data on such institutional constraints are scarce and not comparable across countries. While we expect the segmentation rating (SEG) to be positively correlated with other forms of market segmentation that it does not directly measure (e.g., investment constraints specific to bonds), the relative size of such institutional investors gives another indicator of the "pressure" of such constraints.
- ii. *Past bond returns and betas*: We include the past 3-year bond return (B_RET3) and the bond beta based on 36-month data (B_BETA). All results are similar when we use the past 1-year return or the beta based on 60-month data. We use the total return bond market indices (in local currency) from the Datastream (Datastream Government Bond Indices).²⁸
- iii. *Bond market size*: Size of the bond market (B_SIZE) is measured as bond market capitalization as a percentage of GDP. Data are obtained from BIS and the World Bank. The domestic bond market capitalization is not related to the value of the real

28 There is no world index for the Datastream indices. We create a value-weighted world index based on the individual country's bond market capitalization data and bond return data.

economy, like for equity, but to the extent of past public deficits. It is not obvious that foreigners want to hold bonds of highly indebted countries.

Column (3) of Table VI presents the results.²⁹ It shows a positive coefficient (0.054) on B_RO and it is statistically significant at the 5% level. The coefficient on C_RO is positive and statistically significant at the 10% level, suggesting that relative optimism for home currencies induces home bias in bond portfolio holdings. Column (3) also shows that countries with a more common language (DUMLANG), a more efficient judicial system (EFFICIENCY), better investor protection (PROTECTION), and higher past 3-year bond returns have lower home bias in bond portfolio holdings. On the other hand, countries with more capital controls (SEG), common law legal origin (DUMLEGAL), and better credit quality (CREDIT) exhibit more home bias in bond portfolio holdings. In addition, more developed and bigger countries (B_SIZE) exhibit higher bond home bias. In column (4), when we introduce November and October expectations, (i.e., ΔB_RO (Lag 1) and ΔB_RO (Lag 2)), the coefficient on B_RO remains positive and statistically significant at the 5% level. The coefficients on other variables remain similar to those in column (3). In terms of economic significance, increasing the estimate of relative optimism for bond (B_RO) by its average magnitude (0.204) translates into a one percentage point increase in the bond home bias ratio (B_BIAS). To get a more concrete idea of what this number means, we take the example of the USA in 2011 where the home bias ratio is 90%. *Ceteris paribus*, a decrease of one percentage point in B_BIAS would imply a capital flow of about a quarter trillion US dollars from domestic to foreign bond investments.

Unlike equity home bias that is mainly explained by behavioral factors (relative optimism and proximity), bond home bias seems to be equally driven by institutional factors (e.g., capital controls, investor protection, and past bond returns). These results suggest that we should not extrapolate the results on one asset class to the other since the nature of the two markets is different. Interestingly, we still observe that differential return expectations induce both equity and bond home bias. It could be that cognitive biases explain relative optimism, but we find that heterogeneous expectations contribute to an explanation of home bias beyond the variables traditionally used to proxy familiarity. Moreover, based on the magnitude of the regression coefficient, the effect of relative optimism on home bias is economically meaningful.

4.2 Difference-in-Differences Tests

We now use a difference-in-differences test to alleviate the problem posed by omitted variables which could have a bearing on home bias. One might argue that we do not control for all possible reasons (either institutional or behavioral) for home bias in the earlier cross-sectional tests. In the difference-in-differences setup, the effects of those time-invariant variables on home bias will be eliminated because the focus here is on the changes in home bias. An advantage of our dataset is that both variables of interest (i.e., relative optimism and home bias) exhibit some meaningful time-series variation.

29 We estimate Equations (5) and (6) separately. Results are virtually unchanged when we estimate Equations (5) and (6) jointly as a system of equations by seemingly unrelated regressions.

4.2.1 Equity

First, we look at the equity markets. We regress the annual change in a country's home bias ratio (denoted by ΔE_BIAS) on the annual change in the country's relative optimism (denoted by ΔE_RO and ΔC_RO):

$$\Delta E_BIAS_{it} = a + b \times \Delta E_RO_{it} + c \times \Delta C_RO_{it} + \Gamma \times \Delta Controls_{it} + e_{it}. \quad (7)$$

We include year fixed effects and cluster robust standard errors at the country level. ΔE_BIAS is based on changes in portfolio holdings from the end of year $t-1$ to the end of year t . ΔE_RO is the difference between the December expectation of year t and the December expectation of year $t-1$. The coefficient on ΔE_RO captures how changes in a country's relative optimism for its domestic equity lead to changes in its equity portfolio holdings. The results are reported in column (1) of [Table VII](#). The coefficient on ΔE_RO is positive and statistically significant at the 5% level. The result suggests that an increase in relative optimism for domestic equity leads to an increase in home bias in portfolio holdings. However, an increase in relative optimism for domestic currencies does not lead to an increase in equity home bias. The negative and statistically significant coefficient on ΔE_AUM suggests that those institutional investors tend to invest more in foreign equity (less home bias) as they are long term investors.³⁰

4.2.2 Bonds

We also look at whether changes in a country's relative optimism for its domestic bonds and currencies (denoted by ΔB_RO and ΔC_RO) affect changes in its bond portfolio holdings (denoted by ΔB_BIAS). We run the following regression:

$$\Delta B_BIAS_{it} = a + b \times \Delta B_RO_{it} + c \times \Delta C_RO_{it} + \Gamma \times \Delta Controls_{it} + e_{it}. \quad (8)$$

The results are reported in column (3) of [Table VII](#).³¹ The coefficient on ΔB_RO is positive and statistically significant at the 5% level, indicating that an increase in relative optimism for bonds lead to an increase in bond home bias. The coefficient on ΔC_RO is statistically insignificant.

As discussed in Section 1, most behavioral explanations of home bias have a risk underpinning. The fear of the unfamiliar makes investors reluctant to deviate from domestic assets. Here, we find some support for a story based on heterogeneous expectations. We only consider investment views formulated by asset management institutions, but individual investors are likely to be subject to even higher biases. Our findings suggest that the observed relative optimism for domestic assets can partly explain home bias in portfolio holdings. French and Poterba (2001) argue that substantial differences in expected returns between domestic and foreign investors are needed to justify the observed portfolio holdings (given estimates of the return covariance matrix). Here, we do not have quantified data on expected returns but only an indicator of bullishness. Nevertheless, it appears that one should not simply discard an expectation story for the home bias in portfolio holdings. Of course, it could be that the same cognitive biases simultaneously affect portfolio

30 All former regressors that represent constant country characteristics disappear from the regression.

31 We estimate [Equations \(7\) and \(8\)](#) separately. Results are virtually unchanged when we estimate [Equations \(7\) and \(8\)](#) jointly as a system of equations by seemingly unrelated regressions.

Table VII. Cross-sectional relation of changes in home bias and changes in relative optimism

Columns (1) and (2) of this table report the regression coefficients and standard errors (in parentheses) of Equation (7). Columns (3) and (4) of this table report the regression coefficients and standard errors (in parentheses) of Equation (8). The period is from 2001 to 2011. We use a panel econometric method that includes all years and countries, with year fixed effects and robust standard errors clustered at the country level. ***, **, and * denote significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively.

	Dependent variable: ΔE_BIAS		Dependent variable: ΔB_BIAS		
	(1)	(2)	(3)	(4)	
ΔE_RO	0.114** (0.057)	0.152** (0.062)	ΔB_RO	0.046** (0.018)	0.046** (0.018)
ΔE_RO (Lead)		0.064 (0.053)	ΔB_RO (Lead)		-0.003 (0.012)
ΔC_RO	0.014 (0.018)	0.015 (0.018)	ΔC_RO	0.005 (0.005)	0.005 (0.005)
ΔSEG	0.002 (0.007)	0.001 (0.008)	ΔSEG	-0.003 (0.002)	-0.003 (0.002)
ΔE_AUM	-0.332* (0.182)	-0.310* (0.176)	ΔB_AUM	0.043 (0.164)	0.042 (0.164)
ΔE_RET3	-0.013 (0.032)	-0.017 (0.032)	ΔB_RET3	-0.038 (0.060)	-0.040 (0.059)
ΔE_BETA	-0.053 (0.056)	-0.046 (0.057)	ΔB_BETA	0.044 (0.031)	0.044 (0.031)
$\Delta GDPC$	0.293 (0.183)	0.251 (0.198)	$\Delta GDPC$	-0.083 (0.072)	-0.082 (0.072)
$\Delta RGDP$	0.929 (0.909)	1.057 (0.870)	$\Delta RGDP$	-0.353 (0.247)	-0.357 (0.242)
$\Delta CREDIT$	-0.007 (0.249)	0.011 (0.251)	$\Delta CREDIT$	-0.184 (0.124)	-0.181 (0.124)
ΔE_SIZE	0.374*** (0.139)	0.375*** (0.141)	ΔB_SIZE	0.071* (0.034)	0.070* (0.035)
Year FE	Yes	Yes	Year FE	Yes	Yes
Observations	140	140	Observations	134	134
Adjusted R^2 (%)	29.0	29.3	Adjusted R^2 (%)	44.2	43.7

holdings, risk perception, and expectations. Our study does not completely rule out disagreement on risk as a source of home bias, and both effects can be at play simultaneously.

4.3 Granger Causality

Our difference-in-differences tests suggest that relative optimism induces bias in portfolio holdings. Next, we augment Equations (7) and (8) with the lead change in relative optimism, ΔE_RO (Lead) and ΔB_RO (Lead), measured as the coming January expectation minus the current December expectation.

A test of Granger causality would be that an increase in future relative-optimism does not predict an increase in current home bias (i.e., the coefficient on the lead change in relative optimism is weak and statistically insignificant). The results are tabulated in columns

(2) and (4) of Table VII. In column (2), the coefficient on ΔE_RO (Lead) is positive but statistically insignificant, suggesting that an increase in a country's equity home bias does not induce an increase in its relative optimism for its domestic equity. In column (4), the coefficient on ΔB_RO (Lead) is also statistically insignificant, suggesting that an increase in a country's bond home bias does not induce an increase in its relative optimism for its domestic bonds.

Some of these results could be relevant to the argument sometimes advanced that the observed relative optimism is related to a self-serving marketing bias. As asset managers tend to have portfolios geared toward their home assets they would display optimistic views on their home markets to attract more funds. That view would suggest that causality goes from home bias to relative optimism. But here we do not find evidence supporting this view.

5. Conclusions

Past research has separately shown that investors have a bias in domestic equity portfolio holdings and exhibit some relative optimism toward their domestic equity market. We test the link between relative optimism and home bias for both equity and bonds by looking at two comprehensive databases: (1) the IPE survey that includes identified asset management companies' expectations for equity, bonds, and currencies detailed by region and over a long period; and (2) the CPIS data that covers both equity and bond portfolio holdings for IMF member countries since 2001 (also including the pilot year 1997). We reach two major conclusions.

First, we find strong evidence of persistent relative optimism for equity. Relative optimism for equity is present in bull and bear markets and remains evident over time, including in the recent period of financial crisis. However, we find that persistent relative optimism toward the domestic equity market does not extend to other types of domestic assets such as bonds or to currencies. The difference in relative optimism between the equity and bond asset classes is puzzling. Most of the asset managers in our sample offer both equity and bond management, so that result cannot come from specialization. It could be that relative optimism for equity is partly grounded in the belief of local asset managers that they can have better information on local companies but not on government monetary/fiscal policy or central bank intervention. It could also be that cognitive biases are strongly felt for local companies and the real economy but less so for government interest rates and currencies. Further analysis of the sources of relative optimism (e.g., familiarity, confidence, or information) would require a very different type of data. For example, comparisons between *ex ante* views and *ex post* performance could shed light on the information channel.

Second, we look at data on home bias in equity/bond portfolio holdings. We find that the extent of national home bias in equity/bond portfolio holdings is correlated with the extent of national relative optimism for equity/bonds. In addition, an increase in relative optimism for equity/bonds leads to an increase in home bias in equity/bond portfolio holdings (in the Granger causality sense). Our findings suggest that expectation differentials (relative optimism for home equity/bonds) can partly explain home bias in equity/bond portfolio holdings.

One should not too quickly dismiss relative optimism as an oddity limited to some particular surveys and without much practical relevance. Our survey covers a significant number of leading asset management companies catering to international institutional clients

with large AUM. It is not a small sample of poorly informed individuals, with limited time devoted to global investing, or of economists removed from the real investment world. We find that the home bias in portfolio holdings of a country is correlated with its measure of relative optimism; even if it is purely cognitive, relative optimism could have significant asset allocation and global equilibrium asset pricing implications. Prior global asset pricing models with home preference rely on either institutional constraints (e.g., [Errunza and Losq, 1985](#); [Chaieb and Errunza, 2007](#); [Lau, Ng, and Zhang, 2010](#)) or heterogeneous risk perceptions (e.g., [Cao et al., 2011](#); [Solnik and Zuo, 2012](#)). Our results that heterogeneous return expectations cause home bias open a new window on global equilibrium asset pricing.

Appendix

Table A1. Cross-sectional relation of home bias ratio and relative optimism after excluding potential outliers

Columns (1) and (2) of this table report the regression coefficients and standard errors (in parentheses) of [Equation \(5\)](#). Columns (3) and (4) of this table report the regression coefficients and standard errors (in parentheses) of [Equation \(6\)](#). Columns (1) and (3) exclude Japan and Greece. Columns (2) and (4) exclude Japan, Greece, and Austria. The period is from 2001 to 2011. We use a panel econometric method that includes all years and countries, with year fixed effects and robust standard errors clustered at the country level. ***, **, and * denote significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively.

	Dependent variable: E_BIAS		Dependent variable: B_BIAS		
	(1)	(2)	(3)	(4)	
E_RO	0.155** (0.070)	0.141* (0.076)	B_RO	0.056** (0.024)	0.062** (0.027)
C_RO	0.091** (0.034)	0.097** (0.035)	C_RO	0.035 (0.026)	0.033 (0.028)
DUMLANG	-0.423 (0.611)	-0.144 (0.662)	DUMLANG	-1.620** (0.614)	-1.478** (0.628)
DISTANCE	0.436*** (0.123)	0.394** (0.131)	DISTANCE	-0.240 (0.186)	-0.324 (0.201)
SEG	-0.000 (0.010)	0.002 (0.011)	SEG	0.036** (0.015)	0.041** (0.017)
E_AUM	-0.019 (0.095)	0.009 (0.100)	B_AUM	0.251 (0.261)	0.182 (0.256)
EFFICIENCY	-0.136*** (0.021)	-0.134*** (0.021)	EFFICIENCY	-0.084*** (0.019)	-0.083*** (0.018)
DUMLEGAL	0.228* (0.107)	0.189 (0.113)	DUMLEGAL	0.526*** (0.123)	0.513*** (0.134)
PROTECTION	-0.306** (0.131)	-0.268* (0.142)	PROTECTION	-0.344** (0.133)	-0.329** (0.140)
E_RET3	0.042 (0.038)	0.055 (0.053)	B_RET3	-0.389** (0.181)	-0.386* (0.193)
E_BETA	-0.039 (0.057)	-0.028 (0.072)	B_BETA	-0.034 (0.041)	-0.020 (0.048)

(continued)

Table A1. Continued

	Dependent variable: E_BIAS		Dependent variable: B_BIAS		
	(1)	(2)	(3)	(4)	
GDPC	0.108 (0.123)	0.122 (0.126)	GDPC	0.120 (0.132)	0.139 (0.124)
RGDP	1.063 (1.665)	1.053 (1.750)	RGDP	-0.650 (0.521)	-0.646 (0.550)
CREDIT	1.773*** (0.266)	1.689*** (0.262)	CREDIT	0.452 (0.332)	0.366 (0.370)
E_SIZE	0.143** (0.056)	0.119* (0.063)	B_SIZE	0.180*** (0.039)	0.195*** (0.045)
Year FE	Yes	Yes	Year FE	Yes	Yes
Observations	142	134	Observations	137	129
Adjusted R^2 (%)	62.5	61.4	Adjusted R^2 (%)	64.2	65.1

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