

Estimating the Costs of International Equity Investments*

PIET SERCU¹ and ROSANNE VANPÉE²

¹*K.U. Leuven*; ²*Fortis Investments*

Abstract. Generalizing Cooper-Kaplanis (1994), we estimate implied costs that reconcile international portfolios with InCAPM predictions. Costs depend on home- and host-country characteristics and on interactions; we estimate risk tolerance rather than pre-specifying it; and we control for currency risk, inflation hedging, fixed-interest investments, round-tripping and omitted countries. Estimates for developed markets are lower than reported before, but those for new markets are quite high: 2001-2004 inward shadow costs range from 0.01 %p.a. (US) to 37 (Indonesia). We find that equity home bias is related to a mixture of risks and frictions, such as information asymmetries, institutional factors and explicit costs.

JEL classification: G11, G15, F36

Introduction

In this paper we build on Cooper and Kaplanis' (CK, 1994 and 2000) idea of estimating a set of deadweight costs that can reconcile actual international portfolio weights with the predictions of the International CAPM (InCAPM). The CK approach provides point estimates of each country's cost of either inward or outward investments, conditional on a postulated value of relative risk aversion. In contrast, we adopt a regression approach: home bias depends on deadweight costs which can be instrumented by variables related to information costs, uncertainties and market imperfections. The key advantage of this route is that we can measure far more. First, we can estimate simultaneously a home-country cost vector,

* Rosanne Vanpée gratefully acknowledges financial support from the Fonds for Wetenschappelijk Onderzoek-Vlaanderen (FWO-Vlaanderen). We thank Peter Schotman, Ian Cooper, Constant Beckers, Hans Dewachter, Bartolomé Pascual-Fuster, Mramor Dusan and participants in workshops at KU Leuven, CERGE-EI Prague, University of Namur, and at the 2006 EFMA Annual Meeting for useful comments and criticisms. We especially thank the anonymous referees, whose comments substantially improved the text. All remaining errors are the authors'.

a host-country one, and even interactions, thus ending up with a complete matrix of costs for all combinations of home and host countries. Second, we are able to estimate relative risk aversion rather than having to assume one. True, the estimate requires a regression model, but it does have the advantage that it is obtained without relying on estimates of expected returns, which are hard to measure precisely (Merton, 1980; Elton, 1999); in that sense, it may be a useful complement to the standard approach. Third, the regression delivers more than just point estimates: we can study fitted values (which presumably are less noisy), and obtain confidence intervals and significance tests as to both the level of the implied overall deadweight costs and the contribution of the various variables to those overall costs.

An additional strength, relative to the original, is that we have better estimates for wealths and portfolios. While our measure is still imperfect since we omit non-financial wealth and direct loans, we do not need to assume that a country's equity holdings are equal in value to its stock market cap, as CK do; and we do include bond holdings. Lastly, we control for exchange rate risk and omitted countries, and we show that the results are not sensitive to round-tripping and other data problems associated with financial centers.

None of this would have been possible without the better data that have become available since CK's work. We were also inspired by recent work on home bias—Chan et al. (2005), Lane and Milesi-Ferretti (2004, 2005), Berkel (2007), Coval and Moskowitz (1999), Faruquee et al., (2004), or Portes and Rey (2005)—that tries to directly explain capital flows or deviations between actual portfolio holdings and InCAPM predictions. In a way, we even merge both approaches. Conducting this type of research firmly within portfolio theory instead of via stand-alone regression offers a neat and rigorous way of controlling for expectations, to which mean-variance portfolio weights are very sensitive, and for the correlations between each and every country's index. Also, our two-layer approach, where the instruments affect portfolio choices via an implied cost, solves a thorny issue of how to specify the regression. Portfolio theory tells us that, if the information and cost regressors are to bear only on one home and one host country, the left-hand side variable should not be deviations between observed and predicted portfolio weights, nor percentage deviations between these, but differences between covariance risks of assets relative to two imperfectly diversified portfolios. In that sense, our handling of variances and correlations is better grounded in theory than the more ad hoc regression models.

We find that the implied shadow costs of foreign investments vary widely across countries, with plausibly modest figures for established market economies and much higher costs for emerging countries. Over the sample period, the estimates of the shadow costs of exporting capital range between 0.01 percent for flows into the US and 30 to 37 percent into Venezuela or Indonesia, the two outliers. Especially developed countries have implicit costs that are much lower than those reported in

prior studies.¹ Informal, information-related costs seem to play a much larger role than explicit cash items like trading costs. A longitudinal replication of the original CK method shows that costs have, generally, come down over time, as one would expect. We estimate the parameter of relative risk aversion to be in the range of 1.2 to 2.9, which is a plausible result. For some (emerging) countries, the estimated shadow costs are very high and hard to digest as reflecting real “costs”, suggesting that perhaps the model is not correctly specified or that the left-hand side variable happened to be overestimated; but when we discard these outliers, estimated costs for the other countries hardly drop.

The estimation of the covariance matrix of stock returns is essential for our methodology. In the standard setting, we estimate a covariance matrix using equally weighted historical monthly return observations over 10 years. As a robustness check, we try to capture more of the dynamics of returns and volatilities by estimating a GARCH covariance matrix *à la* RiskMetrics, that applies an exponential weighting scheme to the observed returns. We find that, when the covariance matrix emphasizes recent returns more strongly, the cross-section of costs for 2001-04 is flatter: estimated costs for developed countries are higher, while estimated costs for emerging markets are lower. But also with these GARCH variances most of the costs seem to be related to information issues and uncertainties rather than to direct expenses.

The remainder of the paper is structured as follows. In the first section, we explain the methodology. In Section 2, we describe our data and motivate our choice for the variables affecting international investment costs. Section 3 discusses the empirical results.

1. The Model

Following Cooper and Kaplanis (CK, 1994), we consider a world with N countries and N currencies. Nominal returns are measured in terms of the N th currency. There are N equity-index assets, $N - 1$ fixed-interest foreign-currency assets and one risk-free domestic security, allocated in the last (i.e. $2N$ th) position. The ordering of the countries is the same for the equity-index assets and currency assets, and both stock prices and exchange rates are risky processes. For each country l , there is a representative investor with a homothetic utility function. Following CK, we assume that when an investor from country l holds stocks from country i , he experiences a proportional deadweight loss of $C_i^l dt$ in the period dt . This allows the costs of holding stocks to vary across investors and assets. For the i -th asset the net returns to investor l are given by

$$R_i^l := \frac{dV_i}{V_i} - C_i^l dt = (\mu_i - C_i^l)dt + \sigma_i dz_i, \quad i = 1, \dots, 2N - 1, \quad (1)$$

¹ Cooper and Kaplanis (1994), Glassman and Riddick (2001) and Jeske (2001).

where μ_i and σ_i are the annualized expectation and standard deviation of the nominal rate of return on this asset respectively, and dz_i is the increment to a standard Wiener process. For notational convenience, dividends and foreign interest are assumed to be included in μ .

The cost of living of an investor of country l , P^l , expressed in the reference currency follows a Brownian motion:

$$p^l := \frac{dP^l}{P^l} = \Pi^l dt + \sigma_\pi^l dz_\pi^l, \quad l = 1, \dots, N, \quad (2)$$

where Π^l and σ_π^l are the annualized expected value and the standard deviation of the instantaneous rate of inflation and dz_π^l is the increment to a standard Wiener process. All moments, costs, portfolio weights, and relative risk aversions are to be viewed as conditional on time- t information, even though time subscripts are omitted to simplify the notation. Under these assumptions, the optimal portfolio weights of risky assets for any investor l are

$$x^l = \alpha \Omega^{-1} (\mu - r \underline{1} - C^l) + (1 - \alpha) \Omega^{-1} w^l, \quad (3)$$

where

- x^l denotes the $(2N - 1) \times 1$ vector of the proportions of investor l 's wealth invested in each risky asset
- α denotes relative risk tolerance
- Ω denotes the $(2N - 1) \times (2N - 1)$ covariance matrix of the *p.a.* nominal rates of return on the risky securities
- r denotes the risk-free rate of the reference country
- $\underline{1}$ denotes the $(2N - 1) \times 1$ vector of elements all equal to unity
- w^l denotes the $(2N - 1) \times 1$ vector of covariances of the risky asset returns with investor l 's rate of inflation.

We now extract the demand for stocks from the above demand equations. A first difference relative to CK is that we take into account the existence of assets other than stocks. In the Appendix, we review how the covariance matrix can be partitioned in a part containing only the N stock returns, a part with only the $N - 1$ exchange rate changes, and a covariance part of stock returns and bond returns. Using the expression for the inverse of a partitioned covariance matrix, we can rewrite the first N rows in equation (3) as

$$x_n^l = \alpha \Omega_{S|X}^{-1} [(R_{e,S} - C^l) - \Gamma'(R_{e,X})] + (1 - \alpha) \Omega_{S|X}^{-1} w_{S|X}^l, \quad (4)$$

where Γ is the matrix of Stein (1961), Johnson (1960) hedge ratios and $\Omega_{S|X}$ is the covariance matrix of the stock returns hedged against exchange risk. $R_{e,S}$ denotes the vector of excess equity returns, $R_{e,X}$ is the vector of excess currency returns (including foreign interest) and $w_{S|X}^l$ denotes the vector of the covariances

of investor l 's rate of inflation with the N hedged stock returns. If stock holding data are available only for some countries, then the markets omitted from the analysis can be treated in the same way as the exchange rate instruments; notably, the returns on the stocks included in the study should be hedged against currency movements and against returns on omitted stocks. By using hedged stock returns, we control for the effect of exchange rates and other omitted assets on international portfolio choices. According to Fidora et al. (2007), currency effects can be substantial: they find that real exchange rate volatility can explain around 20 percent of the cross-country variation in equity home bias and even 60 percent of the cross-country variation in bond home bias. Thus, unconditional and hedged risk do differ nontrivially.

In the OECD data used by CK, only one element of a country's x_n^l is available, the own-country investment in stocks, as a fraction of total equity investments. So they have in total N observations to estimate potentially N^2 pairwise costs. As a result of these data limitations they can estimate either inward costs or outward costs, but never both simultaneously, and surely no interactions. We, in contrast, have a full $N \times N$ data matrix, which would enable us to compute an unconstrained $N \times N$ matrix of costs. Those, however, would just be point estimates with zero degrees of freedom and would still require an exogenous estimate for relative risk aversion. We use a regression structure instead. While all results inevitably depend on the regression specifications, this way of analyzing the data leaves us degrees of freedom. Thus, we can estimate relative risk aversion, study fitted costs (which, in the regression logic, are less noisy than point estimates), compute confidence intervals, and discover their correlation with the instruments used in the regression.

The deadweight costs of investing abroad have three sources. The first component is home-country related (the l -th home effect), including for example the effects of capital export controls. The second component is related to the host country (the i -th foreign effect), like the liquidity in the foreign stock market. The third component is an interaction effect; for instance, the effects of sharing a common language or living in the same region. For riskfree lending and borrowing at home or abroad, lastly, there is assumed to be no cost. For exchange rates and bond yields, information costs are presumably much lower than for stocks. Below, we denote variables that are correlated with international costs by h_l (for the home variables), f_i (for the foreign variables) or $a_{i,l}$ (for interactions).² Then

$$C_i^l = \begin{cases} 0, & \text{if } i \leq N \text{ and } i = l, & \text{(domestic stocks)} \\ C(h_l, f_i, a_{i,l}), & \text{if } i \leq N \text{ and } i \neq l, & \text{(foreign stocks)} \\ 0, & \text{if } i > N & \text{(fixed-interest).} \end{cases}$$

The demand model in Equation (4) is not yet suited for regression analysis since every single observation x_i^l depends on expected returns and costs for all

² The details on the variables and the functional form of $C(h_l, f_i, a_{i,l})$ are provided in Section 2 and Section 3.

host countries i simultaneously. Also, expectations and hedge ratios Γ are hard to estimate. Obtaining an equation where each left-hand-side observation depends just on one C_i^l , rather than on all, is possible by studying covariances with l 's portfolio rather l 's portfolio weights themselves. We simply premultiply each side of equation (4) by $-\Omega_{S|X}$ and denote the resulting covariance by (minus) y^l :

$$y^l := -\Omega_{S|X} x_n^l = \alpha(-R_{e,S} + C^l + \Gamma' R_{e,X}) - (1 - \alpha)w_{S|X}^l, \quad (5)$$

Formally, equation (5) can be understood as:

$$\text{cov}(R_i^h, R_{p(l)}^h) = \alpha(R_i^h - C_i^l) + (1 - \alpha)\text{cov}(R_i^h, \Pi^l), \quad (6)$$

which says that the covariance of asset i 's hedged return with the return of the portfolio chosen by investor l is linearly related to the net expected return on the hedged stock and the covariance of the hedged stock return with investor l 's inflation rate. Equation (5) gives us a structure where each y_i^l depends only on the costs of flows from home l to host i , not to other hosts k . Our procedure also takes into account all (co)variances in a structured and parsimonious way. In contrast, in a simple regression analysis of x_i^l 's one can, at best, bring in just the (co)variances for l and i as regressors, and in an additive way. As a welcome byproduct, bringing $\Omega_{S|X}$ to the left-hand side has also incorporated the estimation errors that are present in $\hat{\Omega}$ into the regressee instead of the regressor. One unresolved issue is that $\hat{\Omega}$ is a constructed variable, as is the inflation covariance on the right hand side.

We now eliminate the expectations and hedge ratios Γ . Below, we write the equation for residence country l and host country i , we compare it to the equation for residence country i and asset i , and lastly we subtract to get the equation used for estimation:

$$\begin{aligned} y_i^l &= \alpha(-R_{e,S_i} + C(h_l, f_i, a_{l,i}) + \Gamma_i' R_{e,X}) - (1 - \alpha)w_{S_i|X}^l, \\ y_i^i &= \alpha(-R_{e,S_i} + \Gamma_i' R_{e,X}) - (1 - \alpha)w_{S_i|X}^i; \\ \Rightarrow (y_i^l - y_i^i) &= \alpha[C(h_l, f_i, a_{l,i})] + (1 - \alpha)(w_{S_i|X}^i - w_{S_i|X}^l). \end{aligned} \quad (7)$$

So we eliminate expectations by taking observation (i, i) as the benchmark for observation (i, l) , instead of the world average as is standard since CK. This very much simplifies the regression without any extra loss of degrees of freedom. With 20 regressors and 40 countries, introducing the mean cost would have been quite cumbersome.

2. Data

2.1 COVARIANCE MATRICES

To calculate the returns on the equity markets, we compose a value-weighted index for each country containing all domestic stocks. Stock data are from an international equity list from Datastream, developed by Lieven De Moor (2004), which contains data from 1980 to December 2000. Stock prices after December 2000 are from the Morgan Stanley International Country Indices. All stock prices and CPIs are in USD. We use ten years of monthly data to calculate the conditional covariances of risky asset returns and inflation rates. In the base-case, we calculate an equally weighted covariance matrix, thus assuming that risks and returns are constant over time. As a robustness check, we try to capture the heteroskedasticity in returns and variances by estimating an exponentially weighted covariance matrix. We return to the estimation of the covariance matrix in Section 3.

2.2. PORTFOLIO DATA

Data on international portfolio holdings are from the Coordinated Portfolio Investment Survey (CPIS), conducted annually by the IMF since 2001. For each participating country, the CPIS reports data on foreign equity portfolio holdings by residence of the issuer. The CPIS data substantially reduces the data shortcomings that existed during earlier decades. However, problems with the CPIS data can still arise for at least three reasons. First, a number of countries, for example China and the Arab countries, did not participate in the CPIS resulting in an incomplete country coverage. Second, there can be an issue of under-reporting by CPIS participants. The German survey, for example, did not cover holdings by households unless they are managed by a professional. Other problems are related to data on country characteristics. Out of the 70 countries participating the CPIS in 2004, only 38 could be retained in this study due to missing data in Datastream or shortcomings of the CPIS dataset. However, our sample still represents 92 percent of the total world market capitalization, and we control for important economies (Australia, New Zealand, China and India) that were omitted in our sample, as shown below. Mexico is not included in the pooled sample as the CPIS provides no portfolio holdings data for this country in the years 2001 and 2002. We do add Mexico to the 2003-2004 subsample. Lastly, the CPIS does not take effects of third-party holdings or round tripping into account. This creates misleading figures for countries as Luxembourg, Ireland and some smaller off-shore financial centers (e.g. Bermuda, Cayman Islands). We now describe our procedures to attenuate the problem.

An important portion of most countries' foreign equity portfolio is, in fact, invested in off-shore financial centers like Luxembourg or Ireland.³ At the end of 2001, 13 percent of the worldwide foreign investments were placed in three financial centers: Luxembourg (8 percent), Bermuda (3 percent) and Ireland (2 percent). The total amount of these investments is far larger than the total market capitalization of the off-shore financial centers' stock and bond markets, meaning that these countries only serve as agents for funds invested somewhere else. We handle the investments in financial off-shores in three alternative ways. First, since the financial centers are all small economies, one can reason that virtually all reported equity outflows from the financial centers in the CPIS are actually foreign holdings of the third countries that invest into these centers, and that the investment decisions are taken by the money managers in the financial centers. Thus, we can reallocate the reported investments in financial off-shore centers over our sample countries, in proportion to the reported foreign investments of the off-shore centers.⁴ For example, at the end of 2004, Germany invested USD 200 billion in Luxembourg, while 26 percent of Luxembourg's foreign equity portfolio is placed in the United States, 11 percent in the United Kingdom and 9 percent in Germany. Of Germany's 200 billion, 52 billion (26 percent) are then deemed to be investments in US assets, 22 billion in the UK assets and USD 18 billion in domestic equities. Alternatively, we add up the total amount that a country invests in all financial off-shore centers and reallocate these investments over the sample host countries in proportion to the direct foreign investments of the home country, thus assuming that the final investor takes the decisions and that her preferences are reflected in her country's direct capital outflows.⁵ In the third version, we drop the financial offshore centers both as investing and destination country, to test the robustness of the conclusions.

The CPIS does not report data on domestic equity holdings, so these are calculated as the difference between the local market capitalization and the country's foreign equity liabilities. Domestic stock market capitalizations are from the World Federation of Exchanges, available at <http://www.world-exchanges.org/>. Table I shows the relative importance of each stock market compared to the world market capitalization and the proportion of domestic equity held in the country's total equity portfolio at the end of 2004.⁶ In this table, investments in off-shore financial

³ We thank an anonymous referee for bringing this point to our attention.

⁴ The off-shore financial centers for which we have outward investment data are Luxembourg, Ireland, Bermuda, Cayman Islands, Panama, the Netherlands Antilles and Guernsey.

⁵ The financial centers for which we have inward investment data are: Andorra, Anguilla, Antigua, Aruba, Bahamas, Bahrain, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Cook Islands, Costa Rica, Cyprus, Djibouti, Dominica, Gibraltar, Grenada, Guam, Guernsey, Isle of Man, Ireland, Jersey, Lebanon, Liechtenstein, Luxembourg, Macau, Malta, Marshall Islands, Mauritius, Micronesia, Montserrat, Nauru, Netherlands Antilles, Niue, Panama, Puerto Rico, Seychelles, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Turks and Caicos, Uruguay, Vanuatu.

⁶ Data for 2001, 2002 and 2003 are similar and can be obtained from the corresponding author.

Table I Weight of Domestic Equity Holdings Relative to Weight in World Market

Portfolio holdings data are from the CPIS at the end of 2004. Market capitalizations are from the World Federation of Exchanges. The table shows the difference between the proportion of domestic equities in a country's portfolio and the proportional market capitalization of that country

Country	Market Capitalization as a Percentage of Total	% of Equity Portfolio in Domestic Equities	Difference
Argentina	0.11	82.18	82.06
Austria	0.24	53.16	52.92
Belgium	0.78	55.79	55.02
Brazil	0.91	99.41	98.50
Canada	3.25	76.46	73.21
Chile	0.32	87.97	87.59
Colombia	0.07	98.21	98.14
Czech Republic	0.15	93.66	93.51
Denmark	0.43	66.05	65.62
Finland	0.51	63.51	63.01
France	6.44	81.44	75.00
Germany	3.30	60.66	57.36
Greece	0.34	94.90	94.56
Hong Kong	2.38	85.39	83.00
Hungary	0.08	93.52	93.44
Indonesia	0.20	99.96	99.76
Israel	0.25	94.41	94.16
Italy	2.18	62.58	60.40
Japan	9.83	89.93	80.10
Korea	1.08	99.46	98.95
Malaysia	0.50	99.46	98.95
Mexico	0.48	97.79	97.32
Netherlands	1.49	29.70	28.20
Norway	0.39	53.47	53.08
Philippines	0.08	99.41	99.33
Poland	0.20	99.15	98.95
Portugal	0.30	86.72	86.42
Russia	0.58	99.96	99.38
Singapore	0.60	78.60	78.00
South Africa	1.22	88.82	87.60
Spain	2.60	87.96	85.36
Sweden	1.04	60.94	59.90
Switzerland	2.28	67.61	65.33
Thailand	0.32	99.49	99.17
Turkey	0.27	99.88	99.60
United Kingdom	7.92	71.85	63.93
United States	45.12	87.33	42.21
Venezuela	0.02	99.46	99.44

centers have been reallocated over the sample countries in proportion to the foreign investments of these centers.

With the exception of Fidora et al. (2007), earlier studies analyze stock holdings only, assuming zero bond holdings and scaling the stock investments such that

their weights sum to unity. This procedure produces unreliable estimates of the relative risk aversion parameter. First, even if all lending and borrowing is among investors, in an international setting it becomes unlikely that a country's net holdings of its own risk-free asset would still be zero. Ignoring a country's choice of risk-free investments would then imply that relative risk aversion is mis-estimated. In addition, omitting foreign bonds, which are low-risk assets, would bias the estimate of the portfolio's total risk and, hence, also the estimate of relative risk aversion. To alleviate the problem we introduce data on the aggregate bond holdings for each country. Amounts invested in foreign bonds are reported in the CPIS. Bond market capitalizations are from the Bank of International Settlements Security Statistics, available at <http://www.bis.org/statistics/secstats.htm>. Domestic bond holdings are calculated as the difference between a country's bond market capitalization and its liabilities in foreign debt securities. The country's total bond holdings are equal to the sum of its domestic bond holdings and the total amount invested in foreign bonds. Total wealth is estimated as the sum of a country's total equity holdings and its total bond holdings. Adding bonds to the measure for wealth is an improvement relative to CK, who only considered equities, but our measure is still imperfect since we ignore human capital, non-traded assets and non-financial assets. Bottazzi et al. (1996) and Julliard (2003) do account for human capital and find a significantly negative correlation with domestic equity returns, suggesting a possible explanation for home bias. Their findings are in contrast with Fama and Schwert (1977), Massa and Simonov (2006) and Baxter and Jermann (1997), who find a zero or even positive correlation between non-financial income and domestic equity returns. Our data also ignore direct loans, as BIS data cover bonds only.

We calculate the vector x_n^l , containing the N proportions of investor l 's wealth portfolio invested in each equity index. By premultiplying the vector of relative portfolio weights with the covariance matrix of hedged stock returns, we obtain the assets' covariance risks in the l -th country's portfolio. As explained before, each covariance risk is then compared to the covariance risk of that asset in its own local-investors portfolio; the difference of these two risks is our left-hand side variable. We illustrate the results using the base-case covariance matrix (equally weighted using ten years of monthly data) of hedged stock returns. Figure 1 shows our left-hand-side variable, $y_i^l - y_i^i$, from the point of view of two developed countries, the United States and Germany, and two newer markets, Turkey and Poland. Each of these four represents a different source country l , and the graph shows the values for all destination countries i . Each figure gives a first indication that there is a large variation in implicit inward investment costs: investments into emerging countries come at far higher implicit cost than investments into the developed countries, and especially for Russia, Thailand, Turkey and Venezuela we see big peaks. We also observe from Figure 1 that there is very little variation in outward investment costs: investors from Germany, the US, Turkey or Poland all face more or less the same

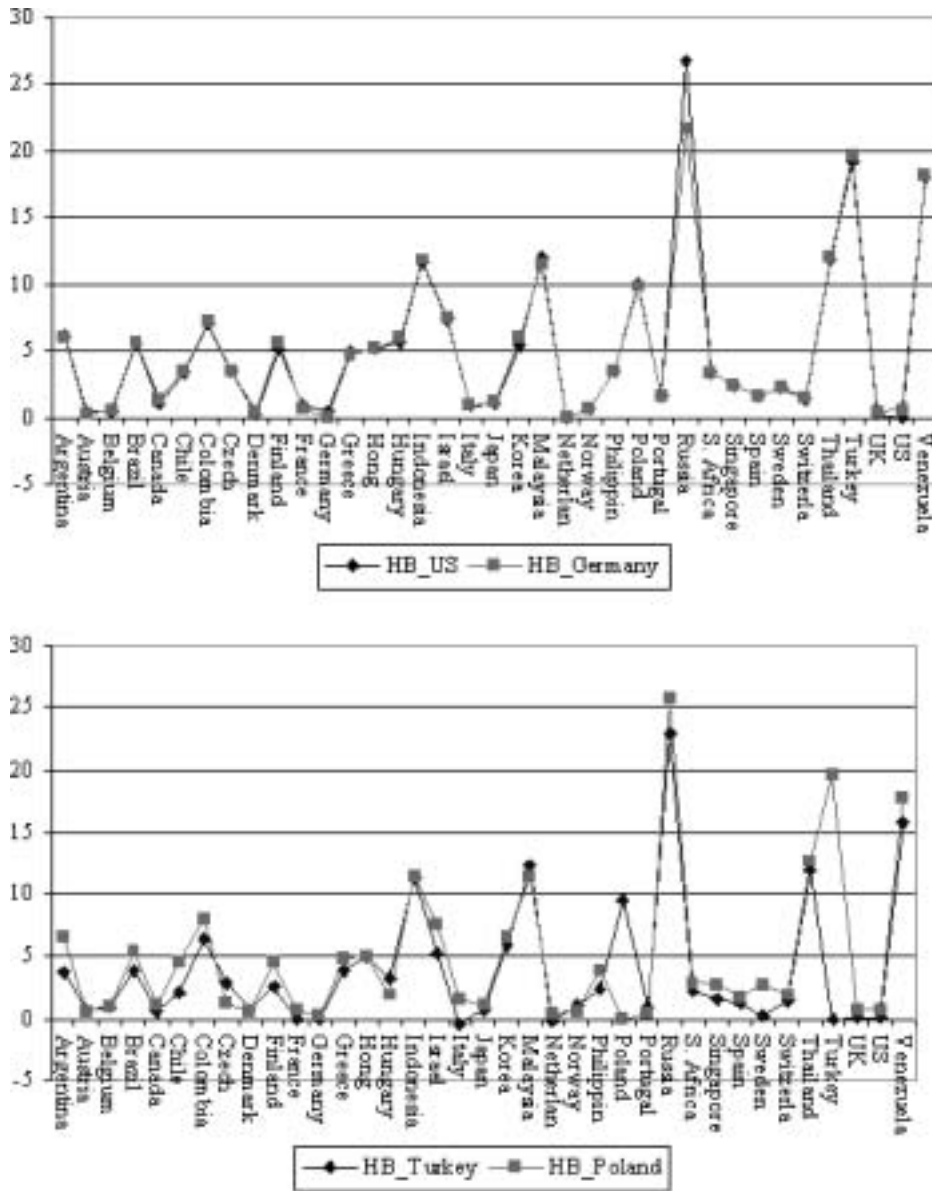


Figure 1. Differential Portfolio Covariance Risks (Foreign Investors v Locals) for Various Indices

The first (second) chart shows our home bias measure, $y_i^f - y_i^l$, the differential portfolio covariance risk of asset i , for investors from the United States and Germany (Turkey and Poland) at the end of 2004. The covariance matrix of hedged stock returns is estimated using 10 years of monthly data.

implicit cost to invest into, for instance, Malaysian equities. For this reason, in the remaining of the paper we mostly report average costs per destination country (i.e. the mean over all source countries) rather than the full $N \times N$ table or the average cost per source country.

To estimate the implied costs of international investments, we use a set of instruments that have been proven to be correlated with home bias (see for instance Chan et al., 2005; Fidora et al., 2007; Lane and Milesi-Ferretti, 2004, 2005; Berkel, 2007; Coval and Moskowitz, 1999; Faruquee et al., 2004; or Portes and Rey, 2005). We subdivide each set of instruments into six groups: one related to implicit costs from information asymmetries proxied by geographical and cultural proximity factors; a second related to explicit trading costs and direct controls on international capital flows; a third measuring the level of financial development, which probably correlates negatively with both information asymmetry and transaction costs; a fourth measuring economic health and stability; a fifth related to political risk and corporate governance; and, lastly, the skewness of stock returns.

Table II summarizes the instruments that are used to estimate the implicit costs of international investments, together with their expected sign of correlation with these costs. We provide a detailed description of each instrument in the Appendix.

3. Estimation and Results

3.1 ESTIMATION

The test equation (7) has as its left-hand side variable the differential portfolio covariance risks of asset i for investors l and i , and on the right the net cost differential $NC(H_{l,t}, F_{i,t}, A_{l,i,t})$ and the asset's differential inflation-hedging potential:

$$(y_i^l - y_i^i)_t = \alpha NC(H_{l,t}, F_{i,t}, A_{l,i,t}) + (1 - \alpha) (w_{S_i|X}^i - w_{S_i|X}^l)_t$$

where $H_{l,t}$, $F_{i,t}$ and $A_{l,i,t}$ are vectors containing instruments for home-related costs, host-related costs and interaction-type costs respectively.

We specify the costs of international investments as an exponential function of the above regressors. This guarantees that fitted costs end up as positive numbers:

$$\begin{aligned} (y_i^l - y_i^i)_t &= \alpha \times \exp \left(c + \sum \beta_j X_j \right)_t + (1 - \alpha) (w_{S_i|X}^i - w_{S_i|X}^l)_t \\ &= \exp \left(\bar{c} + \sum \beta_j X_j \right)_t + (1 - \alpha) (w_{S_i|X}^i - w_{S_i|X}^l)_t, \end{aligned} \quad (8)$$

where $\bar{c} = c + \log(\alpha)$ and $X = [H, F, A]$.

For the pooled sample, we estimate equation (8) using the General Method of Moments (GMM) with a Newey-West weighted covariance matrix such that the GMM-estimates are robust to heteroskedasticity and autocorrelation. As a

Table II Definition of the Variables

Variable		Exp. Sign	Description
Int. investment costs $C(H_i, F_i, A_{i,i})$			
<i>–1. Information-related</i>			
Host	English-speaking	–	Dummy if the host country has English as official language
Interaction	Common region	–	Dummy if home and host country are situated in the same region
	Common language	–	Dummy if home and host country share a the same official language
	Log(distance)	+	Logarithm of the physical distance between the home and the host country
	Bilateral imports	–	Imports of country l from country i divided by country l 's GDP
<i>–2. Explicit frictions</i>			
Host	Transaction costs	+	Elkins/McSherry Co., Inc. transaction costs of the host country
	Capital-import ctrls	+	Index of controls on capital inflows
Home	Transaction costs	–	Elkins/McSherry Co., Inc. transaction costs of the home country
	Capital-export ctrls	+	Index of controls on capital outflows
<i>–3. Fin. development</i>			
Host	(Bank+Cap)/GDP	–	Dom. credit provided by banks plus stock market cap relative to GDP
	Liquidity	–	Stock market turnover relative to stock market capitalization of the host county
<i>–4. Economic health and stability</i>			
Host	GDP	–	GDP of the host country relative to world GDP
	Misery index	+	Annual inflation rate + unemployment rate of the host country
	Current account balance to GDP	+	Host country's current account balance as a percentage of its GDP
	Crisis	+	Dummy if the host country suffered from a financial crisis recently
	GDP-growth	?	3-year annual average GDP-growth of the host country
Home	GDP	?	GDP of the home country relative to world GDP
Interaction	Euroland	–	Dummy if home and host country are Euroland members
<i>–5. Political risk and corporate governance</i>			
Host	ENF index	+	Measure for economic policy opacity (PwC and the Kurtzman Group)
	ACC index	+	Measure for accounting practices and corporate governance (PwC and the Kurtzman Group)
	ENF*ACC index	?	Interaction term country-level and corporate-level opacity (PwC and the Kurtzman Group)
	Government effectiveness	–	Indicator of government effectiveness (Kaufmann, Kraay and Mastruzzi, 2006)
	Insider trading index	–	Index for insider trading in the host country (Global Competitiveness Report)
	TI CPI index	–	Transparency International Corruption Perception Index
<i>–6. Skewness</i>			
Host	Skewness-indicator	–	Skewness of the return of the host country

robustness check, we also estimate equation (8) year by year, using a White-weighted covariance matrix. All right-hand side variables of equation (8) are used as instruments. Thus, the orthogonality conditions are:

$$E \left[\Delta y - \left(\exp \left(\bar{c} + \sum \beta_j X_j \right) + (1 - \alpha) * \Delta w \right) Z \right] = 0, \quad (9)$$

with Z the set of instruments (all the cost-related variables and the inflation-hedge factor), without any cross-correlation restrictions or other overidentifying restrictions.

In the base case, we estimate the covariance matrix of hedged stock returns for each sample year using a rolling sample of monthly data over ten years. Thus, the historical (equally weighted) covariance matrix for 2001 is computed using data over the period 1992-2001, the covariance matrix for 2002 is computed with data from 1993 to 2002 and so on. Bekaert and Harvey (1997, 2000) find that, especially for the emerging markets, expected returns and variances are time-varying. In a second setting we take into account some heteroskedasticity by estimating the covariance matrix using exponentially weighted moving averages of returns:

$$\sigma_{i,t}^2 = (1 - \lambda) \sum_{j=1}^T \lambda^{j-1} (R_{i,t}^h - \bar{R}_i^h)(R_{i,t}^h - \bar{R}_i^h), \quad (10)$$

where λ ($0 < \lambda < 1$) is the decay factor.⁷ This GARCH-(0,1) model is the RiskMetrics covariance estimation method. The decay factor they use for monthly data is 0.97, and mean returns are set to zero for simplicity.⁸

3.2 EMPIRICAL RESULTS

Table III summarizes the estimation results of equation (8) for the pooled sample. Recall that we use three different allocation methods for the investments in financial off-shore centers. The first two columns (Result 1) show the estimation results when we reallocate the investments into off-shores over the destinations in proportion to the outward foreign investments from these centers as reported to the CPIS. The next two columns (Result 2) contain the results of the estimation where we reallocate the investments into the financial off-shore centers in proportion to the foreign investments reported by the original source countries. The estimation results of the model with the financial off-shores omitted from the sample are reported as a robustness check, under Result 3. The last two columns show the estimation results under the first reallocation method, but with a linear cost structure instead of the exponential. In Table IV we present the estimation results for the individual years,

⁷ For the formula (10) of the exponentially weighted variance, we used the approximation $\sum_{j=1}^T \lambda^{j-1} \cong 1/(1 - \lambda)$ if T is large.

⁸ RiskMetrics, Technical Document (1996).

Table III Coefficient Estimates and t-statistics, Pooled Sample 2001-2004

The estimated model is that of equation (8). The second column contains the GMM estimation results for the 2001-2004 sample with investments in financial off-shore centers reallocated proportional to the reported foreign investments of these centers (Result 1). Column three contains the results for the 2001-2004 sample with investments in financial off-shore centers reallocated proportional to the reported foreign investments of the source countries (Result 2). Column four contains the estimating results for the sample omitting the financial off-shores as both destination and investing country (Result 3). The estimation results of the linear costs structure are reported in the last column. Significance at the 99%, 95%, and 90% level is denoted by three, two and one * respectively

Variable	Exp. Sign	Result 1		Result 2		Result 3		Linear Cost Structure	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Risk tolerance (α)	+	0.42	***	4.06	***	4.57	***	0.25	**
Constant ($\log(\alpha)+c$)	?	-1.87	***	-6.91	***	-5.80	***	2.91	**
Int. investment costs $C(H_i, F_i, A_{i,i})$									
<i>-1. Information-related</i>									
F_i English-speaking host	-	-0.32	***	-5.45	***	-6.91	***	-0.26	**
$A_{i,i}$ Common region	-	-0.40	***	-5.81	***	-5.54	***	-0.42	**
Common language	-	-0.17	***	-3.06	***	-2.94	***	-0.09	*
Log(distance)	+	0.35	***	8.74	***	8.02	***	0.38	**
Bilateral imports	-	-0.05	***	-2.73	***	-2.80	***	-0.02	**
<i>-2. Explicit frictions</i>									
F_i Transaction costs, host	+	0.31	***	8.10	***	7.77	***	0.68	***
Dest. capital-import ctrls	+	0.29	***	5.98	***	8.48	***	0.20	**
H_i Transaction costs, home	-	-0.21	***	-5.29	***	-5.12	***	-0.19	**
Home capital-export ctrls	+	-0.02		-0.82	-0.02	-1.02	-0.04	-0.01	-0.47
<i>-3. Fin. development</i>									
F_i (Bank+Cap)/GDP, abroad	-	-0.00		-0.33	-0.05	-4.35	***	-0.08	**
Liquidity abroad	-	-0.14	***	-3.88	***	-6.92	***	-0.11	**

Table IV Coefficient Estimates and t-statistics, Year-by-year Estimation

The estimated model is that of equation (8). Investments in financial off-shore centers reallocated proportional to the reported foreign investments of these centers. Significance at the 99%, 95%, and 90% level is denoted by three, two and one * respectively

Variable	Exp. Sign	2001		2002		2003		2004	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
risk tolerance (α)	+	0.34	***	4.45	***	0.51	***	0.67	**
Constant ($\log(\alpha)+c$)	?	-1.94	**	-2.39	***	-1.25	***	-1.49	**
Int. investment costs $C(H_i, F_i, A_{i,i})$									
<i>-1. Information-related</i>									
F_i English-speaking host	-	-0.24	***	-4.07	***	-0.35	***	-0.70	***
$A_{i,i}$ Common region	-	-0.03		-0.99	***	-0.31	***	-0.00	
Common language	-	-0.43	***	-6.91	***	-0.28	***	-0.14	***
Log(distance)	+	0.06	**	2.19	***	0.06	***	0.06	***
Bilateral imports	-	-0.00		-0.49	***	-0.01	**	-0.00	
<i>-2. Explicit frictions</i>									
F_i Transaction costs, host	+	0.41	***	2.81	***	0.34	***	0.59	***
Dest. capital-import ctrls	+	0.22	*	1.82	***	0.21	***	0.39	***
H_i Transaction costs, home	-	-0.02		-0.88	***	-0.00		-0.00	
Home capital-export ctrls	+	-0.03	***	-3.37	***	-0.02	**	-0.03	***
<i>-3. Fin. development</i>									
F_i (Bank+Cap)/GDP, abroad	-	-0.26	***	-4.98	***	-0.03	***	-0.60	***
Liquidity abroad	-	0.13		1.61	*	-0.08		-0.01	

again with the investments in off-shore centers reallocated over the host countries proportional to the reported foreign investments of the off-shores. Mexico was added to the 2003-2004 subsample.

First note the general explanatory power: of the variance of the $\Delta y_{i,t}^l$ observations, for the full sample up to 82 percent is explained, for the year-by-year estimation even 88 percent. This result can be compared with direct regression analysis of $\Delta x_{i,t}^l$ numbers, like for example in Chan et al. (2005) and Fidora et al. (2007), where R^2 s obtained with very similar regressors do not exceed 50 percent. A first reason for the higher explanatory power is a result of the exponential structure that we apply to the cost function. The overall fit of the model using a simple linear cost structure leads to a substantially lower fit of 56 percent. A second reason could be that part of the variation in investment biases $x_{i,t}^l - \bar{x}_{i,t}$, is related to variance-covariance effects that are captured by our dependent variable but absent from earlier studies.

Our second introductory observation is that, across the years, there is a reassuring degree of consistence in the values of the coefficients and the patterns of significance/insignificance. Third, relative risk tolerance is estimated to be significantly positive and smaller than unity. Significant risk tolerance of course means a significant estimated relative risk aversion. Our estimates of relative risk aversion range between 1.2 and 2.9, which are quite acceptable estimates and can be compared with the estimates by Apte et al. (2004), extracted from real exchange rates and real consumption data, or Friend and Blume's (1975) seminal estimate, around 3.

The estimated risk tolerance parameter is significantly lower than unity, producing a sizable demand for the inflation-hedge portfolio. Note that this does not necessarily mean that stocks are good hedges against inflation. Indeed, assuming that inflation covariances are all zero, the second fund in demand equation (8) would just contain the nominal risk-free asset. We investigate the role of inflation hedging in asset demand by regressing the hedged stock return of country l on all 37 inflation differentials $(\Pi^l - \Pi^i)$, $(l \neq i)$ and conducting a Wald test to verify whether the coefficients are simultaneously significant. We could reject the null-hypothesis of non-significance only once out of 38 countries (not shown). This suggests that inflation hedging is insignificant and thus the second fund is demanded for its nominal risk-reducing characteristics relative to the first one, the log-utility portfolio. This is in line with earlier results by e.g. Adler and Dumas (1983) or CK.

The main interest is, of course, in the levels and nature of transaction costs. We discuss these in turn.

3.2.1 Estimated Cost Levels and Trends

Table IX in the Appendix shows the full 37×37 matrix of estimated total costs of international investment averaged over our four sample years; tables for individual years are similar and can be obtained from the corresponding author. As a more

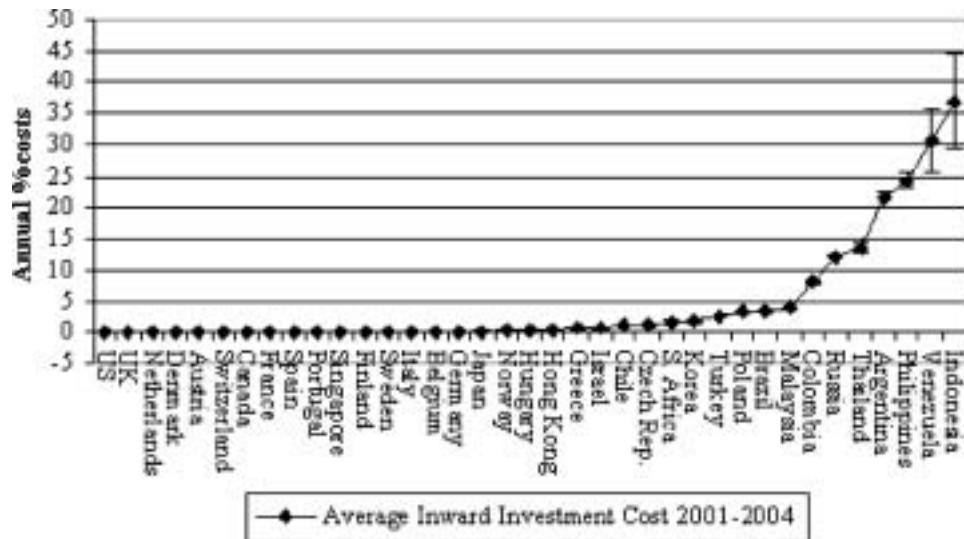


Figure 2. Annual Average Shadow Costs of Inward Investments, 2001-2004

This figure shows the average inward investment cost for each country over the sample period 2001-2004. For each estimate, the figure shows a confidence interval of $\pm$ two standard errors.

digestible summary of the table, Figure 2 shows the estimated annual percentage cost to invest into a particular host country during the sample period, averaged across all home countries over the four years. We also report confidence intervals ($\pm$ 2 standard deviations) for each estimate of average inward costs. The computation of the standard errors is explained in the Appendix. It is again clear from the figure that there is a huge difference between the international investment costs into the industrialized and the developing countries. Over the sample period, the average implicit inward investment costs into the developed countries range from only 0.01 per cent per annum in the United States to 0.72 percent per annum in Israel. Investment into developing countries resulted in a much higher implicit cost, and much more variability: average inward investment costs amounted to 1.7 percent per annum for South Africa, but investing in Indonesia went with an average implicit investment cost estimated at 37.7 percent per annum. Towards the end of this section we present results for the model excluding Argentina, the Philippines, Venezuela and Indonesia from the sample, to check to what extent our results are driven by these four outliers.

Figure 3 shows the average inward investment costs for each country and each year together with a confidence interval for each estimate. The ranking of the countries based on inward investment costs differs slightly over the four years, but the general picture (low inward investment costs for developed countries, high

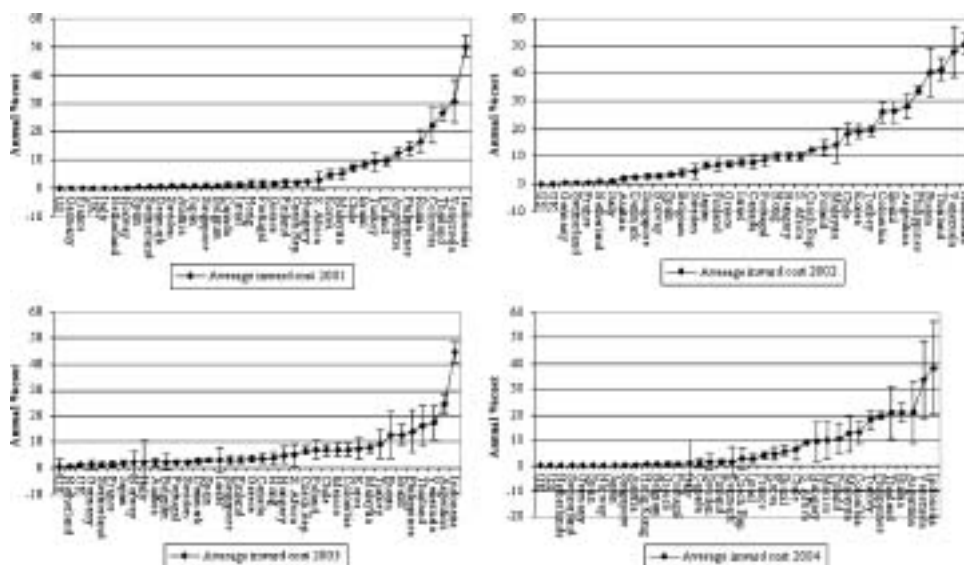


Figure 3. Shadow Costs of Inward Investments Relative to the Mean per Year

This figure shows the average inward investment cost for each of the sample years individually. Confidence intervals of ± 2 standard errors are reported for each estimate.

implicit costs for emerging markets) stays the same. Countries with the lowest inward investment are the US, the UK, the Netherlands, Switzerland and Germany. High-investment-cost countries are Indonesia, Venezuela, Thailand, Argentina, the Philippines, Russia, and Colombia.

Our cost estimates are lower than those reported by Glassman and Riddick (2001). They calculate implied returns for six developed countries, given their actual portfolio holdings and imposing a constant relative risk aversion of 3; and they then compare these with the historic mean returns to estimate the implicit cost of international investments. Glassman and Riddick calculate that for the period 1985-1990 deadweight costs for France, Germany, Japan and the UK must be in excess of 1 percent per month (14-19 percent per year) to explain the actual portfolio holdings. Our estimated level of risk tolerance is similar to the one postulated by Glassman and Riddick, but our methodology comes up with more moderate estimates even for these countries.

Our lower cost estimates may be partially due to the different sample period. Since 1985-90, the period studied by Glassman and Riddick, financial markets have become more integrated and the internet and technological developments have decreased information costs. To get an idea of the evolution the implicit costs of international investment we apply the original CK methodology for the nine countries (Canada, France, Germany, Italy, Japan, Spain, Sweden, the UK and the

US) in their sample that have data on x_t^f over the period 1980-1997 (OECD data). We add the x_t^f data from the IMF surveys to extend the series. The risk aversion parameter is fixed at 2.5, for comparability with our earlier estimates, and with CK (1994).

Figure 4 shows the evolution of the annual average inward investment cost for the nine countries. The results of Figure 4 are point estimates from limited data, which are rather different from the regression results from our methodology. We include the Figure mainly to point out the evolution of the deadweight costs over time, rather than the level of these costs. By and large, implied costs have indeed fallen over time. For two countries, Germany and Spain, implied costs were rising until the late eighties before the downward trend started; possibly, what we really see is not increased home bias due to rising costs but to proportionally large privatizations that strongly targeted the local small investor. Sweden's exceptionally high initial cost reflected capital controls, lifted in the later eighties; we see costs duly plummet as of then. Japan is a lone outsider, with the imputed cost of inward investments rising as its market slumped in the first half of the 1990s. Lastly, and most crucially, also CK-style cost estimates have been falling since 1990, and the 2001-04 levels seem to be well in line with the general picture. But time alone does not fully explain the Glassman-Riddick numbers. For France, Germany, Japan and the UK, the estimated CK-style deadweight costs are still lower than the ones estimated by Glassman and Riddick for the period 1985-1990.

Still, the high implicit costs for the emerging markets (up to 37 percent per annum) are very unlikely to reflect real "costs", or even shadow costs: a 37 percent cost should implicitly be accompanied by a comparable expected return, since investors do hold (small) fractions of their wealth in these countries. Therefore, one alternative or complementary explanation could be an inflated perception of foreign risk. This would mean that (part of) the estimated deadweight costs are just proxies for variance-inflation effects. Alternatively, for some emerging countries the sample covariances, that act as our left-hand side variables, may have been overestimated because of outliers, and then over-fitted by the regression.

3.2.2 *Nature of Costs*

From Table III (pooled estimation) and Table IV (year by year estimation), information-related frictions are significantly related to implicit deadweight costs during the sample period: living in the same region or at a closer distance to the foreign country and sharing a common language comes with lower implicit costs of foreign investments. Implicit investment costs are also lower for host countries where English is the official language. This is consistent with earlier studies that find that location and cultural factors are important determinants in asset allocation decisions (Portes and Rey, 2005; Coval and Moskowitz, 1999; Grinblatt and

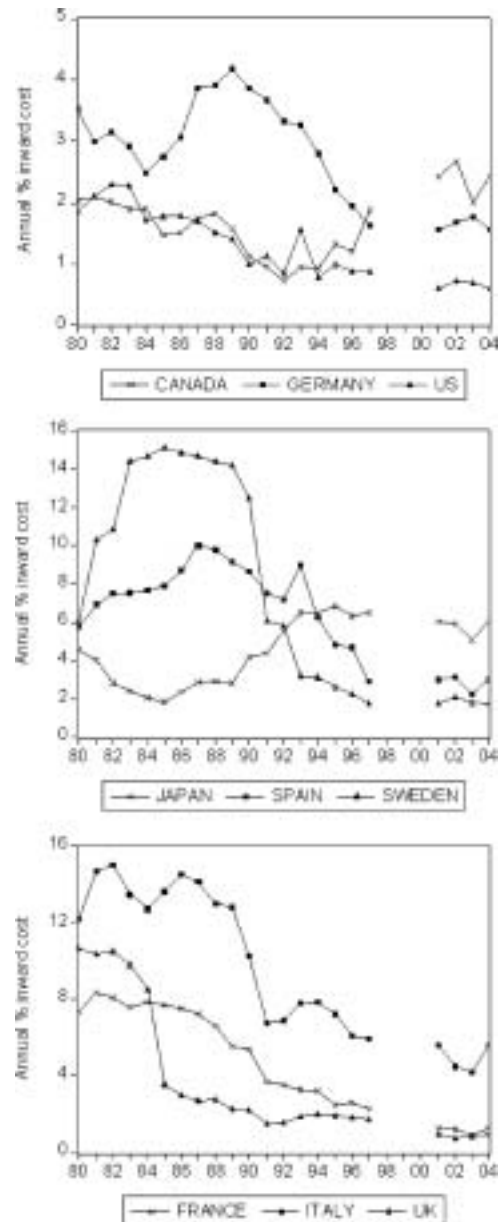


Figure 4. Evolution of Annual Shadow Costs of Inward Investments, $\alpha = 0.4$

Annual inward investment costs are calculated following the CK (1996) methodology. Data on portfolio holdings until 1997 are from the OECD. No data is available for the period 1998-2000.

Keloharju, 2001; Grote and Ueber, 2006; Faruquee et al., 2004; Sarkissian and Schill, 2004). Bilateral trade correlates negatively with implicit investment costs, consistent with Lane and Milesi-Ferretti (2005). The coefficient estimates differ for the year-by-year estimations. For instance, the common-region dummy is significant in 2002 and 2003 only and the variable measuring bilateral imports is only significant in 2003.

Since the nineties, financial markets have been liberalized, especially in the developed economies. Transaction costs and institutional barriers on international capital flows alone are unable to explain a large extent of the observed home bias in equity portfolios. However, in Tables III and IV, we find that they do play a role in the estimates of the deadweight costs for foreign investments. Transaction costs in the host country exhibit a significantly positive correlation with the implicit costs of foreign investments. Home-country transaction costs, on the other hand, are significantly positive for the pooled sample, but we find that the coefficient estimates are insignificantly different from zero for the individual years. These results are in contrast with Goetzmann and Kumar (2008), who find that transaction costs do not noticeably influence diversification decisions; in their study diversification choices are explained by investor-specific characteristics, instead. Another difference with their study considers the data. Goetzmann and Kumar analyze individual portfolio positions of investors at US brokerage houses, while we look at aggregate portfolio holdings for a cross-section of 38 countries. Formal controls on capital inflows correlate positively with implicit investment costs. Restrictions on capital exports have no clear effect.

Again, from Tables III and IV, the level of development of the financial markets of the host country does correlate with implicit investment costs. However, these results depend on the method of reallocation of investments in financial off-shore centers. We find that, when the investments in off-shores are reallocated proportionally to these centers' own reported foreign investments, only the liquidity variable comes up with a significantly negative sign. When we reallocate the investments proportional to the foreign investments of the original home country, both liquidity and "outside" corporate financing as a fraction of GDP in the host country correlate negatively with the implicit costs to invest in that country. For the individual years, we only find the ratio of corporate financing to GDP to have a significant influence on the implicit costs of foreign investments.

In our regressions, economic health and stability is also found to be an important instrument for the implicit costs of international investments. Stability is highly correlated with information asymmetries, since instability causes uncertainty and increases risk. Six out of seven variables are significant. Over the full sample period, host (home) country GDP correlates negatively (positively) with implicit investment costs. This is consistent with amongst others Faruquee et al. (2004) who show that the market size of the host country, measured by the GDP and the number of

publicly listed companies, significantly increases international portfolio holdings. The positive coefficient for home-country GDP can be explained by the fact that investors from large economies have better diversification opportunities inside their own country already, making international diversification less necessary. True, this effect should already be picked up by the variance-covariance matrix that is incorporated into our dependent variable. But there is likely to be an interaction with information processing too. Residents from, say, Luxembourg, do not need quite as much time to digest all relevant local news as US portfolio managers, so they naturally spend more of their day on foreign news. This effect is not picked up by the covariance matrix, and would make small countries more extravert than large ones even after accounting for (co)variance effects. If we look at the yearly estimation results (Table IV), home-country GDP is only significant in 2001. The coefficients for the host-country's Misery Index, the financial crisis dummy, GDP-growth and current account deficit all come up with a significantly positive sign. The fact that a higher score on the Misery Index (which is the sum of inflation and unemployment rates) and a recent financial crisis have an increasing effect on implicit costs of investments is rather intuitive. The positive sign on the host GDP-growth variable can be explained by the fact the fast growing countries are also emerging countries, about which information is scarce and where uncertainties are often large. In addition, high expected growth leads to high stock-price multiples, which makes markets quite sensitive to variations in expected growth.⁹ The current account deficit correlates positively with the implicit costs of inward investments. This correlation is not necessarily reflecting a cost: deficits are in general long lasting and automatically generate a surplus on the financial account, which, in turn is interpreted as evidence of low costs to non-residents. Surprisingly, in the pooled sample we find no clear effect for the Euroland dummy, which is inconsistent with the euro-area bias documented in Lane and Milesi-Ferretti (2005). But significance of our Euroland dummy depends on the allocation method of the investments in financial off-shore centers and on the sample period; for 2001 and 2002 we find no effect, while for 2003 and 2004 the coefficient is significantly negative, as expected.

Political risk and corporate governance in the host country are also found to be important factors in international portfolio choice problems (as in La Porta et al., 1998, 1999; Dahlquist et al., 2003; Giannetti and Simonov, 2006; Gelos and Wei, 2005). Our three measures of country-level governance, the ENF-index (economic policy opacity), the TI Corruption Perception Index and the Government Effectiveness Index all point in the same direction: higher transparency and good governance in the host country reduces implicit investment costs to invest into this country. When we consider corporate governance rather than public governance, we

⁹ Consider for instance the Gordon model, which says that the prospective price-earnings ratio is $P_t/\hat{X}_{t+1} = 1/(R - g)$, with R the discount rate and g the growth rate. The growth elasticity of P/E then equals $g/(R - g)$, which rises sharply in g .

find no clear relation with implicit investment costs. The coefficient for the ACC-index, which measures accounting policies and corporate governance, is significant but comes up with an incorrect sign, while the coefficient for the insider trading index is never significant. The incorrect sign for the ACC-index is probably due to multicollinearity problems. In the Appendix, where we report the correlation matrix of all our cost-related instruments, correlations are especially high amongst the measures for political risk and corporate governance. Also, if we estimate the model with the ACC-index as single explanatory variable, its coefficient estimate is positive, albeit insignificant. The high correlation between the governance variables does not affect the estimation results for the other variables: if we estimate the model omitting the governance variables, the coefficient estimates for the remaining instruments hardly change. The interaction term between firm-level and country-level governance, ENFACC, is significantly positive over the four sample years.

Unexpectedly, return skewness has a positive significant sign. A potential explanation can be found in Bekaert et al. (1998): skewness is typical for emerging markets, and also changes over time, thus creating extra uncertainty. The coefficient estimate for the skewness variable differs significantly depending on the sample year. For 2001 and 2002, the coefficient is significantly positive, but for 2003 and 2004 we find a weakly negative coefficient estimate.

3.2.3 Robustness Checks

As a first robustness check, we estimate the covariance matrix with an exponential decay, which can be compared with a simple GARCH (0,1) model. Following RiskMetrics, we use a decay factor of 0.97, but we also report results from the covariance estimation with a decay factor equal to 0.95. Costs estimates for the pooled sample and corresponding coefficient estimates are given in Figure 5 and Table V, respectively. Estimation results for the individual years are similar and can be obtained from the corresponding author.

Figure 5 shows that the estimated inward investment costs hardly change if we apply a decay factor of 0.97 to weight the return observations in the covariance matrix. Similarly, the coefficient estimates in Table V are highly comparable to the estimation results reported in Table III. If we use a weight of $\lambda = 0.95$ for the estimation of the covariance matrix, however, the estimated costs and coefficient estimates do differ from those based on an equally weighted covariance matrix. Setting λ equal to 0.95 emphasizes recent data more strongly than RiskMetrics would have done, but the results look less reliable: the overall fit of the model drops significantly from an adjusted R^2 of 82 percent to an adjusted R^2 66 percent. Six coefficient estimates have a different sign compared to the estimates from the original setting: the physical distance, home-country transaction costs, financial development in the home country, the ENF Index, the Insider Trading Index and the

Table V Coefficient Estimates and t-statistics, Alternative Covariance Matrices

The estimated model is that of equation (8). The second column contains the GMM estimation results for the pooled sample with the exponentially weighted covariance matrix, using a decay factor $\lambda = 0.97$. Column three contains similar results for a decay factor $\lambda = 0.95$. Investments in financial off-shore centers are reallocated proportional to the reported foreign investments of these centers. Significance at the 99%, 95%, and 90% level is denoted by three, two and one * respectively

Variable	Exp. Sign	Covariance with $\lambda = 0.97$		Covariance with $\lambda = 0.95$	
		Coefficient	t-stat	Coefficient	t-stat
risk tolerance (α)	+	0.43	*** 9.03	0.65	*** 23.02
Constant ($\log(\alpha) + c$)	?	-3.56	*** -17.32	-5.05	*** -23.19
Int. investment costs $C(H_i, F_i, A_{l,i})$					
<i>-1. Information-related</i>					
F_i English-speaking host	-	-0.34	-1.56	-0.33	-1.60
$A_{l,i}$ Common region	-	-0.03	-1.14	-0.04	-1.19
Common language	-	-0.18	*** -3.83	-0.15	*** -3.21
Log(distance)	+	0.07	*** 3.12	-0.08	*** -3.58
Bilateral imports	-	-0.04	*** -5.22	-0.06	*** -6.35
<i>-2. Explicit frictions</i>					
F_i Transaction costs, host	+	0.39	*** 12.17	0.33	*** 10.17
Dest. capital-import ctrls	+	0.98	*** 28.44	0.99	*** 27.45
H_i Transaction costs, home	-	0.05	*** 2.99	0.05	*** 2.52
Home capital-export ctrls	+	-0.02	*** -2.95	-0.02	*** -2.47
<i>-3. Fin. development</i>					
F_i (Bank+Cap)/GDP, abroad	-	0.02	1.18	0.06	*** 3.15
Liquidity abroad	-	-0.84	*** -3.31	-0.87	*** -3.36
<i>-4. Economic health and stability</i>					
F_i GDP, host	-	-13.10	*** -9.77	-14.01	*** -11.12
GDP-growth host	?	1.72	*** 14.16	1.63	*** 13.23
Misery index, host	+	0.01	*** 9.97	0.02	*** 19.76
Current acc deficit, host	+	0.05	*** 6.99	0.04	*** 5.76
Crisis, host	+	0.28	*** 11.78	0.12	*** 5.07
H_i Home GDP	?	0.08	0.86	0.06	0.54
$A_{l,i}$ Euroland	-	-0.16	*** -2.50	-0.10	* -1.78
<i>-5. Political risk and corporate governance</i>					
F_i ENF, host	+	0.02	*** 7.24	-0.05	*** -9.55
ACC, host	+	-0.08	*** -21.44	-0.08	*** -22.77
ENFACC, host	+	0.00	*** 19.91	0.00	*** 20.44
Government effect., host	-	-1.60	*** -13.99	-1.69	*** -12.15
Insider trading, host	-	-0.52	* -1.75	0.41	*** 3.25
TI CPI, host	-	-0.14	*** -5.33	0.56	1.05
<i>-6. Skewness</i>					
F_i Skewness, host	-	0.03	1.46	0.07	*** 3.25
Adjusted R^2		0.82		0.66	

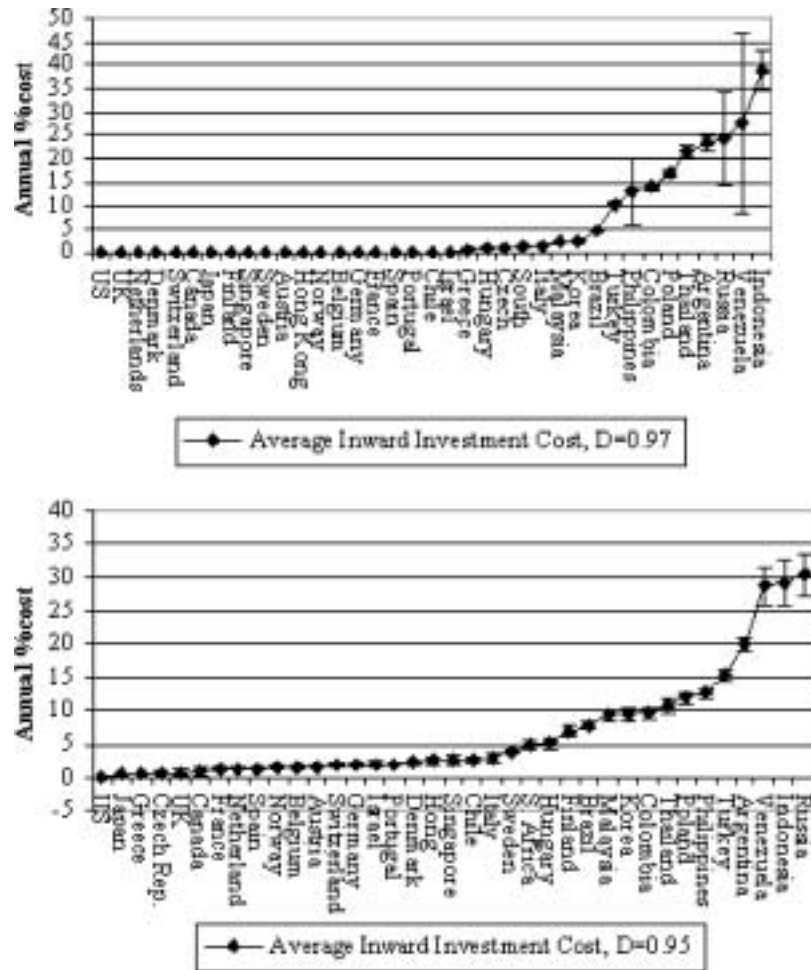


Figure 5. Annual Average Shadow Costs of Inward Investments, Exponentially Weighted Covariance Matrix

Covariance matrices are computed following the RiskMetrics method of exponential decay. We use decay factors of 0.97 and 0.95 respectively.

TI Corruption Perception Index. This probably means that a lower decay factor leads to noisier estimates of the variances since recent events get a lot of weight and less of the available past data set is used. Figure 5 shows that the estimated costs schedule for $\lambda = 0.95$ is flatter than the original one (with $\lambda = 1$): the estimated costs are higher for the industrialized countries and lower for the emerging countries. This reflects the fact that the emerging markets' high-volatility period (1997-1999) came earlier than that of OECD countries, 1999-2003.

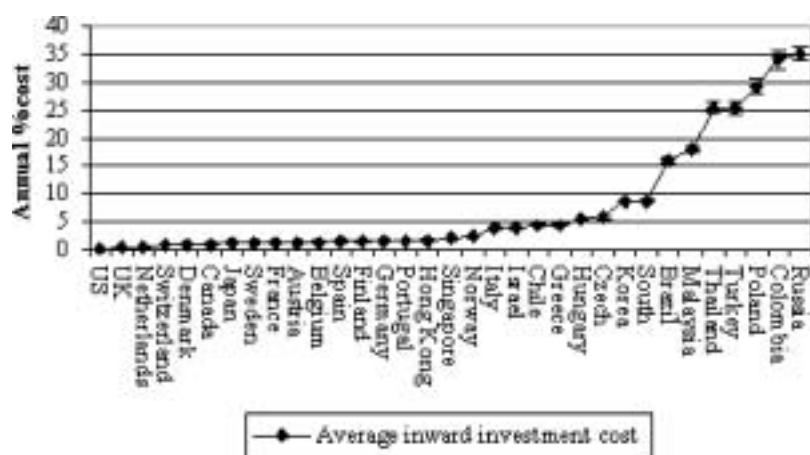


Figure 6. Annual Average Shadow Costs of Inward Investments, Omitting High Cost Countries

Omitted countries are Argentina, Indonesia, the Philippines and Venezuela.

As a second robustness check, we re-estimate the model omitting the countries that are estimated to have extremely high implicit inward costs of foreign investments, notably Argentina, Indonesia, the Philippines and Venezuela. Costs estimates are shown in Figure 6 and coefficient estimates and t-statistics are given in Table VI. The levels of the estimated costs hardly change if we exclude these countries. Average inward investment costs are now estimated in the range of 0.10 percent per annum for the US to 35 percent per annum for Russia. From Table VI, we can conclude that also the coefficients estimates and the overall fit of the model are not affected by the exclusion of the four high-cost countries. Exceptions are the coefficients for the financial crisis dummy and for the bilateral imports, that are no longer significantly different from zero.

4. Conclusion

In this paper we use actual portfolio holdings to estimate the implicit costs for an investor to diversify internationally. This integrates the work of Cooper and Kaplanis (1994) on costs of investments with the studies of determinants of international capital flows and yields a methodology that allows us to estimate the costs on inward and outward investment, their nature, and the universal risk tolerance parameter simultaneously. We also account for interaction effects between two countries. The technology is applied to a fairly wide cross section of countries, 38 of them, over four years. We also apply the original CK algorithm to a smaller cross section of nine countries over 19 years.

Table VI Coefficient Estimates and t-statistics, Omitting High Cost Countries

The estimated model is that of equation (8). The second column contains the GMM estimation results for the 2001-2004 sample with investments in financial off-shore centers reallocated proportional to the reported foreign investments of these centers. Argentina, Indonesia, the Philippines and Venezuela are excluded from the sample. Significance at the 99%, 95%, and 90% level is denoted by three, two and one * respectively

Variable	Exp. Sign	Robustness check		
		Coefficient		t-stat
risk tolerance (α)	+	0.78	***	5.48
Constant ($\log(\alpha) + c$)	?	-1.99	***	-7.55
Int. investment costs $C(H_i, F_i, A_{i,i})$				
<i>-1. Information-related</i>				
F_i English-speaking host	-	-0.10	*	-1.74
$A_{i,i}$ Common region	-	-0.45	***	-5.46
Common language	-	-0.62	***	-6.75
Log(distance)	+	0.13	***	3.28
Bilateral imports	-	0.00		0.10
<i>-2. Explicit frictions</i>				
F_i Transaction costs, host	+	0.16	**	2.42
Dest. capital-import ctrls	+	0.33	***	9.01
H_i Transaction costs, home	-	-0.29	***	-3.87
Home capital-export ctrls	+	-0.07	***	-2.62
<i>-3. Fin. development</i>				
F_i (Bank+Cap)/GDP, abroad	-	-0.11	***	-6.71
Liquidity abroad	-	-0.06	**	-2.07
<i>-4. Economic health and stability</i>				
F_i GDP, host	-	-6.41	***	-9.49
GDP-growth host	?	2.75	***	20.38
Misery index, host	+	0.01	***	9.56
Current acc deficit, host	+	0.05	***	25.67
Crisis, host	+	0.01		0.19
H_i Home GDP	?	0.51	***	3.15
$A_{i,i}$ Euroland	-	-0.04		-0.46
<i>-5. Political risk and corporate governance</i>				
F_i ENF, host	+	0.01		0.87
ACC, host	+	-0.03	***	-4.85
ENFACC, host	+	0.00	***	2.94
Government effect., host	-	-0.87	***	-13.79
Insider trading, host	+	-0.14		-0.55
TI CPI, host	-	-0.02	**	-2.13
<i>-6. Skewness</i>				
F_i Skewness, host	-	0.28	***	17.57
Adjusted R^2		0.87		

We confirm that the implicit costs to invest in less developed countries are substantially higher than the costs to invest in developed countries: investors seem to find early-stage countries too costly, even taking into account the advantages of low correlation with major markets and the positive skewness in the returns of emerging countries. These countries typically have less developed financial markets, a lower GDP, and higher inflation and unemployment rates than the industrialized countries. They are also more likely to have suffered from a financial crisis. Most emerging countries have underdeveloped information channels and procedures, which can increase the costs for both residents and foreigners to acquire information on certain companies, resulting in a total cost of foreign investment that is far higher than the explicit costs that are actually charged (transaction costs, withholding taxes). In fact, the bigger numbers seem implausibly high, suggesting a flaw in the model or in the risk estimates.

Our estimates of the implicit costs to invest in a developed country, in contrast, are substantially lower than estimates reported earlier (Cooper and Kaplanis, 1994; Coën, 2001; Glassman and Riddick, 2001). We show that the implicit costs have indeed been trending downward over the last two decades, at least for the nine countries that have data over this period. As a result, foreign investors that enter mainstream markets now face implicit investment costs below 1 percent per annum, and often substantially less.

Appendices

A1. Partitioning the Covariance Matrix to Extract the Demand for Stocks

Following Sercu (1980), the covariance matrix of risky asset returns is partitioned into:

$$\Omega = \begin{bmatrix} \Omega_S & \Omega_{SX} \\ \Omega'_{SX} & \Omega_X \end{bmatrix},$$

where Ω_S is the covariance matrix of the N stocks and Ω_X is the covariance matrix of the $N - 1$ exchange-rate changes. Familiarly, the inverse of the partitioned covariance matrix can then be interpreted as:

$$\Omega^{-1} = \begin{bmatrix} \Omega_{S|X}^{-1} & -\Omega_{S|X}^{-1} \Gamma' \\ -\Gamma \Omega_{S|X}^{-1} & \Omega_X^{-1} + \Gamma \Omega_{S|X}^{-1} \Gamma' \end{bmatrix},$$

where Γ' is a $N \times (N - 1)$ matrix, each row containing the $(N - 1)$ multivariate slope coefficients in the regression of the equity return indices on all exchange rate changes and $\Omega_{S|X}$ is the $N \times N$ covariance matrix of the errors of these N regressions. Thus, Γ is the matrix of Stein (1961), Johnson (1960) hedge ratios and

$\Omega_{S|X}$ is thus the covariance matrix of the stock returns hedged against exchange risk. This means that we can rewrite the first N rows in equation (3) as

$$x_n^l = \alpha \Omega_{S|X}^{-1} [(R_{e,S} - C^l) - \Gamma'(R_{e,X})] + (1 - \alpha) \Omega_{S|X}^{-1} w_{S|X}^l, \quad (11)$$

with $R_{e,S}$ the vector of excess equity returns, $R_{e,X}$ the vector of excess currency returns (including foreign interest) and $w_{S|X}^l$ the vector of the covariances of investor l 's rate of inflation with the N hedged stock returns.

A2. Description of the Instruments Used to Estimate and Explain the Implicit Costs of International Investments

A2.1 INFORMATION ASYMMETRIES

Geographical Proximity

Distance. The physical distance between countries is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities or agglomerations (in terms of population). Our source is the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII).

Same-region indicator. The regional classification of the countries is as follows:

- North America: Canada, United States, Mexico
- South America: Argentina, Brazil, Chile, Colombia, Venezuela
- Southern Africa: South Africa
- Northern Europe: Denmark, Finland, Norway, Sweden
- Eastern Europe: Hungary, Poland, Czech Republic, Russian Federation
- Southern Europe: Greece, Italy, Portugal, Spain
- Western Europe: Austria, Belgium, France, Germany, the Netherlands, Switzerland, UK
- East Asia: Hong Kong, Japan, South Korea
- South East Asia: Indonesia, Malaysia, Philippines, Singapore, Thailand
- West Asia: Israel, Turkey.

Cultural Proximity

English-language dummy. We add an indicator that equals unity if the host country has English as official language. English being the dominant world language, information flows more easily from these countries than towards them, so this lowers the cost of investing into them.

Common-language indicator. We include a dummy variable which is equal to unity if two countries share a common language, and expect it to have a negative

effect on the costs of international investments. The language dummies are also from CEPIL.

Bilateral imports. We add the bilateral imports of country l from country i relative to the GDP of country l . Data on bilateral imports are from Datastream.

A2.2 EXPLICIT FRICTIONS

Transaction Costs

We use *transaction cost* data provided by Elkins/McSherry Co., Inc., published in Institutional Investor and Degryse and Van Achter (2002). The Elkins/McSherry costs are average total trading costs including execution commissions, fees and market impact costs (the difference between the price of a stock trade and the average of that stock's high, low, opening and closing prices during the day) as a percentage of trade value for active managers. For the Russian Federation there was no data available, so we approximated the transaction costs in Russia by the average of trading costs in the Czech Republic, Poland and Hungary.

Direct Controls on Capital Flows

We want a separate index for outward and inward controls, that can also account for the intensity of capital controls. Therefore, we use the 0/1 dummies provided by the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The AREAER capital account transactions are subdivided into fourteen categories. Following Miniane (2004), we add a fifteenth category. For each of the subdivisions, it is noted if there are capital controls on inflows and/or on outflows. For each subdivision, we distinguish between prohibitions (score 6), need of prior approval of authorization (score 3), a limitation on the contract agreement (score 2) or a notification (score 1). Many countries impose the specific provisions to commercial banks and institutional investors, notably limitations on the percentage of the total portfolio that can be held abroad. We apply following scores for these subdivisions: a score of 6 for prohibitions to hold foreign investments, a score of 5 when foreign investments are limited to 10% or less of the total portfolio, a score of 4 when foreign investments are limited to 20% or less of the total portfolio, and so on. A score of 1 is given when institutions are limited to hold 50% or more of their total assets in foreign securities. A country receives a score of 0 if there is no limitation at all.

The capital account transactions are subdivided the following categories:

- Capital market securities: shares or other securities of a participating nature
- Capital market securities: bonds or other debt securities
- Money market instruments

- Collective investment securities
- Derivatives and other instruments
- Commercial credit operations
- Financial credit operations
- Guarantees, suretees, and financial backup facilities
- Direct investment
- Liquidation of direct investment (only for outflows)
- Real estate transactions
- Personal capital transactions
- Commercial banks and other credit institutions
- Institutional investors

The fifteenth category accounts for the presence of multiple exchange rate regimes. For the index on capital outflows, we add an extra score if the country imposes differential (more restrictive) reserve requirements on foreign holdings.

A2.3 FINANCIAL DEVELOPMENT

Our first measure for financial development is equal to the sum of domestic credit provided by the banking sector and stock market capitalization divided by GDP. Market cap is obtained from the World Federation of Exchanges, and annual data on the domestic credit provided by the banking sector are from World Development Indicators and the IFS Database.

Our second measure for financial development is stock market *liquidity*. We measure liquidity as the ratio of annual turnover over market capitalization. Annual turnover is obtained from Datastream.

A2.4 ECONOMIC HEALTH AND STABILITY

Host-country GDP, Home-country GDP. As a measure of market size of the host (home) country, we use its GDP relative to the total world GDP. GDP data are from Datastream.

Host-country GDP growth. GDP-growth of the host country is measured as the mean rate over the preceding three years.

Host-country misery index. A country's misery index is the sum of its inflation and unemployment rates and measures a country's degree of macro-economic distress, which adds to uncertainty about future policy and hence to information costs. Unemployment and inflation rates are from the IMF.

Host-country current account balance/GDP. As a measure of the macroeconomic trade policy we use the ratio of a country's current account balance to its GDP. Data are from the IMF.

Financial-crisis indicator. Some countries suffered from a financial crisis in the recent past: Argentina (2002), Brazil (1999), Mexico (1997), the Asian countries (1997), Russia (1998) and Venezuela (1997). For the host country, a recent crisis adds to uncertainty and increases the shadow cost of investing to them. For the home country a recent crisis lowers the differential information cost of moving funds out.

Euroland indicator. Lastly, we create a Euro-dummy for the ten countries in our sample that share the same currency.

A2.5 POLITICAL RISK AND CORPORATE GOVERNANCE

We make a distinction between country-level and firm-level governance variables and allow for an interaction term between country-level and firm-level governance. We include two corporate governance variables and three country-level governance variables.

A first measure for corporate governance is the *ACC Index*, that captures the effect of accounting practices and corporate governance. The ACC Index is a subindex of the Opacity Index developed by PricewaterhouseCoopers and the Kurtzman Group.¹⁰ It captures accounting standards, banking inspections and shareholder concentration. Higher levels on the ACC Index correspond to lower quality of accounting practices and corporate governance. As a second corporate governance indicator, we use the *Insider Trading Index* obtained from the Global Competitiveness Report, that indicates whether insider trading in a country is in a range from pervasive (score of 1) to extremely rare (score of 7). Thus, we expect a negative (positive) correlation between the Insider Trading Index (ACC Index) and the implicit costs of inward investments.

A first public governance indicator is the *Transparency International Corruption Perception Index (TI CPI)*.¹¹ The TI CPI ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. It is a survey-based composite index that reflects the views of business people and analysts from around the world. Higher values on this index indicate low perceived corruption, thus for the host (home) we expect this variable to correlate negatively (positively) with investment costs. A second measure for country level governance is the *Government Effectiveness Index* developed by Kaufmann et al. (2006). This index tries to capture the effects of the quality of government institutions in general; and in particular the quality of public services, the quality of the civil service and the

¹⁰ www.opacityindex.com. and www.kurtzmangroup.com

¹¹ <http://www.transparency.org/>

degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Data can be obtained from <http://www.govindicators.org>. A higher level on the Government Effectiveness Index corresponds to higher quality of public institutions, thus we expect this variable to correlate negatively with the implicit costs of foreign investments. A third measure for country-level governance is the *ENF Index*, which is also a subindex of the PwC Opacity Index, and measures the extent of economic policy opacity. Higher values on this index correspond to higher values of economic policy opacity, thus we expect a positive correlation with implicit inward investment costs.

Lastly, we create an interaction term between country-level and firm-level governance, ENF^*ACC . Doidge et al. (2004) and Stulz (2005) suggest the importance of this interaction term by stating that in certain circumstances, corporate governance and country-level governance are complements. In contrast, Klapper and Love (2005) find that companies tend to compensate bad country-level governance with better corporate governance.

A2.6 SKEWNESS

In addition to the instruments above, we add the standardized *skewness* for the return of the host-country, to capture non-gaussian features in the distribution. We expect that investors prefer positive skewness in returns, thus this variable is expected to have a negative effect on investment costs. The correlation matrix for the instruments is found in Tables VII-VIII. There are isolated cases of high correlation (above 0.5) between distance and the same-region dummy; trading costs and liquidity; financial development and government effectiveness; and misery index and corruption (TI CPI). There are clusters of high correlation of either trading costs or capital controls or government-policy opacity (ENF) or skewness with Government effectiveness, insider trading and corruption (all host); and there are very high correlations between corruption, government effectiveness, and insider trading.

A3. Estimates of the Annual Percentage Shadow Cost of International Investment

Each column of Table IX corresponds to the country of investment (host country), each row to an investing country (home country). For example, the second entry of the first row says that for the period 2001-2004, an Argentine investor faces an implicit investment cost of 0.13 percent per annum to invest in Austrian shares.

Table VII Correlation Matrix Cost-related Instruments

	English	Region	Language	Distance	Import	Costs Host	Controls Inflows	Costs Home	Controls Outflows	Findev Host	Liquidity Host
English	1.00										
Region	-0.02	1.00									
Language	0.15	0.25	1.00								
Distance	0.03	-0.50	-0.09								
Import	0.18	0.29	0.22	-0.32	1.00						
Costs, host	-0.18	-0.01	0.02	0.26	-0.21	1.00					
Controls, inflows	-0.25	-0.02	-0.09	0.19	-0.15	0.41	1.00				
Costs, home	0.00	-0.01	0.02	0.26	0.00	-0.03	-0.01	1.00			
Controls, outflows	0.01	-0.02	-0.07	0.25	-0.02	-0.01	-0.03	0.48	1.00		
Findev, host	0.16	0.01	0.12	-0.03	0.12	-0.36	-0.45	0.01	0.01	1.00	
Liquidity, host	0.22	-0.01	-0.03	-0.17	0.23	-0.55	-0.34	0.02	0.01	0.25	1.00
GDP, host	0.58	-0.03	0.05	0.05	0.37	-0.30	-0.22	0.01	0.01	0.14	0.42
GDP, growth	-0.02	-0.01	-0.05	0.03	-0.08	0.24	0.27	-0.01	-0.01	0.14	0.42
Misery Index	-0.15	-0.03	-0.01	0.09	-0.13	0.34	0.36	-0.01	-0.01	-0.50	-0.19
Current acc balance	-0.17	0.02	0.06	0.09	-0.01	0.03	-0.03	0.00	0.00	0.23	-0.11
Crisis, host	-0.14	0.01	-0.04	0.22	-0.02	0.19	0.46	-0.01	-0.01	-0.28	-0.25
GDP, home	-0.02	-0.03	0.05	0.05	-0.08	0.01	0.01	-0.30	-0.28	-0.01	-0.01
Euroland	-0.08	0.24	0.03	-0.36	0.16	-0.16	-0.19	-0.16	-0.22	0.04	0.15
ENF, host	-0.07	0.00	-0.02	0.13	-0.07	0.40	0.34	-0.01	-0.01	-0.52	-0.36
ACC, host	-0.22	-0.01	-0.08	-0.12	-0.13	-0.04	0.14	0.00	0.00	-0.11	0.01
ENFACC, host	-0.21	-0.01	-0.08	-0.01	-0.12	0.23	0.31	-0.01	-0.01	-0.46	-0.23
Government effect	0.29	0.03	0.08	-0.24	0.16	-0.59	-0.71	0.02	0.02	0.62	0.41
Insider trading	0.39	0.03	0.09	-0.18	0.20	-0.56	-0.58	0.02	0.02	0.51	0.38
TI CPI, host	0.28	0.02	0.09	-0.19	0.14	-0.53	-0.77	0.01	0.02	0.61	0.32
Skewness	-0.29	-0.03	-0.10	0.14	-0.10	0.35	0.60	-0.01	-0.01	-0.24	-0.15

Table VIII Correlation Matrix Cost-related Instruments, Continued

	GDP host	GDP Growth	Misery Index	Current Acc balance	Crisis host	GDP home	Euro	ENF host	ACC host	ENFACC host	Government effect	Insider trading	TI CPI host	Skewness
English														
Region														
Language														
Distance														
Import														
Costs, host														
Controls, inflows														
Costs, home														
Controls, outflows														
Findev, host														
Liquidity, host														
GDP, host	1.00													
GDP, growth	-0.08	1.00												
Misery Index	-0.17	0.17	1.00											
Current acc balance	-0.19	0.02	-0.10	1.00										
Crisis, host	-0.06	0.15	0.16	0.23	1.00									
GDP, home	-0.03	0.00	0.01	0.00	0.01	1.00								
Euroland	-0.01	-0.06	-0.06	-0.10	-0.13	-0.01	1.00							
ENF, host	-0.09	0.32	0.33	-0.12	0.20	0.00	-0.02	1.00						
ACC, host	-0.22	0.10	0.15	-0.21	-0.01	0.01	0.09	-0.02	1.00					
ENFACC, host	-0.19	0.25	0.33	-0.26	0.12	0.01	0.08	0.64	0.72	1.00				
Government effect	0.21	-0.34	-0.65	0.14	-0.47	-0.01	0.15	-0.60	-0.14	-0.51	1.00			
Insider trading	0.32	-0.26	-0.43	0.10	-0.29	-0.01	0.11	-0.55	-0.18	-0.51	0.79	1.00		
TI CPI, host	0.19	-0.35	-0.59	0.22	-0.43	-0.01	0.12	-0.59	-0.23	-0.57	0.94	0.83	1.00	
Skewness	-0.18	0.15	0.15	0.00	0.29	0.01	-0.13	0.28	0.21	0.35	-0.50	-0.48	-0.54	1.00

Table IX Estimated Annual Percentage Shadow Cost of International Investment, Averaged Over 2001-2004

Home	Host Countries												
	Argentina	Austria	Belgium	Brazil	Canada	Chile	Colombia	Czech Rep	Denmark	Finland	France	Germany	Greece
Argentina		0.13	0.26	1.61	0.11	0.50	4.26	1.59	0.09	0.19	0.15	0.29	0.86
Austria	23.88		0.09	3.84	0.11	1.38	8.95	0.89	0.06	0.13	0.06	0.04	0.57
Belgium	24.50	0.05		3.84	0.10	1.42	9.13	1.13	0.06	0.13	0.03	0.04	0.64
Brazil	10.88	0.13	0.26		0.11	0.70	5.14	1.60	0.09	0.19	0.15	0.29	0.87
Canada	23.36	0.13	0.22	3.78		1.33	8.08	1.59	0.09	0.19	0.12	0.28	0.89
Chile	6.12	0.11	0.23	1.52	0.09		3.62	1.40	0.08	0.17	0.13	0.25	0.76
Colombia	10.22	0.12	0.24	1.91	0.09	0.57		1.44	0.08	0.17	0.13	0.26	0.79
Czech Rep	22.31	0.06	0.16	3.58	0.11	1.29	8.34		0.05	0.13	0.09	0.08	0.63
Denmark	23.90	0.09	0.18	3.87	0.11	1.39	8.95	1.09		0.09	0.10	0.15	0.71
Finland	24.81	0.09	0.18	3.98	0.12	1.43	9.18	1.23	0.04		0.10	0.17	0.65
France	25.36	0.06	0.08	4.05	0.10	1.46	9.42	1.22	0.07	0.14		0.10	0.66
Germany	24.91	0.05	0.07	3.99	0.12	1.44	9.31	1.08	0.06	0.13	0.05		0.65
Greece	21.77	0.08	0.17	3.50	0.11	1.26	8.28	1.13	0.06	0.13	0.09	0.17	
Hong Kong	25.34	0.13	0.26	4.11	0.10	1.46	9.69	1.61	0.09	0.19	0.14	0.27	0.87
Hungary	21.79	0.06	0.17	3.45	0.10	1.26	8.19	0.59	0.06	0.13	0.09	0.09	0.59
Indonesia	21.82	0.12	0.25	3.60	0.11	1.25	8.77	1.47	0.08	0.17	0.14	0.27	0.79
Israel	21.99	0.10	0.19	3.54	0.09	1.28	8.39	1.23	0.07	0.15	0.12	0.21	0.59
Italy	24.58	0.08	0.17	3.93	0.12	1.42	9.27	1.19	0.07	0.14	0.09	0.17	0.39
Japan	28.30	0.15	0.30	4.66	0.13	1.60	10.52	1.81	0.10	0.21	0.17	0.34	0.99

Table IX Estimated Annual Percentage Shadow Cost of International Investment, Averaged Over 2001-2004 (continued)

Home	Host Countries												
	Argentina	Austria	Belgium	Brazil	Canada	Chile	Colombia	Czech Rep	Denmark	Finland	France	Germany	Greece
Korea	23.36	0.12	0.24	3.79	0.11	1.32	8.67	1.46	0.08	0.17	0.14	0.26	0.80
Malaysia	21.47	0.12	0.24	3.55	0.11	1.25	8.64	1.43	0.08	0.17	0.13	0.23	0.77
Netherlands	24.52	0.06	0.06	3.84	0.11	1.42	9.17	1.14	0.06	0.13	0.05	0.06	0.65
Norway	24.45	0.10	0.20	3.92	0.11	1.41	9.05	1.20	0.04	0.09	0.11	0.20	0.75
Philippines	21.25	0.11	0.23	3.53	0.09	1.22	8.23	1.39	0.08	0.16	0.13	0.25	0.75
Poland	21.85	0.08	0.17	3.50	0.10	1.26	8.18	0.61	0.05	0.12	0.10	0.14	0.62
Portugal	22.94	0.09	0.17	3.06	0.11	1.34	8.57	1.31	0.07	0.14	0.09	0.16	0.43
Russia	23.57	0.10	0.21	3.76	0.11	1.36	8.83	0.81	0.07	0.13	0.12	0.21	0.69
Singapore	23.74	0.13	0.25	3.84	0.10	1.37	9.44	1.56	0.09	0.18	0.13	0.23	0.84
South Africa	19.45	0.12	0.24	3.15	0.10	1.15	8.12	1.46	0.08	0.17	0.13	0.23	0.78
Spain	19.72	0.09	0.17	3.73	0.11	1.15	7.42	1.27	0.07	0.14	0.08	0.17	0.43
Sweden	24.76	0.10	0.20	3.98	0.12	1.42	9.19	1.20	0.04	0.07	0.11	0.18	0.74
Switzerland	24.14	0.05	0.10	3.87	0.10	1.39	9.02	1.10	0.06	0.14	0.05	0.09	0.70
Thailand	22.09	0.12	0.24	3.64	0.11	1.29	8.73	1.43	0.08	0.17	0.13	0.24	0.77
Turkey	23.88	0.10	0.21	3.83	0.12	1.38	9.06	1.23	0.07	0.15	0.12	0.20	0.57
UK	23.99	0.07	0.11	3.84	0.09	1.38	8.89	1.18	0.06	0.15	0.06	0.12	0.73
US	27.63	0.16	0.31	4.47	0.05	1.58	9.54	1.90	0.10	0.23	0.18	0.34	1.06
Venezuela	8.46	0.09	0.19	1.55	0.07	0.48	2.45	1.15	0.06	0.14	0.11	0.21	0.64
Average	21.86	0.10	0.19	3.54	0.10	1.27	8.30	1.28	0.07	0.15	0.11	0.19	0.71
Std. dev.	5.02	0.03	0.06	0.74	0.01	0.27	1.72	0.29	0.02	0.03	0.03	0.08	0.14

Argentina	0.60	0.57	40.69	0.84	0.22	0.29	2.10	4.61	0.04	0.41	28.54	4.15	0.14
Austria	0.57	0.30	41.11	0.70	0.12	0.28	1.97	4.54	0.02	0.31	27.85	2.71	0.10
Belgium	0.60	0.43	42.47	0.73	0.13	0.26	2.04	4.74	0.01	0.30	29.15	3.14	0.10
Brazil	0.62	0.58	42.15	0.85	0.22	0.29	2.13	4.75	0.04	0.41	29.59	4.19	0.12
Canada	0.52	0.58	44.56	0.74	0.22	0.27	2.06	4.94	0.04	0.39	25.14	4.15	0.14
Chile	0.53	0.50	35.52	0.74	0.19	0.24	1.76	4.03	0.03	0.36	24.90	3.66	0.12
Colombia	0.56	0.52	39.56	0.78	0.20	0.25	1.86	4.44	0.03	0.37	26.60	3.77	0.12
Czech Rep	0.54	0.22	38.36	0.66	0.13	0.25	1.83	4.16	0.02	0.28	25.92	1.55	0.11
Denmark	0.58	0.42	41.39	0.73	0.17	0.28	1.96	4.58	0.02	0.17	27.98	2.78	0.12
Finland	0.58	0.45	41.47	0.75	0.16	0.27	1.97	4.59	0.03	0.19	28.06	3.01	0.11
France	0.63	0.46	44.58	0.79	0.14	0.30	2.14	4.94	0.01	0.33	30.27	3.38	0.10
Germany	0.61	0.43	43.74	0.77	0.14	0.28	2.08	4.82	0.01	0.30	29.45	3.08	0.10
Greece	0.52	0.39	37.12	0.57	0.08	0.25	1.73	4.11	0.02	0.31	25.44	2.96	0.07
Hong Kong		0.58	32.74	0.69	0.21	0.08	0.79	2.68	0.04	0.41	15.68	4.16	0.15
Hungary	0.52		36.92	0.63	0.11	0.22	1.73	3.95	0.02	0.29	24.71	1.57	0.11
Indonesia	0.43	0.53		0.75	0.21	0.20	1.53	1.90	0.04	0.38	13.57	3.80	0.14
Israel	0.42	0.43	36.63		0.16	0.25	1.77	4.05	0.03	0.33	21.32	3.19	0.12
Italy	0.61	0.42	42.89	0.72		0.29	2.07	4.76	0.03	0.34	29.29	3.26	0.07
Japan	0.36	0.65	40.96	0.95	0.26		1.07	4.57	0.04	0.46	25.61	4.67	0.17

Table IX Estimated Annual Percentage Shadow Cost of International Investment, Averaged Over 2001-2004 (continued)

Home	Host Countries												
	Hong Kong	Hungary	Indonesia	Israel	Italy	Japan	Korea	Malaysia	Netherlands	Norway	Philippines	Poland	Portugal
Korea	0.28	0.52	32.17	0.77	0.20	0.09		3.57	0.04	0.37	20.36	3.76	0.14
Malaysia	0.31	0.51	15.03	0.73	0.19	0.10	1.29		0.03	0.37	11.62	3.69	0.13
Netherlands	0.60	0.44	42.53	0.76	0.15	0.26	2.02	4.56		0.30	28.47	3.14	0.10
Norway	0.58	0.45	42.09	0.76	0.18	0.28	1.98	4.66	0.03		28.33	3.08	0.12
Philippines	0.27	0.50	18.02	0.60	0.20	0.12	1.15	1.95	0.03	0.35		3.59	0.13
Poland	0.52	0.23	37.14	0.64	0.14	0.25	1.76	4.10	0.02	0.27	25.16		0.11
Portugal	0.60	0.48	42.10	0.76	0.09	0.28	2.03	4.68	0.03	0.34	28.71	3.48	
Russia	0.54	0.29	39.08	0.69	0.18	0.26	1.83	4.31	0.03	0.31	26.31	1.98	0.12
Singapore	0.33	0.56	18.06	0.67	0.21	0.10	1.35	0.40	0.04	0.40	10.44	4.05	0.14
South Africa	0.45	0.52	36.03	0.63	0.20	0.25	1.88	4.05	0.03	0.38	21.81	3.82	0.13
Spain	0.60	0.47	42.02	0.75	0.09	0.28	2.03	4.70	0.03	0.34	28.84	3.45	0.05
Sweden	0.58	0.45	42.17	0.75	0.18	0.28	1.99	4.66	0.03	0.16	28.41	2.94	0.13
Switzerland	0.58	0.42	42.26	0.73	0.13	0.28	2.02	4.68	0.02	0.28	28.71	3.07	0.11
Thailand	0.39	0.51	18.33	0.72	0.20	0.12	1.41	1.72	0.03	0.37	12.65	3.70	0.13
Turkey	0.57	0.42	40.03	0.41	0.15	0.27	1.91	4.42	0.03	0.34	27.44	3.15	0.12
UK	0.49	0.45	42.20	0.64	0.17	0.27	2.00	4.66	0.02	0.30	24.17	3.23	0.11
US	0.63	0.69	53.78	0.88	0.27	0.33	2.49	5.93	0.05	0.48	30.21	4.99	0.17
Venezuela	0.45	0.42	32.28	0.63	0.16	0.21	1.55	3.60	0.03	0.29	21.72	3.03	0.10
Average	0.52	0.47	37.73	0.72	0.17	0.24	1.81	4.10	0.03	0.33	24.79	3.37	0.12
Std. Dev.	0.10	0.10	8.33	0.09	0.04	0.07	0.35	1.09	0.01	0.07	5.54	0.73	0.02

Argentina	15.16	0.14	1.64	0.12	0.19	0.13	15.77	3.18	0.03	0.01	16.50	4.06	8.80
Austria	11.55	0.14	1.83	0.10	0.14	0.05	15.14	2.37	0.01	0.01	33.58	5.15	10.29
Belgium	12.80	0.15	1.88	0.09	0.14	0.05	15.56	2.66	0.01	0.01	34.19	5.35	10.62
Brazil	15.32	0.15	1.68	0.14	0.19	0.13	16.21	3.21	0.03	0.01	19.65	4.53	9.27
Canada	15.16	0.13	1.68	0.14	0.19	0.11	16.56	3.26	0.02	0.00	30.36	5.32	10.31
Chile	13.35	0.12	1.46	0.10	0.17	0.11	13.80	2.80	0.02	0.01	14.16	3.70	7.67
Colombia	13.75	0.14	1.64	0.11	0.17	0.12	14.88	2.92	0.02	0.01	11.65	3.90	8.34
Czech Rep	6.48	0.13	1.72	0.10	0.13	0.08	14.13	2.28	0.02	0.01	31.35	4.65	9.57
Denmark	11.77	0.14	1.87	0.12	0.07	0.09	15.25	2.57	0.02	0.01	33.54	5.20	10.33
Finland	9.60	0.14	1.91	0.11	0.06	0.11	15.28	2.65	0.02	0.01	34.76	5.23	10.45
France	13.25	0.15	1.97	0.09	0.16	0.05	16.49	2.79	0.01	0.01	35.33	5.59	11.06
Germany	12.44	0.15	1.94	0.10	0.15	0.05	16.13	2.68	0.01	0.01	34.74	5.45	10.84
Greece	10.43	0.13	1.65	0.06	0.14	0.09	13.69	1.90	0.02	0.01	31.09	4.71	9.39
Hong Kong	14.56	0.07	1.59	0.15	0.19	0.12	10.58	3.16	0.02	0.01	36.86	4.72	9.25
Hungary	5.82	0.12	1.67	0.10	0.13	0.08	13.50	2.10	0.02	0.01	30.76	4.49	9.25
Indonesia	13.46	0.05	1.62	0.13	0.17	0.12	7.14	2.87	0.03	0.01	33.36	3.37	7.02
Israel	11.36	0.10	1.37	0.11	0.15	0.09	13.34	1.40	0.02	0.01	31.73	4.62	9.17
Italy	12.55	0.15	1.88	0.06	0.16	0.08	15.88	2.50	0.02	0.01	34.76	5.40	10.72
Japan	16.41	0.14	2.19	0.17	0.21	0.15	15.18	3.59	0.03	0.01	40.10	5.76	11.02

Table IX Estimated Annual Percentage Shadow Cost of International Investment, Averaged Over 2001-2004 (continued)

Home	Host Countries												Std. Dev.
	Russia	Singapore	S. Africa	Spain	Sweden	Switzerland	Thailand	Turkey	UK	US	Venezuela	Average	
Korea	13.00	0.11	1.77	0.14	0.17	0.12	12.00	2.89	0.03	0.01	33.04	4.61	8.89
Malaysia	13.00	0.02	1.59	0.13	0.17	0.11	5.53	2.78	0.02	0.01	32.73	3.56	7.08
Netherlands	12.18	0.14	1.90	0.10	0.14	0.06	15.67	2.69	0.01	0.01	34.40	5.33	10.59
Norway	11.78	0.14	1.91	0.12	0.07	0.10	15.50	2.70	0.02	0.01	34.01	5.29	10.48
Philippines	12.47	0.05	1.37	0.13	0.16	0.11	6.54	2.74	0.02	0.01	31.40	3.31	6.92
Poland	6.07	0.13	1.68	0.10	0.12	0.09	13.67	2.19	0.02	0.01	30.73	4.50	9.32
Portugal	13.22	0.14	1.81	0.03	0.16	0.10	15.64	2.74	0.02	0.01	31.91	5.22	10.31
Russia		0.13	1.81	0.12	0.14	0.10	14.29	2.43	0.02	0.01	33.23	4.67	9.90
Singapore	14.13		1.48	0.14	0.18	0.11	5.36	3.04	0.02	0.00	35.69	3.86	7.76
South Africa	13.92	0.11		0.13	0.18	0.12	13.79	2.86	0.02	0.01	30.87	4.65	9.00
Spain	13.09	0.14	1.82		0.16	0.10	15.68	2.70	0.02	0.01	27.66	4.99	9.85
Sweden	11.42	0.14	1.92	0.12		0.10	15.48	2.66	0.02	0.01	34.43	5.31	10.54
Switzerland	12.46	0.14	1.87	0.11	0.15		15.59	2.58	0.01	0.01	33.71	5.30	10.51
Thailand	12.88	0.06	1.64	0.13	0.17	0.11		2.80	0.02	0.01	33.10	3.62	7.37
Turkey	10.55	0.14	1.79	0.12	0.15	0.10	14.78		0.02	0.01	34.08	5.05	10.19
UK	12.63	0.12	1.57	0.11	0.15	0.06	15.57	2.68		0.01	33.31	5.16	10.20
US	18.15	0.15	2.00	0.17	0.23	0.15	19.97	3.89	0.03		35.18	6.34	12.30
Venezuela	11.10	0.11	1.34	0.08	0.14	0.09	12.09	2.35	0.02	0.01		2.98	6.71
Average	12.42	0.12	1.73	0.11	0.15	0.10	13.93	2.71	0.02	0.01	31.33		
Std. Dev.	2.56	0.03	0.19	0.03	0.04	0.03	3.21	0.45	0.01	0.00	6.15		

The standard deviation is a descriptive cross-country sigma for the column or row.

A4. Standard Errors for the Estimated Average Inward Investment Costs

We calculate a standard error for the average cost of a host country i . We do this, as standard, using a first-order Taylor approximation, see Equation (12) below, to the exponential cost function used for each country pair. The result is, of course, just a special case of the general Jacobian method. As before, i refers to the host country and l to the investor's home country. k refers to the regressor; N denotes the number of home countries; $\mathbf{B}$ denotes the vector of regression coefficients β_k , $k = 1, \dots, K$; and hats denote estimates.

$$C_{l,i}(\hat{\mathbf{B}}) \approx C_{l,i}(\mathbf{B}) + \sum_{k=1}^K \frac{\partial C_{l,i}(\mathbf{B})}{\partial \beta_k} \Big|_{\mathbf{B}} \cdot (\hat{\beta}_k - \beta_k), \quad (12)$$

where

$$\begin{aligned} C_{l,i}(\mathbf{B}) &:= \exp \left(\sum_{k=1}^K \beta_k x_{l,i,k} \right); \\ \Rightarrow C_{l,i}(\hat{\mathbf{B}}) - C_{l,i}(\mathbf{B}) &\approx \sum_{k=1}^K \exp \left(\sum_{k=1}^K \beta_k x_{l,i,k} \right) x_{l,i,k} (\hat{\beta}_k - \beta_k), \\ &= C_{l,i}(\mathbf{B}) \sum_{k=1}^K x_{l,i,k} (\beta_k - \hat{\beta}_k). \end{aligned} \quad (13)$$

This allows us to specify the error in the mean cost for destination country i across all origin countries l :

$$\begin{aligned} \Rightarrow \frac{\sum_{l=1}^N (C_{l,i}(\hat{\mathbf{B}}) - C_{l,i}(\mathbf{B}))}{N} &= \frac{\sum_{l=1}^N C_{l,i}(\mathbf{B}) \sum_{k=1}^K x_{l,i,k} (\hat{\beta}_k - \beta_k)}{N}, \\ &= \sum_{k=1}^K v_{i,k} (\hat{\beta}_k - \beta_k), \end{aligned} \quad (14)$$

where $v_{i,k} := N^{-1} \sum_{l=1}^N C_{l,i}(\mathbf{B}) \cdot x_{l,i,k}$. Denoting the $1 \times K$ vector of v 's by $\mathbf{V}$ and the covariance matrix of the estimated betas by $\mathbf{W}_B$, we get

$$\text{var}(\bar{C}_i) = \mathbf{V}' \mathbf{W}_B \mathbf{V}. \quad (15)$$

References

- Adler, M. and Dumas, B. (1983) International Portfolio Choice and Corporation Finance: A Synthesis, *Journal of Finance* **38**, 925–984.
- Ahearne, Alan, Grier, G., and W. L. Warnock, F. E. (2004) Information costs and home bias: an analysis of U.S. holdings of foreign equities, *Journal of International Economics* **62**, 313–336.
- Apte, P., Sercu, P., and Uppal, R. (2004) The exchange rate and purchasing power parity: extending the theory and tests, *Journal of International Money and Finance* **23**, 553–571.
- Baxter, Marianne and Urban J. and Jermann (1997) The international diversification puzzle is worse than you think, *American Economic Review* **87**, 170–180.
- Beck, N. and Katz, J. N. (1995) What to do (and not to do) with Time-Series Cross-Section Data, *The American Political Science Review* **89**, 634–647.
- Bekaert, G. and Harvey, C. R. (1997) Emerging equity market volatility, *Journal of Financial Economics* **43**, 29–77.
- Bekaert, G., Erb, C. B., Harvey, C. R., Viskanta, T. E. (1998) Distributional Characteristics of Emerging Market Returns and Asset Allocation, *Journal of Portfolio Management* **24**, 102–116.
- Bekaert, G. and Harvey, C. R. (2000) Foreign Speculators and Emerging Equity Markets, *Journal of Finance* **55**, 565–613.
- Berkel, Barbara (2007) Institutional Determinants of International Equity Portfolios – A Country-Level Analysis, *The B.E. Journal of Macroeconomics* **7**, Article 34.
- Bottazzi, L., Pesenti, P., and van, Wincoop E. (1996) Wages, Profits, and the International Portfolio Puzzle, *European Economic Review* **40**, 219–254.
- Brennan, M. J. and Cao, H. H. (1997) International Portfolio Investment Flows, *Journal of Finance* **52**, 1851–1880.
- Brennan, M. J. and Aranda, C. (1999) What Makes Hot Money Hot? The Relative Volatility of International Flows of Debt and Equity Capital, *Review of Pacific Basin Financial Markets and Policies* **2**, 427–451.
- Chan, K., Covrig, V., Ng, L. (2005) What Determines the Domestic Bias and Foreign Bias? Evidence from Mutual Fund Equity Allocations Worldwide, *Journal of Finance* **60**, 1495–1534.
- Coën, A. (2001) Home Bias and International Capital Asset Pricing Model with Human Capital, *Journal of Multinational Financial Management* **11**, 497–513.
- Cooper, I. A. and Kaplanis, E. (1994) Home Bias in Equity Portfolios, Inflation Hedging, and International Capital Market Equilibrium, *Review of Financial Studies* **7**, 45–60.
- Cooper, I. A. and Kaplanis, E. (2000) Partially segmented international capital markets and international capital budgeting, *Journal of International Money and Finance* **19**, 309–329.
- Coval, J. and Moskowitz, T. (1999) Home bias at home: Local equity preference in domestic portfolios, *Journal of Finance* **54**, 2045–2073.
- Dahlquist, M., Pinkowitz, L., Stulz, R., and Williamson, R. (2003) Corporate Governance and The Home Bias, *Journal of Financial and Quantitative Analysis* **38**, 87–110.
- Degryse, H. and Van Achter, M. (2002) Alternative trading systems and liquidity, in Balling, M., Lierman, F., Mullineux, A. (ed.): *Technology and finance: Challenges for financial markets, business strategies and policy makers*, (Routledge London & New York X), pp. 171–189.
- De Moor, L. and Sercu, P. (2004) CAPM tests and alternative factor portfolio composition: getting the alpha's right, *Tijdschrift voor Economie en Management* **49**, 789–846.
- De Santis, Roberto A. and Gerard, Bruno (2006) Financial integration, international portfolio choice and the European Monetary Union, ECB Working Paper 626.
- Domowitz, I., Glen, J., and Madhavan, A. (2001) Liquidity, Volatility and Equity Trading Costs Across Countries and Over Time, *International Finance* **4**, 221–255.

- Doidge, C., Karolyi G. A., and Stulz, R. M. (2004) Why do countries matter so much for corporate governance?, NBER Working Paper 10726.
- Edison, H. J. and Warnock, F. E. (2003) A simple measure of the intensity of capital controls, *Journal of Empirical Finance* **10**, 81–103.
- Elton, Edwin J. (1999) Expected Return, Realized Return, and Asset Pricing Tests, *Journal of Finance* **54**, 1199–1220.
- Erb, C. B., Harvey, C. R., and Viskanta, T. E. (1996) Political Risk, Economic Risk and Financial Risk, *Financial Analysts Journal* **52**, 29–46.
- Fama, E. F. and Schwert, G. W. (1977) Human capital and capital market equilibrium, *Journal of Financial Economics* **4**, 95–125.
- Faruquee, H., Li S., and Yan, I. K. (2004) The Determinants of International Portfolio Holdings and Home Bias, IMF Working Paper, WP/04/34.
- Ferreira, M. and Matos, P. (2007) The colors of investors' money: Which firms attract insitutional investors from around the world? Available at <http://ssrn.com/abstract=885777>.
- Fidora, M., Fratzscher, M., and Thimann, C. (2007) Home bias in global bond and equity markets: the role of real exchange rate volatility, *Journal of International Money and Finance* **26**, 222–225.
- French, K. R. and Poterba, J. M. (1991) Investor Diversification and International Equity Markets, *American Economic Review* **81**, 222–225.
- Friend, I. and Blume, M. (1975) The Demand for Risky Assets, *American Economic Review* **65**, 900–922.
- Gelos, R. G. and Wei, Shang-Jin (2005) Transparency and International Portfolio Holdings, *Journal of Finance* **60**, 2987–3020.
- Giannetti, M. and Simonov, A. (2006) Which Investors Fear Expropriation? Evidence from Investor's Portfolio Choices, *Journal of Finance* **61**, 1507–1547.
- Glassman, Debra A. and Riddick, Leigh A. (2001) What causes home asset bias and how should it be measured?, *Journal of Empirical Finance* **8**, 35–54.
- Goetzmann, W. N. and Kumar, A. (2008) Equity Portfolio Diversification, *Review of Finance*, Forthcoming.
- Grote, M. H. and Ueber, M. P. (2006) Home biased? A spatial analysis of the domestic merging behavior of US firms, Working Paper 161, Goethe University Frankfurt am Main.
- Hall, R. (1988) Intertemporal Substitution in Consumption, *Journal of Political Economy* **96**, 339–357.
- Huberman, G. (2001) Familiarity Breeds Investment, *Review of Financial Studies* **14**, 659–680.
- Jeske, Karsten (2001) Equity home bias - can information cost explain the puzzle?, Federal Reserve Bank of Atlanta, Economic Review 2001, Q3, 31–42.
- Johnson, L. L. (1960) The theory of hedging and speculation in commodity futures, *Review of Economic and Statistics* **27**, 139–151.
- Morgan, J. P. and Reuters RiskMetrics -Technical Document (New York, 1996).
- Julliard, C. (2003) The International Diversification Puzzle is Not Worse Than You Think, International Finance working paper 0301004, EconWPA.
- Kang, J-K. and Stulz, R. M. (1997) Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan, *Journal of Financial Economics* **46**, 3–28.
- Klapper, L. and Love, I. (2005) Corporate Governance, Investor Protection, and Performance in Emerging Markets, *Journal of Corporate Finance* **10**, 703–728.
- Lane, Philip and Milesi-Ferretti, G. M. (2001) The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries, *Journal of International Economics* **55**, 263–294.

- Lane, Philip and Milesi-Ferretti, G. M. (2004) International Investment Patterns, IMF Working Paper 04/134.
- Lane, Philip and Milesi-Ferretti, G. M. (2005) The International Equity Holdings of Euro Area Investors, IIS Discussion Paper 104.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R. (1998) Law and Finance, *Journal of Political Economy* **106**, 1113–1155.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1999) Corporate ownership around the world, *Journal of Finance* **54**, 471–517.
- Lewis, K. K. (1999) Trying to explain home bias in equities and consumption, *Journal of Economic Literature* **37**, 571–608.
- Lucas, Robert E. (2003) Macroeconomic Priorities, *American Economic Review* **93**, 1–14.
- Massa, M. and Simonov, A. (2006) Hedging, Familiarity and Portfolio Choice, *Review of Financial Studies* **19**, 633–685.
- Merton, Robert C. (1980) On estimating the expected return on the market, *Journal of Financial Economics* **8**, 323–361.
- Miniane, Jacques (2004) A New Set of Measures on Capital Account Restrictions, IMF Staff Papers Vol. 51.2, 276–308.
- Obstfeld, M. and Rogoff, K. (2001) The Six Major Puzzles in International Macroeconomics. Is There a Common Cause?, NBER Macroeconomics Annual 15, 339–390.
- Ozatay, F. and Sak, G. (2002) The 2000–2001 financial crisis in Turkey, available on www.iris-bg.org/publications/turkey.pdf.
- Portes, R. and Rey, H. (2005) The determinants of cross-border equity flows, *Journal of International Economics* **65**, 269–296.
- Sarkissian, S. and Schill, M. J. (2004) The Overseas Listing Decision: New Evidence of Proximity Preference, *Review of Financial Studies* **17**, 769–809.
- Sercu, P. (1980) A Generalization of the International Asset Pricing Model, *Revue de l'Association Française de Finance* **1**, 91–135.
- Solnik, B. (2005) Equity Home Bias and Regret: An Equilibrium Model, Working Paper Series HEC Paris, Available at SSRN.
- Stein, Jerome L. (1961) The simultaneous determination of spot and futures prices, *American Economic Review* **51**, 1012–1025.
- Stulz, R. M. (2005) The Limits of Financial Globalization, *Journal of Finance* **60**, 1595–1638.
- Uppal, R. (1993) A General Equilibrium Model of International Portfolio Choice, *Journal of Finance* **48**, 529–553.
- Wang, Qinghai, Ke, Dongmin and Ng, Lilian, K. (2006) Home Bias in Foreign Investment Decisions, EFA 2006 Zurich Meetings, Available at SSRN: <http://ssrn.com/abstract=891383>.

Copyright of Review of Finance is the property of Oxford University Press / UK and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.