CENTRE *for* ECONOMIC PERFORMANCE

CEP Discussion Paper No 879

July 2008

Relative Factor Endowments and International Portfolio Choice

Alejandro Cuñat and Christian Fons-Rosen

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Abstract
This paper presents a model of international portfolio choice based on the pattern of comparative advantage in goods trade. Countries have varying degrees of similarity in their factor endowment ratios, and are subject to aggregate productivity shocks. Risk averse consumers can insure against these shocks by investing their wealth at home and abroad. The change in relative prices after a positive shock in a particular country provides insurance to countries that have dissimilar factor endowment ratios, but is bad news for countries with similar factor endowment ratios, since their incomes will worsen. Therefore countries with similar comparative advantages have a stronger incentive to invest in one another for insurance purposes than countries with dissimilar comparative advantages. Empirical evidence linking bilateral international investment positions to a proxy for relative factor endowments supports our theory: the similarity of host and source countries in their relative capital-labor ratios has a positive effect on the source country's investment position in the host country. The effect of similarity is enhanced by the size of host countries as predicted by the theory.

Keywords: international portfolio equity investment, gravity equation, factor endowments
JEL classifications: F21, F34, G11

This paper was produced as part of the Centre's Globalisation Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

Acknowledgements
We are grateful to Holger Breinlich, Gyöngyi Lóránth, Steve Redding, Silvana Tenreyro, and seminar participants at the LSE and Royal Economic Society 2007 conference for helpful comments and discussions. All errors remain ours. Cuñat and Fons-Rosen gratefully acknowledge financial support from CICYT (SEJ 2005-01365) and Fundación Rafael del Pino, respectively.

Alejandro Cuñat is an Associate of the Centre for Economic Performance, London School of Economics and Lecturer and deputy director of graduate studies at the University of Essex. Christian Fons-Rosen is an Occasional Research Assistant at the Centre for Economic Performance, LSE.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

ISBN 978-0-85328-286-0

1 Introduction

This paper presents a model of international portfolio choice based on the pattern of comparative advantage in goods trade. Countries have varying degrees of similarity in their factor endowment ratios, and are subject to aggregate productivity (country-specific) shocks. Risk averse consumers can insure against these shocks by investing their wealth at home and abroad. The change in relative prices after a positive shock in a particular country provides insurance to countries that have dissimilar specialization patterns, but is bad news for countries with similar specialization patterns, since their incomes will worsen. Therefore countries with similar comparative advantages have got a stronger incentive to invest in one another for insurance purposes than countries with dissimilar comparative advantages.

Empirical evidence linking bilateral international investment positions to a proxy for relative factor endowment similarity supports our theory. We estimate a 'gravity equation' in which, after controlling for commodity and asset market frictions, the similarity of host and source countries in their relative capital-labor ratios has got a positive effect on the source country's investment position in the host country. The magnitude of this effect depends on the host country's GDP size, as larger countries have a stronger effect on world prices.

The main body of the paper starts by presenting a one-period model in which countries trade Arrow-Debreu securities in a complete asset markets environment prior to the realization of uncertainty. Countries differ in their relative factor endowments and have different patterns of specialization; thus, they also exchange commodities once uncertainty about their productivities is realized. A positive productivity shock in a capital-abundant country, for example, will alter relative prices (raising wage rates and reducing the return to capital), thus raising the incomes of labor-abundant countries and harming the incomes of other capital-abundant countries. The latter countries therefore have got a stronger incentive to buy the Arrow-Debreu security corresponding to this state of nature, which is sold by the country that experiences the shock.

Since our theoretical mechanism works through the effects of shocks on relative prices, the size of the country suffering the shock is obviously a relevant consideration. In a generalization of our model, we study how endowment similarity interacts with country size. We show that, under realistic assumptions, an investor country invests relatively more in a large-similar country than in a small-similar country, and relatively less in a large-dissimilar country than in a small-dissimilar country.

The intuitions of our model do not hinge on the many strong assumptions (Arrow-Debreu securities, complete asset markets, absence of home bias in portfolios) we make for tractability purposes: when we replace the Arrow-Debreu setup with a more 'realistic' financial side, the model yields predictions similar to those of our stylized model: we assume that countries can exchange claims on their GDPs before uncertainty is realized, and that investing abroad is subject to frictions that reduce the expected return of foreign assets. This obviously generates a home bias in the portfolios of countries. By the same line of reasoning as above, investing in countries with similar factor endowment ratios provides better insurance to a country with a home-biased portfolio.

The idea that relative price changes may act as an insurance mechanism can be traced back to Cole and Obstfeld [4], who argued this might explain the lack of international diversification of country portfolios. In their model, two completely specialized countries trade with each other in assets and outputs. But asset trade is almost redundant, as changes in the terms of trade after a shock act as insurance. By allowing for many countries with varying degrees of comparative advantage similarity, we turn this intuition into a theory of international portfolio choice. Unlike Cole and Obstfeld [4], however, the emphasis of our model is not on the terms of trade, but on factor prices. Think of the standard indeterminacy problem of the production structures of countries in a Heckscher-Ohlin model with more goods than production factors. In that environment, it is difficult to talk about the terms of trade of countries, as the latter depend on the countries' production structures. But the model does have instead unambiguous predictions about the behavior of factor prices, as these do not depend on production structures.

Our model consists of endowment economies as in Lucas [18] and Svensson [26]. We allow countries to differ in their patterns of specialization according to their relative factor endowments, in a manner similar to Helpman and Razin [9] and Helpman [8]. In comparison with these references, however, we only allow for country-specific aggregate productivity shocks in our analysis.

Our work adds to a growing body of research that attempts to explain the international portfolio choices of countries. Obstfeld and Rogoff [22] and Lane and Milesi-Ferretti [17] have put emphasis on commodity trade costs; Martin and Rey [19] and [20] have focused on the role of size; and Portes and Rey [23] have highlighted the importance of informational costs for investment flows.[1] In comparison with these references, our paper highlights that bilateral portfolio positions not only depend on frictions between countries, but also on other country-pair specific characteristics. In our theory, even in the absence of frictions (or when bilateral frictions are equal across all country-pairs) is it possible that a country finds it optimal not to invest the same amount across countries.

Finally, the causal direction from asset trade to production specialization has been addressed by Koren [10]. He argues that frictions in international asset markets prevent countries from specializing (as much as they would in a frictionless world), due to the inability to insure against sector-specific productivity shocks. Our paper complements Koren's work by pointing that causality might also run in the opposite direction: the production structures of countries determines their international portfolio positions.

The rest of the paper is structured as follows: Section 2 discusses a stylized model linking production specialization and international portfolio choice. Section 3 discusses our empirical strategy, while Section 4 discusses empirical evidence supportive of the model. Some concluding remarks follow. Finally, the

[1] For other approaches to international portfolio choice, see also Kraay and Ventura [12] and [13], Kraay *et al. [11]*, and Lane and Milesi-Ferretti [15] and [16].

appendix provides proofs and extensions of the model discussed in Section 2.

2 The Model

Let us denote countries with $j \in J$. Abusing notation, we will also use J to denote the number of countries. Each country has got a representative consumer, who maximizes expected utility $E\left[U\left(C_j\right)\right]$. $E\left(\cdot\right)$ is the expectations operator, and $U\left(\cdot\right)$ is the utility function, which we assume concave: $U'\left(\cdot\right) > 0$, $U''\left(\cdot\right) < 0$. C denotes consumption of a freely traded final composite good,

$$C_j = C_{1j}^{\frac{1}{2}} C_{2j}^{\frac{1}{2}}, \tag{1}$$

where C_i denotes consumption of freely traded intermediate good i, $i = 1, 2$. Preferences are identical across countries.

Technologies in the intermediate good industries are also identical across countries. We simplify by assuming linear production functions:[2] $y_{1j} = A_j K_j$ and $y_{2j} = A_j L_j$, where y_{ij} denotes production of good i in country j, and $A_j > 0$ denotes country j's aggregate productivity level. We can think of $A_j K_j$ and $A_j L_j$ as production factors measured in efficiency units. We assume perfect competition.

Each country has got exogenously given endowments of the two production factors, which are internationally immobile and supplied inelastically. We distinguish two subsets of countries, which we denote with k and l: $J_k \cup J_l = J$, $J_k \cap J_l = \varnothing$.[3] For all $k \in J_k$, $l \in J_l$,

$$\begin{aligned} K_k &= \phi_k \left(1/2 + \mu\right), & (2) \\ L_k &= \phi_k \left(1/2 - \mu\right), & (3) \\ K_l &= \phi_l \left(1/2 - \mu\right), & (4) \\ L_l &= \phi_l \left(1/2 + \mu\right). & (5) \end{aligned}$$

$\mu \in [0, 1/2]$. Notice this implies countries in J_k have got a comparative advantage in good 1. For the sake of simplicity, we assume $J_k = J_l = J/2$. The parameter $\phi_j > 0$ is a scaling factor that allows for cross-country differences in size. We assume that the distributions of this scaling factor within J_k and J_l are symmetric.

A_j is *ex-ante* uncertain. We assume there are J states of nature (denoted by s, $s = 1, ..., J$), each with identical probability $\pi\left(s\right) = 1/J$. States of nature are characterized by productivity level vectors

$$A\left(s\right) = \left[A_1\left(s\right), A_2\left(s\right), ..., A_J\left(s\right)\right].$$

[2] In Appendix B we show that this assumption is harmless: a model with neoclassical production functions yields similar insights.

[3] To avoid confusion, we will spare the indices j and j' for when we refer to any country in J; we will use k and k' to refer to countries in J_k; and l and l' to refer to countries in J_l.

In particular,

$$\begin{aligned} A(1) &= (1+a,1,...,1), \\ A(2) &= (1,1+a,...,1), \\ &\dots \\ A(J) &= (1,...,1,1+a), \end{aligned}$$

where $a > 0$ is a constant.[4]

There is a world market in which agents can buy or sell Arrow-Debreu contingent claims before uncertainty is realized. These claims have payoffs that depend on the state of nature: the owner (seller) of the security receives (pays) worth one unit of the final good if state s occurs, but nothing in any other state. We assume asset-market completeness.

2.1 Goods Market Equilibrium

Given the homotheticity of $C(\cdot)$, relative demands depend only on relative prices. Goods market equilibrium is therefore determined by

$$\frac{y_{1W}}{y_{2W}} = \frac{C_{1W}}{C_{2W}} = \frac{C_{1j}}{C_{2j}} = \frac{p_2}{p_1} = \frac{w}{r}, \tag{6}$$

where $C_{iW} \equiv \sum_{j\in J} C_{ij}$ and $y_{iW} \equiv \sum_{j\in J} y_{ij}$. Notice that p_i is also the price of the factor used in industry i when factors are measured in efficiency units. This can be seen from the equilibrium pricing conditions: $p_1 = r$ and $p_2 = w$, where r and w denote, respectively, the price of factor AK and factor AL. Taking the final good as the numeraire,

$$r = \frac{1}{2}\left(\frac{L_W}{K_W}\right)^{\frac{1}{2}}, \tag{7}$$

$$w = \frac{1}{2}\left(\frac{K_W}{L_W}\right)^{\frac{1}{2}}, \tag{8}$$

where $K_W \equiv \sum_{j\in J} A_j K_j$ and $L_W \equiv \sum_{j\in J} A_j L_j$. Obviously, $w/r = K_W/L_W$. Notice that free trade and the pricing conditions imply factor price equalization across countries, as in Trefler [27] or Ventura [28].

2.2 Asset Market Equilibrium

Let $B_j(s)$ denote country j's net purchase of state-s Arrow-Debreu securities. Let $p(s)$ denote the price of one such security. Each country's utility maximization problem can be expressed as

$$\max_{\{B_j(s)\}_{s=1}^{J}} \sum_s \pi(s)\, U\left[Y_j(s) + B_j(s)\right], \tag{9}$$

[4] This is similar to what Acemoglu and Zilibotti [1] and Martin and Rey [19], [20] assume in differents contexts.

subject to budget constraints

$$\sum_{s} p(s) B_j(s) = 0, \tag{10}$$

$$C_j(s) = Y_j(s) + B_j(s). \tag{11}$$

Manipulating the first order conditions for states s and s',

$$\frac{\pi(s) U'[C_j(s)]}{\pi(s') U'[C_j(s')]} = \frac{p(s)}{p(s')}. \tag{12}$$

Market clearing requires $\sum_j B_j(s) = 0$ and $Y_W(s) = \sum_j C_j(s)$ for all s, where Y_W denotes world production of the final good. Finally, we close the model with the no-arbitrage condition $\sum_s p(s) = 1$.

Under log-utility ($U(C) = \ln(C)$), for example, the model yields the following equilibrium asset prices and portfolio choices:

$$p(s) = \frac{[Y_W(s)]^{-1}}{\sum_{s'} [Y_W(s')]^{-1}}, \tag{13}$$

$$B_j(s) = \frac{1}{J} \left[\sum_{s'} \frac{Y_j(s')}{Y_W(s')} \right] Y_W(s) - Y_j(s). \tag{14}$$

The intuition underlying these expressions is rather straightforward. The relative price of a security depends inversely on the relative abundance of the final good in the corresponding state of nature. Regarding the first term on the right-hand side of equation (14), the size of country j's portfolio will be larger the higher its average output relative to the world's output. As for the second term, country j's purchase of state-s security is inversely related to country j's state-s final-good output.

2.3 International Portfolio Choice

We now discuss the effects of *ex-ante* uncertainty in the goods markets on the portfolio choices of countries. To build up intuition, we discuss the model's implications on endowment similarity and country size separately. We start by assuming that all countries are of equal size. We then relax this assumption.

2.3.1 The Role of Endowment Similarity

Let us initially simplify the model by assuming away country-size effects: $\phi_j = 1$ for all $j \in J$. Define a country's gross domestic product as

$$Y_j = rA_jK_j + wA_jL_j. \tag{15}$$

Without loss of generality, consider country $k \in J_k$. In states of nature in which any country $l \in J_l$ has got a high productivity level, country k's GDP improves due to a price effect, whereas states of nature in which any country $k' \in J_k$, $k' \neq k$, has got a high productivity draw bring about a negative price effect on country k's income. Country k's GDP is highest when its own productivity level is high: the negative effect of the change in relative prices is smaller than the positive effect on output of the productivity increase. Appendix A shows

$$Y_k(k) > \frac{1}{J} Y_W > Y_k(l) > Y_k(k'), \tag{16}$$

where $Y_W \equiv \sum_j Y_j(s)$ for all s. A country therefore has got a stronger incentive to insure against states of nature in which countries with similar factor endowment ratios have got a high productivity level. And the obvious provider of such insurance is the country that experiences high productivity: the model's symmetry implies $Y_{k'}(k') > \frac{1}{J} Y_W > Y_l(k') > Y_k(k')$.[5]

Given the model's symmetry and the absence of aggregate uncertainty, we conjecture the equilibrium exhibits full insurance. It is easy to find asset prices, consumption and portfolio allocations such that all the equilibrium conditions hold and countries manage to fully insure:

$$p(s) = \pi(s) = \frac{1}{J}, \tag{17}$$

$$C_j(s) = \frac{1}{J} Y_W, \tag{18}$$

$$B_j(s) = \frac{1}{J} Y_W - Y_j(s), \tag{19}$$

for all j, s. This result not only holds for log-utility, but for any concave utility function.

We can now characterize the international portfolios of countries:

1. Assume $\mu > 0$. Consider state of nature k'. From (16) and (19),

$$B_k(k') > B_l(k') > 0 > B_{k'}(k').$$

   Country k' sells insurance against state k' to all other countries. The model's symmetry implies $B_k(k') > B_k(l) > 0 > B_k(k)$. The share in country k's international portfolio is larger for assets issued by a country with a similar factor endowment ratio than for assets issued by the other type of country.

2. In Appendix A we show $B_k(k') - B_l(k') = Y_l(k') - Y_k(k') = \frac{2a}{Y_W}\mu^2 \geq 0$. Thus,

$$\lim_{\mu \to 0} [B_k(k') - B_l(k')] = 0.$$

[5] In this two-good two-factor model there is an obvious equivalence between factor endowment similarity, production structure similarity, and terms of trade correlations. As we discuss in Appendix B, however, this is a particular feature of the 2x2 model that breaks down if there are more goods than factors; in this case, the production structures of countries are undetermined, but the implications of our model for factor prices remain unaltered. In general, therefore, our results are driven by the role of factor endowment similarity and its implications for factor prices rather than by similarities in production structures or by terms of trade correlations.

When comparative advantage differences are small, countries k and l do not differ in their investment decisions regarding country k'. For low values of μ, all countries have very similar production patterns. Thus, a shock to any particular country will hardly have an important effect on factor prices; in this case, any two countries will take identical positions in any third country.[6]

3. One can also show

$$\lim_{\mu \to 1/2} B_l(k') = 0 < \lim_{\mu \to 1/2} B_k(k'),$$

or, by symmetry, $\lim_{\mu \to 1/2} B_k(l) = 0 < \lim_{\mu \to 1/2} B_k(k')$. With complete specialization and a unitary elasticity of substitution, relative prices offer complete insurance against shocks in countries with different specialization patterns.

4. Define the following elasticity:

$$\beta \equiv \frac{\frac{B_k(k') - B_k(l)}{B_k(l)}}{\frac{\left|\frac{K_{k'}}{L_{k'}} - \frac{K_k}{L_k}\right| - \left|\frac{K_l}{L_l} - \frac{K_k}{L_k}\right|}{\left|\frac{K_l}{L_l} - \frac{K_k}{L_k}\right|}} = -\frac{2\mu^2}{\left(\frac{a}{J} + 1\right)\left(\frac{1}{4} - \mu^2\right)}.$$

β describes how country k's relative position in countries k' and l depends on the relative endowment difference between these two host countries. It is easy to see $d|\beta|/d\mu > 0$:[7] as the dissimilarity between host and source country rises, the source country's portfolio becomes more responsive.[8]

2.3.2 The Role of Size

We now allow for differences in country size, as we assumed initially. For tractability purposes, we consider the log-utility case (see equations (13) and (14)). For a given level of endowment similarity, we study how the host country's

[6] For $\mu = 0$, our model is similar to the one-good standard textbook treatment. See, for example, Obstfeld and Rogoff [21], chapter 5.

[7] Expressions for $B_k(k')$ and $B_k(l)$ can be found in Appendix A.

[8] To assess the sensitivity of our results, we simulated the model above with

$$C_j = \left[(C_{1j})^{\frac{\varepsilon-1}{\varepsilon}} + (C_{2j})^{\frac{\varepsilon-1}{\varepsilon}}\right]^{\frac{\varepsilon}{\varepsilon-1}},$$

where $\varepsilon > 1$ is the (constant) elasticity of substitution between goods 1 and 2. (We assumed $J = 4$ and $a = 0.02$, and for different values of ε and μ.) Result 1 holds for any finite elasticity: $B_{k'}(k')$ is always negative and, as long as goods 1 and 2 are not perfect substitutes, $B_k(k') > B_l(k') > 0$. Result 2 obviously holds for any ε, since it only depends on all countries being identical in their relative factor endowments. Result 3 depends instead on the (unitary) elasticity of substitution implied by the Cobb-Douglas functional form in (1). Higher elasticities of substitution imply a lower response of prices to productivity shocks, and a positive $B_l(k')$. Result 4, however, does not depend on the value of ε: $|\beta|$ depends positively on μ also for $\varepsilon > 1$. These results are available upon request.

size affects the positions of investor countries. For this purpose, we compare the portfolio choices of two investor countries, $k \in J_k$ and $l \in J_l$, with the same size ($\phi_k = \phi_l$), across host countries $k', k'' \in J_k$ with different sizes ($\phi_{k'} < \phi_{k''}$).

From (13) and (14),

$$p\left(k'\right)\left[B_k\left(k'\right) - B_l\left(k'\right)\right] = \frac{1}{\sum_{s'}\left[Y_W\left(s'\right)\right]^{-1}}\left[\frac{Y_l\left(k'\right) - Y_k\left(k'\right)}{Y_W\left(k'\right)}\right], \tag{20}$$

where $k' \in J_k$. The term $\sum_{s'}\left[Y_W\left(s'\right)\right]^{-1}$ is constant. Hence, all we need to analyze is the behavior of the term

$$\begin{aligned}\frac{Y_l\left(k'\right) - Y_k\left(k'\right)}{Y_W\left(k'\right)} &= \frac{r\left(k'\right)\left(K_l - K_k\right) + w\left(k'\right)\left(L_l - L_k\right)}{r\left(k'\right)K_W\left(k'\right) + w\left(k'\right)L_W\left(k'\right)} = \\ &= \frac{1}{2}\left(L_l - L_k\right)\left[\frac{1}{L_W\left(k'\right)} - \frac{1}{K_W\left(k'\right)}\right] > 0,\end{aligned} \tag{21}$$

as $L_l > L_k$, and $L_W\left(k'\right) < K_W\left(k'\right)$ for all $k' \in J_k$. (See Appendix A.) Hence, $p\left(k'\right)\left[B_k\left(k'\right) - B_l\left(k'\right)\right] > 0$. This result simply restates the role of endowment similarity discussed above.

The inequality

$$p\left(k''\right)\left[B_k\left(k''\right) - B_l\left(k''\right)\right] > p\left(k'\right)\left[B_k\left(k'\right) - B_l\left(k'\right)\right] \tag{22}$$

holds if $\frac{1}{L_W(k'')} - \frac{1}{K_W(k'')} > \frac{1}{L_W(k')} - \frac{1}{K_W(k')}$. A sufficient condition for this is

$$\left(\frac{1}{4} - \mu^2\right)a^2 < \frac{\left(\sum_{k \in J_k}\phi_k\right)^2}{\phi_{k''}\phi_{k'}}. \tag{23}$$

Two opposite effects are at stake here. A shock to a larger country has a stronger effect on relative factor prices, leading to a larger difference in the security purchases by countries k and l. Country k will want to take a larger position to insure against the negative effect of the shock on its income, whereas country l will take a smaller position due to the implicit insurance it receives through the change in relative prices. (We call this the *quantity effect.*) At the same time, a shock to a larger country raises world output by more in the corresponding state of nature, leading to a lower price of the associated security. (We call this the *price effect.*) The sufficient condition above makes sure that the quantity effect is stronger than the price effect. Notice that, for given values of ϕ_j, a higher μ implies a larger quantity effect, as the productivity shock on the large country will translate into a large effect on relative factor prices. As μ decreases, the highest a compatible with the sufficient condition decreases: the less dissimilar countries k and l, the smaller the quantity effect. This sufficient condition is very weak, as the term on the right-hand side of equation (23) is larger than one.

2.4 International Portfolio Choice without Arrow-Debreu Securities

The model above delivers the key intuitions that explain our empirical findings: other things equal, countries with more similar (dissimilar) comparative advantages invest more (less) in one another due to better (worse) insurance possibilities. However, many of the model's assumptions and implications are at odds with reality. First of all, most real-life assets are not Arrow-Debreu. Moreover, international consumption correlations are lower than output correlations, which suggests that actual international risk sharing is far from the complete asset market benchmark. (See Backus *et al.* [2].) Finally, countries tend to invest most of their wealth in their own domestic assets. (See French and Poterba [6].)

In Appendix C, we show that a similar model with a more realistic financial side also predicts a positive relationship between comparative advantage similarity and international portfolio choice. Assume investors can buy ownership claims on countries' GDPs rather than Arrow-Debreu securities. Assume also that holding foreign assets is subject to frictions. This creates a home bias in each country's portfolio, and leads in turn, within the portfolio share that is invested in foreign assets, to a bias towards assets issued by countries with similar comparative advantages. This is due to the fact that the latter provide a home-biased portfolio with better insurance for the same reasons we discussed above.

3 Empirical Strategy

3.1 Estimation Issues

We estimate a 'gravity equation' that relates the amount invested by source country S in host country H to a proxy for relative factor endowment similarity between countries S and H, and other controls, such as proxies for frictions in commodity and asset markets, as well as host and source country fixed effects. Consider the following expression:

$$B_{SH} = Z_{SH}^{\alpha_Z} D_{SH}^{\alpha_D} u_{SH}, \tag{24}$$

where B_{SH} denotes country S's portfolio investment in country H; α denotes parameters; Z_{SH} stands for a country-pair control; D_{SH} denotes a proxy for comparative advantage similarity between countries S and H; and u_{SH} denotes an error term assumed to be statistically independent of the variables on the right hand side of the equation.[9]

Apart from using the OLS and Tobit estimators which are commonly employed in the literature, we also use the Poisson estimator. While gravity equations are usually log-linearized and estimated by OLS, this practice may be inappropriate for a number of reasons. First, B_{SH} can be zero, in which case

[9] We are simply augmenting the gravity equation in Lane and Milesi-Ferretti [17] with D_{SH}.

log-linearization is unfeasible. (This problem is often solved by adding one to all observations before taking logs.[10]) Second, as Santos-Silva and Tenreyro [25] have recently pointed out, under heteroskedasticity, the expected value of the log-linearized error will in general be correlated with the regressors, and OLS will therefore be inconsistent. This is because the non-linear transformation changes the properties of the error term, as the conditional expectation of $\ln u_{SH}$ depends on the shape of the conditional distribution of u_{SH}. Santos-Silva and Tenreyro [25] propose the following example as an illustration of this problem: assume u_{SH} is distributed lognormal, with $E(u_{SH} \mid D_{SH}, Z_{SH}) = 1$ and variance $\sigma^2_{SH} = f(D_{SH}, Z_{SH})$.[11] $\ln u_{SH}$ will thus be distributed normal, with $E(\ln u_{SH} \mid D_{SH}, Z_{SH}) = -\frac{1}{2}\ln\left(1 + \sigma^2_{SH}\right)$, which is a function of the regressors.

In the face of this problem, it is more appropriate to estimate the gravity equation in its non-linear form. After assessing the properties of a number of alternative estimators, Santos-Silva and Tenreyro [25] propose the Poisson pseudo-maximum likelihood estimator (often used for count data) for this task. This estimator turns out to be consistent under very weak assumptions (mainly that the model is well specified), and also provides a natural way to deal with zero values, as no logarithmic transformation is necessary for its implementation.

3.2 Accounting for Country Size

Other things equal, a larger country will have a stronger effect on world prices. Thus, countries with similar relative endowments should invest *more* in a large country than in a small country; and countries with dissimilar comparative advantages should invest *less* in the large country than in the small country. Actually, country similarity should not have a positive effect on a country's portfolio at all if the host country cannot affect world prices.

Consider a proxy for country similarity D_{SH} that takes positive values when countries are similar, and negative values when countries are dissimilar. To capture the intuition of the paragraph above, we need to interact D_{SH} with a proxy for the host country's size. We follow two alternative procedures here. First, we interact D_{SH} with the host country's log-GDP, $\ln(Y_H)$. We expect these interaction coefficients to be positive. Our model predicts that countries invest more in each other when they are similar in terms of factor endowment ratios, *i.e.* $D_{SH} > 0$. The greater the size of the host country, the greater the investment, for a given level of similarity. Alternatively, two countries with very different factor endowment ratios ($D_{SH} < 0$) want to invest less in one another because of the insurance mechanism relative prices provide. The greater the

[10] The Tobit estimator is also often used in the gravity equation literature when the dependent variable takes zero and positive values. (Again, a one is added to all observations before taking logs.) However, in the presence of fixed effects, the Tobit estimator may be biased due to the incidental parameters problem.

[11] The characteristics of the data suggest u_{SH} will be heteroskedastic. Since B_{SH} is non-negative, when its conditional expectation approaches zero, the probability of B_{SH} being positive and its conditional variance must also tend to zero. When the conditional expectation of B_{SH} is large instead, it is possible to observe a greater dispersion, as B_{SH} can now deviate from its conditional expectation in either direction.

size of the host country, the more it influences world relative prices, and the more insurance it provides to the source country. Therefore, less investment is required in a host country with dissimilar endowment ratios if it is a large country. Again, this leads us to expect a positive coefficient. The type of gravity equation we estimate in this case has got the following form:[12]

$$B_{SH} = Z_{SH}^{\alpha_Z} e^{\alpha_D D_{SH}} e^{\alpha_Y \ln(Y_H)} e^{\alpha_I [D_{SH} \ln(Y_H)]} u_{SH}. \tag{25}$$

Second, we classify host countries into two categories: 'small' (those with GDP's below the median of the sample) and 'large' (those with GDP's above the median of the sample). We then consider a separate coefficient on D_{SH} for each category, and test the null hypothesis of same coefficient for both categories.

3.3 Data[13]

Our dependent variable B_{SH} is taken from the IMF's Coordinated Portfolio Investment Survey (CPIS).[14] For each participating country, the CPIS reports data on foreign portfolio asset holdings by residence of the issuer (bilateral portfolio equity holdings). These include both equity and debt, but the CPIS has made an effort to exclude foreign direct investment (FDI) from these data.[15] Data have been released for end-1997 (with only 29 source countries), end-2001 (with 67 source countries), end-2002, end-2003, and end-2004. According to Lane and Milesi-Ferretti [17], for those countries that participated in both 1997 and 2001 and 2002 surveys, there is considerable persistence in bilateral equity holdings. We focus exclusively on the 2002 edition. Table 1 reports some information on the countries in our sample.

Our measure of similarity in factor endowment ratio K/L between countries S and H is based on the following variable:

$$d_{SH} \equiv \left| \ln \left(\frac{K}{L} \right)_S - \ln \left(\frac{K}{L} \right)_H \right|. \tag{26}$$

The source for aggregate capital-labor ratios is Caselli and Feyrer [3]. Notice that d_{SH} decreases with the similarity of countries and is always positive. For the reasons discussed above, we need our proxy for comparative advantage similarity (i) to rise with similarity and (ii) to take positive values when countries S and H are 'similar enough' and negative values when they are 'dissimilar enough'. For this purpose, we first compute $d'_{SH} = \max(d_{SH}) - d_{SH}$. Then, we finally rearrange our variable to $D_{SH} = d'_{SH} - med(d'_{SH})$, where $med(d'_{SH})$ is the sample median of d'_{SH}. We interpret $D_{SH} > 0$ as the country pair being

[12] Since D_{SH} takes negative values, we cannot enter it in levels into the gravity equation. Thus, the estimated elasticity of B_{SH} with respect to D_{SH} is not constant. This is actually in agreement with our theoretical results in section 2.

[13] See Appendix D for a detailed description of variables and sources.

[14] See Lane and Milesi-Ferretti [17] for a detailed description of the dataset, as well as a discussion of its potential shortcomings.

[15] The CPIS considers an investment as FDI (as opposed to portfolio investment) if the foreign investor owns 10 percent or more of the ordinary shares or voting power.

similar in terms of factor endowment ratios. Equivalently, $D_{SH} < 0$ implies the two countries have *dissimilar* ratios.[16]

We proxy for commodity and asset trade frictions with the volume of trade, distance, and dummies for country pairs in which countries participate in the same regional trade agreement, share a border, the same currency, a common language, a colonial relationship (past or present), and a common legal origin. The source for these data is Glick and Rose [7], but for the common legal origin dummy, which is taken from La Porta *et al.* [14].

We also use as controls the correlation of real GDP growth rates (which proxies for the correlation of productivity shocks); a proxy for the similarity in GDP per capita (constructed in a manner similar to D_{SH}); and a variable that controls for countries being in different time zones to proxy for informational similarities. As in Lane and Milesi-Ferretti [17] we also include two financial variables: the first is the correlation in stock market returns, since it may influence asset holdings in an incomplete-markets environment. The second one is the correlation between host-country stock market returns and source-country GDP growth, to control for the fact that the host-country stock market can work as a hedge against source-country output fluctuations.

Finally, we use a proxy for similarity in the production structures of countries. For any pair of countries j, j', this variable is constructed as

$$E_{jj'} = 2 - \sum_i (s_{ij} - s_{ij'})^2 , \tag{27}$$

where s_{ij} denotes country j's export share[17] of good i to the world. $E_{jj'}$ is always positive and grows with the similarity of the production structures of countries. Data on manufacturing exports are obtained from the World Trade Flows Database (see Feenstra *et al.* [5]).

4 Results

Tables 2 to 7 report our estimation results. Tables 2-3 report results for the full sample of countries, Tables 4-5 report results when we limit host countries to OECD membership, and Tables 6-7 present results for the sample of High Income and Upper Middle Income countries based on the World Bank classification for 2002.[18]

In each table we present 15 columns. Columns (1) to (5) correspond to our main specification, in which we include the standard 'gravity equation' controls together with the log of bilateral trade, the GDP growth correlations,

[16] Normalising D_{SH} by the mean rather than the median leads to very similar results.

[17] We use exports by country-industry rather than production, because the former is available at fine levels of disaggregation for many more countries than the latter. The correlation between "similarity in exports" and "similarity in K/L ratio" is around 0.16.

[18] To control for outliers, in all regressions we eliminate single observations that account for more than 30% of the total equity invested or received by a country. This reduces the sample by around 1%.

and similarity in the production structure. Column (1) corresponds to the Tobit estimation, columns (2)-(3) to the OLS estimation without and with zeroes, respectively; finally, columns (4)-(5) corresponds to the Poisson estimation without and with zeroes, respectively.

Columns (6) to (10) redo the same process after including the two financial variables that may influence asset holdings in an incomplete financial market scenario. Apart from the correlation in stock returns, we also include the correlation between host country stock market returns and source country GDP growth. This variable is supposed to take into account the role of the host country stock market in potentially hedging against source country output fluctuations. In all cases, correlations are calculated using historical data between 1980 and 1996. In the same way as Lane and Milesi-Ferretti, we are confident that the endogeneity of financial correlations to the size of bilateral financial holdings is not a major concern, since most foreign equity investment took place since the mid-1990s.

Finally, columns (11) to (15) repeat the same procedure after including two additional variables that are supposed to proxy for informational frictions: the difference in time zone across countries and the similarity in the log of GDP per capita.

Across the tables we observe that the controls that seem to be most significant in explaining bilateral financial asset holdings are: (i) bilateral trade, as was already suggested by Lane and Milesi-Ferretti [17]; (ii) correlation in GDP growth; (iii) common language; (iv) currency area.

4.1 Full Sample

In Table 2 (also Tables 4 and 6) we interact our similarity in capital-labour ratio with $\ln(GDP)$. In Table 3 (also Tables 5 and 7) we divide the sample in two parts based on the host country's GDP level and allow each subsample to have its own coefficient. Therefore, no interaction terms are included in these regressions. We always test the null hypothesis of equal coefficients for the two subsamples.

In Table 2 we find that our interaction term is positive and significantly different from zero at the 1% level in all 15 specifications. But since the coefficient on the similarity of capital-labor ratio is rather negative and also very significant, we cannot conclude yet that the final coefficient is actually positive, as our theory predicts. The value of the combined coefficient, hereafter CC, will depend on the host country GDP size, and is determined in the following way:

$$CC = coef[simKL] + \ln(GDP) * coef[simKL * \ln(GDP)],$$

where $coef[simKL]$ denotes the coefficient corresponding to endowment similarity, and $coef[simKL * \ln(GDP)]$ denotes the coefficient corresponding to the interaction between endowment similarity and host-country size.

This combined coefficient becomes positive well before the mean and median of $\ln(GDP)$ in our sample, which are 26.8 and 26.6, respectively. For example, in column (1) the coefficient becomes positive for values of $\ln(GDP)$ above 25.92.[19] Additionally, this combined coefficient is positive *and significantly different from zero at the 5% level* at levels of $\ln(GDP)$ around the median, even though for the Poisson estimations the value is usually somewhat higher.[20] The interpretation is that while the combined coefficient is positive for almost all the sample of host GDP countries, only the countries with a relatively large size (*i.e.* above the median of GDP) affect world prices, in turn having a coefficient that is significantly different from zero.

Let us now address the economic significance of our results. Based on Table 2, we focus first on the effect of host-country size on equity positions, which is captured by our interaction term:[21] a 1% increase in the host country's GDP leads to a reduction in the equity position towards this country of 0.25% when the value of the factor endowment similarity index is -0.68, i.e. at the 25th percentile of our similarity index. Similarly, it leads to an increase in the equity position of 0.1% under a value of the factor endowment similarity index of 0.26, i.e. at the 75th percentile of our similarity index.[22] Regarding country similarity, an increase in the index of factor endowment similarity by 0.1 leads to an increase in equity positions towards the host country by 0.08% when the latter is of middle size ($\ln(GDP) = 25$) and by 0.15% when it is large ($\ln(GDP) = 27$).

In Table 3, the coefficient of the large host countries is positive and, in general, significantly different from zero at the 1% level, while the coefficient for the small host countries is never significant. Additionally, we test for equality of coefficients and always reject the null hypothesis of equal coefficients between subsamples.[23]

4.2 Robustness Checks

4.2.1 OECD Membership

In Tables 4-5 we do exactly the same procedure as in Tables 2-3, but by limiting the host countries to be OECD members. This implies eliminating South Africa, Argentina, Brazil, Chile, Colombia, Peru, Israel, Indonesia, Malaysia, and Thailand from the sample of host countries. Throughout the tables and specifications, the main message is the same as for the full sample regressions: similarity in capital-labor ratios matters for equity holdings in the way proposed by our theoretical framework, and this effect becomes stronger as the size of the host country increases. Additionally, the values of the coefficients that

[19] See "GDP positive interaction threshold" at the bottom of the table.

[20] See "GDP 5% significance threshold" at the bottom of the table.

[21] Another size effect is captured by the host-country fixed effect, and goes back to the original gravity equation intuition: an increase in host-country GDP leads to a proportional increase in equity positions allocated to that country.

[22] Regarding the factor endowment similarity index, by construction, the median takes the value of 0, its 25th percentile is -0.68, while its 75th percentile is 0.26. Finally, the mean of our index variable is -0.26 with a standard deviation of 0.61.

[23] See "H0: coef[KL_small]=coef[KL_large]" at the bottom of the table.

we obtain are similar to the ones we obtained with the full sample.

4.2.2 World Bank Income Classification

In Tables 6-7 we redo the exercise by looking at relatively rich source and host countries. The World Bank classification for the year 2000 divides countries into four categories: (1) High Income; (2) Upper Middle Income; (3) Lower Middle Income; (4) Low Income. We restrict our attention to countries included in categories (1) and (2).[24] Also for this sample do we find that the previous story holds. Again, the values of the coefficients are very similar to the ones we obtain with the previous samples.

5 Concluding Remarks

Recent explanations of the international portfolio positions of countries are based on commodity and asset trade frictions: a country invests more in countries with which goods and assets are traded more freely. This paper complements these theories by pointing out that international portfolio decisions are also influenced by the similarity in the capital-labor ratios of countries. In particular, countries with similar capital-labor ratios have a stronger incentive to invest in one another for insurance purposes due to the effect of countries on prices when they suffer a shock. This effect obviously depends on the host country's size. We confirm our hypothesis with different econometric specifications and data samples. Future work should try to elucidate whether and how other sources of comparative advantage also affect the international portfolio decisions of countries.

[24] We eliminate Colombia, Peru, Indonesia, and Thailand.

References

[1] Acemoglu, D. and F. Zilibotti (1997): "Was Prometheus Unbound by Chance? Risk, Diversification, and Growth," *Journal of Political Economy*, 105, 709-751.

[2] Backus, D., P. Kehoe and F. Kydland (1992): "International Real Business Cycles," *Journal of Political Economy*, 100, 745-775.

[3] Caselli, F. and J. Feyrer (2007): "The Marginal Product of Capital," *Quarterly Journal of Economics*, 122, 535-568..

[4] Cole, H.L. and M. Obstfeld (1991): "Commodity Trade and International Risk Sharing," *Journal of Monetary Economics*, 28, 3-24.

[5] Feenstra, R.C., R.E. Lipsey, H. Deng, A.C. Ma, and H. Mo (2005): "World Trade Flows," *NBER WP 11040.*

[6] French, K. and J. Poterba (1991): "Investor Diversification and International Equity Markets," *American Economic Review, Papers and Proceedings,* 81, 222-226.

[7] Glick, R. and A.K. Rose (2001): "Does a Currency Union Affect Trade? The Time Series Evidence," manuscript.

[8] Helpman, E. (1988): "Trade Patterns under Uncertainty with Country Specific Shocks," *Econometrica*, 56, 645-659..

[9] Helpman, E. and A. Razin (1978): "Uncertainty and International Trade in the Presence of Stock Markets," *Review of Economic Studies*, 45, 239-250.

[10] Koren, M. (2005): "Financial Globalization, Portfolio Diversification, and the Pattern of International Trade," manuscript, Harvard University.

[11] Kraay, A., N. Loayza, L. Servén and J. Ventura (2005): "Country Portfolios," *Journal of the European Economic Association*, 3 914-945.

[12] Kraay, A. and J. Ventura (2000): "Current Accounts in Debtor and Creditor Countries," *Quarterly Journal of Economics*, 115, 1137-1166.

[13] Kraay, A. and J. Ventura (2002): "Trade Integration and Risky Assets," *European Economic Review*, 46, 1023-1048.

[14] La Porta, R., F. López de Silanes and A. Shleifer (2003): "What Works in Securities Laws?", *Journal of Finance*, 61, 1-32.

[15] Lane, P. and G.M. Milesi-Ferretti (2001): "The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries," *Journal of International Economics*, 55, 263-294.

[16] Lane, P. and G.M. Milesi-Ferretti (2002): "Long-Term Capital Movements," *NBER Macroeconomics Annual 2001,* 16, 73-116.

[17] Lane, P. and G.M. Milesi-Ferretti (2004): "International Investment Patterns," *Review of Economics and Statistics*, forthcoming.

[18] Lucas, R.E. (1982): "Interest Rates and Currency Prices in a Two-Country World," *Journal of Monetary Economics*, 10, 335-360.

[19] Martin, P. and H. Rey (2000): "Financial Integration and Asset Returns," *European Economic Review*, 44, 1327-1350.

[20] Martin, P. and H. Rey (2004): "Financial Super-markets: Size Matters for Asset Trade," *Journal of International Economics*, 64, 335-361.

[21] Obstfeld, M. and K. Rogoff (1995): *Foundations of International Macroeconomics*, MIT Press.

[22] Obstfeld, M. and K. Rogoff (2001): "The Six Major Puzzles in International Macroeconomics. Is There a Common Cause?" *NBER Macroeconomics Annual 2000*, 15, 339-389.

[23] Portes, R. and H. Rey (2005): "The Determinants of Cross Border Equity Flows," *Journal of International Economics*, 65, 269-296.

[24] Samuelson, P.A. (1954): "The Transfer Problem and Transport Costs," *Economic Journal*, 64, 264-289.

[25] Santos-Silva, J.M.C. and S. Tenreyro (2005): "The Log of Gravity," *Review of Economics and Statistics*, 88, 641-658.

[26] Svensson, L.E.O. (1988): "Trade in Risky Assets," *American Economic Review*, 78, 375-394.

[27] Trefler, D. (1993): "International Factor Price Differences: Leontieff was Right!" *Journal of Political Economy*, 101, 961-987.

[28] Ventura, J. (1997): "Growth and Interdependence," *Quarterly Journal of Economics*, 112, 57-84.

[29] Wooldridge, J.M. (2002): *Econometric Analysis of Cross Section and Panel Data*, MIT Press.

6 Appendix A: Proofs

6.1 The Role of Endowment Similarity

Assume $\phi_j = 1$ for all $j \in J$.

6.1.1 Proof 1: $Y_k(l) > Y_k(k')$

Since $r(l) = w(k') > r(k') = w(l)$,

$$\begin{aligned} Y_k(l) &= \left(\frac{1}{2}+\mu\right) r(l) + \left(\frac{1}{2}-\mu\right) w(l) > \\ &> \left(\frac{1}{2}+\mu\right) r(k') + \left(\frac{1}{2}-\mu\right) w(k') = Y_k(k'). \end{aligned}$$

Tedious algebra yields

$$Y_k(l) - Y_k(k') = \frac{2a}{Y_W}\mu^2. \tag{28}$$

6.1.2 Proof 2: $\frac{1}{J}Y_W > Y_k(l)$

Since we have factor price equalization (à la Trefler [27]), we can find Y_W from the integrated equilibrium:

$$\begin{aligned} Y_W &= Y_W(l) = [y_{1W}(l)]^{\frac{1}{2}} [y_{2W}(l)]^{\frac{1}{2}} = \\ &= \left(\frac{J}{2}K_k + \frac{J}{2}K_l + aK_l\right)^{\frac{1}{2}} \left(\frac{J}{2}L_k + \frac{J}{2}L_l + aL_l\right)^{\frac{1}{2}}. \end{aligned}$$

Concerning $Y_k(l)$,

$$Y_k(l) = r(l)K_k + w(l)L_k = \frac{1}{2}\left[\frac{y_{2W}(l)}{y_{1W}(l)}\right]^{\frac{1}{2}} K_k + \frac{1}{2}\left[\frac{y_{1W}(l)}{y_{2W}(l)}\right]^{\frac{1}{2}} L_k =$$
$$= \frac{1}{2}\left[\left(\frac{\frac{J}{2}L_k + \frac{J}{2}L_l + aL_l}{\frac{J}{2}K_k + \frac{J}{2}K_l + aK_l}\right)^{\frac{1}{2}} K_k + \left(\frac{\frac{J}{2}K_k + \frac{J}{2}K_l + aK_l}{\frac{J}{2}L_k + \frac{J}{2}L_l + aL_l}\right)^{\frac{1}{2}} L_k\right].$$

Tedious algebra yields

$$Y_W - JY_k(l) = Y_W^{-1}\left(a^2 + Ja\right) L_k L_l = Y_W^{-1}\left(a^2 + Ja\right)\left(\frac{1}{4} - \mu^2\right) > 0. \tag{29}$$

6.1.3 Proof 3: $Y_k(k) > \frac{1}{J}Y_W$

Recall $\frac{1}{J}Y_W = \frac{1}{J}\sum_j Y_j(s) = \frac{1}{J}\sum_s Y_j(s)$. Since $\frac{1}{J}Y_W > Y_k(l) > Y_k(k')$, it follows that $Y_k(k) > \frac{1}{J}Y_W$.

6.1.4 Proof 4: $B_k(k'), B_l(k'), B_{k'}(k')$

From (2)-(5), (19), and (29),

$$B_k(l) = B_l(k') = Y_W^{-1}\left(\frac{a^2}{J}+a\right)\left(\frac{1}{4}-\mu^2\right) > 0. \tag{30}$$

As for $B_k(k')$, from (19), (28), and (30),

$$B_k(k') = Y_W^{-1}\left[\left(\frac{a^2}{J}+a\right)\left(\frac{1}{4}-\mu^2\right)+2a\mu^2\right] > 0. \tag{31}$$

Asset market clearing and equations (30) and (31) yield

$$B_{k'}(k') = -Y_W^{-1}\left[\left(\frac{a^2}{J}+a\right)\left(\frac{1}{4}-\mu^2\right)(J-1)+2a\mu^2\left(\frac{J}{2}-1\right)\right] < 0.$$

6.2 The Role of Size

We allow for cross-country differences in size. We assume that the distributions of the scaling factor ϕ_j within J_k and J_l are symmetric.

6.2.1 Proof 5: $L_W(k') < K_W(k')$

$$\begin{aligned} K_W(k') &= \sum_{k\in J_k}\phi_k\left(\frac{1}{2}+\mu\right)+\sum_{l\in J_l}\phi_l\left(\frac{1}{2}-\mu\right)+\phi_{k'}a\left(\frac{1}{2}+\mu\right)= \\ &= \sum_{k\in J_k}\phi_k+\phi_{k'}a\left(\frac{1}{2}+\mu\right), \qquad (32)\\ L_W(k') &= \sum_{k\in J_k}\phi_k\left(\frac{1}{2}-\mu\right)+\sum_{l\in J_l}\phi_l\left(\frac{1}{2}+\mu\right)+\phi_{k'}a\left(\frac{1}{2}-\mu\right) \\ &= \sum_{k\in J_k}\phi_k+\phi_{k'}a\left(\frac{1}{2}-\mu\right) < K_W(k'). \qquad (33) \end{aligned}$$

6.2.2 Proof 6: Sufficient Condition for $p(k'')[B_k(k'')-B_l(k'')] > p(k')[B_k(k')-B_l(k')]$

$$\begin{aligned} K_W(k'')-K_W(k') &= (\phi_{k''}-\phi_{k'})\,a\left(\frac{1}{2}+\mu\right) > 0, \qquad (34)\\ L_W(k'')-L_W(k') &= (\phi_{k''}-\phi_{k'})\,a\left(\frac{1}{2}-\mu\right) > 0. \qquad (35) \end{aligned}$$

Notice $p(k'')[B_k(k'')-B_l(k'')]-p(k')[B_k(k')-B_l(k')] > 0$ if

$$\begin{aligned} &\left[\frac{1}{L_W(k'')}-\frac{1}{K_W(k'')}\right]-\left[\frac{1}{L_W(k')}-\frac{1}{K_W(k')}\right]= \\ &=\left[\frac{K_W(k'')-K_W(k')}{K_W(k'')K_W(k')}\right]-\left[\frac{L_W(k'')-L_W(k')}{L_W(k'')L_W(k')}\right] > 0, \qquad (36) \end{aligned}$$

which is equivalent to

$$\frac{\frac{1}{2}+\mu}{\frac{1}{2}-\mu} > \frac{\left[\sum_{k\in J_k}\phi_k+\phi_{k''}a\left(\frac{1}{2}+\mu\right)\right]\left[\sum_{k\in J_k}\phi_k+\phi_{k'}a\left(\frac{1}{2}+\mu\right)\right]}{\left[\sum_{k\in J_k}\phi_k+\phi_{k''}a\left(\frac{1}{2}-\mu\right)\right]\left[\sum_{k\in J_k}\phi_k+\phi_{k'}a\left(\frac{1}{2}-\mu\right)\right]}. \tag{37}$$

A sufficient condition for this inequality to hold is

$$a^2 < \frac{\left(\sum_{k\in J_k}\phi_k\right)^2}{\phi_{k''}\phi_{k'}\left(\frac{1}{4}-\mu^2\right)}. \tag{38}$$

7 Appendix B: A Many-Good Model

This appendix discusses a many-good generalization of the model in section 2. Our purpose here is to show that the model's key feature driving international portfolio choice is relative factor endowment similarity. In the Heckscher-Ohlin model, production structures are undefined in the presence of more goods than factors. Therefore factor endowment similarity does not necessarily imply similar production structures. On the other hand, a country will still be interested in investing a larger share of its international portfolio in countries with similar factor endowments for insurance purposes.

We maintain most of the model's assumptions, but for the ones we mention here:

1. The final good C is now defined over a continuum of goods, which are aggregated in a Cobb-Douglas fashion:

$$C_j = \exp\left[\int_0^1 \ln C_j(z)\, dz\right], \tag{39}$$

   where $C(z)$ denotes consumption of freely traded intermediate good z, $z \in [0,1]$.

2. Each industry employs the two production factors, K and L, which are freely mobile between industries. Production functions are also of the Cobb-Douglas type:

$$y_j(z) = \left[A_j K_j(z)\right]^{\alpha(z)}\left[A_j L_j(z)\right]^{1-\alpha(z)},$$

   where $y_j(z)$ denotes production of good z in country j; and $\alpha(z) \in [0,1]$. For simplicity, we assume $\alpha(z) = z$.[25]

3. There is an upper limit $\bar{\mu} < 1/2$ to the differences in relative factor endowments we can allow for, as we focus (for simplicity) on the factor price equalization case.

4. We assume equal size for all countries: $\phi_j = 1$ for all $j \in J$.

[25] Any symmetric distribution of $\alpha(z)$ such that $\alpha(z) = 1 - \alpha(1-z)$ would yield similar results.

7.1 Goods Market Equilibrium

We again assume factor price equalization à la Trefler [27]. We will therefore find equilibrium prices by solving for the integrated equilibrium; *i.e.*, we assume both commodities and factors are freely mobile in the world, as if the latter were a single (closed) economy.

The integrated equilibrium conditions are the following:

- Pricing:

$$p(z) = b(z, r, w), \tag{40}$$

$$b(z, r, w) = \left[\frac{r}{\alpha(z)}\right]^{\alpha(z)} \left[\frac{w}{1-\alpha(z)}\right]^{1-\alpha(z)}, \tag{41}$$

$$P = \exp\left[\int_0^1 \ln p(z)\, dz\right], \tag{42}$$

  where $b(z, r, w)$ denotes industry z's cost function; r and w are, respectively, the prices of capital and labor in efficiency units; and P denotes the price of the final good, which we will use as numeraire: $P = 1$.

- Commodity market clearing:

$$C_W(z) = \frac{PC_W}{p(z)} = y_W(z), \tag{43}$$

$$C_W = Y_W = rK_W + wL_W,$$

  where $K_W \equiv \sum_{j \in J} A_j K_j$ and $L_W \equiv \sum_{j \in J} A_j L_j$.

- Factor market clearing:

$$\int_0^1 \frac{\partial b(z, r, w)}{\partial r} y_W(z)\, dz = K_W, \tag{44}$$

$$\int_0^1 \frac{\partial b(z, r, w)}{\partial w} y_W(z)\, dz = L_W. \tag{45}$$

Putting conditions (40), (41), (43), (44), and (45) together, $w/r = K_W/L_W$, and $P = e^{-\frac{1}{2}} r^{\frac{1}{2}} w^{\frac{1}{2}}$. These last two equations and the choice of numeraire yield $r = e^{-\frac{1}{2}} (K_W/L_W)^{-\frac{1}{2}}$ and $w = e^{-\frac{1}{2}} (K_W/L_W)^{\frac{1}{2}}$. It is easy to show that the results we discussed in section 2.1 also hold here. Defining country j's gross domestic product as $Y_j = r(A_j K_j) + w(A_j L_j)$, we obtain $Y_k(k) > \frac{1}{J} Y_W > Y_k(l) > Y_k(k')$. The model's symmetry implies $Y_{k'}(k') > \frac{1}{J} Y_W > Y_l(k') > Y_k(k')$.

7.2 Asset Market Equilibrium

The following results are the counterpart to results 1, 2 and 4 in section 2.3:

1. Assume $\mu > 0$. Consider state of nature k', $k' \in J_k$: $B_k(k') > B_l(k') > 0 > B_{k'}(k')$. By symmetry, $B_k(k') > B_k(l) > 0 > B_k(k)$.

2. When factor endowment ratio differences are small, countries k and l do not differ in their investment decisions regarding country k':

$$\lim_{\mu \to 0} [B_k(k') - B_l(k')] = 0.$$

3. Regarding β, $\beta = -\frac{2\mu^2}{\left(\frac{a}{J}+1\right)\left(\frac{1}{4}-\mu^2\right)}$, $d|\beta|/d\mu > 0$.

8 Appendix C: International Portfolio Choice without Arrow-Debreu Securities

This appendix discusses a model without Arrow-Debreu securities that yields results comparable to those we obtained in section 2. We assume the same setup as in section 2 on the goods side (including our assumptions on productivity shocks and states of nature), but consider a completely different asset side.

1. Let us simplify by assuming $J = 4$, $\phi_j = 1$ for all $j \in J$, and complete specialization ($\mu = 1/2$).

2. We assume quadratic utility

$$U(C_j) = C_j - \frac{b}{2} C_j^2, \tag{46}$$

   where $b > 0$.[26]

3. Before uncertainty is realized countries can only exchange ownership claims on their GDPs.

4. International asset trade is costly: a fraction $\tau_{jj'} = \tau \in (0,1)$ of the payoff that country j receives from its claims on country-j' GDP, $j' \neq j$, is wasted as a cost of keeping foreign assets in country j's portfolio ($\tau_{jj} = 0$ for all j).[27]

Let V_j be the market value of country j's uncertain GDP $Y_j \equiv p_j y_j$. The problem's budget constraints can be written as follows:

$$V_j = \sum_{j'=1}^{J} x_{jj'} V_{j'}, \tag{47}$$

$$C_j = \sum_{j'=1}^{J} x_{jj'} (1 - \tau_{jj'}) Y_{j'}, \tag{48}$$

[26] b must be small enough so that $U'(C) > 0$.

[27] This is the classical 'iceberg' assumption due to Samuelson [24], which has been used in international finance by Martin and Rey [19], [20].

where $x_{jj'}$ denotes country j's share of ownership claims on country-j' income.[28] Asset market clearing requires $\sum_{j=1}^{J} x_{jj'} = 1$ for all $j' \in J$. Country j's utility maximization problem can be expressed as:

$$\max_{\{x_{jj'}\}_{j'=1}^{J}} \quad E\left[U\left[\sum_{j'=1}^{J} x_{jj'}\left(1-\tau_{jj'}\right) Y_{j'}\right]\right], \tag{49}$$

subject to $V_j = \Sigma_{j'} x_{jj'} V_{j'}$. The first-order conditions with respect to $x_{jj'}$, $j' = 1, ..., J$, yield

$$\frac{\lambda_j V_{j'}}{1-\tau_{jj'}} = E\left[U'\left(C_j\right) Y_{j'}\right] = cov\left[U'\left(C_j\right), Y_{j'}\right] + E\left[U'\left(C_j\right)\right] E\left(Y_{j'}\right), \tag{50}$$

$j' \in J$, and where λ_j is the Lagrange multiplier associated to the constraint. Due to the model's symmetry, $\lambda_j = \lambda$, $E\left(Y_j\right) = E\left(Y\right)$, and $V_j = V$ for all j. The presence of international asset market frictions thus implies $cov\left[U'\left(C_j\right), Y_j\right] < cov\left[U'\left(C_j\right), Y_{j'}\right]$ for all $j' \neq j$. With quadratic utility, this is equivalent to $cov\left[C_j, Y_j\right] > cov\left[C_j, Y_{j'}\right]$. Thus, portfolios will be home-biased due to the presence of frictions.

We now show $x_{kk'} > x_{kl}$. Consider first $k, k' \in J_k$: since $cov\left[C_k, Y_k\right] > cov\left[C_k, Y_{k'}\right]$ and $var\left(Y_k\right) = var\left(Y_{k'}\right)$,

$$\left[x_{kk} - x_{kk'}\left(1-\tau\right)\right] var\left(Y_k\right) > \left[x_{kk} - x_{kk'}\left(1-\tau\right)\right] cov\left(Y_k, Y_{k'}\right). \tag{51}$$

Since $cov\left(Y_k, Y_{k'}\right) < 0$,[29] $x_{kk} > x_{kk'}\left(1-\tau\right)$. Consider now $k, k' \in J_k$ and $l, l' \in J_l$: since, from the first-order condition (50), $cov\left[C_k, Y_{k'}\right] = cov\left[C_k, Y_l\right]$,

$$x_{kk'}\left(1-\tau\right) var\left(Y_{k'}\right) + x_{kk} cov\left(Y_k, Y_{k'}\right) = x_{kl}\left(1-\tau\right) var\left(Y_l\right) + x_{kl'}\left(1-\tau\right) cov\left(Y_l, Y_{l'}\right). \tag{52}$$

By symmetry, $var\left(Y_{k'}\right) = var\left(Y_l\right) > 0$, $cov\left(Y_j, Y_k\right) = cov\left(Y_l, Y_{l'}\right) < 0$, and $x_{kl} = x_{kl'}$. Solving for $x_{kl}\left(1-\tau\right)$,

$$\begin{aligned} x_{kl}\left(1-\tau\right) &= \frac{x_{kk'}\left(1-\tau\right) var\left(Y_{k'}\right) + x_{kk} cov\left(Y_k, Y_{k'}\right)}{var\left(Y_{k'}\right) + cov\left(Y_k, Y_{k'}\right)} < \\ &< \frac{x_{kk'}\left(1-\tau\right)\left[var\left(Y_{k'}\right) + cov\left(Y_k, Y_{k'}\right)\right]}{var\left(Y_{k'}\right) + cov\left(Y_k, Y_{k'}\right)} = x_{kk'}\left(1-\tau\right), \end{aligned} \tag{53}$$

since $x_{kk} > x_{kk'}\left(1-\tau\right)$ and $cov\left(Y_k, Y_{k'}\right) < 0$. Hence, $x_{kk'} > x_{kl}$: country k invests a larger share of its wealth in country k' than in country l.[30]

This setup is correctly spelt out only for the case $x_{kk} > x_{kk'} > x_{kl} \geq 0$. How can we make sure that we have no shortselling in equilibrium? Notice that

[28] Country j's 'total consumption' of the final good (that is, inclusive of the resources wasted in keeping its international portfolio) is $\sum_{j'=1}^{J} x_{jj'} Y_{j'}$.

[29] Under complete specialization, it is easy to prove that $cov(Y_k, Y_{k'}) < cov\left(Y_k, Y_l\right) = 0$.

[30] According to our computer simulations, allowing for CRRA utility and a higher elasticity of substitution between goods, as well as for a less restrictive distribution of states of nature, yields similar results. These results are available upon request.

in the absence of asset trade frictions ($\tau = 0$), countries would be able to insure fully by choosing $x_{kk} = x_{kk'} = x_{kl} = 1/4$. We can show that x_{kl} is a continuous function of τ. Hence, by continuity, for a small positive τ, $x_{kl} > 0$. (In any case, we do not observe shortselling in the data.)

9 Appendix D: Sources and Definitions of Variables

- Bilateral portfolio equity holdings (in millions of US dollars): Portfolio equity instruments issued by host country residents and held by source country residents. Source: 2002 Coordinated Portfolio Survey (IMF). Year: 2002.

- GDP (in millions of year-2000 US dollars). Source: Penn-World Tables. Year: 2001.

- Total population. Source: World Development Indicators. Year: 2001.

- Log of bilateral trade. Source: Glick and Rose [7].

- Distance: Logarithm of great circle distance in miles between the capital cities of source and host countries. Source: Glick and Rose [7].

- Common border: Dummy variable taking the value of 1 if source and host countries share a border. Source: Glick and Rose [7].

- Regional trade agreement (RTA): Dummy variable taking the value of 1 if source and host countries share the same regional trade agreement. Source: Glick and Rose [7].

- Currency area: Dummy variable taking the value of 1 if source and host countries are in the same (strict) currency union. Source: Glick and Rose [7]. (Updated for the euro area by the authors.)

- Colony/Colonizer: Dummy variable taking the value of 1 if source and host countries ever had a colonial relationship. Source: Glick and Rose [7].

- Common language: Dummy variable taking the value of 1 if source and host countries share a common language. Source: Glick and Rose [7].

- Common legal origin: Dummy variable taking the value of 1 if source and host countries have a legal system with a common origin (common law, French, German, or Scandinavian). Source: La Porta *et al.* [14].

- Correlation in GDP growth rates: Correlation between the real GDP growth rate in the source and host country. Authors' own computations based on real GDP growth rates. Source: World Development Indicators. Period: 1981-2000.

- Correlation of stock returns. Period 1980-96. Source: Lane and Milesi-Ferretti [17]

- Correlation of growth-stock returns. Period 1980-96. Source: Lane and Milesi-Ferretti [17]

- Capital-labor ratios. Source: Caselli and Feyrer [3]. Year: 2000.

- Time difference. Authors' calculation. The variable is constructed as $\ln(0.001 + time\_difference)$.

- Exports by sector to the world at the 2-digit level. Source: Feenstra (NBER database). We only include countries that have at most 4 missing sectoral values.

Table 1. Information on countries in the sample

Countries	ln(GDP)	Total source equity	Total host equity
Mexico	27.42	-	32179
Peru	25.46	-	830
United States	29.91	1211995	883255
United Kingdom	28.02	454824	617163
Italy	27.91	236145	111258
Netherlands	26.78	209553	234769
Canada	27.45	196270	94029
France	28.04	191511	286155
Japan	28.75	187926	300688
Ireland	25.34	134574	104392
Belgium	26.27	104597	33493
Sweden	26.14	93698	51921
Australia	26.96	62581	71793
Spain	27.44	52846	97670
Norway	25.75	52033	15965
South Africa	26.61	32075	18261
Austria	26.12	28606	6731
Finland	25.5	21551	80365
Portugal	25.92	7705	10694
New Zealand	25.11	7548	4272
Argentina	26.72	6760	1374
Chile	25.91	4466	2900
Greece	25.8	2548	5032
Israel	25.58	1734	12639
Brazil	27.87	1184	21496
Korea	27.36	1156	58973
Malaysia	26.25	1046	11893
Colombia	26.22	402	190
Indonesia	27.49	63	7544
Thailand	26.76	52	8355
Turkey	26.62	40	6342

"ln(GDP0)" is the log of real GDP of 2001 in units of US$ 2000.
"Total source equity" and "Total host equity" are both measured in millions of US$ 2002.

Table 2. Full Sample. Interaction term: ln(GDP) with host countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson
	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0
Log of bilateral trade	0.600	0.365	0.382	0.137	0.150	0.602	0.373	0.354	0.143	0.154	0.608	0.349	0.347	0.170	0.180
	[0.118]***	[0.134]**	[0.155]**	[0.130]	[0.130]	[0.123]***	[0.148]**	[0.168]**	[0.130]	[0.129]	[0.124]***	[0.151]**	[0.175]*	[0.126]	[0.126]
Log of distance	-0.172	-0.341	-0.215	-0.042	-0.034	-0.146	-0.317	-0.193	-0.025	-0.021	-0.136	-0.289	-0.171	-0.039	-0.035
	[0.159]	[0.143]**	[0.150]	[0.119]	[0.119]	[0.164]	[0.144]**	[0.156]	[0.118]	[0.118]	[0.170]	[0.135]**	[0.149]	[0.113]	[0.113]
Common legal origin	0.269	0.293	0.251	-0.071	-0.075	0.287	0.316	0.273	-0.077	-0.079	0.293	0.318	0.280	0.025	0.023
	[0.145]*	[0.158]*	[0.130]*	[0.157]	[0.158]	[0.148]*	[0.175]*	[0.137]*	[0.160]	[0.161]	[0.149]**	[0.179]*	[0.137]**	[0.149]	[0.149]
Dummy for common border	0.270	0.190	0.175	0.435	0.433	0.234	0.159	0.108	0.431	0.428	0.211	0.216	0.116	0.460	0.450
	[0.289]	[0.293]	[0.309]	[0.131]***	[0.133]***	[0.292]	[0.288]	[0.299]	[0.136]***	[0.138]***	[0.293]	[0.286]	[0.290]	[0.138]***	[0.141]***
Dummy for common language	0.251	0.080	0.174	0.492	0.494	0.214	0.064	0.127	0.475	0.478	0.203	0.117	0.156	0.437	0.438
	[0.218]	[0.201]	[0.213]	[0.178]***	[0.177]***	[0.224]	[0.211]	[0.233]	[0.181]***	[0.180]***	[0.229]	[0.214]	[0.209]	[0.165]***	[0.163]***
Dummy for ever colony/colonizer	0.324	0.458	0.477	-0.232	-0.236	0.356	0.474	0.493	-0.221	-0.225	0.354	0.430	0.457	-0.172	-0.181
	[0.288]	[0.354]	[0.346]	[0.201]	[0.200]	[0.297]	[0.361]	[0.353]	[0.205]	[0.204]	[0.303]	[0.355]	[0.337]	[0.203]	[0.201]
Dummy. Strict currency area	-0.057	-0.134	-0.108	0.988	0.991	-0.108	-0.120	-0.073	0.994	0.994	-0.140	-0.021	-0.045	0.996	0.996
	[0.270]	[0.315]	[0.328]	[0.249]***	[0.249]***	[0.277]	[0.314]	[0.320]	[0.246]***	[0.246]***	[0.281]	[0.325]	[0.332]	[0.250]***	[0.249]***
Dummy. Regional trade agreement	-0.262	-0.304	-0.060	0.186	0.175	-0.373	-0.346	-0.123	0.199	0.186	-0.390	-0.332	-0.127	0.226	0.217
	[0.290]	[0.331]	[0.330]	[0.131]	[0.127]	[0.300]	[0.323]	[0.327]	[0.137]	[0.132]	[0.301]	[0.326]	[0.329]	[0.148]	[0.142]
GDP growth correlations	0.696	0.637	0.776	-0.217	-0.209	0.708	0.647	0.703	-0.250	-0.241	0.736	0.575	0.687	-0.317	-0.299
	[0.239]***	[0.328]*	[0.295]**	[0.193]	[0.192]	[0.245]***	[0.330]*	[0.286]**	[0.229]	[0.228]	[0.248]***	[0.324]*	[0.280]**	[0.242]	[0.244]
Similarity in K/L ratio	-8.477	-8.709	-8.633	-7.737	-7.465	-7.995	-7.706	-7.648	-7.704	-7.443	-7.728	-8.286	-7.848	-7.356	-7.203
	[2.538]***	[3.132]***	[2.338]***	[2.470]***	[2.493]***	[2.586]***	[3.200]**	[2.130]***	[2.491]***	[2.513]***	[2.608]***	[3.164]**	[2.177]***	[2.551]***	[2.572]***
Similarity in K/L ratio *log(GDP)	**0.327**	**0.355**	**0.348**	**0.295**	**0.285**	**0.309**	**0.319**	**0.310**	**0.294**	**0.284**	**0.307**	**0.322**	**0.312**	**0.286**	**0.281**
	[0.093]* **	**[0.118]*** **	**[0.089]*** **	**[0.084]*** **	**[0.086]*** **	**[0.095]*** **	**[0.119]** **	**[0.081]*** **	**[0.085]*** **	**[0.087]*** **	**[0.095]*** **	**[0.114]*** **	**[0.082]*** **	**[0.091]*** **	**[0.093]*** **
Similarity in exports	5.742	13.098	2.850	-6.591	-6.434	-0.414	10.483	-1.635	-7.262	-7.268	0.780	6.542	-2.410	-4.892	-3.391
	[18.314]	[13.376]	[16.505]	[9.114]	[8.876]	[18.941]	[15.758]	[17.253]	[8.589]	[8.367]	[19.013]	[16.507]	[17.183]	[9.828]	[9.623]
Similarity in exports*log(GDP)	-0.288	-0.494	-0.182	0.206	0.196	-0.070	-0.386	-0.017	0.227	0.223	-0.116	-0.237	0.018	0.137	0.077
	[0.678]	[0.495]	[0.614]	[0.296]	[0.285]	[0.700]	[0.582]	[0.640]	[0.277]	[0.266]	[0.703]	[0.612]	[0.637]	[0.330]	[0.322]
Correlation stock returns						0.723	0.219	1.139	0.257	0.239	0.787	0.057	1.094	0.268	0.292
						[0.576]	[0.481]	[0.457]**	[0.328]	[0.330]	[0.583]	[0.538]	[0.416]**	[0.361]	[0.358]
Correlation growth-stock returns						-0.368	0.020	-0.044	-0.025	-0.047	-0.359	-0.011	-0.053	-0.029	-0.050
						[0.204]*	[0.310]	[0.208]	[0.221]	[0.222]	[0.205]*	[0.327]	[0.209]	[0.219]	[0.219]
Similarity in log(GDP per capita)											-0.296	0.715	0.184	-0.177	-0.323
											[0.370]	[0.515]	[0.480]	[0.581]	[0.557]
Time difference											-0.012	-0.000	-0.011	0.035	0.035
											[0.025]	[0.026]	[0.022]	[0.024]	[0.024]
Observations	650	523	650	523	650	624	501	624	501	624	624	501	624	501	624
GDP positive interaction threshold:	25.92	24.53	24.81	26.23	26.19	25.87	24.16	24.67	26.20	26.21	25.17	25.73	25.15	25.72	25.63
GDP 5% significance threshold:	26.74	26.28	26.08	27.84	27.79	26.79	26.19	25.98	27.84	27.79	26.93	28.00	27.18	27.56	27.52
R-squared		0.88	0.88				0.88	0.88				0.88	0.88		
Pseudo R-squared	0.44			0.96	0.96	0.44			0.96	0.96	0.44			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations. Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.
The Pseudo R-squared available for Poisson are without clustering.

Table 3. Full Sample. Interaction term: sample split in two parts based on host GDP size

	(1) Tobit Equity>=0	(2) OLS Equity>0	(3) OLS Equity>=0	(4) Poisson Equity>0	(5) Poisson Equity>=0	(6) Tobit Equity>=0	(7) OLS Equity>0	(8) OLS Equity>=0	(9) Poisson Equity>0	(10) Poisson Equity>=0	(11) Tobit Equity>=0	(12) OLS Equity>0	(13) OLS Equity>=0	(14) Poisson Equity>0	(15) Poisson Equity>=0
Log of bilateral trade	0.573	0.340	0.354	0.181	0.192	0.578	0.348	0.333	0.188	0.198	0.587	0.325	0.328	0.207	0.212
	[0.118]***	[0.136]**	[0.151]**	[0.121]	[0.121]	[0.123]***	[0.149]**	[0.165]*	[0.118]	[0.119]*	[0.124]***	[0.152]**	[0.173]*	[0.120]*	[0.120]*
Log of distance	-0.199	-0.355	-0.252	0.006	0.011	-0.172	-0.332	-0.227	0.026	0.027	-0.170	-0.313	-0.215	0.008	0.009
	[0.160]	[0.144]**	[0.147]*	[0.110]	[0.111]	[0.164]	[0.147]**	[0.154]	[0.109]	[0.109]	[0.171]	[0.139]**	[0.148]	[0.106]	[0.106]
Common legal origin	0.278	0.304	0.253	-0.121	-0.125	0.293	0.326	0.276	-0.126	-0.129	0.295	0.326	0.280	-0.018	-0.021
	[0.145]*	[0.160]*	[0.132]*	[0.156]	[0.157]	[0.149]**	[0.177]*	[0.138]*	[0.158]	[0.159]	[0.149]**	[0.181]*	[0.138]*	[0.147]	[0.146]
Dummy for common border	0.240	0.152	0.127	0.397	0.397	0.204	0.123	0.069	0.386	0.383	0.181	0.180	0.076	0.425	0.417
	[0.290]	[0.293]	[0.306]	[0.130]***	[0.132]***	[0.293]	[0.288]	[0.296]	[0.134]***	[0.136]***	[0.294]	[0.286]	[0.290]	[0.134]***	[0.137]***
Dummy for common language	0.245	0.062	0.188	0.502	0.505	0.217	0.053	0.146	0.479	0.483	0.198	0.100	0.166	0.441	0.446
	[0.219]	[0.208]	[0.207]	[0.178]***	[0.177]***	[0.225]	[0.217]	[0.229]	[0.179]***	[0.178]***	[0.230]	[0.218]	[0.206]	[0.165]***	[0.163]***
Dummy for ever colony/colonizer	0.339	0.472	0.486	-0.171	-0.175	0.369	0.485	0.503	-0.153	-0.157	0.379	0.448	0.480	-0.101	-0.111
	[0.289]	[0.354]	[0.336]	[0.207]	[0.206]	[0.298]	[0.362]	[0.344]	[0.210]	[0.209]	[0.304]	[0.356]	[0.331]	[0.206]	[0.204]
Dummy. Strict currency area	-0.077	-0.158	-0.127	0.985	0.989	-0.130	-0.140	-0.096	0.991	0.992	-0.166	-0.045	-0.076	0.994	0.995
	[0.271]	[0.314]	[0.327]	[0.243]***	[0.243]***	[0.277]	[0.316]	[0.319]	[0.240]***	[0.240]***	[0.281]	[0.328]	[0.329]	[0.244]***	[0.244]***
Dummy for regional trade agreement	-0.266	-0.316	-0.064	0.223	0.214	-0.372	-0.354	-0.121	0.237	0.225	-0.386	-0.339	-0.123	0.285	0.285
	[0.291]	[0.327]	[0.329]	[0.107]**	[0.105]**	[0.302]	[0.319]	[0.326]	[0.115]**	[0.113]**	[0.302]	[0.323]	[0.328]	[0.142]**	[0.133]**
GDP growth correlations	0.687	0.652	0.759	-0.256	-0.246	0.706	0.663	0.696	-0.315	-0.304	0.735	0.594	0.684	-0.385	-0.359
	[0.240]***	[0.332]*	[0.296]**	[0.177]	[0.176]	[0.246]***	[0.335]*	[0.288]**	[0.209]	[0.209]	[0.248]***	[0.330]*	[0.285]**	[0.224]*	[0.228]
Similarity in K/L ratio (Small countries)	-0.079	0.553	0.302	-0.538	-0.525	-0.038	0.651	0.357	-0.561	-0.550	0.215	0.134	0.236	-0.465	-0.437
	[0.219]	[0.410]	[0.248]	[0.442]	[0.437]	[0.225]	[0.443]	[0.241]	[0.431]	[0.426]	[0.368]	[0.434]	[0.338]	[0.409]	[0.399]
Similarity in K/L ratio (Large countries)	**0.646**	**1.199**	**1.050**	**0.741**	**0.723**	**0.611**	**1.189**	**0.988**	**0.741**	**0.723**	**0.855**	**0.684**	**0.866**	**0.875**	**0.875**
	[0.178]*	**[0.385]***	**[0.297]***	**[0.283]***	**[0.268]***	**[0.182]***	**[0.385]***	**[0.280]***	**[0.281]***	**[0.266]***	**[0.342]**	**[0.400]***	**[0.383]**	**[0.322]***	**[0.323]***
Similarity in exports (Small countries)	-1.562	0.129	-1.810	-0.979	-1.079	-2.168	0.312	-2.063	-1.195	-1.311	-2.235	0.297	-1.970	-1.140	-1.272
	[2.226]	[1.876]	[2.410]	[2.141]	[2.115]	[2.292]	[2.017]	[2.633]	[2.141]	[2.118]	[2.296]	[1.983]	[2.557]	[2.051]	[2.012]
Similarity in exports (Large countries)	-1.609	-0.108	-1.095	0.818	0.681	-1.516	0.363	-0.971	0.698	0.560	-1.635	0.484	-0.859	0.396	0.202
	[2.298]	[2.228]	[2.682]	[2.122]	[2.081]	[2.329]	[2.375]	[2.900]	[2.105]	[2.068]	[2.340]	[2.375]	[2.857]	[1.948]	[1.907]
Correlation stock returns						0.632	0.177	0.990	0.379	0.359	0.705	0.011	0.955	0.389	0.408
						[0.578]	[0.495]	[0.475]**	[0.302]	[0.304]	[0.585]	[0.557]	[0.436]**	[0.354]	[0.347]
Correlation growth-stock returns						-0.362	0.036	-0.041	-0.093	-0.115	-0.352	0.006	-0.047	-0.102	-0.125
						[0.206]*	[0.315]	[0.206]	[0.203]	[0.204]	[0.206]*	[0.332]	[0.207]	[0.200]	[0.201]
Similarity in log(GDP per capita)											-0.314	0.704	0.150	-0.162	-0.286
											[0.369]	[0.505]	[0.466]	[0.472]	[0.456]
Time difference											-0.007	0.004	-0.005	0.037	0.036
											[0.025]	[0.026]	[0.022]	[0.024]	[0.024]
Observations	650	523	650	523	650	624	501	624	501	624	624	501	624	501	624
H0: coef[KL_small]=coef[KL_large]:	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
R-squared		0.88	0.88				0.88	0.88				0.88	0.88		
Pseudo R-squared	0.44			0.96	0.96	0.44			0.96	0.96	0.44			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations.
Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.
The Pseudo R-squared available for Poisson are without clustering.

Table 4. Source countries: Full sample. Host countries: OECD sample. Interaction term: ln(GDP) with host countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson
	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0
Log of bilateral trade	0.321	0.155	0.164	0.099	0.110	0.307	0.152	0.125	0.106	0.115	0.325	0.141	0.125	0.137	0.145
	[0.139]**	[0.180]	[0.212]	[0.145]	[0.145]	[0.141]**	[0.178]	[0.210]	[0.141]	[0.140]	[0.141]**	[0.176]	[0.210]	[0.138]	[0.137]
Log of distance	-0.261	-0.404	-0.351	-0.062	-0.059	-0.284	-0.410	-0.357	-0.032	-0.034	-0.348	-0.451	-0.420	-0.040	-0.040
	[0.179]	[0.208]*	[0.229]	[0.132]	[0.132]	[0.182]	[0.206]*	[0.227]	[0.135]	[0.134]	[0.193]*	[0.197]**	[0.213]*	[0.126]	[0.125]
Common legal origin	0.474	0.492	0.457	-0.093	-0.098	0.517	0.525	0.493	-0.099	-0.100	0.519	0.517	0.482	0.008	0.007
	[0.167]***	[0.179]**	[0.133]***	[0.168]	[0.169]	[0.169]***	[0.175]***	[0.130]***	[0.171]	[0.172]	[0.169]***	[0.173]***	[0.127]***	[0.167]	[0.167]
Dummy for common border	0.125	0.181	0.271	0.471	0.465	0.107	0.166	0.257	0.472	0.463	0.041	0.177	0.243	0.484	0.474
	[0.317]	[0.329]	[0.331]	[0.133]***	[0.133]***	[0.318]	[0.334]	[0.321]	[0.139]***	[0.140]***	[0.320]	[0.342]	[0.333]	[0.144]***	[0.145]***
Dummy for common language	0.375	0.094	0.209	0.520	0.523	0.419	0.142	0.207	0.498	0.502	0.361	0.140	0.194	0.459	0.461
	[0.249]	[0.229]	[0.256]	[0.190]***	[0.188]***	[0.253]*	[0.245]	[0.269]	[0.192]***	[0.191]***	[0.256]	[0.242]	[0.251]	[0.174]***	[0.172]***
Dummy for ever colony/colonizer	0.071	0.379	0.230	-0.228	-0.236	0.130	0.404	0.263	-0.215	-0.223	0.227	0.449	0.332	-0.170	-0.181
	[0.324]	[0.360]	[0.332]	[0.207]	[0.207]	[0.330]	[0.369]	[0.336]	[0.212]	[0.211]	[0.339]	[0.374]	[0.361]	[0.205]	[0.203]
Dummy. Strict currency area	0.259	-0.016	0.082	1.013	1.018	0.191	-0.033	0.054	1.023	1.026	0.111	-0.024	0.033	1.024	1.025
	[0.288]	[0.362]	[0.370]	[0.259]***	[0.259]***	[0.290]	[0.355]	[0.346]	[0.255]***	[0.255]***	[0.293]	[0.363]	[0.363]	[0.256]***	[0.256]***
Dummy for regional trade agreement	0.088	0.373	0.333	0.293	0.276	0.042	0.367	0.331	0.327	0.307	0.054	0.405	0.352	0.350	0.334
	[0.338]	[0.333]	[0.381]	[0.143]**	[0.138]**	[0.342]	[0.348]	[0.374]	[0.155]**	[0.149]**	[0.343]	[0.347]	[0.376]	[0.163]**	[0.157]**
GDP growth correlations	0.292	0.149	0.321	-0.213	-0.200	0.298	0.157	0.288	-0.270	-0.255	0.308	0.142	0.281	-0.340	-0.319
	[0.286]	[0.306]	[0.259]	[0.192]	[0.194]	[0.291]	[0.315]	[0.265]	[0.237]	[0.238]	[0.290]	[0.326]	[0.272]	[0.240]	[0.245]
Similarity in K/L ratio	-7.015	-9.144	-10.035	-8.370	-8.014	-7.639	-9.341	-10.391	-8.388	-8.025	-7.075	-9.145	-10.128	-8.052	-7.795
	[2.596]***	[3.647]**	[3.091]***	[2.470]***	[2.447]***	[2.620]***	[3.929]**	[3.228]***	[2.491]***	[2.467]***	[2.644]***	[3.704]**	[3.234]***	[2.538]***	[2.540]***
Similarity in K/L ratio*log(GDP)	**0.278**	**0.365**	**0.402**	**0.316**	**0.304**	**0.300**	**0.372**	**0.412**	**0.316**	**0.304**	**0.296**	**0.362**	**0.405**	**0.309**	**0.301**
	[0.094]* **	**[0.130]*** **	**[0.116]*** **	**[0.084]*** **	**[0.084]*** **	**[0.095]*** **	**[0.140]** **	**[0.120]*** **	**[0.085]*** **	**[0.085]*** **	**[0.095]*** **	**[0.131]** **	**[0.118]*** **	**[0.090]*** **	**[0.091]*** **
Similarity in exports	-6.772	-3.460	-4.378	-10.565	-10.587	-11.973	-5.383	-8.885	-11.357	-11.528	-8.876	-6.825	-8.397	-7.492	-6.609
	[18.655]	[15.914]	[13.439]	[10.077]	[9.972]	[18.756]	[17.407]	[14.583]	[9.353]	[9.245]	[18.807]	[17.151]	[14.345]	[11.004]	[11.014]
Similarity in exports*log(GDP)	0.251	0.224	0.159	0.348	0.345	0.450	0.306	0.322	0.372	0.373	0.332	0.357	0.301	0.228	0.189
	[0.687]	[0.580]	[0.499]	[0.336]	[0.330]	[0.690]	[0.631]	[0.528]	[0.309]	[0.303]	[0.692]	[0.623]	[0.516]	[0.374]	[0.373]
Correlation stock returns						-0.188	-0.230	0.515	0.376	0.351	-0.026	-0.340	0.477	0.420	0.426
						[0.670]	[0.483]	[0.460]	[0.373]	[0.372]	[0.680]	[0.483]	[0.394]	[0.414]	[0.411]
Correlation growth-stock returns						-0.564	-0.211	-0.369	-0.019	-0.042	-0.559	-0.188	-0.353	-0.032	-0.054
						[0.237]**	[0.315]	[0.218]	[0.234]	[0.234]	[0.238]**	[0.301]	[0.224]	[0.227]	[0.229]
Similarity in log(GDP per capita)											-0.671	0.274	-0.026	-0.291	-0.393
											[0.413]	[0.451]	[0.485]	[0.656]	[0.640]
Time difference											0.021	0.021	0.027	0.034	0.033
											[0.027]	[0.026]	[0.026]	[0.025]	[0.025]
Observations	468	390	468	390	468	461	383	461	383	461	461	383	461	383	461
GDP positive interaction threshold:	25.23	25.05	24.96	26.49	26.36	25.46	25.11	25.22	26.54	26.40	23.90	25.26	25.01	26.06	25.90
GDP 5% significance threshold:	26.86	26.71	25.95	28.34	28.32	27.08	26.75	26.15	28.41	28.39	26.22	27.15	26.64	28.18	28.14
R-squared		0.90	0.90				0.90	0.91				0.90	0.91		
Pseudo R-squared	0.47			0.96	0.96	0.47			0.96	0.96	0.47			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations. Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The Pseudo R-squared available for Poisson are without clustering.

Table 5. Source countries: Full sample. Host countries: OECD sample. Interaction term: sample split in two parts based on host GDP size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson
	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0
Log of bilateral trade	0.286	0.111	0.114	0.146	0.155	0.274	0.113	0.080	0.156	0.163	0.291	0.101	0.081	0.173	0.176
	[0.139]**	[0.180]	[0.214]	[0.133]	[0.133]	[0.141]*	[0.180]	[0.214]	[0.127]	[0.127]	[0.141]**	[0.180]	[0.216]	[0.133]	[0.133]
Log of distance	-0.289	-0.428	-0.390	-0.013	-0.014	-0.314	-0.436	-0.396	0.020	0.015	-0.389	-0.489	-0.470	0.008	0.004
	[0.180]	[0.212]*	[0.237]	[0.123]	[0.123]	[0.183]*	[0.211]**	[0.235]	[0.125]	[0.125]	[0.195]**	[0.209]**	[0.225]**	[0.118]	[0.118]
Common legal origin	0.499	0.523	0.494	-0.148	-0.152	0.543	0.556	0.529	-0.152	-0.154	0.543	0.545	0.517	-0.038	-0.042
	[0.168]***	[0.179]***	[0.132]***	[0.168]	[0.169]	[0.170]***	[0.177]***	[0.129]***	[0.169]	[0.169]	[0.170]***	[0.175]***	[0.127]***	[0.166]	[0.166]
Dummy for common border	0.136	0.193	0.270	0.428	0.422	0.116	0.175	0.255	0.421	0.412	0.045	0.182	0.239	0.445	0.436
	[0.319]	[0.331]	[0.327]	[0.131]***	[0.132]***	[0.320]	[0.338]	[0.318]	[0.138]***	[0.139]***	[0.322]	[0.344]	[0.330]	[0.141]***	[0.143]***
Dummy for common language	0.349	0.055	0.179	0.532	0.535	0.394	0.109	0.183	0.503	0.507	0.333	0.105	0.166	0.466	0.471
	[0.250]	[0.229]	[0.243]	[0.193]***	[0.191]***	[0.255]	[0.246]	[0.257]	[0.194]***	[0.192]***	[0.257]	[0.241]	[0.237]	[0.179]***	[0.177]***
Dummy for ever colony/colonizer	0.071	0.372	0.233	-0.172	-0.179	0.127	0.393	0.262	-0.152	-0.160	0.239	0.454	0.345	-0.106	-0.118
	[0.325]	[0.374]	[0.337]	[0.214]	[0.213]	[0.331]	[0.385]	[0.342]	[0.216]	[0.215]	[0.340]	[0.394]	[0.368]	[0.206]	[0.205]
Dummy. Strict currency area	0.212	-0.071	0.021	1.012	1.019	0.141	-0.091	-0.008	1.022	1.026	0.057	-0.085	-0.033	1.024	1.026
	[0.288]	[0.373]	[0.376]	[0.253]***	[0.253]***	[0.291]	[0.368]	[0.353]	[0.248]***	[0.248]***	[0.294]	[0.377]	[0.369]	[0.250]***	[0.250]***
Dummy for regional trade agreement	0.088	0.367	0.370	0.315	0.298	0.042	0.358	0.367	0.347	0.326	0.058	0.401	0.391	0.410	0.397
	[0.340]	[0.347]	[0.389]	[0.124]**	[0.121]**	[0.344]	[0.366]	[0.383]	[0.134]***	[0.131]**	[0.345]	[0.365]	[0.385]	[0.158]***	[0.151]***
GDP growth correlations	0.300	0.164	0.323	-0.266	-0.250	0.308	0.179	0.296	-0.351	-0.334	0.317	0.163	0.288	-0.416	-0.388
	[0.287]	[0.311]	[0.261]	[0.173]	[0.175]	[0.292]	[0.321]	[0.269]	[0.209]*	[0.211]	[0.292]	[0.331]	[0.276]	[0.215]*	[0.220]*
Similarity in K/L ratio (Small countries)	0.146	0.408	0.338	-0.680	-0.628	0.079	0.408	0.279	-0.720	-0.664	0.584	0.350	0.366	-0.607	-0.553
	[0.325]	[0.402]	[0.209]	[0.477]	[0.471]	[0.338]	[0.403]	[0.212]	[0.466]	[0.460]	[0.441]	[0.435]	[0.388]	[0.457]	[0.449]
Similarity in K/L ratio (Large countries)	**0.809**	**1.110**	**1.301**	**0.709**	**0.722**	**0.800**	**1.137**	**1.254**	**0.695**	**0.711**	**1.298**	**1.060**	**1.329**	**0.843**	**0.857**
	[0.282]***	**[0.311]*****	**[0.275]*****	**[0.360]****	**[0.366]****	**[0.293]*****	**[0.313]*****	**[0.265]*****	**[0.363]***	**[0.370]***	**[0.405]*****	**[0.367]*****	**[0.382]*****	**[0.402]****	**[0.412]****
Similarity in exports (Small countries)	0.702	3.077	0.737	-0.917	-1.045	0.737	3.319	0.519	-1.142	-1.278	0.733	3.194	0.453	-1.095	-1.253
	[2.614]	[2.044]	[2.537]	[2.217]	[2.194]	[2.637]	[2.070]	[2.698]	[2.190]	[2.172]	[2.631]	[2.077]	[2.690]	[2.093]	[2.065]
Similarity in exports (Large countries)	0.449	3.504	0.692	1.142	0.989	0.933	3.953	0.877	0.970	0.823	0.688	3.891	0.710	0.611	0.410
	[2.732]	[2.294]	[2.841]	[2.201]	[2.152]	[2.753]	[2.271]*	[2.886]	[2.138]	[2.094]	[2.752]	[2.286]	[2.838]	[1.962]	[1.918]
Correlation stock returns						-0.240	-0.316	0.422	0.492	0.467	-0.078	-0.431	0.380	0.552	0.551
						[0.673]	[0.519]	[0.439]	[0.339]	[0.338]	[0.682]	[0.523]	[0.371]	[0.395]	[0.390]
Correlation growth-stock returns						-0.547	-0.196	-0.344	-0.083	-0.106	-0.541	-0.168	-0.326	-0.104	-0.126
						[0.238]**	[0.311]	[0.210]	[0.213]	[0.215]	[0.238]**	[0.301]	[0.216]	[0.208]	[0.210]
Similarity in log(GDP per capita)											-0.702	0.265	-0.041	-0.301	-0.383
											[0.414]*	[0.454]	[0.484]	[0.515]	[0.497]
Time difference											0.025	0.026	0.032	0.035	0.033
											[0.027]	[0.026]	[0.026]	[0.026]	[0.026]
Observations	468	390	468	390	468	461	383	461	383	461	461	383	461	383	461
H0: coef[KL_small]=coef[KL_large]:	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared		0.90	0.90				0.89	0.90				0.89	0.91		
Pseudo R-squared	0.47			0.96	0.96	0.47			0.96	0.96	0.47			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations.
Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.
The Pseudo R-squared available for Poisson are without clustering.

Table 6. World Bank sample of High Income and Upper Middle Income countries. Interaction term: ln(GDP) with host countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson
	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0
Log of bilateral trade	0.538	0.326	0.388	0.133	0.143	0.551	0.341	0.371	0.138	0.147	0.576	0.328	0.380	0.164	0.173
	[0.121]***	[0.137]**	[0.177]**	[0.132]	[0.132]	[0.127]***	[0.153]**	[0.187]*	[0.131]	[0.131]	[0.128]***	[0.154]**	[0.199]*	[0.128]	[0.127]
Log of distance	-0.144	-0.288	-0.208	-0.042	-0.038	-0.128	-0.276	-0.204	-0.024	-0.023	-0.151	-0.268	-0.212	-0.038	-0.037
	[0.161]	[0.151]*	[0.202]	[0.120]	[0.120]	[0.166]	[0.150]*	[0.203]	[0.120]	[0.120]	[0.171]	[0.145]*	[0.198]	[0.114]	[0.114]
Common legal origin	0.370	0.372	0.355	-0.072	-0.075	0.414	0.413	0.404	-0.078	-0.079	0.409	0.411	0.401	0.026	0.026
	[0.151]**	[0.152]**	[0.119]***	[0.158]	[0.159]	[0.155]***	[0.168]**	[0.126]***	[0.161]	[0.162]	[0.156]***	[0.173]**	[0.129]***	[0.151]	[0.151]
Dummy for common border	0.286	0.183	0.302	0.442	0.436	0.258	0.155	0.253	0.439	0.431	0.211	0.185	0.241	0.466	0.455
	[0.297]	[0.288]	[0.308]	[0.133]***	[0.135]***	[0.299]	[0.287]	[0.294]	[0.138]***	[0.140]***	[0.300]	[0.289]	[0.289]	[0.140]***	[0.143]***
Dummy for common language	0.361	0.153	0.321	0.494	0.496	0.399	0.198	0.347	0.475	0.478	0.353	0.215	0.332	0.437	0.439
	[0.227]	[0.176]	[0.198]	[0.180]***	[0.179]***	[0.236]*	[0.187]	[0.211]	[0.184]***	[0.183]***	[0.240]	[0.187]	[0.204]	[0.167]***	[0.166]***
Dummy for ever colony/colonizer	0.236	0.384	0.280	-0.226	-0.232	0.297	0.414	0.307	-0.213	-0.219	0.343	0.400	0.324	-0.166	-0.175
	[0.298]	[0.337]	[0.296]	[0.205]	[0.205]	[0.308]	[0.346]	[0.304]	[0.210]	[0.210]	[0.315]	[0.346]	[0.324]	[0.207]	[0.206]
Dummy. Strict currency area	0.021	-0.025	-0.010	0.988	0.993	-0.091	-0.058	-0.042	0.995	0.996	-0.163	-0.010	-0.066	0.996	0.998
	[0.270]	[0.318]	[0.332]	[0.250]***	[0.250]***	[0.277]	[0.323]	[0.318]	[0.247]***	[0.247]***	[0.281]	[0.339]	[0.333]	[0.251]***	[0.250]***
Dummy for regional trade agreement	-0.026	-0.046	0.026	0.205	0.195	-0.104	-0.081	-0.031	0.220	0.208	-0.111	-0.079	-0.033	0.249	0.240
	[0.295]	[0.284]	[0.277]	[0.133]	[0.130]	[0.305]	[0.265]	[0.266]	[0.139]	[0.135]	[0.305]	[0.270]	[0.267]	[0.150]*	[0.145]*
GDP growth correlations	0.440	0.337	0.552	-0.224	-0.213	0.486	0.377	0.528	-0.259	-0.248	0.518	0.355	0.540	-0.329	-0.312
	[0.271]	[0.312]	[0.304]*	[0.196]	[0.197]	[0.277]*	[0.317]	[0.309]	[0.235]	[0.236]	[0.278]*	[0.319]	[0.315]*	[0.248]	[0.251]
Similarity in K/L ratio	-7.166	-6.953	-9.231	-7.843	-7.560	-6.569	-5.864	-8.023	-7.815	-7.541	-6.044	-6.114	-7.848	-7.484	-7.293
	[2.920]**	[3.074]**	[3.515]**	[2.510]***	[2.512]***	[2.979]**	[2.656]**	[3.047]**	[2.535]***	[2.537]***	[2.997]**	[2.700]**	[3.025]**	[2.585]***	[2.602]***
Similarity in K/L ratio*log(GDP)	**0.280**	**0.282**	**0.363**	**0.298**	**0.289**	**0.258**	**0.243**	**0.318**	**0.297**	**0.288**	**0.255**	**0.243**	**0.317**	**0.290**	**0.284**
	[0.107]* **	**[0.116]** **	**[0.131]** **	**[0.086]*** **	**[0.086]*** **	**[0.109]** **	**[0.100]** **	**[0.114]*** **	**[0.087]*** **	**[0.088]*** **	**[0.109]** **	**[0.098]** **	**[0.114]** **	**[0.093]*** **	**[0.094]*** **
Similarity in exports	5.321	8.271	-1.869	-7.118	-7.082	-2.356	3.646	-7.422	-7.855	-8.000	0.276	1.809	-6.724	-5.108	-4.224
	[18.206]	[15.205]	[16.515]	[9.176]	[9.046]	[18.827]	[17.979]	[19.075]	[8.635]	[8.522]	[18.891]	[18.361]	[19.383]	[9.925]	[9.897]
Similarity in exports*log(GDP)	-0.217	-0.245	0.054	0.225	0.220	0.061	-0.060	0.265	0.248	0.249	-0.042	0.007	0.236	0.144	0.108
	[0.674]	[0.541]	[0.579]	[0.299]	[0.292]	[0.695]	[0.641]	[0.672]	[0.279]	[0.273]	[0.698]	[0.657]	[0.684]	[0.334]	[0.332]
Correlation stock returns						-0.080	-0.305	0.312	0.274	0.258	0.041	-0.376	0.350	0.293	0.306
						[0.605]	[0.492]	[0.308]	[0.344]	[0.344]	[0.611]	[0.539]	[0.306]	[0.374]	[0.373]
Correlation growth-stock returns						-0.528	-0.155	-0.264	-0.028	-0.051	-0.517	-0.159	-0.259	-0.035	-0.057
						[0.218]**	[0.346]	[0.233]	[0.224]	[0.224]	[0.218]**	[0.350]	[0.232]	[0.220]	[0.221]
Similarity in log(GDP per capita)											-0.599	0.381	-0.183	-0.209	-0.308
											[0.384]	[0.517]	[0.462]	[0.591]	[0.574]
Time difference											0.005	0.002	0.003	0.036	0.035
											[0.024]	[0.026]	[0.023]	[0.024]	[0.024]
Observations	546	471	546	471	546	521	449	521	449	521	521	449	521	449	521
GDP positive interaction threshold:	25.59	24.66	25.43	26.32	26.16	25.46	24.13	25.23	26.31	26.18	23.70	25.16	24.76	25.81	25.68
GDP 5% significance threshold:	26.68	26.92	26.43	27.96	27.92	26.69	26.71	26.27	27.98	27.94	26.04	27.92	26.76	27.72	27.67
R-squared		0.88	0.89				0.88	0.89				0.88	0.89		
Pseudo R-squared	0.46			0.96	0.96	0.46			0.96	0.96	0.46			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations.
Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.
The Pseudo R-squared available for Poisson are without clustering.

Table 7. World Bank sample of High Income and Upper Middle Income countries. Interaction term: sample split in two parts based on host GDP size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson	Tobit	OLS	OLS	Poisson	Poisson
	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0	Equity>=0	Equity>0	Equity>=0	Equity>0	Equity>=0
Log of bilateral trade	0.522	0.316	0.376	0.179	0.188	0.544	0.335	0.369	0.185	0.193	0.572	0.323	0.381	0.202	0.207
	[0.121]***	[0.139]**	[0.173]**	[0.122]	[0.123]	[0.127]***	[0.154]**	[0.184]*	[0.119]	[0.120]	[0.128]***	[0.156]**	[0.196]*	[0.121]*	[0.122]*
Log of distance	-0.172	-0.298	-0.244	0.006	0.008	-0.158	-0.286	-0.242	0.027	0.025	-0.188	-0.287	-0.261	0.008	0.006
	[0.161]	[0.153]*	[0.202]	[0.110]	[0.112]	[0.166]	[0.154]*	[0.204]	[0.110]	[0.111]	[0.171]	[0.150]*	[0.201]	[0.107]	[0.108]
Common legal origin	0.389	0.391	0.361	-0.122	-0.125	0.426	0.427	0.405	-0.127	-0.128	0.417	0.423	0.398	-0.015	-0.017
	[0.151]**	[0.152]**	[0.119]***	[0.157]	[0.158]	[0.155]***	[0.169]**	[0.127]***	[0.159]	[0.160]	[0.156]***	[0.174]**	[0.128]***	[0.148]	[0.148]
Dummy for common border	0.250	0.164	0.246	0.401	0.396	0.218	0.135	0.198	0.390	0.383	0.171	0.163	0.187	0.428	0.417
	[0.297]	[0.286]	[0.298]	[0.132]***	[0.134]***	[0.299]	[0.286]	[0.288]	[0.137]***	[0.138]***	[0.301]	[0.289]	[0.286]	[0.137]***	[0.140]***
Dummy for common language	0.342	0.133	0.298	0.504	0.507	0.395	0.189	0.341	0.480	0.484	0.341	0.199	0.313	0.443	0.447
	[0.227]	[0.186]	[0.205]	[0.181]***	[0.180]***	[0.236]*	[0.193]	[0.217]	[0.182]***	[0.181]***	[0.240]	[0.194]	[0.208]	[0.169]***	[0.167]***
Dummy for ever colony/colonizer	0.241	0.380	0.298	-0.168	-0.174	0.303	0.408	0.324	-0.149	-0.154	0.365	0.403	0.360	-0.098	-0.108
	[0.297]	[0.339]	[0.292]	[0.211]	[0.211]	[0.307]	[0.346]	[0.295]	[0.214]	[0.214]	[0.314]	[0.349]	[0.316]	[0.210]	[0.209]
Dummy. Strict currency area	-0.000	-0.051	-0.037	0.987	0.992	-0.119	-0.083	-0.074	0.992	0.995	-0.195	-0.043	-0.107	0.995	0.997
	[0.269]	[0.322]	[0.331]	[0.244]***	[0.245]***	[0.276]	[0.330]	[0.318]	[0.241]***	[0.241]***	[0.280]	[0.348]	[0.331]	[0.245]***	[0.245]***
Dummy for regional trade agreement	-0.053	-0.072	-0.010	0.234	0.224	-0.131	-0.108	-0.067	0.249	0.237	-0.131	-0.105	-0.064	0.303	0.298
	[0.293]	[0.281]	[0.272]	[0.110]**	[0.108]**	[0.303]	[0.263]	[0.264]	[0.118]**	[0.116]**	[0.303]	[0.269]	[0.266]	[0.145]**	[0.138]**
GDP growth correlations	0.449	0.358	0.562	-0.266	-0.252	0.507	0.400	0.553	-0.328	-0.314	0.538	0.381	0.568	-0.399	-0.376
	[0.270]*	[0.323]	[0.312]*	[0.179]	[0.180]	[0.276]*	[0.326]	[0.317]*	[0.214]	[0.215]	[0.276]*	[0.330]	[0.326]*	[0.229]*	[0.233]
Similarity in K/L ratio (Small countries)	-0.043	0.352	0.021	-0.556	-0.521	-0.016	0.441	0.106	-0.582	-0.547	0.432	0.212	0.262	-0.484	-0.438
	[0.244]	[0.426]	[0.234]	[0.446]	[0.441]	[0.251]	[0.444]	[0.213]	[0.435]	[0.430]	[0.373]	[0.418]	[0.344]	[0.415]	[0.407]
Similarity in K/L ratio (Large countries)	**0.737**	**0.931**	**0.969**	**0.724**	**0.731**	**0.722**	**0.942**	**0.953**	**0.721**	**0.730**	**1.168**	**0.713**	**1.112**	**0.862**	**0.880**
	[0.205]* **	**[0.378]*** *	**[0.241]*** **	**[0.295]*** *	**[0.298]*** *	**[0.209]*** **	**[0.369]*** *	**[0.232]*** **	**[0.295]*** *	**[0.299]*** *	**[0.345]*** **	**[0.376]***	**[0.395]*** **	**[0.339]*** *	**[0.349]*** *
Similarity in exports (Small countries)	0.129	2.107	-0.012	-0.982	-1.066	-0.452	2.202	-0.142	-1.204	-1.304	-0.582	2.139	-0.267	-1.139	-1.252
	[2.310]	[2.528]	[2.863]	[2.153]	[2.125]	[2.371]	[2.680]	[3.041]	[2.150]	[2.126]	[2.375]	[2.675]	[3.061]	[2.057]	[2.023]
Similarity in exports (Large countries)	-0.852	1.383	-0.114	0.819	0.710	-0.569	1.999	0.313	0.696	0.585	-0.792	1.970	0.150	0.389	0.241
	[2.388]	[2.433]	[2.818]	[2.131]	[2.086]	[2.418]	[2.530]	[2.979]	[2.109]	[2.068]	[2.427]	[2.558]	[2.990]	[1.948]	[1.906]
Correlation stock returns						-0.216	-0.368	0.109	0.386	0.370	-0.084	-0.433	0.162	0.407	0.414
						[0.606]	[0.501]	[0.347]	[0.316]	[0.316]	[0.611]	[0.549]	[0.337]	[0.365]	[0.360]
Correlation growth-stock returns						-0.539	-0.156	-0.266	-0.099	-0.121	-0.529	-0.158	-0.261	-0.111	-0.135
						[0.219]**	[0.353]	[0.229]	[0.206]	[0.207]	[0.219]**	[0.358]	[0.228]	[0.202]	[0.204]
Similarity in log(GDP per capita)											-0.619	0.348	-0.217	-0.198	-0.274
											[0.381]	[0.510]	[0.447]	[0.480]	[0.462]
Time difference											0.011	0.006	0.010	0.037	0.036
											[0.024]	[0.025]	[0.022]	[0.024]	[0.024]
Observations	546	471	546	471	546	521	449	521	449	521	521	449	521	449	521
H0: coef[KL_small]=coef[KL_large]:	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
R-squared		0.88	0.89				0.88	0.89				0.88	0.89		
Pseudo R-squared	0.44			0.96	0.96	0.44			0.96	0.96	0.44			0.96	0.96

Note: Equity holdings of source country *i* in host country *j* are measured in millions of US dollars. Dependent variable is ln(1+Equity) in the case of OLS and Tobit, while it is Equity in Poisson estimations. Regressions include fixed source and host country effects. Clustered standard errors are reported in parenthesis. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. The Pseudo R-squared available for Poisson are without clustering.

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

878	Marco Manacorda	The Cost of Grade Retention
877	Ralph Ossa	A 'New Trade' Theory of GATT/WTO Negotiations
876	Monique Ebell Albrecht Ritschl	Real Origins of the Great Depression: Monopoly Power, Unions and the American Business Cycle in the 1920s
875	Jang Ping Thia	Evolution of Locations, Specialisation and Factor Returns with Two Distinct Waves of Globalisation
874	Monique Ebell Christian Haefke	Product Market Deregulation and the U.S. Employment Miracle
873	Monique Ebell	Resurrecting the Participation Margin
872	Giovanni Olivei Silvana Tenreyro	Wage Setting Patterns and Monetary Policy: International Evidence
871	Bernardo Guimaraes	Vulnerability of Currency Pegs: Evidence from Brazil
870	Nikolaus Wolf	Was Germany Ever United? Evidence from Intra- and International Trade 1885 - 1993
869	L. Rachel Ngai Roberto M. Samaniego	Mapping Prices into Productivity in Multisector Growth Models
868	Antoni Estevadeordal Caroline Freund Emanuel Ornelas	Does Regionalism Affect Trade Liberalization towards Non-Members?
867	Alex Bryson Harald Dale-Olsen	A Tale of Two Countries: Unions, Closures and Growth in Britain and Norway
866	Arunish Chawla	Multinational Firms, Monopolistic Competition and Foreign Investment Uncertainty
865	Niko Matouschek Paolo Ramezzana Frédéric Robert-Nicoud	Labor Market Reforms, Job Instability, and the Flexibility of the Employment Relationship
864	David G. Blanchflower Alex Bryson	Union Decline in Britain
863	Francesco Giavazzi Michael McMahon	Policy Uncertainty and Precautionary Savings

862	Stephen Hansen Michael F. McMahon	Delayed Doves: MPC Voting Behaviour of Externals
861	Alex Bryson Satu Nurmi	Private Sector Employment Growth, 1998-2004: A Panel Analysis of British Workplaces
860	Alejandro Cuñat Szabolks Deak Marco Maffezzoli	Tax Cuts in Open Economies
859	Bernd Fitzenberger Karsten Kohn Alexander Lembcke	Union Density and Varieties of Coverage: The Anatomy of Union Wage Effects in Germany
858	Dimitra Petropoulou	International Trade, Minimum Quality Standards and the Prisoners' Dilemma
857	Andreas Georgiadis	Efficiency Wages and the Economic Effects of the Minimum Wage: Evidence from a Low-Wage Labour Market
856	L. Rachel Ngai Christopher A. Pissarides	Employment Outcomes in the Welfare State
855	Carlo Rosa	Talking Less and Moving the Market More: Is this the Recipe for Monetary Policy Effectiveness? Evidence from the ECB and the Fed
854	Dimitra Petropoulou	Competing for Contacts: Network Competition, Trade Intermediation and Fragmented Duopoly
853	Barbara Petrongolo Christopher A Pissarides	The Ins and Outs of European Unemployment
852	Mirko Draca Steve Machin Robert Witt	Panic on the Streets of London: Police, Crime and the July 2005 Terror Attacks
851	Augustin de Coulon Jonathan Wadsworth	On the Relative Gains to Immigration: A Comparison of the Labour Market Position of Indians in the USA, the UK and India
850	Andreas Georgiadis	HRM Practices and Knowledge Processes Outcomes: Empirical Evidence from a Quasi-Experiment on UK SMEs in the Tourism Hospitality and Leisure Sector
849	Mirabelle Muûls Dimitra Petropoulou	A Swing-State Theory of Trade Protection in the Electoral College

The Centre for Economic Performance Publications Unit
Tel 020 7955 7673 Fax 020 7955 7595 Email info@cep.lse.ac.uk
Web site http://cep.lse.ac.uk