Investor protection rights and foreign investment

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.

Abstract

Different investor classes are endowed with different rights, and conflicting interests among them can make protection afforded to one party detrimental to another. We find that investor protection laws have sizeable "cross" effects on foreign portfolio investment and the direction of these effects supports the conjecture that foreign investors are particularly sensitive to the perceived riskiness of assets. Specifically, we find that strong protection of creditor rights – limiting excessive risk taking – positively affects foreign shareholders, whereas strong protection of shareholder rights – potentially shifting firms toward riskier projects – negatively impacts foreign bondholders. These findings, on the one hand, emphasize that strengthening investor protection is not a universally desirable policy; on the other hand, they provide a rationale for the failure of convergence toward any successful standard of effective investor protection. The degree of protection enjoyed by investors in each country is indeed endogenously determined by the balancing of many forces. Among them, the political choice to promote inward investment and to favour particular categories of investor may play an important role.

Keywords: International portfolio investments, Investor Protection Rights, Bondholder-shareholder conflicts, Home bias

JEL Classifications: G11, G15, G30

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1 Introduction

This paper investigates the impact of investor protection rights on cross-border investment. Since domestic sources of outside finance are limited in many countries around the world (Giannetti and Koskinen (2010)), foreign capital has become increasingly important (Bekaert et al. (2002)). In this respect, corporate governance, with its peculiar role of facilitating access to external finance through reduction of information asymmetry (La Porta et al. (1998); LLSV (1998) henceforth), can be critical in attracting foreign portfolio investment. Indeed, in the presence of information barriers, domestic investment appear, other things equal, more attractive to investors that indeed display a strong preference for domestic assets. Corporate governance can partially offset this lack of information by signalling the quality of the institutions in terms of rights guaranteed to the investor and thereby foster international diversification.

Standard asset pricing models using a representative agent predict that differences in investor rights and financial development should be capitalized in share prices such that investing in any given nation's stocks will be a fair investment regardless of that nation's level of investor protection (Dahlquist et al. (2003)). However, as noted by Leuz et al. (2009), the key question is whether this price discount is sufficient for foreign investors that plausibly face information problems and monitoring costs beyond those of domestic investors. Indeed, the prevalence of disproportionate investment in domestic assets – the so-called "home bias" puzzle – can be read as evidence of the asymmetric perception of asset characteristics by home and foreign investors thus breaking the representative agent hypothesis (Gehrig (1993); Kang and Stulz (1997)).

Dahlquist and Robertsson (2001) and Kang and Stulz (1997) emphasize that large, financially solid, well-known firms are preferred by foreigners, thereby underlining the asymmetry between resident and foreigner investors. Chan et al. (2005) investigate the determinants of foreign and domestic investment, finding that familiarity and variables capturing investment barriers have a significant but asymmetric effect on domestic and foreign bias. This evidence is consistent with the conjecture that foreign investors are more vulnerable to information asymmetry than domestic investors; hence, they might be more influenced by governance rules that reduce information costs.

In this work, we are interested in the impact of investor protection laws on stock and bond portfolios held by foreign investors[1]. This effect cannot be directly observed from market price or total market capitalization, since these indicators capture only aggregate equilibrium behavior.

Previous work originating from LLSV (1998) underlines how investor protection affects financial market development, that is, the supply of equity, leaving the demand side mostly unexplored[2]. This latter perspective is relevant insofar as we account for heterogeneity across investors. For instance, Giannetti and Koskinen (2010) show that investor protection impacts financial market development by influencing the demand for equity, because different classes of investor can differ in the benefits accruing to them and therefore in their willingness to pay for stocks. Specifically, controlling shareholders can gain access to both private and security benefits and thus be willing to pay more for a stock than investors who can enjoy only security benefits. These authors' theoretical model provides valuable testable implications with respect to home bias and stock market participation rates. However, they assume that domestic and foreign outside investors face the same cost of participation in both domestic and foreign markets. This hypothesis is quite strong and at odds with the prolific empirical literature emphasizing the role of asymmetric information as a potential explanation for the home bias puzzle.

Our contribution can be viewed as complementary to Giannetti and Koskinen (2010): while they split the universe of investors into inside and outside investors we focus on outside investors only, in order to test how corporate governance affects foreign portfolio investors. A perspective closer to ours, though at the firm-level, is taken by Leuz et al. (2009). They maintain that foreign investors are at an informational disadvantage relative to local investors and that these information asymmetries are particularly pronounced when it comes to evaluating firms' governance and ownership structures. They find indeed that foreigners invest less in firms with poor outsider protection and opaque earnings because firms with potentially problematic governance structures are particularly taxing to foreign investors in terms of their information and monitoring costs.

We depart from previous works in that we investigate the effect of investor protection laws on foreign

[1] We ignore any direct explanation relative to the home bias phenomenon and focus on the determinants of foreign positions. See Giannetti and Koskinen (2010) for a discussion of the implications of minority investor rights on home equity bias.

[2] For an extensive synthesis of the finance and law literature, see Beck and Levine (2004). For an empirical critique of the predictions of the theory of law and finance, see Graff (2008).

portfolio investment – debt and equity portfolios – accounting for the interaction of various governance mechanisms on stakeholders endowed with different rights and interests.

More specifically our analysis accounts for the conflicting interests of the various stakeholder groups. Within the corporation, the distinct interests of managers, stockholders and creditors coexist and are often in conflict with one another. As a consequence, legislation particularly favorable to one type of stakeholder turns out to be detrimental to others.

Shareholder-manager conflicts have received much attention in the literature, but important sources of conflict can also arise between shareholders and bondholders. The corporate governance literature has analyzed the complex mechanisms of conflicts of interest between shareholders and creditors, suggesting that the potential conflict between equity and debt claimants lies primarily in wealth expropriation and risk shifting (Jensen and Meckling (1976)). These conflicts can give rise to intricate effects on portfolio decision making on the part of foreign investors that are particularly sensitive to information asymmetry issues. Specifically, strong shareholder rights protection are likely to benefit foreign shareholders ("direct" effect) but may also deter foreign bondholders ("cross" effect) as shareholders are more prone to risk-taking activities than is optimal for creditors (Myers (1977); Jensen and Meckling (1976)). Creditors might indeed be more in line with managers, who may be more concerned with their own job security and so choose to undertake less risky projects. On the other hand, strong creditor rights are likely to attract foreign bondholders ("direct" effect) but may deter stock investments ("cross" effect) if firms are induced to engage in risk-reducing processes such as acquisitions that are likely to be value-destroying (Acharya et al. (2011)).

Ultimately, the question of the impact of investor protection provisions on foreign investors, the focus of the present paper, is an empirical one and depends on foreigners' perception of the balance among various interests. Our results highlight that laws protecting the interests of different types of investors asymmetrically affect foreign stakeholders and, more specifically, that foreign portfolio investors highly value corporate governance practices that are risk-reducing. Foreign shareholders appear to appreciate strong creditor rights that potentially mitigate the riskiness of projects, while bondholders are negatively affected by strong shareholder rights that could induce the firm to engage in risky asset investments.

Finally, our findings also contribute to the literature that investigates the failure of convergence in investor protection legislation. Djankov et al. (2008) find no convergence in creditor rights scores. La Porta et al. (2000) reject the hypothesis of legal convergence of rules and enforcement mechanisms toward some successful standard of effective investor protection. These authors claim that this is due to the dominance of interest group politics: extensive legal, regulatory and judicial reforms are needed but governments are reluctant, as the first order effect is a tax on insiders. Mansi et al. (2009), focusing on the heterogeneity across US states' legislation, critically discuss the evidence of no polarization toward a system of stronger or weaker investment protection. Different states compete also on legal dimensions in terms of their effectiveness in attracting investment but competition does not necessarily induce a "race to the bottom" or a "race to the top". Firms, in fact, sort themselves either away from binding payout restrictions that reduce financial flexibility and value, or toward greater restrictions that reduce debt financing costs. Not all jurisdictions then need or should converge to the single best or worst alternative. Rather, the existence of a variety of jurisdictions and different economic environments allows firms to maximize value by choosing a set of laws most appropriate to their own situation. Our findings contribute to this debate by providing an indirect rationalization of the evidence of no convergence toward the strongest investor protection setting: investor protection can be beneficial to one type of investor and detrimental to another. Accordingly, the level of investor protection in each country is endogenously determined by many conflicting forces, among which are the political choice to promote inward investment and to favour some classes of investors over others.

The remainder of this paper is organized as follows. After describing the conceptual framework and its main implications in Section 2, we present our empirical analysis in Section 3. Section 4 and 5 summarize the main findings and Section 6 addresses the potential policy implications of our analysis.

2 Conceptual framework and testable implications

2.1 A conceptual framework

Our theoretical framework relies on equilibrium portfolio allocations in which investors are supposed to face different costs from investing in various financial markets. According to Gehrig (1993), for-

eign investments appear on average more risky to domestic investors–leading to an information-based justification to home bias–and portfolios differ among investors depending on their perceived variance-covariance matrix. We adopt this approach allowing for a different investor-specific perceived variability of return for each foreign index included in the investment opportunity set.

Absent any investor-specific factor, the "unbiased" portfolio holding of an asset depends, as in standard portfolio choice theory, on asset characteristics (risk and return)[3]. When considering equilibrium asset holdings without investment barriers, all investors ought to hold the same portfolio, i.e., the value-weighted portfolio, in which each asset is weighted according to its share in world stock market capitalization. The same portfolio is still universally optimal in equilibrium even in the presence of investment barriers, provided that these barriers identically affect all investors. Conversely, heterogeneity in investment barriers generates a wedge between the investor-specific portfolio and the value-weighted portfolio. This wedge depends, in particular, on the distance between the investment barrier of country l investing in country j and the average barrier calculated over all countries investing in the same asset.

The optimal portfolio weight in asset j (w^{lj}) by country l is

$$w^{lj} = \frac{1}{D^{lj}} MS^j \tag{1}$$

or in log terms

$$\log\left(\frac{w^{lj}}{MS^j}\right) = \log\left(\frac{1}{D^{lj}}\right) \tag{2}$$

where MS^j is the market share of asset j in the world market capitalization and D^{lj} represents the relative (to the world average) investment barriers of country l investing in asset j[4]. Investors residing in country l will demand a share of asset j greater than its market share in proportion to $\frac{1}{D^{lj}}$, that is the reciprocal of the relative investment barrier[5].

[3] See Appendix A for details on the derivation of our stylized model.

[4] Note that if $D^{lj} = 1$, i.e., if the investment barrier of country l in country j is equal to the average, then MS^j is optimally held in equilibrium.

[5] Our theoretical framework is equivalent to the return-reducing approach of Cooper and Kaplanis (1994) and Chan et al. (2005). In fact, in equilibrium, what matters is the investment barrier relative to the average. In our approach, investment barriers enter in a multiplicative way, making our equation conveniently implementable and interpretable in log terms.

The ratio $\frac{w^{lj}}{MS^j}$ can be interpreted as the "overall bias" in asset j of a representative investor in country l: a portfolio share w^{lj} larger than MS^j then signals that asset j is over-weighted in country l's portfolio and vice versa[6]. In our analysis, risky assets can be either stocks or bonds and the risk-free asset is determined in the model as the residual portfolio share.

2.2 Estimable equation and testable implications

Our empirical implementation focuses on the determinants of the allocation of assets within the foreign portfolio, thus ignoring domestic positions. Consequently, we need to compute the "foreign bias" dependent variable from the "overall bias" measure derived above. First, we exclude the domestic share w^{ll} from the overall portfolio, re-scale foreign shares accordingly and obtain the numerator $\hat{w}^{lj}$. Then, we exclude the domestic foreign share MS^l from the world market capitalization, re-scale foreign market capitalization accordingly thus obtaining our denominator $\hat{MS}^j$[7].

The equation to estimate will be therefore

$$\log\left(\frac{\hat{w}^{lj}}{\hat{MS}^j}\right) = \log\left(\frac{1}{D^{lj}}\right) \tag{3}$$

where now our dependent variable is the foreign bias[8].

To estimate it we must provide an empirical counterpart to the variable D^{lj} on the right-hand-side which is not directly observable. Our final estimable regression is as follows

$$\log\left(\frac{\hat{w}^{lj}}{\hat{MS}^j}\right)^k = \alpha^k + \sum_{i=1,..,I} \beta_i^k \log(X_i^{lj}) + \sum_{n=1,..,N} \lambda_n^k Y_n^{lj} + \sum_{h=1,..,H} \delta_h^k \log(Z_h^j) + \varepsilon^k \tag{4}$$

[6] Our stylized theoretical setting ignores relevant factors such as inflation and exchange rate uncertainty, like many other models that focus on barriers to international investment (Dahlquist et al. (2003)). Since these factors are unlikely to be strongly correlated with investor protection laws, they are not expected to undermine our results. See Lewis (1999) and Karolyi and Stulz (2003) for a review of the effects of inflation and exchange rate uncertainty on portfolio choice.

[7] Note that in the empirical implementation, we consider D^{lj} (relative investment barrier in which the average includes also the domestic component) rather than $\hat{D}^{lj}$ (relative investment barrier excluding the domestic component from the average). Indeed, due to the logarithmic specification and the quite stable home bias over time, any difference between the two measures is almost fully captured by the investing country fixed effect (results available upon request from the author).

[8] As discussed below, among robustness checks, we also account in column (5a) of Table 4, for the presence of closely held shares that are not available for portfolio investment (Dahlquist et al. (2003)).

where the superscript $k = B, S$ identifies bonds (B) or stocks (S).

We consider i proxies, denoted by X^{lj} and n dummy variables Y^{lj} which might, a priori, capture investment barriers. If we consider, for instance, the distance between country l and j as an indicator of investment cost, we expect a negative sign for the associated β coefficient: a higher "relative proxy" (e.g., greater distance between investing country l and target country j with respect to average distance) is associated with investor l biasing her portfolio away from country j stocks.

We also consider H destination-country-specific variable (Z^j), among which are the main variables of interest of the paper, that is investor protection laws.

Since we are interested in testing the direct and cross effects of investor protection laws on different types of investors – shareholders and bondholders – we take out of the pool of destination-specific variables the index of shareholders' rights (Antidirector Rights index, ADR_j) and the index of creditor rights (CR_j)[9].

Then we estimate equation (4) for stock portfolios (5) and bond portfolios (6) as follows

$$\log\left(\frac{\hat{w}^{lj}}{\hat{MS}^j}\right)^S = \alpha^S + \sum_{i=1,..,I} \beta_i^S \log(X_i^{lj}) + \sum_{n=1,..,N} \lambda_n^S Y_n^{lj} + \pi^S \log(ADR^j) + \theta^S \log(CR^j) + \sum_{h=1,..,H-2} \delta_h^S \log(Z_h^j) + \varepsilon^S \tag{5}$$

$$\log\left(\frac{\hat{w}^{lj}}{\hat{MS}^j}\right)^B = \alpha^B + \sum_{i=1,..,I} \beta_i^B \log(X_i^{lj}) + \sum_{n=1,..,N} \lambda_n^B Y_n^{lj} + \pi^B \log(ADR^j) + \theta^B \log(CR^j) + \sum_{h=1,..,H-2} \delta_h^B \log(Z_h^j) + \varepsilon^B \tag{6}$$

To estimate the above parameters, we adopt a feasible Generalized Least Squares specification that assumes the presence of cross-section heteroskedasticity, includes fixed effects for investing countries, time dummies, and cross-section weight correction of the variance-covariance matrix[10].

We label as "direct" effect the impact of corporate rules on "target" investors, i.e., of shareholder (creditor) rights on shareholders (bondholders); this is measured by $\pi^S(\theta^B)$. We expect these coefficients

[9] Note that, in so doing, the number of destination specific-factors Z_j^h is reduced to $H-2$.

[10] As an alternative, we have also run a Pooled OLS regression with fixed effect for investing countries, time dummies and White correction of the variance-covariance matrix. Our findings remain unaffected under this alternative specification.

to be positive – $\pi^S(\theta^B) > 0$; that is, we expect foreign stock (bond) investment to be encouraged by stronger shareholder (creditor) rights. We label as "cross" effect the impact of corporate rules on "non-target" investors, i.e., creditor (shareholder) rights on shareholders (bondholders); this is measured by $\theta^S(\pi^B)$ and the expected sign of this coefficient is a priori unknown.

The core of our analysis hinges upon the test of two main sets of hypotheses and its relative implications.

The first one generally addresses the issue of the role played by corporate governance rules on foreign investors.

If the impact of investor protection legislation (ADR and CR) were fully capitalized in share prices then the joint null hypothesis $\pi^S = 0 \wedge \theta^B = 0$ would not be rejected, that is, we should find no effect on foreign investment(Dahlquist et al. (2003)). Conversely, evidence of positive (negative) coefficients of investor protection rights on foreign portfolio positions can be interpreted as better corporate governance rules fostering (deterring) inward investment.

The second testable hypothesis concerns more specifically the cross effect of investor protection on foreign investors. Let us assume that the first hypothesis is rejected and, more specifically, that direct effects are positive, and let us focus on cross effects.

If cross-effects were both positive, that is the joint hypothesis $\theta^S > 0 \wedge \pi^B > 0$ holds, then investor protection laws would generally benefit foreign investors – both bondholders and shareholders – so that policies leading to stronger investor protection should be encouraged without reservation.

If instead cross-effects were both negative, that is the joint hypothesis $\theta^S < 0 \wedge \pi^B < 0$ holds, then a systematic trade-off would exist between the effect of corporate rules on "target" investors (e.g., shareholder rights rules on shareholders) and "non-target" investors (e.g., shareholder rights rules on bondholders). Both types of investor protection rules should then be carefully gauged to account for the trade-off between direct and cross effects and policies aimed to strengthen investor protection are not universally optimal.

Finally, if any of the joint hypotheses $\theta^S < 0 \wedge \pi^B > 0$ or $\theta^S > 0 \wedge \pi^B < 0$ holds, then a trade-off would exist between direct and cross effects exclusively for one type of investor protection legislation

and policies need to be designed accordingly.

Specifically, if $\theta^S < 0 \wedge \pi^B > 0$, then foreign shareholders should be negatively affected by strong creditor rights, since these can result in value-destroying processes such as mergers and acquisitions (Acharya et al. (2011)); the positive impact of shareholder rights on bondholders is less economically interpretable since bondholders have a quite low upside potential from riskier projects.

On the contrary, the set of parameter estimates such that $\theta^S > 0 \wedge \pi^B < 0$ would reveal that creditor rights positively affect foreign shareholders and shareholder rights negatively influence foreign bondholders. The latter joint hypothesis is not rejected by the data and represents the main innovative finding of this paper: strong creditor rights – shifting the firm toward less risky behavior – affect positively ($\theta^S > 0$) foreign shareholders, while strong shareholder rights – shifting the firm toward riskier projects – affect negatively ($\pi^B < 0$) foreign bondholders. This evidence provides support to the conjecture that foreign investors are particularly sensitive to risk-reducing practices.

3 Data and descriptive statistics

3.1 Data

We consider portfolio investments in equities and debt securities by 14 major investing countries – Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, United Kingdom, and the United States – for the period 2001–2006[11]. We adopt the *CPIS* (*Coordinated Portfolio Investment Survey*, by IMF) dataset which has been exploited in many recent papers (Lane and Milesi-Ferretti (2007); Sorensen et al. (2007); Fidora et al. (2007)). This survey collects security-level data from the major custodians and large end-investors. Portfolio investment is broken down by instrument (equity or debt) and residence of issuer, the latter providing information on the destination of portfolio investment[12].

[11] The CPIS survey is now available until 2009. However, since the number of observations is sufficient to provide consistent estimates, we chose to constrain our sample to the pre-financial crisis period. Indeed, properly dealing with the crisis would entail taking into account its effect on different financial markets (bonds and stocks) and economies, according to the evolution of the contagion. This issue deserves a separate deeper investigation.

[12] While the CPIS provides the most comprehensive survey of international portfolio investment holdings, it is still subject to a number of important caveats. See www.imf.org/external/np/sta/pi/datarsl.htm for more details on the survey.

The opportunity set is made up of 20 destination stock markets[13]: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Korea, Mexico, Netherlands, Portugal, Singapore, Spain, Sweden, United Kingdom, and the United States[14,15].

Details on the construction of the dependent variable and the full set of regressors are provided in Appendix B.

3.2 Descriptive statistics

3.2.1 Domestic shares and foreign bias

We show in Table 1 domestic shares by investing country, averaged over time[16]. For reference, we report in the second column average market shares, that is, the respective fractions of world market capitalization that would prevail as optimal portfolio shares under the assumption of no market segmentation. As expected, all countries display home bias, that is, they place a disproportionately high fraction of their financial wealth in domestic assets[17]. All countries invest internally more than 50 percent of their portfolio, with Austria and Netherlands being the only exceptions for stocks and Austria for bonds. The pervasive and persistent home bias corroborates the evidence of asymmetry in the investment behavior of foreign and domestic investors with respect to asset-observable characteristics.

In Table 2 , we turn to overall bias (averaged over time), computed as the ratio of actual share to market share, following equation (2) . We report the average bias in several destination countries, obtained by averaging the overall bias across foreign investing countries. There emerges a notable

[13] Notice that we include the larger investment set conditional on data reliability. That is why the number of recipient countries is larger than the number of investing countries.

[14] Since we focus on *foreign* portfolio allocation, the destination stock markets number 19, since the domestic country is excluded from the analysis. The GLS regression is run, therefore, on 1596 observations (19 observations for each year for each investing country, with some missing values). Specifically, we excluded investing countries and destination countries with undisclosed "confidential" data that could undermine our results. As is common practice, Switzerland, Luxembourg and Ireland are excluded from the sample since they are considered in the international finance literature as mainly off-shore financial centers.

[15] Notice that even though our investment opportunity set is restricted to 20 out of more than two-hundred countries available in the CPIS dataset, excluded countries cover on average less than 3 percent of total stock market portfolio (ranging from less than 1 percent in Canada to slightly more than 6 percent in Austria).

[16] Notice that in Table 1 we consider domestic positions and therefore refer to the overall bias measure, as from equation (2). To allow comparability, we refer to the overall portfolio also in Table 2. See Appendix B.1 for details on the empirical derivation of this measure.

[17] The measure of home bias we refer to is equal to the ratio of domestic share to market share, as from (2).

degree of heterogeneity in bias toward various foreign assets. To provide an economic interpretation for this measure, consider that a bias measure equal to 1 implies that foreign assets enter portfolios with a weight equal to their market share.

The evidence that overall bias is almost everywhere below unity – i.e., the evidence that foreign assets are underweighted – is not surprising given the disproportionate domestic positions reported in Table 1. The median bias is larger for bonds than for stocks: the median destination country enters the bond portfolio and stock portfolio with, respectively, 58 and 43 percent of its market share. The stock market bias ranges from 0.12 for Canada to 1.09 for Sweden, which jointly with Finland, is the only country overweighted on average by foreign investors. In bond markets, the lowest bias is in South Korea and Japan (0.03) while the highest in Netherlands (1.21).

Interestingly, destination countries with a bias above the median, both in the stock and in the bond portfolios, are mainly members of the European Monetary Union (EMU). These findings are consistent with the evidence of Balta and Delgado (2009) and Lane and Milesi-Ferretti (2007), who find a notable increase of foreign investments in EMU countries by EMU countries as a result of monetary integration.

In contrast, destination countries with relatively low bias are those on average geographically distant from investing countries: indeed, the countries more severely underweighted are Canada and Mexico– close to the US but far from all other investing countries– Hong Kong, Australia, Japan and South Korea. These descriptive statistics suggest that both the common currency variable and the distance variable are likely to play an economically significant role in explaining foreign portfolio investment.

For our purposes, the most intriguing element is the overall heterogeneity across destination countries. This suggests that there might be country-specific effects – among which are investor protection laws – making some countries more attractive than others to foreign investors. Finally, we report the standard deviation of foreign bias around the average, providing information on dispersion of foreign bias of various investing countries. The degree of dispersion is quite large: the standard deviation is 90 percent of average bias for stocks, with roughly the same magnitude for bonds. This evidence underlines another interesting feature for our analytical purposes: beyond the differences between domestic and foreign investors and the differences arising from destination-country effects, there might also be

investing-country effects and/or pair-specific components that induce differing evaluations of the same assets by various investors[18]. This suggests the need to consider both pair-specific and country-specific factors as potential determinants of cross-border investment in our empirical analysis.

3.2.2 Regressors

In Table 3a we report descriptive statistics on regressors. We consider the covariates as they enter our regression specification, that is as ratios to the world average, except for dummy variables[19]. Interestingly, notwithstanding the quite small and relatively homogenous sample of countries, the standard deviation is on average quite high.

In Table 3b we report the correlation matrix of the included variables. The highest correlation value is between the ADR and the takeover index (0.839), consistently with the existing literature (Rossi and Volpin (2004)). Of course, the takeover index enters our regression specification as alternative to ADR (column (8), Table 5).

There are however other variables entering contemporaneously our regressions and that are very highly correlated. To address the problems related to potential multicollinearity, we run our regression excluding those covariates appearing overly correlated with other regressors. In column (7) of Table 4 and 5 we report results from a specification that excludes the variable capturing the accounting standards, the language dummy and the EMU dummy. Our main findings are not affected by the elimination of these covariates.

4 Results on the equity markets

We account first for variables indicated by the literature as natural determinants of bias in foreign portfolios[20]. The first variables included in the regression analysis are gravity variables. Market proximity

[18] Consistently, Guiso et al. (2009) find that the perceived credibility of managers in various nations depends on match–specific, destination-country– specific, and source-country–specific factors.

[19] Notice that the sample average of regressors is generally different from 1. This is because the average we adopt as denominator, for consistency with the theoretical setting, is reffered to all countries covered in the various datasets adopted while our investment opportunity set is restricted to a sub-sample of countries.

[20] Note that censoring is not an issue in our setting since our dependent variable is foreign bias – rather than foreign portfolio share – that is an unbounded variable.

captures the influence of asymmetric information on investor portfolio choice (Gehrig (1993); Brennan and Cao (1997); Kang and Stulz (1997)). Many empirical contributions find that the cultural and geographic proximity of the market has an important influence on investor stock holdings and trading (Grinblatt and Keloharju (2001); Chan et al. (2005); Portes and Rey (2005)).

For consistency with extant literature on gravity models, we include distance, common border dummy, common language dummy and colonial dummy[21]. The common border (language) dummy takes the value 1 if the investing and destination country share a common border (language) and 0 otherwise. The first two variables, distance and common border, simply capture physical distance between the country of the investor and the destination country[22]. Since transactions in financial assets are "weightless", a role for distance may be found only if it has informational content (Portes and Rey (2005)). Common language can encourage investment since foreign languages make collecting information more difficult. Finally, to capture cultural and/or historical ties, we check whether countries are tied by colonial heritage. The dummy variable 'common colony' takes value 1 if the considered pair of countries shares a similar colonial history.

These variables play an economically and statistically significant role in explaining the dependent variable as confirmed by the sizeable adjusted-R^2 (0.53). The elasticity of foreign bias to relative distance is about 0.48, while sharing a common border boosts the dependent variable by 80 percent ($e^{0.590} = 1.804$)[23]. Sharing a common language or colonial past should predict higher foreign investment but their impact, though positive as expected, is not statistically significant[24].

We then account for other pair-specific variables, capturing institutional linkages: namely, common currency area (EMU), common exchange platform (Euronext), and common legal origin. Lane and Milesi-Ferretti (2007) and Lane (2006) analyze the portfolio investment patterns of EMU countries after EMU integration revealing, for both fixed securities markets and stock markets, a Euro-area bias; that is, EMU member countries disproportionately invest in one another relative to other country

[21] To assure consistency with the theoretical framework, each variable X (dummy variables excluded) enters our regression specifications as the logarithm of the ratio of X to its world average. See Appendix B.2 for further details.

[22] A separate role for the border dummy can be found insofar as this variable is considered as "correcting" the distance variable, which is measured as the great circle distance between the capital cities of the destination and investing countries.

[23] Please note that all specifications include investing country fixed effects and time dummies.

[24] Note that common language and colonial dummy are not individually statistically significant but are jointly significant (F-stat: 3.49; p-value: 0.03).

pairs. Moreover, after controlling for EMU integration, Giofré (2008) finds a separate role for the consolidation of stock exchanges in the Euronext platforms: the common trading platform, on the one hand, has generated higher liquidity (Padilla and Pagano (2005)) and on the other hand, may have helped to alleviate informational asymmetries by inducing adoption of common trading rules and practices. The EMU (Euronext) dummy takes the value 1 if the investing and destination countries are EMU (Euronext) members and 0 otherwise. The coefficients of both variables are positive and significant and their effect is quite large: EMU membership and Euronext membership boost foreign bias by 2.5 times and 25 percent, respectively.

Finally, sharing the same legal framework might encourage cross-border investment by mitigating the fear of unknown factors (Guiso et al. (2009); Lane (2006)). We include a dummy variable ($dummy\_eq\_law$) taking the value 1 if the investing and destination countries share the same legal framework (i.e., civil law or common law) and 0 otherwise.

However, in the spirit of LLSV (1998), common law countries should provide both shareholders and creditors the strongest protection and should represent, per se, a factor attracting foreign investors, thus reducing the importance of sharing the same legal family[25]. We interact the $dummy\_eq\_law$ variable with a dummy taking the value 1 if the destination country belongs to the common law family and 0 otherwise, with the expectation of a negative sign. In column 2, both the $dummy\_eq\_law$ and its interaction with the common law status of the destination country have expected positive and negative sign, respectively, but are not statistically significant (column (2))[26]. However, they become very significant in statistical and economic terms when controlling for other factors (columns (3)-(7))[27].

4.1 Investor protection variables

After controlling for pair-specific regressors, we shift the focus of our analysis to destination-country-specific factors[28]. Asset-specific factors are relevant only to the extent that there is some heterogeneity

[25] Beck et al. (2003) find in cross-country regressions that legal origin matters for financial development because legal traditions differ in their ability to adapt efficiently to evolving economic conditions.

[26] The two variables are also jointly non significant (F-stat: 0.23; p-value: 0.79).

[27] Our results are generally consistent with Vlachos (2004), who shows that cultural and regulatory differences generate a negative impact on cross-country portfolio holdings.

[28] The regression includes fixed *investing* country effects to take into account the specificity of the investor.

in their evaluation on the part of investors. Otherwise, any asset-specific factor should be properly capitalized into the asset's market price (Dahlquist et al. (2003)). In our case, if all investing countries equally weighted a given factor, there should be no impact on portfolio bias. Conversely, if investors were asymmetrically influenced, for instance, by investor protection laws, these laws should help explain the distance between foreign portfolio positions and what is predicted by market shares (Leuz et al. (2009)).

We include first a variable capturing investor protection rights (column (3)) that can influence equity portfolio bias through either "direct" or "cross" effects.

The direct impact of investor protection laws is the effect of shareholder rights on foreign shareholders. The index of shareholder rights (ADR_j, LLSV (1998)) measures how strongly the legal system favors minority shareholders against managers or dominant shareholders in the corporate decision making process[29].

The cross effect is instead the effect of investor protection legislation on "non-target" investors – namely, the effect of creditor rights (CR_j) on foreign shareholders. Creditor rights are captured by an index aggregating the rights of secured lenders following Djankov et al. (2007)[30]. This index measures the legal rights of creditors against defaulting debtors in different jurisdictions, and has been interpreted by recent literature as a measure of creditor power.

Results on the direct effect of shareholder rights are qualitatively consistent with recent evidence by Leuz et al. (2009) and Thapa and Poshakwale (2011). Specifically, destination countries characterized by shareholder protection rights 1 percent higher than the average are relatively more attractive for foreign shareholders, inducing a foreign bias 0.4 percent larger[31].

Creditor rights might a priori impact foreign equity portfolios in either direction: on the one hand, strong creditor rights might be viewed as mitigating firm risk-taking, thereby lowering the perceived

[29] As discussed below, we consider as an alternative measure to shareholder rights, the "corrected" antidirector rights index as redefined in Spamann (2010). Our results hold under both specifications.

[30] We make use of the most recent value taken by the creditor rights index (year 2003) in Djankov et al. (2007). For all countries included in our sample, this index is identical to the creditor rights index adopted in LLSV (1998).

[31] It is worth noting that the endogeneity critique often raised against LLSV (1998) is much less an issue here. In fact, LLSV (1998) investigate the linkage between investor protection laws and development of financial markets (capturing aggregate asset supply) in which the direction of causality is quite controversial. In our analysis, the dependent variable is the bilateral foreign bias (capturing bilateral asset demand), that is, the ratio between bilateral portfolio position and market share, and the direction of causality, if any, goes arguably from investor protection to portfolio bias.

variability of the underlying asset; on the other hand, as suggested by Acharya et al. (2011), strong creditor protection laws might induce firms to engage in risk-reducing investments, such as diversifying acquisitions that are potentially inefficient and value reducing. Excessively strong creditor rights in default could lead to inefficient liquidations that extinguish the continuation option of a firm's enterprise and thereby hurt stockholders.

When creditor rights mandate the dismissal of management, a private cost is imposed on managers. To avoid these costs, shareholders and managers lower the likelihood of distress by reducing operating risk. If this implies a reduction in value not compensated adequately by a reduction in risk, then creditors' rights entail dead-weight costs to firms and to the whole economy. In particular, Acharya et al. (2011) find that stronger creditor rights are associated with lower operating risk and a greater propensity to pursue diversifying acquisitions and mergers. Since corporate diversification has been shown in some studies to destroy value, strong creditor rights may have negative consequences for shareholders.

In our analysis, the cross effect of creditor rights on stockholders is positive, statistically and economically significant, and its size is 40 percent of the direct effect (column (4)).

This evidence suggests that the risk-reducing effect prevails upon the profit-reducing effect. This outcome can be easily rationalized from a foreign investor's perspective because, as the literature shows, foreign investors are relatively more severely hit by information asymmetry. Such investors plausibly perceive domestic assets as more risky than do domestic investors (Gehrig (1993)), such that any institutional devices allowing investors to reduce riskiness are particularly valuable to foreign investors.

To be sure that what we capture is the effect of investor protection laws, we control in column (5) for correlated confounding factors. LLSV (1998) show how creditor and shareholder rights are strongly linked to legal origin[32]. We therefore include a series of dummies to capture the legal family of the destination country (French, English, German and Scandinavian)[33]. The evidence is consistent with LLSV (1998) and suggests that French and German legal origins induce lower investments[34].

[32] For a critical assessment of the importance of legal origin in finance see Klerman and Mahoney (2007) and Roe (2007).

[33] This is a destination-country-specific dummy and is different from the above-mentioned common legal framework variable ($dummy\_eq\_law$), which is a pair-specific variable identifying whether investing and destination countries share the same legal framework (common law or civil law).

[34] Among the four legal dummies, we drop the Scandinavian legal family dummy that constitutes the benchmark against

Interestingly, even after accounting for the legal origin of the destination country, shareholder rights and creditor rights are still economically and statistically relevant in explaining foreign investment.

4.1.1 Controlling for other institutional factors

We then control for other destination country-specific variables potentially correlated with investor protection that, if omitted, can bias the coefficients of the included regressors.

First, we include two variables that capture the soundness of the economic environment from a more general to a more specific level: (control of) expropriation risk and transparency of accounting rules.

Previous literature has documented that fraudulent transactions, bribery, unenforceable contracts, legal and regulation complexity can significantly affect portfolio investments (Gelos and Wei (2005); Leuz et al. (2009)). Control of the risk of expropriation captures government stance toward business while accounting standards are critical to corporate governance in that they render company disclosure interpretable. Aggarwal et al. (2005), find that countries with better accounting standards, shareholder rights, legal frameworks, and firms issuing American Depository Receipts attract more US mutual fund investment relative to benchmark indices. Their results emphasize that high-quality accounting information allows foreign investors to monitor and protect their investments and to efficiently allocate capital. Consistently, we find that while control of risk of expropriation shows a non-systematic impact on foreign portfolio investment, good accounting practices have a strong and robust impact.

Secondly, we consider two factors that can substitute for legal protection in an environment where investors' rights are poorly protected, that is ownership concentration and efficiency of the judicial system.

Ownership concentration Some concentration of ownership within a firm is typically efficient in providing managers incentives to work and in providing large investors incentives to monitor managers and thus increase the value of the firm (Shleifer and Vishny (1986)). In the presence of poor investor protection, ownership concentration becomes indeed a substitute for legal protection (LLSV (1998)).

which the impact of other dummies is evaluated. However, the software drops the English origin dummy as well due to multicollinearity with the variable obtained by interacting the common law status of the destination country with the $dummy\_eq\_law$. Coefficients are therefore reported only for German and French legal systems.

However, some dispersion of ownership is also desirable to diversify risk.

We consider the effect of ownership concentration using two alternative procedures. First, we account for it by correcting the foreign bias portfolio for the fraction of shares closely held (column (5a)). Alternatively, we include ownership concentration as a regressor and seize its direct impact on foreign portfolio bias and its indirect effect through shareholder rights (column (6)).

Let us illustrate the first procedure. Dahlquist et al. (2003) estimate the fraction of shares closely held across 51 countries, finding that on average 32 percent of shares are not available for trading and cannot therefore be held by foreign investors. This illustrates a measurement error in the size of domestic and foreign bias that was neglected by previous literature. These authors construct the world *float* portfolio, which considers only shares that can actually be held by investors.

Following Dahlquist et al. (2003), we consider the fraction of closely held shares as exogenous, thus making it relatively easy to correct the exogenous asset supply and to compute the corrected bias measure. The dependent variable to be explained in column (5a) is therefore changed as the market share in the denominator of the foreign bias measure is replaced by the share in the world *float* portfolio. In principle, this measurement error, albeit relative to the dependent variable, can potentially affect our results, since countries with stronger protection rights are those with a lower proportion of closely held shares. In column (5a), we report results after adopting the world float portfolio. Interestingly, we observe an about three times larger direct and cross impact of investor protection rights[35].

In column (6), we include ownership concentration as a regressor.

Ownership concentration per se might have an impact on foreign bias since expropriation by controlling shareholders could be perceived as particularly dangerous by foreign minority shareholders. We observe indeed that countries with higher ownership concentration attract less foreign investment.

In addition, we interact ownership concentration with shareholder protection ownership because concentration can affect portfolio investment also through corporate governance. On the one hand,

[35] Previous studies that analyze the effect of governance on foreign investments, when the float portfolio is properly accounted for, provide a mixed picture. Dahlquist et al. (2003) find that differences in investor rights and financial development across countries cannot explain the portfolio investment of US investors when the float portfolio is included as a determinant. However, Leuz et al. (2009) find opposite results when considering heterogeneity in governance practices across US firms: some firms can be underweighted and other overweighted resulting in no effect in the aggregate. Although keeping an aggregate perspective similar to Dahlquist et al. (2003), we shift from a US-based perspective to a cross-section of investing countries diversifying their portfolios and obtain results consistent with Leuz et al. (2009).

the more concentrated the ownership structure in the economy, the more important might be the role of shareholder protection rights in defending minority shareholders. On the other hand, investor protection laws could influence the level of ownership concentration: Shleifer and Wolfenzon (2002) assess that ownership is more concentrated when investor protection is weaker and LLSV (1998) argue that the weaker the investor protection, the higher the incentives toward ownership concentration are. In our regression, the positive and significant coefficient of the interacted variable seems to suggest that the first effect prevails upon the second[36].

Efficiency of the judicial system In principle, a strong system of legal enforcement could substitute for weak rules: active and well functioning courts can serve as recourse for investors aggrieved by management (LLSV (1998)). The efficiency of the judicial system can hence act as the most obvious substitute mechanism for poor investor protection laws. If this is the case, we should observe that the stronger the efficiency of the judicial system, the lower the impact of investor protection laws. In column (6), we interact shareholder rights with the efficiency of the judicial system to infer how the importance of the law on the books depends on the degree of efficiency of the judicial system. We observe that stronger efficiency of the judicial system beyond its significant impact per se, also reinforces the role played by investor protection on foreign investments. These findings are in line with LLSV (1998) and in contrast with the substitutability hypothesis: the laws on the books are more effective when they are better enforced.

4.2 Robustness

As a first robustness check we consider the "corrected" antidirector rights index as refined in Spamann (2010) as an alternative to the ADR index defined in LLSV (1998)[37]. The author, by a reexamination of the legal data, derives more precise estimates of antidirector rights leading to corrections for forty-three of the forty-six countries analyzed in LLSV (1998). The difference between corrected and original

[36] It is often recommended in statistics textbooks to *center* continuous variables (subtract the mean) before interacting them, to make the effects more easily interpretable. This recommendation is automatically fulfilled here since all continuous variables are entered in logs and in relative terms with respect to the world average (i.e., their logs are demeaned).

[37] See Spamann (2010) for further details on the corrected index.

values is such that many empirical results established using the original indexes may not be replicable with corrected values[38]. Consequently, our findings may be potentially invalidated when considering Spamann (2010) indexes. In column (6a) we report results when the original LLSV (1998) indexes are replaced by the revised Spamann (2010) indexes. Our results are robust to the alternative revised specification of antidirector rights: the coefficient of the Spamann (2010) index are comparable, in statistical and economic terms, to that of the LLSV (1998) index and most of other coefficients are basically unaffected by the alternative specification. Interestingly, the coefficient of the interaction between ownership concentration and the corrected measure of shareholder protection remains positive but becomes large and significant: the more concentrated the ownership structure in the economy, the more important is the role played by shareholder protection rights in shielding foreign outside investors.

Secondly, we try to address the problems of potential multicollinearity as highlighted by the correlation matrix in Table 3b. In particular we identify three covariates appearing overly correlated with other regressors: the language dummy, the EMU dummy and the accounting standards variables. In column (7) we therefore report results when these variables are excluded from the set of regressors: our main findings are not affected.

In summary, we underscore that both shareholder rights and creditor rights positively influence foreign portfolio investments. Foreign stock portfolio investments are attracted by strong shareholder rights, which better protect portfolio minority investors. Also, strong creditor rights, by mitigating excessive risk exposure, turn out to benefit foreign shareholders, who are plausibly particularly sensitive to information asymmetry. Quite interestingly, the cross effect, that is the coefficient of creditor rights, is comparable in size to the coefficient of shareholder rights. This piece of evidence suggests that ignoring the cross effect of investor protection laws entails missing a prominent component of the incentives provided by corporate governance to foreign investment.

[38] As stressed by Spamann (2010), Djankov et al. (2008) adopted a "revised" version of the antidirector rights index incorporating most of the corrections suggested in an early manuscript of the Spamann (2010) article.

5 Results on the bond markets

We now replicate the same analysis, taking the perspective of foreign bondholders. Our objective is to identify the direct and cross effect of investor protection laws on cross-border investment in fixed securities.

Following the above analysis, we first consider pair-specific variables as determinants of heterogeneity in portfolio position and then focus on destination-specific variables.

In column (1) of Table 4, we show that the distance variable has a significant impact on bondholders, with a coefficient even larger than for stockholders. Also, the language dummy is strongly significant, differently from the stocks' regression: sharing a common language has the effect of increasing the dependent variable by 2.9 times. However, when controlling for other determinants (column (5)-(8)), this effect, though still highly significant, shrinks to 40 percent. The coefficients of the border and colonial dummy are instead neither individually nor jointly statistically significant. In column (2), the EMU dummy coefficient appears to be quite large and strongly significant: the common currency area determines an impact almost five times larger for member countries, much stronger than in the stock market case[39]. The $dummy\_eq\_law$ variable shows a negative sign but this seems to be the result of an omitted variable problem. Indeed, after controlling for other correlated factors, the impact of this variable turns out to be positive as expected (columns (5)-(8))[40].

5.1 Investor protection variables

As for stocks, destination-country-specific factors could be responsible for heterogeneity in portfolio bias to the extent that these factors do not evenly affect all investors. We first focus on the direct effect, i.e. on the effect of creditor rights (CR_j) on foreign bondholders. The adopted measure of creditor rights indicates how easily a creditor may exercise her rights or how easy it is to foreclose on

[39] Sharing the Euronext stock exchange, which plays an important role for stockholders, does not positively affect bondholders (not reported). This latter piece of evidence suggests that the informational content of the common Euronext platform does not spill over from the stock market to the bond market.

[40] When the coefficient of the $dummy\_eq\_law$ is (counter-intuitively) negative, the interaction of the $dummy\_eq\_law$ with the dummy capturing the common versus civil law origin of the destination country is (counter-intuitively) positive: it maintains an opposite sign with respect to the $dummy\_eq\_law$, confirming the conjecture that the common law legal origin of the destination country mitigates the effect of sharing the same legal background. The interaction turns out to be negative whenever the coefficient of $dummy\_eq\_law$ becomes, consistently with the expectation, positive and significant.

collateral (Djankov et al. (2007)). We expect strong creditor rights to induce more investment in debt securities, as investors are better protected against the risk of default.

We immediately observe in column (3) that the coefficient of creditor rights is instead negative and statistically significant. These findings are at odds with our predictions, but the type of index of investor protection adopted necessitates a caveat: while the *ADR*'s index is an indicator well tailored for our purposes, the interpretation of the variable that captures creditor rights is less straightforward.

There are different types of creditors, with different interests: protecting the rights of some creditors might have the effect of reducing the rights of others. Senior loans have priority over bondholders, preferred shareholders, and common stockholders in the event of default. In assessing creditor rights, both LLSV (1998) and Djankov et al. (2007) take the perspective of senior secured creditors, as most debt around the world is of that type. In case of a default, senior secured creditors may have a simple interest in taking possession of collateral no matter what happens to the firm, whereas junior unsecured creditors may wish to preserve the firm so that they can possibly get some of their money back in case the firm eventually makes some profits.

What we actually observe in our analysis is the effect of senior secured creditor rights on bond investments and we can therefore expect a less clear-cut direct effect than for the stock portfolio[41]. However, insofar as particular legitimate interests are better protected in an institutional environment more effectively guaranteeing individual rights, we should observe, after controlling for other correlated determinants, a positive influence of creditor rights on foreign bondholders. This is indeed the case: after controlling for the role played by the efficiency of the judicial system, creditor rights are found to positively affect bond bias (column (6)-(7))[42].

The predicted direction of the cross effect, namely the effect of shareholder rights on bondholders, is theoretically not obvious.

On the one hand, an effective corporate governance mechanism can affect bond yields and ratings

[41] The cross effect of creditor rights on foreign shareholders discussed in the previous subsection, is much less controversial; it indeed captures how foreign shareholders benefit from the protection of interests limiting downside risk, regardless of the nature of the protected creditor.

[42] We made several attempts to find a more specific measure capturing bondholders rights but we could not find any valuable alternative. Lacking a specific measure, we chose therefore to adopt a general index capturing, albeit imprecisely, protection afforded to creditors. The correct positive sign recorded in the full specification regressions reassures us about the suitability of the index.

through its impact on the default risk of the firm. Indeed, efficient governance mechanisms reduce potential conflicts of interest between management and providers of capital through effective monitoring. This can reduce expropriation or misallocation of funds, improve the firm's productivity and disclosure and could be perceived positively by bondholders, resulting in a reduction in the default risk of the firm. The result could be a positive impact of strong shareholder rights on bondholders.

On the other hand, bondholders and shareholders can also have conflicting interests. In particular, bondholders and stockholders can disagree about the amount of risk the firm should take. Jensen and Meckling (1976) and Myers (1977) detail how the existence of outstanding debt creates a moral hazard problem where stockholder interests diverge from the interests of creditors. Jensen and Meckling (1976) underline how highly leveraged firms, i.e., firms where creditors are more at risk, have incentives to engage in risky asset portfolios because of information asymmetry. If we view the equity of a leveraged firm as equivalent to a call option, we can easily see how shareholders have incentive to increase the riskiness of the firm: the payoff to shareholders is unbounded, so there is some positive probability of a large payoff, whereas debt holders' payoff is limited. The moral hazard problem can of course be mitigated using restrictive covenants, but the costs of writing and enforcing these contracts are not economically trivial. Furthermore, even costly and severe constraints can leave open opportunities to shift risks and rewards.

Klock et al. (2004) investigate the impact of anti-takeover provisions on wealth transfers between stockholders and bondholders. Bondholders, by definition, have a limited upside potential and significant downside risk. Takeovers, which typically increase the financial risk of the firm by adding debt, can therefore result in wealth transfer from bondholders to shareholders. This suggests that provisions shifting power from managers to shareholders can result in shareholder expropriation of bondholder wealth. Market-based data provide evidence that antitakeover amendments, although not beneficial to stockholders, are viewed positively in the bond market: strong antitakeover provisions (weak shareholder rights) are indeed associated with a lower cost of debt financing. This analysis strongly suggests that it is important to examine the effects of governance provisions on all classes of securities before concluding that particular provisions are desirable.

Also Cremers et al. (2007) emphasize how policies benefiting stockholders do not generally benefit bondholders. In particular, various governance mechanisms available to shareholders can have different consequences for bondholders. For example, acquisitions and disciplinary takeovers can benefit target shareholders but also hurt target bondholders by adding more debt to the firm as firm leverage generally increases after a takeover. This increase in leverage can reduce the value of outstanding bonds, not only by increasing the probability and the deadweight costs of a possible future bankruptcy, but also by reordering the priority of claims in bankruptcy.

However, the cost of debt – the focus of the above-mentioned contributions – cannot seize the different impact generated by conflicting interests on foreign investors, because what is priced by the market is aggregate behavior. Ultimately, the question of the impact of shareholder protection provisions on foreign bondholders is an empirical one and depends precisely on how foreigners perceive the balancing of differing interests.

To estimate the cross effect of investor protection on bondholders, we add in column (4) the shareholder rights variable to our specification and find a negative but not precisely estimated impact on bondholders. We then check below how the significance of the coefficient attached to this covariate responds to the inclusion of other institutional variables potentially correlated with investor protection.

5.1.1 Controlling for other institutional factors

After controlling for the legal family of the destination country and the soundness of the economic system (column (5)), which are correlated with ADR in the destination country, the negative cross effect of ADR_j emerges more clearly and is statistically different from zero. Moreover, the coefficient of CR_j though still negative, is no longer statistically different from zero.

In column (6) we observe that after accounting for the efficiency of the judicial system, the impact of CR_j becomes positive well-defined and the size of the ADR_j's coefficient increases, in absolute value.

We also control for possible mechanisms of substitution between the role played by creditor rights and law enforcement. Analogously to what we have found for shareholder rights, the coefficient of the interaction of the efficiency of the judicial system with creditor rights is positive. This suggests that the

efficiency of the judicial system amplifies the effect of creditor rights, consistently with previous findings in the literature[43]. LLSV (1998) stress the complementarity between investor protection and legal enforcement and more recently, Safavian and Sharma (2007) highlight that the effectiveness of creditor rights on bank credit is strongly linked to the efficiency of contract enforcement. The particularly relevant role played by the judicial system should therefore not be surprising referred to a contract where the risk run by creditors mainly consists of default risk and the priority of claimants.

It is worth emphasizing that the evidence of a significant cross impact of investor protection on foreign investors survives after controlling for other destination country characteristics relating to various dimensions of institutional quality.

5.2 Robustness

As a first robustness check we adopt in column (6a) the Spamann (2010) index as alternative to the shareholder right index proposed by LLSV (1998). Our results still hold under this alternative specification, and the size of the coefficient of shareholder rights and creditor rights benefits from the adoption of the Spamann (2010) index, becoming more significant in economic terms.

Secondly, in column (7) we report results in which the language dummy, the EMU dummy and the accounting standards that are overly correlated with other regressors, are excluded: our main findings are not affected by the exclusion of these variables.

Overall, we uncover for bondholders a positive role played by creditor rights, conditional on the efficiency of the judicial system, and a negative impact of shareholder rights, which foreign bondholders may perceive as to increase the default probability. Strong shareholder rights can be detrimental to foreign bondholder interests by inducing excessive risk-taking behavior in firms.

As a final robustness check for this key result, we then directly test the impact of specific legislative

[43] From a mirror perspective, this result can be read as enforcement of rules being effective on foreign bondholders only in a context where creditor rights are well-established. The effectiveness of the judicial system per se shows an apparently counterintuitive negative impact on foreign bondholding. However, this coefficient captures its effect when creditor rights are equal to the average – that is when the logarithm of the relative creditor rights ratio is equal to 0. To measure its total effect, it is necessary to account for the additional effect mediated by creditor rights, that is indeed positive and very large. The final impact of the efficiency of the judicial system on foreign bondholding crucially depends on the value taken by the interacted variable: it is positive only for countries with highest creditor rights (top thirty percent of the distribution, averaging across regression specifications in (6)-(8)).

measures that potentially favours shareholders to the detriment of bondholders. As discussed above, the negative cross effects could be related to antitakeover legislation that can asymmetrically impact bondholders and shareholders (Klock et al. (2004)).

We test the impact of antitakeover legislation on bondholders by adopting the takeover index developed by Nenova (2006)[44]. In column (8) the shareholder index is replaced by the takeover index and the coefficient is negative and statistically significant[45]. Nenova (2006) shows that the takeover index is significantly and positively correlated with the level of takeover activity, as measured by the volume of takeovers, and Rossi and Volpin (2004) demonstrates that the takeover index is highly positively correlated with investor protection[46]. The negative coefficient is therefore not surprising.

What instead was not so obviously predictable is the large effect of the takeover index on foreign debt investment. Since both shareholder rights and takeover indexes enter our regression in relative terms, i.e., as logarithm of the ratio of the index with respect to the average, the magnitude of coefficients cannot be ascribed to different units of measure but rather to regressors' explanatory power[47]. Comparing column (6) with column (8), we note that the elasticity of the foreign portfolio bias to the relative takeover index is indeed four times larger than the elasticity with respect to shareholder rights. Specifically, a country with a 1 percent higher relative ADR index determines a reduction in foreign portfolio bias by 0.38 percent for bondholders while the same variation in the takeover index causes a reduction in portfolio bias by 1.55 percent. These results strongly support takeover legislation as one specific legal mechanism potentially responsible of the negative impact of shareholder right protection on foreign bondholders.

Our findings confirm and reinforce the evidence on the relatively strong importance of cross effects. In fact, the role of creditor rights is comparable in size for shareholders and for bondholders while the negative impact of shareholder rights protection on bondholders turns out to be generally greater (in absolute value) than its positive direct impact on foreign stock positions. These results suggest that

[44] See Nenova (2006) for a detailed discussion on the components of the takeover index.

[45] Nenova (2006) index is not available for Portugal and Denmark. This explains why the number of observations in column (8) falls to 1417.

[46] This is confirmed by the high correlation between the ADR_j and the takeover index (0.839) reported in Table 3b.

[47] Furthermore, the scale factor becomes irrelevant when variables are expressed in logarithmic terms as eventual differences in scale are fully captured by the intercept.

policies designed to generally attract foreign investments ought to take into account the interaction of multiple governance mechanisms, since the cross effects of investor protection laws are not necessarily second order effects.

6 Summary and conclusions

We investigate the impact of investor protection laws on foreign investment, namely foreign equity portfolio investments and foreign bond portfolio investments.

Our results show, first, that investor protection laws have a significant impact on foreign investments. These findings are consistent with results in Leuz et al. (2009) relative to outward equity investment by US firms. We generalize their results to different investing countries and to debt securities. Specifically, we find that strong shareholder rights (creditor rights) stimulate foreign equity (bond) portfolio investments. Since foreign investors are mostly affected by information asymmetry issues, these findings can also be interpreted as corporate governance rules serving as a means to overcome information asymmetries and thereby to enhance international diversification.

Secondly, our findings highlight how investor protection asymmetrically affects foreign investment. These results, obtained controlling for relevant dimensions of countries' institutional quality, represent the most innovative contribution of the paper to the extant literature. More specifically, we highlight that foreign shareholders appreciate strong creditor rights, which potentially mitigate the riskiness of projects, while bondholders are negatively affected by strong shareholder rights, which might induce the firm to engage in excessively risky behavior. Importantly, our results are robust to an updated specification of shareholder rights and reveal that the negative cross effect on foreign bondholders can be plausibly ascribed to antitakeover legislation asymmetrically influencing inward bond and stock investment.

The immediate implication to draw from this picture is that strengthening investor protection is not a universally desirable policy. Specifically, our results suggest that stronger creditor rights are helpful in attracting foreign investment, while stronger shareholder rights are effective in attracting foreign equity investment but may deter foreign bond investment in equal measure. Thus, the choice

to reinforce shareholder rights can be read as a choice to benefit foreign shareholders to the detriment of foreign bondholders.

It is worth stressing now that our work investigates the effects of investor protection rights on cross-border investments, while a more comprehensive analysis is needed to derive general welfare conclusions on the desirability of stronger or weaker investor protection. Moreover, we consider the determinants of foreign investments, leaving unexplored effects on domestic investors that are harder to investigate due to both the limited number of available observations (one for each investing country for each available year) and to difficulties in removing all sources of familiarity bias.

With the above-mentioned caveats in mind, our findings also contribute to the literature on convergence in investor protection legislation.

A large body of literature comparing financial systems, especially among capitalist economies, has produced a renewed interest in institutional economics (Djankov et al. (2003))[48]. On the one hand, the classical distinction between bank-based and market-based systems is less relevant than in the past (Rajan and Zingales (2003); Hölzl (2006)), on the other hand, domestic financial markets remain heterogeneous despite integration and globalization[49]. Djankov et al. (2008) find no convergence in creditor scores. La Porta et al. (2000) reject the hypothesis of legal convergence of rules and enforcement mechanisms toward some successful standard of effective investor protection. Mansi et al. (2009) claim that competition on legal dimensions in terms of their effectiveness in attracting investment does not imply that all jurisdictions need to or should converge to the single best or worst alternative.

Consistently, our findings provide a rationale for the evidence of no convergence toward the strongest investor protection setting as the level of investor protection in each country is endogenously determined by the balancing of many forces. Among them, the political choice to promote inward investment and to favour particular categories of investor may play an especially important role.

[48] See Pistor et al. (2003) for a comparisons of the evolution of statutory corporate law and the law on secured transactions in key countries.

[49] Another strand of literature focuses more specifically on convergence of financial instruments. For instance, Bruno et al. (2012) examine holdings of different financial instruments by many industrialized countries and find strong convergence for shares and insurance products and mixed results for deposits and debt securities.

Table 1. Domestic position in stock and bond portfolios (by investing country).

This table reports, for both stock and bond portfolios, the domestic share and the market share of each investing country. The reported figure are averages over the period 2001-2006. *Source*: Coordinated Portfolio Investment Survey (IMF), Datastream (Thomson Financial) and Bank for International Settlements (BIS) Security Statistics.

	Stock market		**Bond market**	
	domestic share	market share	domestic share	market share
Austria	0.362	0.002	0.404	0.007
Belgium	0.509	0.007	0.611	0.013
Finland	0.603	0.006	0.522	0.003
France	0.681	0.046	0.571	0.047
Germany	0.502	0.035	0.737	0.072
Italy	0.629	0.023	0.788	0.049
Netherlands	0.289	0.019	0.569	0.022
Spain	0.772	0.018	0.713	0.024
Canada	0.825	0.029	0.931	0.021
Denmark	0.554	0.004	0.796	0.008
Japan	0.709	0.107	0.835	0.148
Sweden	0.550	0.010	0.739	0.008
United Kingdom	0.652	0.087	0.478	0.040
United States	0.814	0.436	0.943	0.413

Table 2. Overall bias in stock and bond portfolios (by destination country)

This table reports the average and standard deviation of overall portfolio bias[§] by the fourteen investing countries in each destination country index (head of rows) included in the opportunity set. Statistics are reported for both stock market and bond market. *Source*: Coordinated Portfolio Investment Survey (IMF), Datastream (Thomson Financial) and Bank for International Settlements (BIS) Security Statistics.

	Stock market		**Bond market**	
	average bias	standard deviation of bias	average bias	standard deviation of bias
Austria	0.426	0.394	0.817	0.788
Belgium	0.469	0.455	0.559	0.492
Finland	1.001	0.811	0.974	0.922
France	0.665	0.461	0.601	0.446
Germany	0.743	0.830	0.773	0.638
Italy	0.439	0.263	0.634	0.502
Netherlands	0.921	0.542	1.208	0.844
Portugal	0.426	0.461	0.769	0.774
Spain	0.481	0.284	0.680	0.569
Australia	0.160	0.156	0.215	0.105
Canada	0.118	0.132	0.147	0.101
Denmark	0.367	0.398	0.604	0.689
Japan	0.179	0.101	0.026	0.037
Mexico	0.192	0.188	0.189	0.148
Sweden	1.089	2.018	0.908	1.302
United Kingdom	0.481	0.231	0.488	0.242
United States	0.224	0.164	0.117	0.072
South Korea	0.237	0.189	0.025	0.016
Hong Kong	0.151	0.146	0.287	0.712
Singapore	0.244	0.196	0.218	0.399
median	0.426		0.580	

[§] : "overall bias" of country l investing in country j is defined as the ratio of country l's observed portfolio share invested in country j to country j's market share. "Average bias" is obtained averaging across time and across foreign investing countries. "Standard deviation of bias" is computed as a standard dispersion measure of overall bias around the average bias.

Table 3a. Descriptive statistics regressors.

The table shows descriptive statistics on "relative" regressors as they enter our regression specification. Super-scripts l and j refer, respectively, to the investing country and the destination country. *Source*: LLSV (1998), Spamann (2010); Nenova (2009)

	Mean	Maximum	Minimum	Std. Dev.
dist^{lj}/av_dist^{j}	1.081	4.034	0.034	0.926
dummy border^{lj}	0.105	1	0	0.306
dummy lang^{lj}	0.079	1	0	0.271
dummy colon^{lj}	0.071	1	0	0.257
dummy EMU^{lj}	0.234	1	0	0.424
dummy EURONEXT^{lj}	0.025	1	0	0.156
dummy equal_law^{lj}	0.573	1	0	0.495
dummy German origin^{j}	0.222	1	0	0.416
dummy French origin^{j}	0.331	1	0	0.471
ADR^{l}/av_ADR	1.018	1.695	0.000	0.530
Spamann_ADR^{l}/av_Spamann_ADR	1.013	1.478	0.493	0.258
takeover^{j}/av_takeover	1.416	2.018	0.811	0.387
cred_rights^{j}/av_cred_rights	1.010	1.905	0.000	0.573
contr_risk_expr^{j}/av_contr_risk_expr	0.999	1.068	0.780	0.074
account^{j}/av_account	1.029	1.252	0.814	0.116
eff_jud^{j}/av_eff_jud	1.012	1.138	0.683	0.173
concentr^{j}/av_concentr	0.981	1.563	0.440	0.357

Table 3b. Correlation matrix regressors

The table shows the correlation matrix of "relative" regressors. Super-scripts l and j refer, respectively, to the investing country and the destination country. *Source*: LLSV (1998), Spamann (2010); Nenova (2009)

		Correlation matrix															
		1	2	3	4	5	6	7	8a	8b	9a	9b	10	11	12	13	14	15
rel_dist^{lj}	1	1																
dummy border^{lj}	2	-0.367	1															
dummy lang^{lj}	3	-0.054	0.553	1														
dummy colon^{lj}	4	-0.099	0.241	0.646	1													
dummy EMU^{lj}	5	-0.695	0.410	0.129	-0.273	1												
dummy EURONEXT^{lj}	6	-0.349	0.483	0.685	-0.133	0.436	1											
dummy equal_law^{lj}	7	-0.246	0.277	0.387	0.144	0.618	0.270	1										
dummy German origin^{j}	8a	-0.002	0.040	-0.054	-0.120	0.056	-0.203	0.228	1									
dummy French origin^{j}	8b	-0.296	0.128	-0.081	-0.086	0.555	0.566	0.299	-0.374	1								
rel_ADR^{j}	9a	0.304	-0.204	0.053	0.206	-0.567	-0.329	-0.446	-0.260	-0.531	1							
rel_Spamann_ADR^{l}	9b	-0.011	-0.089	-0.139	0.004	0.012	-0.158	0.116	0.338	-0.086	0.231	1						
rel_takeover^{j}	10	0.409	-0.203	0.086	0.158	-0.570	-0.217	-0.499	-0.322	-0.575	0.839	0.064	1					
rel_cred_rights^{j}	11	0.139	-0.141	0.052	-0.136	-0.080	-0.139	-0.181	0.281	-0.374	0.165	0.263	0.288	1				
rel_contr_risk_expr^{j}	12	-0.380	0.138	0.000	0.005	0.415	0.226	-0.038	0.030	-0.122	0.169	-0.035	0.141	0.082	1			
rel_account^{j}	13	0.155	-0.085	0.061	0.200	-0.473	-0.176	-0.331	-0.519	-0.455	0.629	0.021	0.699	-0.048	0.201	1		
rel_eff_jud^{j}	14	0.052	-0.017	0.135	0.003	-0.161	0.066	-0.276	-0.114	-0.537	0.419	-0.357	0.543	0.298	0.550	0.512	1	
rel_concentr^{j}	15	-0.130	0.088	0.000	-0.186	0.436	0.057	0.157	-0.136	0.480	-0.500	-0.280	-0.426	-0.042	-0.347	-0.504	-0.337	1

Table 4. Foreign bias in equity portfolios

This table reports results of the feasible GLS regression as in equation (5) in the text. The dependent variable is the logarithm of the foreign portfolio bias, i.e., the ratio of portfolio share to market share, $\log(\frac{\hat{w}^{lj}}{\hat{M}S^j})$, where the subscript lj represents the couple investment country l -destination country j. In column (5a) the dependent variable is foreign portfolio bias corrected for the fraction of shares closely held Dahlquist et al. (2003). Further details on the derivation of the dependent variable are provided in Appendix A.1. In column (6a) the shareholder rights' index (LLSV (1998)) is replaced by the antidirector rights index corrected by Spamann (2010). Each regressor X (dummy variables excluded) is expressed as the logarithm of the ratio of X to its world average. Further details on the variables included as regressors are provided in Appendix A.2. Investing country dummies, constants and time dummies are included but not reported. Cross-section weights standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	Foreign equity portfolios								
	(1)	(2)	(3)	(4)	(5)	(5a)	(6)	(6a)	(7)
rel_dist^{lj}	-0.480 ***	-0.358 ***	-0.374 ***	-0.360 ***	-0.320 ***	-0.246 ***	-0.326 ***	-0.314 ***	-0.365 ***
	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)	(0.022)	(0.018)	(0.018)	(0.022)
dummy_lang^{lj}	0.116	0.127	0.158 *	0.109	0.103	-0.169 *	0.033	0.021	
	(0.071)	(0.093)	(0.092)	(0.091)	(0.083)	(0.101)	(0.082)	(0.082)	
dummy_border^{lj}	0.590 ***	0.425 ***	0.478 ***	0.525 ***	0.491 ***	0.756 ***	0.522 ***	0.507 ***	0.760 ***
	(0.069)	(0.062)	(0.060)	(0.060)	(0.056)	(0.066)	(0.053)	(0.053)	(0.063)
dummy_colon^{lj}	0.102	0.155 **	0.078	0.143 **	0.086	0.142 **	0.088	0.120 **	0.014
	(0.075)	(0.065)	(0.066)	(0.066)	(0.061)	(0.071)	(0.058)	(0.058)	(0.065)
dummy_EMU^{lj}		0.915 ***	0.931 ***	0.919 ***	1.074 ***	1.300 ***	1.219 ***	1.223 ***	
		(0.056)	(0.054)	(0.054)	(0.080)	(0.092)	(0.052)	(0.052)	
dummy_EURONEXT^{lj}		0.226 **	0.228 ***	0.283 ***	0.489 ***	-0.025	0.395 ***	0.462 ***	0.559 ***
		(0.093)	(0.087)	(0.089)	(0.080)	(0.092)	(0.078)	(0.077)	(0.098)
dummy_eq_law^{lj}		0.019	0.248 ***	0.919 ***	0.628 ***	0.958 ***	0.658 ***	0.589 ***	0.731 ***
		(0.045)	(0.049)	(0.054)	(0.056)	(0.065)	(0.062)	(0.053)	(0.073)
dummy_eq_law^{lj}*comm_law^{j}		-0.069	-0.563 ***	-0.689 ***	-1.326 ***	-1.879 ***	-1.380 ***	-1.243 ***	-1.147 ***
		(0.104)	(0.113)	(0.115)	(0.121)	(0.145)	(0.133)	(0.115)	(0.143)
dummy_german^{j}					-0.206 ***	0.120 *	-0.425 ***	-0.373 ***	-0.330 ***
					(0.052)	(0.062)	(0.055)	(0.054)	(0.062)
dummy_french^{j}					-0.103 **	0.907 ***	-0.092	-0.107 *	0.162 **
					(0.051)	(0.061)	(0.058)	(0.056)	(0.069)
rel_ADR^{j}			0.406 ***	0.422 ***	0.396 ***	1.102 ***	0.252 ***	0.287 ***	0.213 ***
			(0.041)	(0.041)	(0.041)	(0.048)	(0.057)	(0.070)	(0.065)
rel_ADR^{j}*rel_eff_jud^{j}							1.660 ***	2.125 ***	2.205 ***
							(0.281)	(0.333)	(0.314)
rel_ADR^{j}*rel_concentr^{j}							0.242 *	1.054 ***	0.690 ***
							(0.143)	(0.133)	(0.158)
rel_CR^{j}				0.171 ***	0.228 ***	0.753 ***	0.316 ***	0.410 ***	0.304 ***
				(0.034)	(0.037)	(0.044)	(0.039)	(0.046)	(0.045)
rel_contr_risk_expr^{j}					-0.054	-0.147	0.319	-0.887 ***	2.047 ***
					(0.221)	(0.264)	(0.325)	(0.337)	(0.367)
rel_account^{j}					1.223 ***	2.002 ***	0.700 ***	1.077 ***	
					(0.101)	(0.120)	(0.123)	(0.134)	
rel_eff_jud^{j}							0.220 *	-0.242	0.465 ***
							(0.131)	(0.176)	(0.134)
rel_concentr^{j}							-0.448 ***	-0.617 ***	-0.312 ***
							(0.053)	(0.045)	(0.055)
#obs	1579	1579	1579	1579	1579	1579	1579	1579	1579
Adj-R^2	0.53	0.64	0.67	0.67	0.73	0.73	0.76	0.76	0.62

Table 5. Foreign bias in bond portfolios

The table reports results of the feasible GLS regression as in equation (6) in the text. The dependent variable is the logarithm of the foreign portfolio bias, i.e., the ratio of portfolio share to market share, $\log(\frac{\hat{w}^{lj}}{\hat{M}S^j})$, where the subscript lj represents the couple investment country l -destination country j. Further details on the derivation of the dependent variable are provided in Appendix A.1. In column (6a) the shareholder rights' index (LLSV (1998)) is replaced by the antidirector rights index corrected by Spamann (2010). In column (7) the shareholder rights' index is replaced by the takeover index developed by Nenova (2006). Each regressor X (dummy variables excluded) is expressed as the logarithm of the ratio of X to its world average. Further details on the variables included as regressors are provided in Appendix A.2. Investing country dummies, constants and time dummies are included but not reported. Cross-section weights standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	Foreign bond portfolios								
	(1)	(2)	(3)	(4)	(5)	(6)	(6a)	(7)	(8)
rel_dist^{lj}	-0.822 ***	-0.656 ***	-0.690 ***	-0.690 ***	-0.502 ***	-0.409 ***	-0.423 ***	-0.607 ***	-0.384 ***
	(0.052)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)	(0.033)	(0.027)
dummy_lang^{lj}	1.059 ***	0.191	0.246	0.236	0.298 **	0.396 ***	0.367 ***		0.291 **
	(0.152)	(0.152)	(0.152)	(0.152)	(0.142)	(0.132)	(0.133)		(0.128)
dummy_border^{lj}	-0.116	-0.357 ***	-0.421 ***	-0.427 ***	-0.162 *	-0.144	-0.112	0.291 ***	0.025
	(0.139)	(0.100)	(0.099)	(0.100)	(0.096)	(0.091)	(0.090)	(0.100)	(0.093)
dummy_EMU^{lj}		1.585 ***	1.566 ***	1.563 ***	1.696 ***	1.805 ***	1.816 ***		1.439 ***
		(0.085)	(0.084)	(0.084)	(0.111)	(0.082)	(0.082)		(0.091)
dummy_colon^{lj}	-0.150	-0.152	-0.283 **	-0.277 **	-0.203 *	-0.121	-0.140	-0.207 *	-0.122
	(0.139)	(0.116)	(0.117)	(0.117)	(0.111)	(0.111)	(0.111)	(0.125)	(0.105)
dummy_eq_law^{lj}		-0.492 ***	-0.610 ***	-0.638 ***	0.156 *	0.454 ***	0.718 ***	0.534 ***	0.668 ***
		(0.070)	(0.071)	(0.083)	(0.091)	(0.089)	(0.087)	(0.102)	(0.147)
dummy_eq_law^{lj} **comm_law*^{j}		1.950 ***	2.209 ***	2.276 ***	0.543 **	-0.148	-0.660 ***	0.701 ***	-0.464
		(0.191)	(0.196)	(0.218)	(0.238)	(0.230)	(0.223)	(0.240)	(0.309)
dummy_german^{j}					-1.340 ***	-1.478 ***	-1.363 ***	-1.350 ***	-2.453 ***
					(0.092)	(0.090)	(0.088)	(0.103)	(0.182)
dummy_french^{j}					-0.597 ***	-1.340 ***	-1.256 ***	-0.692 ***	-2.053 ***
					(0.090)	(0.106)	(0.103)	(0.119)	(0.171)
rel_ADR^{j}				-0.049	-0.179 **	-0.382 ***	-0.490 ***	-0.318 ***	
				(0.071)	(0.071)	(0.072)	(0.111)	(0.083)	
rel_takeover^{j}									-1.552 ***
									(0.192)
rel_CR^{j}			-0.337 ***	-0.342 ***	-0.028	0.392 ***	0.586 ***	0.199 ***	0.565 ***
			(0.057)	(0.057)	(0.063)	(0.066)	(0.075)	(0.072)	(0.068)
rel_CR^{j} **rel_eff_jud*^{j}						5.780 ***	6.130 ***	3.857 ***	5.621 ***
						(0.383)	(0.406)	(0.383)	(0.423)
rel_contr_risk_expr^{j}					1.209 ***	7.675 ***	7.530 ***	7.479 ***	8.843 ***
					(0.377)	(0.602)	(0.612)	(0.632)	(0.631)
rel_account^{j}					0.069	1.687 ***	2.173 ***		-0.225
					(0.174)	(0.204)	(0.240)		(0.538)
rel_eff_jud^{j}						-1.714 ***	-2.008 ***	-0.908 ***	-1.540 ***
						(0.228)	(0.271)	(0.225)	(0.228)
#obs	1579	1579	1579	1579	1579	1579	1579	1579	1417
Adj-R^2	0.45	0.57	0.58	0.58	0.64	0.68	0.68	0.57	0.78

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A Theoretical framework

Following Merton (1969) with constant relative risk aversion utility function and constant investment opportunities the vector of optimal portfolio shares takes the well known following form:

$$\mathbf{w}^* = \frac{1}{\lambda}\mathbf{\Sigma}^{-1}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) \tag{7}$$

where λ is the coefficient of relative risk aversion, $\mathbf{w}$ is the vector of weights in the overall portfolio, $\bar{\boldsymbol{\mu}}$ is the vector of expected stock returns, r is the risk-free interest rate, $\mathbf{i}$ is a vector of ones and $\mathbf{\Sigma}$ is the variance-covariance matrix of stock returns.

We incorporate in this standard setting investment cross-border barriers following Gehrig (1993) approach. In his contribution foreign investments appear on average more risky to domestic investors -leading to an information-based justification to home bias- and the portfolio of each investor is different depending on the perceived variance-covariance matrix[50]. We consider this approach focusing on foreign investment only, considering a different investor-specific perceived variability of stock returns for each foreign stock index in the investment opportunity set.

Let us denote by $\mathbf{C}^l$ the NxN positive definite diagonal matrix of investment barriers, where the $j-th$ diagonal element C^{lj} is the cost of holding country j's stock by country l's investor. Capturing C^{lj} the investment barrier cost for country l investing in j , its reciprocal $\frac{1}{C^{lj}}$ stands for a variable capturing the investment "advantage" of country l investing in country j. Consequently, the optimal portfolio is no longer universal ($\mathbf{w}^*$) but is investor-specific ($\mathbf{w}^l$)

$$\mathbf{w}^l = \frac{1}{\lambda}\left(\mathbf{\Sigma}^l\right)^{-1}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) = \left(\mathbf{C}^l\right)^{-1}\mathbf{\Omega}^{-1}\frac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) \tag{8}$$

where $\mathbf{\Sigma}^l = \mathbf{\Omega}\mathbf{C}^l$ (and therefore $\left(\mathbf{\Sigma}^l\right)^{-1} = \left(\mathbf{C}^l\right)^{-1}\mathbf{\Omega}^{-1}$)[51]

Therefore the equilibrium condition, equating stock demand and stock supply, will be

$$\mathbf{MS} = \mathbf{\Phi}\mathbf{\Omega}^{-1}\left[\frac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i})\right] \tag{9}$$

where **MS** represents the supply side, that is the vector of shares in the world market capitalization and the right hand side is the (weighted) sum of stock indexes' demands (demand side). $\mathbf{\Phi}$ is a diagonal

[50] In a standard setting with asymmetric information (Grossman and Stiglitz (1980)) an informed investor has a lower perceived variance due to its private signal but, at the same time, her perceived expected return is generally also different from the uninformed investor's. It implies that we should sometimes observe a "foreign-bias" when the domestic investors observe bad signals. What we, instead, label "information asymmetries" throughout the paper is closer to the concept of "model uncertainty" or "Knightian uncertainty" (Epstein and Miao (2003) and Uppal and Wang (2003)): roughly speaking, the foreign investor's perceived uncertainty is higher than the domestic investor's one, though they observe the same return. This approach may help to understand home bias because small differences in the ambiguity about the return distributions can lead to largely under-diversified portfolio holding. The same reasoning applies when considering allocation in several foreign stock markets rather than the choice between home and foreign assets.

[51] The matrix $\mathbf{\Omega}$ is the universal variance-covariance matrix that would prevail in absence of investment barriers.

NxN positive definite matrix where the $j-th$ diagonal element, $\phi^j = \sum_{l=1}^{L} MS^l \frac{1}{C^{lj}}$ is the average investment "advantage" in holding asset j across investors, weighted by the market share of each investor's domestic stock market.

Let us define $\mathbf{D}^l = \mathbf{\Phi C}^l$, where $\mathbf{D}^l$ is again a diagonal NxN positive definite matrix. We can rewrite the above expression (8) as

$$\mathbf{w}^l = \left(\mathbf{D}^l\right)^{-1} \mathbf{\Phi \Omega}^{-1} \left[\tfrac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i})\right] \tag{10}$$

where $D^{lj} = \phi^j C^{lj}$ and $\dfrac{1}{D^{lj}} = \dfrac{\dfrac{1}{C^{lj}}}{\sum_{l=1}^{L} MS^l \dfrac{1}{C^{lj}}}$

and using the equilibrium condition (9) we get the following result

$$\mathbf{w}^l = \left(\mathbf{D}^l\right)^{-1} \mathbf{MS} \tag{11}$$

or, in terms of individual asset, the following optimal portfolio weights

$$w^{lj} = \frac{1}{D^{lj}} MS^j \tag{12}$$

that is equation (1) in the main text.

MS^j is the market share of stock index j in the world stock market, $\frac{1}{D^{lj}}$ represents the inverse of relative (with respect to world average) cost of country l investing in asset j. In other words, the investor l will demand a share of assets greater than the market share in proportion to $\frac{1}{D^{lj}}$[52]. Note that if $C^{lj} = \phi^j$, i.e. if the investment barrier for country l is equal to the average then the investor l will hold the value market share of asset j.

[52] As in Obstfeld and Rogoff (2001), the share of country j's equity held by country l is a decreasing (increasing) function of the bilateral trading cost (efficiency) between l and j relative to the average trading cost (efficiency) between country j and all other countries.

B Variables' description

B.1 Dependent variables

Foreign stock and bond market portfolios

The CPIS dataset contains information on foreign holdings only and does not include domestic positions. For our regression analysis it suffices since we focus on the allocation of foreign assets within the foreign portfolio (that is we normalize to one both the overall foreign portfolio and the world market capitalization excluding the domestic market share). To derive the descriptive statistics in Table 1 and 2, however, we need to derive the foreign portfolio positions in the overall portfolio and then to retrieve the share of foreign assets.

Accordingly we can derive the "foreign share" of country i at time t, FS_{it}[53]

$$FS_{i,t} = \frac{(FA)^k_{i,t}}{(MCAP^k_{i,t} + FA^k_{i,t} - FL^k_{i,t})} \tag{13}$$

where k represents alternatively stocks (S) or bonds (B). FA stands for "foreign assets", FL for "foreign liabilities" and $MCAP$ for "market capitalization". After obtaining the foreign share FS it is possible to recover the share of each foreign asset in the overall portfolio.

To accomplish this objective for stocks we drew from *Datastream (Thomson Financial)* the stock market capitalization of all country indexes and from the *International Financial Statistics* (*IFS*) the outstanding foreign equity portfolio investments and the corresponding liabilities.

The same reasoning above applies to the foreign bond share. The outstanding foreign fixed securities portfolio investments and the corresponding liabilities are still drawn from the *IFS* while the source for bond market capitalization is the *Bank for International Settlements (BIS) Security Statistics* containing data on international debt securities by residence of issuer and domestic debt securities by residence of issuer of all maturities and sectors. In our analysis short term and long term fixed securities are pooled together. In fact, in the *CPIS* dataset debt instruments are partly broken down by long-term debt and short-term debt, with the latter being defined as debt securities with an original maturity of up to one year. However, not all countries provide a breakdown of debt securities by maturity whereas they report the total value of debt securities. Moreover, we cannot identify amounts outstanding of debt securities by *original* maturity, as the BIS only provides a separate breakdown for debt securities with *remaining* maturity of up to one year.

Market share

Market shares refer to the values at the end of December of each year.

Source: Datastream, Thomson Financial

World float portfolio

The world float portfolio is a corrected value weighted portfolio obtained by multiplying the market share by a fraction taking into account the fraction of closely held shares drawn from Worldscope (Dahlquist et al. (2003)). We convert our world market portfolio weights into world float portfolio weights (Dahlquist et al. (2003), Table 2). We keep the conversion coefficient invariant over the time period considered being the fraction of country closely-held shares quite stable over a short time horizon while the most important source of variability, the cross-sectional one, is properly taken into account.

[53] Fidora et al. (2007) and Sorensen et al. (2007) follow the same procedure dealing with the CPIS dataset.

B.2 Regressors

To assure consistency with the theoretical framework, each variable X (dummy variables excluded) enters our regression specifications as the logarithm of the ratio of X to its world average.

Proximity variables

Distance

The distance is measured as the Great Circle distance in miles between capital cities of source (l) and destination (j) country. The average distance from a destination country (j) is obtained as weighted (by market share) average of the distance of investing countries. The variable included in the regression is the logarithm of the ratio of the distance lj to the average distance.

Border dummy

Dummy variable taking value of 1 if the investing country and the destination country share a common border (0 otherwise).

Language dummy

Dummy variable taking value of 1 if the investing country and the destination country share a common language (0 otherwise)

Colony dummy

Dummy variable taking value of 1 if the investing country and the destination country share a common colonial past (0 otherwise)

Euronext dummy (Common Stock Exchange dummy)

Dummy variable taking value of 1 if the investing country and the destination country share the Euronext stock exchange platform (0 otherwise). In our case, it coincides with a common stock exchange dummy since the investing countries considered did not merge in a common stock exchange with other countries.

EMU dummy (Common Currency dummy)

Dummy variable taking value of 1 if the investing country and the destination country are members of the European Monetary Union (0 otherwise). In our case, it coincides with a common currency dummy since do not belong to any other currency union.

Equal law

Dummy variable taking value 1 if the investing country and the destination country belong to the same legal root, common law or civil law.

Legal origin

Identifies the legal origin of the company law or commercial code of each country: English, French, German, Scandinavian. Due to multicollinearity, two out of four dummies are dropped in the analysis.

Creditor rights

An index aggregating creditor rights, following LLSV (1998). We adopt the updated version (2002) reported in Djankov et al. (2007): for the countries included in our sample, this index is identical to LLSV (1998), except for a marginal difference in Japan, thus our results are unchanged under both specifications. A score of one is assigned when each of the following rights of secured lenders are defined in laws and regulations: 1) restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization; 2) secured creditors are able to seize their collateral after the reorganization petition is approved, i.e. there is no automatic stay or asset freeze; 3) secured creditors are paid first out of the proceeds of liquidating a bankrupt firm,as opposed to other creditors such as government or workers; 4) management does not retain administration of its property pending the resolution of the

reorganization. The original index ranges from 0 (weak creditor rights) to 4 (strong creditor rights). Since we adopt a log specification where a zero argument is not allowed, we add one unit to each score.

Shareholder rights

The index captures antidirector rights, following LLSV (1998). Antidirector rights measure how strongly the legal system favors minority shareholders against managers or dominant shareholders in the corporate decision making process. This is an index formed by adding one when (1) the country allows shareholders to mail their proxy vote directly to the firm, (2) shareholders are not require to deposit their shares prior to a shareholders' meeting, (3) cumulative voting for directors or proportional representation in the board is allowed, (4) an oppressed minority mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than 10 percent, or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote. The original index ranges from 0 (weak antidirector rights) to 6 (strong antidirector rights). Since we adopt a log specification where a zero argument is not allowed, we add one unit to each score.

Corrected Antidirector Rights Index

The index is constructed by Spamann (2010). It is constructed as in LLSV (1998) but a reexamination of the legal data leads to corrections for thirty-three out of forty-six countries analyzed.

Takeover Index

The takeover laws index is a simple average of 12 components characterizing takeover laws around the world (See Nenova (2006) for details on the construction of the index).

Expropriation risk

ICR's assessment of the risk of "outright confiscation" or "forced nationalization". Scale from zero to 10 with lower scores for higher risk (LLSV (1998)).

Accounting rules

Index based on information disclosure and accounting practices (LLSV (1998)).

Efficiency of judicial system

Assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms" produced by Business International Corporation. Scale from zero to 10 with lower scores for lower efficiency level.

Ownership concentration

Average percentage of common shares owned by the top three shareholders in the ten largest non-financial, privately-owned domestic firms in a given country (LLSV (1998))