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Mariassunta Giannetti
Stockholm School of Economics, CEPR and ECGI

Yrjö Koskinen
Boston University and CEPR

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Mariassunta Giannetti
Department of Finance and SITE
Stockholm School of Economics,
CEPR and ECGI

Yrjö Koskinen
Boston University
School of Management
and CEPR

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Abstract

Anecdotal evidence suggests that investor protection affects the demand for equity, but existing theories emphasize only the effect of investor protection on the supply of equity. We build a model showing that the demand for equity is important in explaining stock market development. If the level of investor protection is low, wealthy investors have an incentive to become controlling shareholders, because they can earn additional benefits by expropriating outside shareholders. In equilibrium, since the market price reflects the demand from both controlling and outside shareholders, the stock price of weak corporate governance stocks is not low enough to fully discount the extraction of private benefits. This generates the following empirical implications. First, stocks have lower expected return when investor protection is weak. Second, differences in stock market participation rates across countries, home equity bias and flow of foreign direct investment depend on investor protection. Finally, we uncover a good country bias in investment decisions as portfolio investors from countries with low level of investor protection hold relatively more foreign equity. We provide novel international evidence on stock market participation rates, and on holdings of domestic and foreign stocks consistent with the predictions of the model.

JEL codes: G11; G32; G38; F21; F36.

Keywords: Investor Protection; Private Benefits of Control; Stock Returns; Portfolio Choice; Home Equity Bias.

"I simply would not buy a company with poor corporate governance".

CFO, USD three billion European Private Bank

(quoted by McKinsey&Company, 2003a)

I Introduction

Extraction of private benefits of control by company insiders is a well-known distortion in corporate finance. A vast literature initiated by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997 and 1998) has established that the weaker the protection of minority shareholders is, the stronger are controlling shareholders' incentives to expropriate part of the returns as private benefits of control. Both theory and empirical evidence clearly demonstrate that the distortions caused by extraction of private benefits of control have significant effects on firms' cost of external funds and investment decisions (Shleifer and Wolfenzon, 2002). It is by now well accepted that weak investor protection limits firms' access to capital, especially to equity capital. Hence, in countries where investors are poorly protected firms issue less equity and stock markets are underdeveloped. Put differently, poor investor protection affects the supply of equity negatively.

Researchers have focused less attention on how investor protection affects the demand for equity, as in theoretical models investors are assumed to provide any amount of funds as long as they are appropriately compensated for the risk they bear. Practitioners, however, seem to believe that the demand for equity is affected by investor protection. In two recent surveys, McKinsey&Company (2003a and b) reports that domestic and foreign portfolio investors put corporate governance considerations at the heart of their investment decisions. Investors claim that they decrease their holdings or even avoid investing in companies or countries that are perceived to provide poor investor protection. Recent empirical studies also support this claim (Giannetti and Simonov, 2005; and Leuz, Lins and Warnock, 2005).

These findings are consistent with the recent and growing empirical evidence showing that weaker investor protection is associated with lower stock returns (Gompers, Metrick and Ishii, 2003; Core, Guay and Rusticus, 2005; Cremers and Nair, 2004; and Yermack, 2005). From a theoretical point of view, however, it is a puzzle why the distortions related to weak corporate governance are not fully incorporated in stock prices –thus equalizing stock returns.

This paper develops a simple equilibrium model showing that investor protection has an impact on stock market development also through the demand for equity. We provide a joint rationale for the lower expected returns of weak corporate governance stocks and investors' portfolio decisions. In our model, investor protection affects how a firm's cash flows are divided between security benefits, which accrue to all shareholders pro-rata, and private benefits, which only the controlling shareholders have access to. This division in turn affects the prices that different classes of investors are willing to pay for their stocks. If some investors can gain access to both private and security benefits, then those investors are willing to pay more for a stock than investors who can only enjoy security benefits. Since the market price of stocks reflects the demand from both controlling and outside shareholders, the equilibrium stock price of weak corporate governance stocks –although lower than for strong corporate governance stocks– is not low enough to fully discount the extraction of private benefits. As a consequence, outside shareholders find that the price is too high (and hence the expected return is too low) and reduce their demand.

In this context, we study how investor protection affects the equity-holdings of different classes of investors, depending on the amount of wealth they have been endowed with. Using a simple two-country equilibrium model, we generate several interesting empirical implications. First, in countries with low levels of investor protection, where private benefits of control are larger, wealthy investors find it optimal to forgo diversification benefits in order to acquire control. The extraction of control benefits diminishes the security benefits available to all outside investors. In equilibrium, the security return –in other words, the expected return of holding stocks for outside investors– is lower than it would be in the absence of expropriation of private benefits of control because wealthy investors have bid up the prices in their quest for control benefits.

Second, lower security returns reduce the incentives to invest in stocks for those shareholders who are not wealthy enough to acquire large equity stakes and to participate in the extraction of private benefits of control. Weak investor protection reduces the incentives to participate in the domestic stock market for both domestic and foreign outside investors. Hence, our model implies that the large cross-country differences in investor participation in the domestic stock market (see Guiso, Haliassos and Jappelli, 2001 and 2003, for some recent empirical evidence) depend on investor protection. The model also highlights the similarities in the behavior of domestic and foreign portfolio investors, thus suggesting that home equity bias and limited participation puzzle are related.

Investors from a strong corporate governance country prefer to invest in their own country, leading to the *home equity bias*. In contrast, domestic non-controlling investors are interested in investing in foreign countries that offer better investor protection than their home country. To put it differently, these investors are less prone to participate in the domestic market and exhibit a *good country bias*. In the aggregate, however, we expect the home equity bias to hold in all countries, because the domestic wealthy investors have an incentive to acquire control blocks in their own country when less wealthy investors have stronger incentives to invest abroad. Large shareholders' home equity bias overwhelms the good country bias of domestic portfolio investors in aggregate data.

Third, while portfolio investors have a good country bias in selecting their equity investment, foreign controlling shareholders exhibit a *bad country bias*, meaning that they prefer to invest in weak investor protection countries. This last theoretical implication is consistent with some recent empirical evidence on the foreign investments of U.S. multinationals (Kelley and Woitke, 2005), international M&A (Rossi and Volpin, 2004) and foreign investment to emerging markets (Desai and Moel, 2004). The flows of foreign direct investments (which refers to foreign investment that, contrary to portfolio investment, involves control) to countries with weak investor protection do *not* eliminate the home equity bias, because the literature –and the statistics–on home equity bias refer only to equityholdings of portfolio investors.

Fourth, by explicitly considering the effect of initial wealth on the demand for stocks, we are also able to provide a new counterintuitive explanation why firms with more concentrated ownership structures have higher valuations. The standard explanation for higher valuations for companies with concentrated ownership is based on partial equilibrium analysis, where large ownership stakes provide managers or principal shareholders incentives to maximize shareholder value, and as a result firm cash flows and valuations are increased (see, e.g., Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990). Our explanation in a general equilibrium framework is based on increased demand from wealthy investors. In order to acquire control in domestic companies and enjoy the consumption of private benefits of control, wealthy investors may have high demand for domestic stocks. As a result, stock prices may be high. Empirically we then could observe that there is a positive correlation between ownership concentrations and company valuations, even if expected cash flows have not increased.

Fifth, we show that, if the market for corporate control is segmented across countries, in equilibrium it is not necessarily true that a country with worse investor protection has higher ownership

concentration. The initial distribution of wealth is as important as investor protection in determining ownership structure and extraction of private benefits. If wealth distribution is even and the markets for control are segmented, nobody may be wealthy enough to be able to acquire control and extract private benefits. Hence even if investor protection is low, participation in the domestic stockmarket and return on equity for portfolio investors may be high. Conversely, improvements in investor protection are not sufficient to spur equity market participation if the wealth distribution is very skewed. Changes in wealth distribution can thus explain why the relation between ownership concentration and investor protection is weaker or does not hold if long periods of time are considered as Rajan and Zingales (2003) notice.

Finally, we explore the empirical relevance of the demand for equity channel by testing the equilibrium implications of our model for investors' portfolios. We find that cross-country differences in portfolio choices are indeed related to differences in investor protection. First, fewer individuals participate in the domestic stock market in weak investor protection countries. Second, in weak investor protection countries, domestic investors' portfolio holdings of foreign relative to domestic equity are larger than in countries where minority shareholders are better protected. Moreover, they have a preference for countries providing strong protection of shareholder rights, even after controlling for variables measuring stock market development in the destination country and the supply of financial assets in the home country.

The remainder of this paper is organized as follows. Section 2 relates the paper to the literature. Section 3 presents the model and Section 4 describes the equilibrium implications. Section 5 provides some cross-country empirical evidence supporting the implications of the model. Section 6 concludes.

II Related literature

This paper is related to three main strands of literature: the law and finance literature, the home equity bias literature, and the literature on limited investor participation in stock markets. Firstly, as we noted before, this paper is related to the large and growing strand of literature initiated by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997 and 1998).¹ They show that the size and scope of capital markets are positively related and that ownership concentration is negatively related to investor protection. Moreover, they also show that companies with controlling shareholders are very common around the

¹For an overview of the approach and results, see La Porta et. al (2000).

world (La Porta, Lopez-de-Silanes and Shleifer, 1999). Typically, the literature on law and finance has emphasized how minority shareholders are protected in the corporate law. However, securities law may be as important for the functioning of financial markets. In a recent paper La Porta, Lopez-de-Silanes and Shleifer (2003) show that securities market law may be even more important than corporate law in explaining the development of financial markets.

Our paper is closest to Shleifer and Wolfenzon (2002), who show that companies have higher valuation and ownership is less concentrated in countries with better investor protection. There are, however, important differences between Shleifer and Wolfenzon (2002) and our paper: Shleifer and Wolfenzon (2002) focus on the implications of investor protection on corporate financing and investment, while we aim to analyze investors' portfolio choices. In our model, controlling shareholders emerge endogenously in equilibrium, while less wealthy investors may opt out of the market. As a contrast, Shleifer and Wolfenzon (2002) model a going public process, where the existence of a controlling shareholder is assumed, and outside investors are risk neutral and provide funds as long as their participation constraint is satisfied. The strategy we choose is more appropriate in analyzing changes in ownership structure for companies that are already listed in a stock market.

Secondly, this paper is also related to a large literature that studies, separately, home equity bias and limited participation puzzle. Home equity bias is one of the least contested empirical facts in finance (for a recent survey, see Lewis, 1999). Under standard assumptions from portfolio theory and absent legal restrictions, investors should hold the world portfolio. Empirically, however, this is not the case. Empirical studies document that home bias holds for very diverse countries ranging from the developed financial markets of the U.S. to small markets like the Scandinavian ones, all the way to less developed emerging markets.² There exist several other explanations for the home equity bias besides the explanation provided in this paper. Legal restrictions were an important factor when there were binding restrictions on international capital flows, but home bias has persisted even though legal restrictions on foreign ownership have disappeared. Also foreign investments may be taxed more harshly than domestic investments.³ However, as argued by Ahearne, Grier and Warnock (2004), legal restrictions and taxes are of secondary importance in explaining the home equity bias. In international finance, the most widely cited reason for home equity bias is based on asymmetric

²For example, for the U.S., Ahearne, Grier, and Warnock (2004) document that at the end of 1997, U.S. stocks comprised 48.3% of the world market portfolio, yet U.S. investors only invested 10.1% of their stock portfolios abroad.

³Black (1974) and Stulz (1981) model barriers to international investments as taxes paid on foreign holdings.

information. Domestic investors are assumed to know more about domestic stocks than foreign investors leading to increased investments in domestic equities (Brennan and Cao, 1997). This explanation can, however, be challenged. Informational advantage could be in fact the opposite in some cases: it can be argued that large foreign portfolio investors are more sophisticated and therefore better informed than small domestic investors. Consistent with this assumption Grinblatt and Keloharju (2000) show using Finnish data that foreign investors have outperformed domestic investors.

In a recent paper Dahlquist, Pinkowitz, Stulz and Williamson (2003) relate home equity bias to corporate governance, as we do. In their paper deficiencies in investor protection lead to larger shareholdings by inside owners. This then leads to diminished availability of shares to foreign investors. We view the Dahlquist, Pinkowitz, Stulz and Williamson (2003) as complementary to ours. Dahlquist, Pinkowitz, Stulz and Williamson (2003) concentrate on the supply of stocks and on the agency conflict between managers and all investors. We, on the contrary, concentrate on the demand for stocks and on the agency conflict between inside and outside investors.

Finally, this paper is related to the literature on limited stock market participation, which has also been widely studied in the asset pricing literature (see, for instance, Mankiw and Zeldes, 1991; Vissing-Jorgensen, 2002; and Brav, Constantinides and Gezcy, 2002). All papers in this literature, however, explore the implications of low degree of household participation in the stock market within a single country. Only recently, Guiso, Haliassos and Jappelli (2001 and 2003) have showed that there are significant cross-country differences in investor participation rates. The phenomenon has lacked a theoretical justification and this paper is the first one to provide an explanation for that.

III The model

There are two countries that differ in the quality of investor protection. Investor protection affects negatively the private benefits of control, which can be extracted by controlling shareholders and reduce the cash flows available to compensate portfolio investors. We model private benefits of control as a transfer from portfolio investors to controlling shareholders. Investors can become controlling investors by acquiring a large enough ownership stake in their domestic risky asset. Since we do not allow for short sales or borrowing, only investors endowed with a lot of wealth can become controlling investors and are thus able to extract private benefits of control. The incentive to become a controlling investor

depends on the level of private benefits, in other words on how well other investors' cash flow rights are protected.

For simplicity, we have only one risky asset with a random payoff in each country in addition to a riskless asset. We assume that all investors pay the same market clearing price for the risky asset in each country. Allowing only one market clearing price for the risky asset abstracts from the issue of multiple share classes and block trading. This assumption allows us to concentrate on long-run changes in ownership concentration in the secondary market for stocks⁴, and is not crucial for our analysis. Only if the price discrimination between investors with and without control were perfect, would the demand effect our model is based on lose its relevance. As long as controlling investors also trade in the open markets (which is necessarily the case when ownership concentration changes over time), the demand from such investors does not allow the price of weak corporate governance stocks to fully discount the extraction of private benefits. Controlling investors' demand thus reduces equilibrium returns, and less wealthy domestic and foreign investors' demand for equity. In what follows, we describe the model in detail.

A Timing

- At $t = 0$, domestic and foreign investors make their portfolio decisions.
- At $t = 1$, before the random payoffs are realized, investors who have acquired control rights have the opportunity to extract private benefits of control.
- At $t = 2$, payoffs net of private benefits of control are distributed to all investors.

B Investment opportunities

There are two symmetric countries, called Home and Foreign, which differ only in the level of investor protection. The following describes the Home economy. The Foreign economy is to be considered completely symmetric, unless stated otherwise. Foreign variables will be denoted with an asterisk. A risky asset with gross random payoff \tilde{X} is available in both countries. The expected payoff of the domestic risky asset is μ_X and the variance is σ_X^2 . The payoffs of the two assets are identically distributed and positively correlated. The correlation coefficient ρ is strictly less than 1. The price of the domestic

⁴Block trading outside of the market is instead used to transfer control, thus keeping ownership concentration fixed.

(foreign) risky asset is denoted by P (P^*) and is determined endogenously in equilibrium. Risky assets are available in fixed supply, which we normalize to be 1, and are owned initially by the domestic investors of the two countries. Investors have also access to a risk-free storage technology, identical in both countries, which provides zero return. We think of this as cash and deposits and will generally refer to it as the risk free asset.

C Investors

Both countries have heterogeneous investors, who differ in the amount of their initial wealth, W_0 . We assume that their wealth consists of a share w_0 of the domestic assets. Total domestic wealth is $1 + P$ in Home and $1 + P^*$ in Foreign. The initial share of wealth w_0 is distributed between 0 and \bar{w}_0 , and satisfy the condition $\int_0^{\bar{w}_0} w_0 dF(w_0) = 1$, where F (F^*) is a continuum cumulative density function describing the distribution of initial wealth at Home (in Foreign). Investors can allocate their initial wealth $W_0 \equiv w_0(1 + P)$ ($W_0^* \equiv w_0^*(1 + P^*)$ in Foreign) between the risk free asset, domestic and foreign risky assets. We assume that investors cannot borrow to invest in the stock market, nor can they sell stocks short.

In our model buying a risky asset is equivalent to participating in the stock market. Following the existing literature (see, e.g., Vissing-Jorgensen, 2002) we assume that buying a risky asset entails a fixed participation cost, denoted by c . Investors pay a separate cost for participating in the domestic and foreign markets. The cost is assumed to be equal for both markets.⁵

To derive the benchmark results of the model, we first assume that the market for control is segmented, while financial markets are perfectly integrated. Domestic investors who own a large stake in domestic companies enjoy private benefits of control in addition to the security benefits, which are shared equally by all investors. In contrast, foreign investors are not able to extract private benefits of control, and controlling shareholders who invest abroad act like ordinary portfolio investors. The main reason we make this assumption is that foreign equityholdings that have a control motive are classified as foreign direct investment and are not included in the portfolio investments in the literature on home equity bias to which we want to relate (see, e.g., Ahearne, Grier and Warnock, 2004). We extend the model in Section IV by allowing foreigners to acquire control and derive empirical implications for foreign direct investment.

We assume that to divert cash flows and enjoy private benefits of control, shareholders have to own

⁵None of the qualitative results of the model would change if we assumed the participation costs to differ across markets.

a fraction α of the shares that is larger than a threshold $\underline{\alpha}$, i.e. $\alpha \geq \underline{\alpha}$. Since we have normalized the supply of the risky assets to 1, α denotes both the fraction of shares held in a company and the quantity invested in the company. We refer to the investors who own more than $\underline{\alpha}$ as the controlling shareholders (CS) and denote their domestic and foreign shareholdings as α_{CS}^H and α_{CS}^F ($\alpha_{CS^*}^F$ and $\alpha_{CS^*}^H$ for the controlling shareholders in Foreign). The emergence of controlling shareholders will be determined endogenously.

A company may have several controlling shareholders. If a company has several controlling shareholders, all controlling shareholders collude in expropriating outside shareholders. This emerges as an equilibrium outcome because there are no conflicts of interest between different controlling shareholders, as will be clear later.⁶ We refer to investors without control as portfolio investors (PI) and denote their domestic and foreign shareholdings as: α_{PI}^H and α_{PI}^F ($\alpha_{PI^*}^F$ and $\alpha_{PI^*}^H$ for portfolio investors in the Foreign country).

We assume that the extraction of private benefits of control is a transfer to investors with control and reduces the cash flow available to all investors. We define B as the amount of cash flows controlling shareholders divert and enjoy. For simplicity, we assume that $B < X_{\min}$, where X_{\min} is the lower bound of the support for the payoffs from the risky technology. This assumption implies that even when the realized payoffs are low there is always some output that can be extracted by the controlling shareholders.⁷ The private benefits that controlling shareholders can enjoy depend on the quality of investor protection. As investor protection weakens, B increases. If there are several controlling shareholders (several investors with an ownership stake larger than $\underline{\alpha}$), they enjoy private benefits pro rata.⁸

Our assumption aims to focus on wealthy individuals' incentives to acquire control. In other words, we model the entrenchment effect of ownership concentration by assuming that the benefits from stockholdings are increasing in the ownership stake. For simplicity, we ignore the deadweight losses from the extraction of private benefits and consequently the incentive effect of ownership concentration. These

⁶The assumption that there are several controlling shareholders that collude in expropriating outside shareholders is not crucial. An alternatively arrangement would be an auction for the exclusive right to control a company. In that arrangement the wealthiest shareholder would end up being the controlling shareholder.

⁷This assumption is done for simplicity only. The qualitative results would not change if private benefits were *ex ante* uncertain, although the algebra would become more cumbersome.

⁸These assumptions can be considered a reduced form of Zwiebel (1995), who studies the strategic interaction among controlling shareholders in a partial equilibrium model and derives a theory of divisible control benefits. We abstract from strategic interactions in order to focus on the general equilibrium implications of private benefits extraction.

issues are important when one analyzes the incentive effects of varying a controlling shareholder ownership stake, like Burkart, Gromb and Panunzi (1998), but are likely to be of second order importance in the decision whether to acquire control that necessarily involves some private benefits extraction. Additionally, the empirical literature has failed to find a stable relation between ownership concentration and firm value and the opposite effects of incentive and entrenchment effects on firm value may be the reason for this empirical ambiguity (Denis and McConnell, 2003).

All investors maximize the expected utility from final period wealth, and have an utility function that is quadratic in the monetary wealth \widetilde{W} .⁹ The utility also depends positively on the private benefits of control that controlling shareholders enjoy. From the point of view of the Home investor, the expected utility can be expressed as:

$$U(\alpha^H, \alpha^F, B) = \widetilde{W} - \frac{\widetilde{W}^2}{2\gamma} + \frac{\alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) B}{\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)}, \quad (1)$$

where γ is the risk aversion parameter and $I_{\alpha^H > \underline{\alpha}}(\alpha^H)$ is an indicator function equal to 1 if $\alpha^H > \underline{\alpha}$ and equal to zero otherwise. It captures the idea that investors can enjoy private benefits of control only by becoming controlling shareholders. The denominator of the last term of the utility function captures the idea that controlling shareholders share private benefits according to their ownership stakes.

The choice variables of an investor are the portfolio shares, α^H and α^F , to be allocated to the domestic and foreign risky assets, respectively, and whether to become a controlling shareholder. Investors' expected utility depends on the expected final period wealth and its variance, which can be written as follows:

$$E(\widetilde{W}) = W_0 - \alpha^H P - \alpha^F P^* + \alpha^H (\mu_X - B) + \alpha^F (\mu_X - B^*) - I_{\alpha^H > 0}(\alpha^H) c - I_{\alpha^F > 0}(\alpha^F) c \quad (2)$$

$$Var(\widetilde{W}) = \sigma_X^2 \left((\alpha^H)^2 + (\alpha^F)^2 + 2\rho\alpha^H\alpha^F \right), \quad (3)$$

where $I_{a>0}(a)$ is an indicator function equal to 1 if $a > 0$ and equal to zero otherwise. The expressions for the Foreign investors are similar and are thus omitted.

⁹We need a quadratic utility function to have a tractable portfolio model because asset returns are non-normal under the assumption $X_{\min} > B$.

To make the problem non trivial, we assume that $\underline{\alpha}$ is larger than the amount an investor would find it optimal to invest in the absence of control benefits. A sufficient condition for this to hold is:

$$\underline{\alpha} > \max \left\{ \frac{\mu_X - B}{\gamma \sigma_X^2}, \frac{\mu_X - B^*}{\gamma \sigma_X^2} \right\}.$$

D Equilibrium

The initial wealth distributions, the quality of investor protection and the distribution of asset returns in both countries are common knowledge. Home and Foreign controlling shareholders and portfolio investors maximize their expected utility, taking other agents' choice variables and prices as given. The markets for both risky assets clear.

IV Portfolio choices and extraction of private benefits of control

A Main results

In this section, in order to derive a benchmark case, we assume that the market for control is segmented, but financial markets are otherwise perfectly integrated. Thus, only domestic investors can become controlling shareholders.

Let's define $\alpha_{optimal}^H \equiv \frac{\mu_X - B - P - \rho(\mu_X - B^* - P^*)}{\gamma \sigma_X^2 (1 - \rho^2)}$ and $\alpha_{optimal}^F \equiv \frac{(\mu_X - B^* - P^*) - \rho(\mu_X - B - P)}{\gamma \sigma_X^2 (1 - \rho^2)}$ as the optimal portfolio weights for a portfolio investor for whom the no-borrowing constraint $W_0 \geq \alpha^H P + \alpha^F P^* + 2c$ is not binding in equilibrium. Our assumptions on the parameters of the model clearly imply that $\underline{\alpha} > \max \left\{ \alpha_{optimal}^H, \alpha_{optimal}^F \right\}$. In the absence of control benefits no shareholder would find it optimal to acquire a share of the asset equal to $\underline{\alpha}$.

To solve the model we first derive the demand for risky assets of investors with different levels of initial wealth. Proposition 1 gives conditions for the existence of controlling shareholders and describes their asset holdings.

Proposition 1 *Investors with initial wealth $W_0 \geq \overline{W}(B, B^*, P, P^*)$ become controlling shareholders and demand domestic and foreign risky assets in the following amounts: $\alpha_{CS}^H \geq \underline{\alpha} > \alpha_{optimal}^H$ and $0 \leq \alpha_{CS}^F \leq \alpha_{optimal}^F$. Ownership concentration, defined as the aggregate demand for controlling stakes, $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)$, is increasing in B .*

Proof. See the Appendix. ■

The marginal payoff from investing in the domestic assets for a controlling shareholder is equal to $\mu_X - B + \frac{B}{\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)}$ instead of $\mu_X - B$ (which is the marginal payoff of portfolio investors). For controlling shareholders it is optimal to extract private benefits because $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha) \leq 1$, i.e., not all investors are controlling shareholders in equilibrium. This implies that investors who are able to acquire control have higher returns than portfolio investors from investing in the asset they control. The wealth threshold above which an investor chooses to become controlling shareholder differs across countries because potential controlling shareholders at Home and in Foreign face different investor protection, equity prices, and competition for control from other controlling shareholders (the latter is determined by the wealth distribution that we allow to differ across countries).

Controlling shareholders emerge endogenously and the emergence is determined by investor protection and the wealth distribution. In particular, very wealthy individuals have an incentive to over-invest in domestic stocks and become controlling shareholders due to the possibility of enjoying private benefits of control. The incentive is stronger where investor protection is weak, as B is larger. Security benefits in the foreign country matter for domestic ownership concentration as much as domestic investor protection. If security returns in the foreign country ($\mu_X - B^* - P^*$) increase, the opportunity cost of acquiring control at Home increases. Hence, domestic extraction of private benefits may decrease as a consequence of an improvement in investor protection abroad.

Corollary 1 *For a given wealth distribution in the domestic and foreign countries, and given prices of the risky assets, the portfolio shares of Home portfolio investors with different levels of wealth are:*

1. If $W_0 \leq \underline{W}(B, B^*, P, P^*)$, then $\alpha_{PI}^H = \alpha_{PI}^F = 0$,
2. If $\underline{W}(B, B^*, P, P^*) \leq W_0 < \overline{W}(B, B^*, P, P^*)$, then $\alpha_{PI}^H \leq \frac{\mu_X - B - P}{\gamma \sigma_X^2}$, and $\alpha_{PI}^F = 0$, if $\mu_X - B - P > \mu_X - B^* - P^*$; $\alpha_{PI}^H = 0$ and $\alpha_{PI}^F \leq \frac{\mu_X - B^* - P^*}{\gamma \sigma_X^2}$ if $\mu_X - B - P < \mu_X - B^* - P^*$,
3. If $\overline{W}(B, B^*, P, P^*) \leq W_0 < \overline{\overline{W}}(B, B^*, P, P^*)$, then $0 < \alpha_{PI}^H \leq \alpha_{PI}^H{}_{optimal}$, $0 < \alpha_{PI}^F \leq \alpha_{PI}^F{}_{optimal}$.

Proof. See the Appendix. ■

Due to the existence of participation costs and the possibility of extracting private benefits of control, individuals have different incentives to diversify their portfolios depending on the level of initial wealth. Less wealthy individuals have the weaker incentives to invest in the domestic stock market

when expected domestic security returns, $\mu_X - B - P$, are low. In particular, if the security returns are higher in Foreign than at Home (i.e., $\mu_X - B - P < \mu_X - B^* - P^*$), individuals with relatively low levels of wealth will invest only in the foreign risky asset. Contrary to investors who aspire to acquire control, portfolio investors face identical risks and returns independently from their country of residence. Foreign and domestic investors with equal initial wealth thus hold identical portfolios.

It is useful to note that for given prices an improvement in investor protection at Home has the following effects on the demand for equity: If investor protection improves in the domestic economy, it becomes more lucrative to invest in the domestic risky asset for the less wealthy investors, because domestic stocks' payoffs are higher. If corporate governance at Home becomes better than in Foreign, some individuals, who previously found it optimal to stay out of both of the risky asset markets, are now willing to pay the fixed participation cost c and invest in the domestic stock market. Improved domestic investor protection also increases the incentives to invest in the domestic risky asset compared to investing abroad. Those less wealthy investors that found it optimal to invest only in the foreign stock market may be willing to switch to the domestic market or start investing in the domestic market in addition to the foreign market. Wealthier investors, who participate in both the domestic and the foreign markets, are now willing to invest more at Home.

Until now, we have taken prices as given. Differences in investor protection of course affect the demand of investors with different wealth levels. As a consequence, prices of risky assets at Home and in Foreign are also affected. We need to consider this to determine the equilibrium ownership structure and the level of international diversification. The prices are determined from the following market clearing conditions:

$$\int_{\underline{W}}^{\overline{W}} \alpha_{PI}^H(W_o, P, P^*) dF(W_0) + \int_{\underline{W}^*}^{\overline{W}^*} \alpha_{PI^*}^H(W_o, P, P^*) dF^*(W_0) + \int_{\underline{W}}^{\infty} \alpha_{CS}^H(W_o, P, P^*) dF(W_0) + \int_{\underline{W}^*}^{\infty} \alpha_{CS^*}^H(W_o, P, P^*) dF^*(W_0) = 1 \quad (4)$$

$$\int_{\underline{W}^*}^{\overline{W}^*} \alpha_{PI^*}^F(W_o, P, P^*) dF^*(W_0) + \int_{\underline{W}}^{\overline{W}} \alpha_{PI}^F(W_o, P, P^*) dF(W_0) + \int_{\underline{W}^*}^{\infty} \alpha_{CS^*}^F(W_o, P, P^*) dF^*(W_0) + \int_{\underline{W}}^{\infty} \alpha_{CS}^F(W_o, P, P^*) dF(W_0) = 1. \quad (5)$$

It is not possible to derive prices in closed form without assuming a specific functional form for the distribution of wealth. Additionally, participation costs and the non-linear return profile for investors who may acquire control imply that the market clearing conditions are non linear in the asset prices. However, we can derive implications on the relation between equilibrium prices and the level of investor protection, and on stock market participation. We prove in the appendix that our assumptions guarantee that an equilibrium exists.

An important consequence of Proposition 1 is that the wealth distribution is important in determining which equilibrium prevails in a country.

Corollary 2 *The equilibrium level of ownership concentration and extraction of private benefits of control depends not only on the quality of investor protection, but also on the wealth distribution.*

As an illustration, let's consider a country with low level of investor protection, but even distribution of wealth and low average level of wealth. We then could have an equilibrium in which no individual is wealthy enough to acquire control rights. Equilibrium prices would be such that individuals would invest in the risky asset without being able to extract private benefits of control. Moreover, even if the quality of investor protection were very low, stock market participation would be high. The reason for this is that there would be no diversion of cash flows, and thus investors would have a higher incentive to participate in the risky asset market.

Wealth distribution – through ownership concentration – influences the equilibrium relation between equity prices and investor protection.

Proposition 2 *The relation between the price of the risky asset and quality of investor protection is non-monotonic. If in equilibrium the ownership concentration measure, $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)$, is larger than the threshold \underline{A} , P (P^*) is increasing (decreasing) in B , while for lower levels of ownership concentration P is decreasing in B .*

Proof. See the Appendix. ■

La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) provide evidence that firms are valued more in countries where minority shareholders are well protected, but only after controlling for the ownership stake of the controlling shareholder. This is exactly what Proposition 2 implies: the relationship between corporate valuations and investor protection is ambiguous without controlling for the ownership

structure, but after controlling for the amount that large shareholders hold (i.e., the demand from the controlling shareholders) valuations are positively related to investor protection.

Proposition 2 also underlines that the consideration of general equilibrium effects may be very important for the analysis of the relationship between ownership structure and firm valuation. Several influential empirical papers (see, e.g., McConnell and Servaes, 1990) have interpreted the positive correlation between company market valuation and existence of blockholders – other than the controlling shareholder – as evidence that these large shareholders limit the extraction of private benefits of control by monitoring the controlling shareholders.¹⁰ Analogously, a large equity share owned by the largest shareholder has been thought to increase market valuation because it would increase the incentives for the controlling shareholder to maximize future cash flows (Morck, Shleifer and Vishny, 1988). In our model there is no role for monitoring and the alignment effect of ownership concentration. Nonetheless, stock prices may increase in ownership concentration because of a general equilibrium effect: when wealth is concentrated, the aggregate demand for a risky asset increases if extracting private benefits of control becomes easier. The stock price increases because some investors try to acquire control using open-market transactions. This effect is similar in spirit to Zingales (1995) who shows that, because of the probability of a corporate control contest, ownership concentration has an effect on the price of voting shares without any effect on the company’s cash flows. We show that this effect may be important even when there are no control contests because in general equilibrium increased demand for stock from wealthy investors reduces the amount of stocks that is available for portfolio investors. Note that any change in the identity of controlling shareholder (i.e., block transactions that do not affect the free float) would not have any effect on prices in our model.

Changes in wealth distribution can also explain why the relation between ownership concentration and investor protection is weaker or does not hold if long periods of time are considered. Morck, Percy, Tian and Yeung (2004) report that in Canada at the beginning of the 1900’s ownership was highly concentrated and investor protection poor. By the middle of the century, however, widely held firms had become predominant, even though investor protection had *not* improved. This finding is less surprising if one takes into account that in the same period an expanding middle class capable of investing in shares emerged. Our model suggests that the demand for shares by the middle class

¹⁰In a recent paper Lins (2003) shows that non-management blockholders increase firm valuations especially in countries with weak investor protection laws. Lins (2003) interprets this finding as a evidence that blockholders limit the extraction of control benefits. The alternative interpretation would be that increased firm valuations are due to increased demand from large shareholders.

increased stock prices and this in turn made it optimal for controlling shareholders to reduce their equityholdings. Morck, Shleifer and Vishny (2004) also show that the prevalence of widely held firms in Canada has declined starting from the 1970's. This coincides with the abolition of the inheritance tax in Canada in 1972 and widening inequalities of wealth.¹¹

The implications of our model are also compatible with the experience of Italy in the same period. Aganin and Volpin (2004) report that Italian listed companies were widely held in the early part of the last century. Ownership became more concentrated only after the Great Depression, when the recession and the high level of inflation had eroded the incomes of the middle class and hence their ability to invest in stocks (Zamagni, 1990). More in general, Rajan and Zingales (2003) demonstrate that there was a great reversal in financial development in Europe, where financial markets were well developed before the World War I and deteriorated afterwards. The negative impact of the Great Depression on the middle class incomes in Europe can contribute to the explanation why this reversal happened.

The model has also other implications. Consider two countries where some shareholders acquire control and extract private benefits. First, equity returns in a country are increasing in the level of investor protection. Second, for given distribution of wealth, domestic households participation in the domestic stock market is lower in countries with poor investor protection, because the security benefits from investing in the domestic risky asset are lower. This is proved in Proposition 3 and Corollary 3.

Proposition 3 *Expected security returns at Home, $\mu_X - B - P$, are increasing in the level of investor protection. Additionally, if wealth distribution is identical in both countries, security returns are higher in the country with stronger investor protection.*

Proof. See the Appendix. ■

Proposition 3 implies that the return to equity for portfolio investors always decreases, if investor protection worsens. In other words, the price P does not decrease enough to compensate for an increase in B . The intuition is the following: As B increases the stock price does not fully decrease to reflect the lower security benefits $\mu_X - B$ —and as Proposition 2 establishes the price may even increase—because some investors increase their demand and acquire control stakes.

The following corollary follows immediately from Proposition 3.

Corollary 3 *Domestic and Foreign portfolio investors' participation in the domestic stock market de-*

¹¹For the widening inequality in wealth in Canada, see Kerstetter (2002).

creases as domestic investor protection gets weaker. Conversely, the higher is the quality of investor protection in the Foreign country, the more willing are domestic and foreign portfolio investors to invest in Foreign.

Corollary 3 also implies that portfolio investors in countries with poor investor protection are more likely to invest in foreign countries compared to portfolio investors in countries where investors are well-protected. To put it differently, they exhibit a *good country bias*. Less wealthy portfolio investors may find it optimal to overweigh or even invest only in foreign stocks and not to participate in the domestic stock market. Also note, that in our model domestic and foreign portfolio investors are identical and, for given initial wealth, have the same portfolio weights. This implies that portfolio investors from countries with weak investor protection invest abroad more than portfolio investors from countries with stronger investor protection.

Even though we identify a good country bias, our model exhibits *home equity bias* in the aggregate because wealthy investors have a stronger incentive to over-invest in domestic stocks in countries with poorer investor protection.

Interestingly, private benefits of control can help to explain why French and Poterba (1991) find that, based on the observed portfolio patterns, investors seem to expect domestic stock returns to be several hundred basis points higher than returns in other markets. This finding would be consistent with unobservable private benefits of control: Part of the expected returns would be due to expected cash flows and part to private benefits of control. To an outside observer the situation would look like that investors had biased expectations about stock returns, whereas in reality controlling shareholders would get additional returns in the form of private benefits.

The home equity bias, however, does not necessarily become less severe as investor protection improves. If investor protection is strong at Home but weak in Foreign, portfolio investors, including the domestic ones, are more willing to invest at Home. This counterbalances the fact that the very wealthy have stronger incentives to diversify internationally instead of acquiring control.¹²

Interestingly, changes in investor protection at Home affect ownership structure also in Foreign. Depending on the initial wealth distribution, this may bring convergence in ownership structures. For example, assume that investor protection improves at Home. As a consequence, some investors will want to give up the possibility of enjoying private benefits of control and will begin to diversify their portfolio

¹²The extent of home equity bias depends once again on wealth distribution.

internationally to a larger extent. If the group of such investors is large enough, the aggregate demand for foreign stocks will increase. Prices of foreign stocks will increase as a consequence and ownership concentration will decrease in Foreign just like at Home, since the opportunity cost of enjoying private benefits has increased also in Foreign.

Convergence in ownership structure, however, is not the only possible outcome of financial reform in a country. Depending on the initial wealth distribution divergence in ownership structures is possible as well. Assume that the wealth distribution before the improvement in investor protection is such that there are only a few rich controlling shareholders, whose portfolio shares are well above the threshold of $\underline{\alpha}$. After a marginal improvement in investor protection they may well decide to remain controlling shareholders and will increase their holdings of the foreign risky asset to a smaller extent than in the previous case. On the other hand, the portfolio investors, who were initially holding the foreign asset to a large extent because security benefits in the Home country were lower, will decrease their demand for foreign assets. Some of them may even stop investing in the foreign stock market. If the amount of this type of investors is sufficiently large, demand for the foreign risky asset may decrease following an improvement in investor protection at Home. Consequently, the price of the foreign risky asset will decrease and ownership concentration may increase. Therefore, divergence in ownership structures is also a possible outcome of financial reforms in one country.

The model also helps to analyze the effects of financial reforms on the welfare of different investors. Assume that the simple model was extended with one identical period and further assume that investor protection unexpectedly improves at Home in the intermediate period, before investors have made their portfolio choices (and payoffs are realized). An improvement in investor protection at Home would certainly benefit domestic and foreign portfolio investors, who would have access to higher payoffs and could diversify better their portfolios. The individuals who ex ante did not participate in the financial market and begin to do so after the financial reform also would gain for the same reasons. Interestingly, controlling shareholders would not necessarily lose. Obviously, they would be able to extract less private benefits of control in equilibrium and this would affect negatively their expected utility. However, if the distribution of wealth is such that the total demand for shares increases enough, the controlling shareholders could benefit from the capital gains on their current holdings. Hence, we expect to observe less resistance to improvements in investor protection in countries with a large middle class, able to participate in the stock market.

B Extension: Perfectly integrated market for control

So far we have assumed that the markets for the control of the risky assets are segmented. This assumption has some empirical support as foreign ownership restrictions often limit outsiders' possibility to acquire control stakes. Biases of domestic judges and politicians towards domestic stakeholders may also induce segmentation in the market for control. Finally, regulation in the domestic country may limit extraction of private benefits by controlling shareholders from strong investor protection countries.

Complete segmentation of the market for control is however a too strong assumption as we observe cross-country acquisitions and large flows of foreign direct investment, which may in principle enable extraction of private benefits in other countries. Therefore this Section modifies the analysis of the previous Section and assumes that the market for control is perfectly integrated.

Now foreign (domestic) controlling shareholders are allowed to enjoy private benefits at Home (in Foreign). Hence they might choose $\alpha_{CS}^F > \underline{\alpha}$ and $\alpha_{CS}^H > \underline{\alpha}$.

Proposition 1 and Corollary 1 easily extend to this context because the incentives to acquire control are similar for domestic and foreign investors. The only difference is that if the borrowing constraint is not binding, some very rich investors may acquire control both in Home and Foreign. The demand for the risky assets still comes from controlling shareholders and portfolio investors and the equilibrium conditions (4) and (5) are only slightly modified. Hence allowing for an integrated market for control does not affect the mechanisms driving our main results. In particular, Proposition 2 and 3 still hold. Since private benefits of control are reflected in the market price, security returns continue to be lower when corporate governance is weaker. Also, portfolio investors underweight countries with weak corporate governance like in the previous Section.

Since only the holdings of *foreign portfolio investors* are taken into account in studies documenting the home equity bias, our model can still explain the home equity bias. Note however that if the market for control is perfectly integrated there is no longer a connection between domestic wealth distribution and extraction of private benefits. If no domestic investors are wealthy enough to acquire control in weak investor protection countries, foreign wealthy investors are able to extract private benefits.

Proposition 4 describes the flow of foreign direct investment.

Proposition 4 *Assume that there is extraction of private benefits in both countries and $B > B^*$, then in equilibrium:*

1. *Ownership is more concentrated at Home;*
2. *Participation of portfolio investors is larger in Foreign;*
3. *Security returns are lower at Home than in Foreign;*
4. *If wealth distribution is identical in both countries, Home receives net inflows of foreign direct investment, while Foreign receives net inflows of portfolio investment.*

Proof. See Appendix. ■

The model with integrated market for control generates an interesting implication for the directions of portfolio flows and foreign direct investment. While portfolio investors have a good country bias in selecting their equity investment, controlling shareholders exhibit a bad country bias, meaning that *ceteris paribus* they prefer to invest in weak investor protection countries. This suggests that portfolio flows and foreign direct investment to a country may be substitutes and that the type of investment a country receives depends on investor protection. Consistently, comparing the experiences of Poland and the Czech Republic, Desai and Moel (2004) note that the Czech Republic that offers relatively less investor protection receives more foreign direct investment and less portfolio investment than stronger-investor-protection Poland. Other empirical evidence also supports this implication of the model. Kelley and Woitke (2005), for instance, show that foreign direct investments of U.S. multinationals are predominantly in countries with weak investor protection. Similarly, Rossi and Volpin (2004) find that targets are typically from countries with poorer shareholder protection than their acquirers. The contrary is true for portfolio flows. In fact, Leuz, Lins and Warnock (2005) find that the portfolio flows of U.S. investors are directed primarily to strong investor protection countries.

C Discussion of the hypotheses

The model relies on two main assumptions. First, the payoff on stock investments increases non-linearly in the equity stake for domestic investors: domestic investors who own a large enough fraction of the equity of a company gain control and can extract private benefits of control in addition to security benefits. This makes the payoff from investment for large shareholders higher than the payoff from investment for portfolio investors who can enjoy only security benefits, and explains their different behavior. There is empirical evidence supporting this assumption. Barclay and Holderness (1989) show

that in block trades the premium that the buyer is willing to pay is increasing in the percentage of the stock that is purchased, suggesting that the payoff is increasing in the size of the block as well.

Secondly, we assume that neither the supply nor the demand for stocks are perfectly elastic. This is compatible with the empirical evidence showing that demand shocks do affect stock prices (Shleifer, 1986; Gompers and Metrick, 2001; and Wurgler and Zhuravskaya, 2002). Additionally, we also need to assume that the market for portfolio investors and controlling shareholders is not completely segmented. We make the assumption that there is only one market clearing price for the stock. Hence we do not allow for price of blocks of shares to deviate from the open market price of stocks. This assumption is stronger than we actually need. It would suffice for our purposes that controlling shareholders traded both in the open market as well as in the market for controlling blocks. This is in fact what actually happens, since it is cheaper for investors with a control interest to assemble part of a block in the open market.¹³ Moreover, in our model investor protection matters because it affects ownership concentration (i.e., the amount of equity held by investors who enjoy control benefits). Any changes in ownership concentration has to necessarily pass through the market as they are equivalent to changes in the free float.

Similarly, we assume that there is only one class of shares, so that there is no separation between cash flow and voting rights and hence there are no different stock for portfolio investors and controlling shareholders. This assumption is not very restrictive, since dual shares are far from being predominant. For example, Dyck and Zingales (2003) report for the countries that allow two classes of shares that only 14 percent of companies had dual shares. Additionally, when dual class shares are used, they are often traded also by portfolio investors.

These are the only assumptions that we really need. All the other assumptions we make are not essential for the results, and are done only for simplicity. All our results would still hold with different utility functions, although the model would be less tractable. Furthermore, we could assume a different technology for the extraction of private benefits of control. Our assumption simplifies significantly our computations, without driving our results. If the optimal level of private benefits of control were a function of α_{CS}^H , the payoff from investing in domestic equity would still be higher for controlling shareholders than for the remaining domestic investors. The incentives to underdiversify portfolios

¹³For example, in the context of takeovers Betton and Eckbo (2000) show that bidders, who by definition have a control interest, are likely to trade in the open market by acquiring a toehold before launching a takeover bid. In a comprehensive sample of U.S. 1353 takeover contests Betton and Eckbo (2003) show that the initial bidder has a positive toehold in 54 percent of cases and a significant toehold comprising of more than 10 percent of shares in 36 percent of cases.

would still be present. Since there is clear empirical evidence (see Claessens, Djankov and Lang, 2002) that both the incentive and entrenchment effects of ownership are important, we think that including the entrenchment effects into the analysis of extraction of control benefits is perhaps a more realistic way of modelling the issue than considering only the incentive effects of ownership concentration, as Shleifer and Wolfenzon (2002) do.

We also assume that investors take prices as given when they make their portfolio choices. In contrast, the existing literature (see again, Shleifer and Wolfenzon, 2002) generally assumes that a controlling shareholder already exists and chooses the amount of equity to sell to outside investors internalizing the effect on the stock price. Our assumption allows us to analyze under what conditions controlling shareholders emerge in equilibrium.¹⁴ Moreover, it allows the set of shareholders who are able to extract private benefits of control to vary with the level of investor protection and the initial distribution of wealth.

The interpretation of the model can also be generalized. In the exposition, we concentrate on individual investors' direct shareholdings. The analysis would be similar, if we considered indirect shareholdings through mutual funds and mutual funds were not able to distribute private benefits of control to their investors. As a consequence, mutual funds would be rarer in countries with poor legal environment. Khorana, Servaes and Tufano (2004) provide empirical evidence consistent with this.

Finally, we have framed this model as an analysis of two countries with separate stock markets. Another interpretation would be that it deals with different risky assets in a single country. According to this interpretation all outside investors should avoid stocks where extraction of control benefits is likely because of firm-level corporate governance problems. Interestingly, using individual shareholdings in Swedish companies, Giannetti and Simonov (2005) indeed find that outside investors invest a smaller proportion of their portfolios in companies where extraction of private benefits of control is expected to be larger.

¹⁴If we had a controlling shareholder who internalizes the effect on prices when selling equity, there would be another force leading to ownership concentration, due to the fact that an increase in supply of stocks depresses prices (see Martin and Rey, 2002 on this point).

V Empirical evidence

Our model has several implications on equity returns and portfolio holdings of different categories of investors in relation to investor protection. *Ceteris paribus*, the following relations hold:

1. Equity returns are lower in weak investor protection countries (Proposition 3).
2. Ownership is more concentrated in countries with poor investor protection (Corollary 2 for a given wealth distribution and Proposition 4);
3. Foreigners hold less equity in countries with poor investor protection (Corollary 3);
4. Household participation in the domestic market is lower in countries with poor investor protection (Corollary 3);
5. In countries with low investor protection, portfolio investors hold relatively more foreign equity (Corollary 3).

The existing literature offers plenty of evidence on the first three points. The theoretical implications of our model are consistent with the recent and growing empirical evidence showing that weaker investor protection is associated with lower stock returns in the U.S. (Gompers, Ishii and Metrick, 2003; Core, Guay and Rusticus, 2005; Cremers and Nair, 2004; Yermack, 2005).¹⁵ Note that our model implies a positive relation between stock returns and investor protection only for countries with *similar* wealth distribution. In this respect, the model may be more useful in rationalizing differences in returns between portfolios of weak and strong corporate governance companies within the same country. Thus our model's implications do not necessarily contrast the results of Hail and Leuz (2004) or Daouk, Lee and Lee (2004), who show that expected returns are higher in poor corporate governance countries. Moreover, the country-level evidence is ambiguous, since Lombardo and Pagano (1999) show that countries with weak investor protection have lower stock returns.

The relation between investor protection and ownership concentration has been widely studied. La Porta et al. (1998) provide detailed empirical evidence on the negative relation between ownership concentration and investor protection and also document that countries with more inequality have

¹⁵In particular, our model can explain why differences in the probability of a takeover are priced in equilibrium, as Cremers, Nair and John (2005) show. Weak corporate governance by decreasing the probability of a takeover would increase B , thus affecting ownership concentration and prices.

higher ownership concentration, as we would expect. Although this empirical evidence is compatible with our model, there exist other explanations in the literature that help to rationalize it. Ownership concentration can be a substitute for legal protection, and can thus be optimal in countries where investors are poorly protected.

Anecdotal evidence, however, suggests that ownership concentration and lack of international diversification are related. The Financial Times (October 26, 2003) for instance reports that "as pressure mounts on the country's business oligarchs", referring to the government's attempt to improve rule of law in Russia, the controlling shareholders – oligarchs – have begun to try to dissolve their domestic equityholdings and to diversify their portfolios internationally.

There exists empirical evidence also in support of the second implication of our model. Dahlquist et al. (2003) show that the prevalence of closely held firms in countries with poor investor protection explains part of the home bias of U.S. investors, and that the world stock portfolio available to investors who are not controlling shareholders is more important than the world market portfolio in explaining the portfolio weights of U.S. investors. This is exactly what our model implies: if investors who can enjoy private benefits of control have a large demand for shares, the holdings of portfolio investors who enjoy only security benefits must be lower as a consequence. Perhaps even more important for our theory is the empirical finding that the quality of corporate governance matters directly for investment decisions. Aggarwal, Klapper and Wysocki (2005), Daouk, Lee and Ng (2004), and Leuz, Lins and Warnock (2005) show that portfolio investors hold less equity in companies and countries with weaker corporate governance and poorer security laws.

The most original implications of our theory concern the equityholdings of domestic and foreign portfolio investors. We will now turn to test whether investor protection affects the decision to participate in the domestic market and portfolio investors' foreign equityholdings.

A Participation in the domestic market

There are hardly any international comparisons of households' portfolio choices. This is mainly due to lack of data, as aggregate financial accounts do not allow to distinguish between the decision of participating in the stock market and the amount invested conditional on participation. In addition, the microeconomic data available in national households' surveys may provide heterogeneous information for different countries, because the samples do not represent equally the population and because the

surveys have been done for different purposes. Guiso, Haliassos and Jappelli (2001 and 2003) make a first attempt to compare cross-country differences in stock market participation decisions. Using the household surveys of six countries (France, Germany, Italy, Sweden, U.K., U.S.), they show that there are sizable differences in stock market participation rates across countries and that these differences do not depend on households' characteristics. Differences across countries are actually even larger if households' socioeconomic characteristics that are known to affect the participation decision are controlled for. Moreover, as our model would predict, Guiso, Haliassos and Jappelli find that the main differences in stock market participation rates between continental Europe and the U.S. are between the poor and middle-class households, who are significantly less inclined to hold stocks in Europe. Rich households have high participation rates in all countries.

In order to analyze whether the empirical evidence is compatible with the results of our model, we gather data for a larger set of countries, and then analyze whether differences in participation rates are related to differences in investor protection. Our main source of data is the 1999 Share Ownership Survey conducted by the World Federation of Exchanges, which provides data on the fraction of households who directly hold stocks in 1999 for Australia, Austria, Canada, Denmark, Finland, Hong Kong, Japan, New Zealand, Norway, Sri Lanka, the UK, and the US. The data on France, Italy, the Netherlands, and Sweden are taken from Guiso, Haliassos and Jappelli (2003), which in turn use the national household surveys. The data for Belgium, Germany, Greece, India, Singapore, Taiwan, and Turkey are from the June 2002 Factbook published by the Deutsches Aktieninstitut. Finally, the data on Switzerland, Portugal and Ireland are from national private investment reports, which are respectively: a report of the Marktforschungsinstitut Demoscope, which surveyed a representative sample of 3242 people on their shareholdings activities in 1998, the "Survey into the profile of the Portuguese private investor" from the Comissão do Mercado de Valores Mobiliários, and the report "Private share ownership in Ireland", published in 2000 by Goodbody Stockbrokers.

[INSERT TABLE 1]

These data measure domestic investors' participation in the domestic stock market. Their main drawback is that we do not have information on indirect holdings, which obviously have an important impact on the diversification of investors' portfolios. Moreover, the data refer to different years: the survey of the World Federation of Exchanges is from 1998, the data from Guiso, Haliassos and Jappelli

(2003) from 1997 or 1998, the Deutsches Aktieninstitut data from 2000, the report on Switzerland from 1998, and the reports on Portugal and Ireland from 1999. Although these caveats will have to be kept in mind, we believe that it is valuable to provide some empirical evidence on cross-country differences in household stock market participation rates. Moreover, the lack of information on indirect stockholdings should not bias our results, since Guiso, Haliassos and Jappelli (2003) find that financial intermediaries are less developed in countries where stock market participation is low. Guiso Haliassos and Jappelli (2003) even argue that the low level of intermediation may explain the low stock market participation rates.

[INSERT FIGURE 1]

Figure 1 shows that the correlation between stock market participation and the antidirector rights index, measuring investor protection, constructed by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) is positive in our sample.¹⁶ Furthermore, not only the impact of investor protection on stock market participation is positive and significant, but it also explains 48 percent of the variance in stock market participation rates across countries.¹⁷ Moreover, our model implies that wealth distribution matters. We try to control for this effect using the Gini coefficient of income.¹⁸ The coefficient of this variable is negative but not statistically significant. The coefficient of the quality of investor protection remains positive and significant, even after controlling for the income distribution.

[INSERT TABLE 2]

We examine how robust these results are to the inclusion of control variables. Investors may participate in the stock market to a greater extent in richer countries. Moreover, investors might also have more incentives to participate in the stock market the larger the stock market is. When we add GDP

¹⁶Alternatively, we could estimate the mechanism of our model by relating household participation to equity returns. However, it is difficult to obtain clean measures of expected equity returns. Therefore, we prefer to relate equityholdings to variables that proxy for the exogenous parameters of our model.

¹⁷It is worthwhile to note that the anti-director rights index we use is predetermined with respect to the participation rates we observe. In fact, La Porta et al. (1997) compute the index for the first half of the 1990's, while households' participation rates increased dramatically in the second half of the decennium (Guiso et al., 2003). Hence, it is very unlikely that in countries with high participation rates households lobbied for investor protection. Nor can the results on foreign holdings we present in the next subsection be subject to this criticism, as foreigners cannot vote to support improvements in investor protection.

¹⁸Ideally, we would like to use the Gini coefficient of wealth. However, we have not been able to find that for a large cross-section of countries.

per capita as a control variable and control for the size of the market by including the stock market capitalization, the antidirector measure remains positive and highly significant (at the 1 or 5 percent levels). Results (not reported) are also similar if we use alternative measures of investor protection such as a measure of law and order, constructed by the International Country Risk Guide, measuring a country's law and order tradition, or the index constructed by La Porta, Lopez-de-Silanes and Shleifer (2005), measuring the quality of the laws facilitating private enforcement through disclosure and liabilities rules.¹⁹

B Foreign equityholdings

Even more compelling empirical evidence is obtained from the holdings of foreign equity in countries with poor investor protection. According to our model, portfolio investors from countries with weak investor protection should have a strong incentive to invest in foreign stocks. We attempt to test this implication of our model using both macro and micro data. Aggregate data may be preferable to understand the magnitude of foreign equityholdings without sample selection biases. On the other hand, aggregate data do not allow to identify the identity of investors and may therefore include the foreign holdings of the controlling shareholders of a country.

The aggregate data we use are from the Coordinated Portfolio Survey (CPIS), undertaken by the IMF. This survey collects information on the holdings of equity, and long- and short-term securities for a wide range of countries as of December 2001. We use the measures of foreign equity assets (i.e., domestic holdings of foreign equity) and liabilities (i.e., foreign holdings of domestic equity), which include only portfolio investment.²⁰ To measure the portfolio shares of investors who enjoy only security benefits, we need to distinguish their equityholdings from those of controlling shareholders. In fact, our model implies that the good country bias emerges only for portfolio investors (and not in the aggregate). From Dahlquist et al. (2003), we get a measure of the percentage of market capitalization that is closely held. Therefore we can proxy the holdings of domestic and foreign portfolio investors using the percentage of the stock market capitalization that is not closely held. Then, we add the domestic holdings of foreign equity and subtract the foreign holdings of domestic equity to obtain an estimate of the total

¹⁹La Porta et al. (2003) find some evidence that public enforcement is important when bureaucracies are well-functioning, whereas private enforcement is always important in explaining financial development.

²⁰The measure of foreign equity we include is very unlikely to include any wealth that individuals illegally keep abroad to avoid taxes in the domestic country. Hence, our results should not depend on the fact that individuals often invest abroad to avoid taxes.

equityholdings of domestic portfolio investors. At this point, the share of foreign equity in the portfolios of domestic investors who are not controlling shareholders can be proxied as follows:

$$\widehat{\alpha}_{PI}^F = \frac{\text{Domestic Holdings of Foreign Equity}}{(1-\% \text{ Closely Held Market Cap.}) \times \text{Market Cap.} + \text{Domestic Holdings of Foreign Equity} - \text{Foreign Holdings of Domestic Equity}}.$$

Note that the main bias in our estimate of $\widehat{\alpha}_{PI}^F$ is that it also includes the foreign holdings of controlling shareholders. We must keep this in mind in the interpretation of the empirical evidence.

[INSERT FIGURE 2]

As an implication of our model we expect $\widehat{\alpha}_{PI}^F$ to be larger in countries with low level of investor protection. Figure 2 shows the mean level of foreign equity shares in countries with different levels of investor protection, as measured by the private enforcement index. The figure shows that indeed $\widehat{\alpha}_{PI}^F$ is lower in countries with high investor protection. The differences emerge also from more rigorous statistical testing: As we would expect on the basis of our model, the portfolio share of foreign equity is significantly lower in countries with high level of investor protection.

Furthermore, from the international capital asset pricing model we know that investors should hold equity in different countries in proportion to their weights in the world market portfolio. Hence, the share of investors' foreign equityholdings should be negatively related to the size of the domestic country's stock market capitalization relative to the world stock market capitalization. When we add the weight of each country's stock market in the world portfolio as a control variable, the antidirector index remains negative and significant (at the 10 percent level). Results are also similar when we use alternative measures of shareholders' rights, such as the private enforcement index.²¹

To test whether a good country bias indeed exists, we need to know in which countries domestic portfolio investors invest. To this end, we use also a micro-level dataset, compiled by Thomson Financial Securities Data (TFSD), which provides information on the equityholdings of mutual funds – both closed-end and open-end – and other institutional portfolio investors, mainly financial institutions, in

²¹For obtaining this result it is crucial to distinguish the holdings of controlling shareholders by correcting the denominator for the % Closely Held Market Cap. If we did not use this correction, we would find the opposite, as for instance Morse and Shive (2004) show. This would be consistent with our model which always implies home equity bias in the aggregate.

over 100 different countries. The dataset includes the total equity holdings of each institutional investor and the equity positions an investor holds in different countries. TFSD gathers the data directly from institutional investors worldwide or from financial market regulators. Our data is the investors' equity holdings as of December 31, 2002 or June 30, 2003, depending on the reporting frequency of an investor.²² From this dataset we can compute the portfolio shares that all investors from a given country (origin) have in another country (target). We think that this variable is more appropriate than measures of the home country bias for our purposes, because we want to study the determinants of investor behavior, similarly to Kang and Stulz (1997), rather than the extent of the home equity bias.

Note that the fact that institutional investors from different countries may be differently represented in the dataset should not be a big problem for our analysis, as we aggregate the holdings of all institutional investors in a country and study the positions of an average institutional investor. The country of origin is the country where the institutional investor is incorporated. Although more than one hundred countries are included in the sample, there are several countries for which our institutional indicators are not defined or for which we miss other control variables. This reduces the size of the sample considerably. Our final sample includes investments from 61 countries.

[INSERT TABLE 3]

Table 3 clearly shows that investors based in countries with lower investor protection invest more abroad and that they invest a larger share of their assets in better investor protection countries, as the logarithm of the portfolio share decreases in the level of investor protection in the origin country and increases in the level of investor protection of the destination country. This holds for all three investor protection indices we use. The sample size slightly varies for different specifications because our indices are not defined for all countries.

However, these results do not take into account that different countries differ in the domestic supply of financial assets. Domestic investors may be prone to invest abroad not because they chase higher security returns as our model implies but because the supply of assets at Home is too small. Also it is expected that investors invest more in countries like the U.K. or the U.S. because they represent a large part of the world market capitalization. Our preliminary findings could thus spuriously depend on the fact that we do not control for the weight of the target country in the world stock market capitalization.

²²Chan, Covrig and Ng (2005) use an earlier version of the dataset.

In columns 4-6 of Table 3, we add several control variables: the market capitalization to GDP of the origin country to control for the supply of assets at Home; the logarithm of the target country's stock market capitalization relative to the world market capitalization; the target country's weight in the world float portfolio, constructed on the free-floating shares available to all investors; the logarithm of the distance between the main financial centres of each pair of countries to control for familiarity²³; and measures of capital controls (both restrictions on foreign capital and access to foreign capital markets for domestic investors). We still find that portfolio investors from weak investor protection countries invest more abroad and that strong investor protection countries receive more foreign investment. Moreover, consistently with our model and the results of Dahlquist et al. (2003), foreign investors hold more stocks in countries with dispersed ownership.

The results are not only statistically, but also economically significant. In Column 4 of Table 3, if the index of private enforcement in the origin country increases by one standard deviation, the logarithm of the portfolio shares invested in foreign countries decreases by almost 10 percent. If then index of private enforcement increases in the target country by one standard deviation, the logarithm of the portfolio share invested increases by 5 percent. The ability to privately enforce one's own rights is revealed to be more important than laws on the books for foreign investment. This is not surprising as it may be more difficult for foreigners to enforce law on the book and more costly to win in a court if they have the burden of proof. This interpretation is also compatible with the fact that the index of public enforcement constructed by La Porta et al. (2003) does not seem to have any effect on foreigners' stock market participation (results not reported).

Alternative explanations have a hard time in reconciling these empirical findings. Guiso, Haliassos and Jappelli (2003), for instance, argue that differences in stock market participation rates across countries may depend on differences in participation costs. It may well be that participation costs are higher in countries with poor investor protection. However, a difference in participation costs cannot explain why in countries with low level of investor protection domestic investors hold more foreign equity than in countries with high investor protection, without making an assumption that in countries where investors rights are well protected, the fixed costs associated to buying foreign equity are higher than in countries with lower investor protection. Our explanation based on the relative payoff from domestic and foreign investments allows a more coherent explanation of these different aspects of portfolio choices.

²³These data are calculated as in Gande and Parsley (2003). We thank David Parsley for providing us with the data.

VI Conclusions

To our knowledge, this is the first paper analyzing the effect of investor protection on the demand for equity. We show that the explicit consideration of the demand for equity is important for understanding why investor protection affects positively stock returns. Stock prices reflect the demand for equity of controlling shareholders and portfolio investors alike. Wealthy individuals are relatively more willing to acquire control when investor protection is weaker. Stock prices are thus too high with respect to the cash flows distributed to all shareholders.

The demand effect, which drives up stock prices in our model, suggests a rationale why companies want to issue voting and non-voting shares. Investors buy non-voting shares exclusively for portfolio reasons. Hence, their price reflects only future cash flows after the extraction of private benefits, and not the demand from investors who wish to acquire control. Consequently, having non-voting shares may make it easier to attract portfolio investors, for whom the mere security return of voting shares would be too low.

Lower expected returns for portfolio investors lead to lower stock market participation rates in the domestic market. Empirically, we indeed find that differences in investor protection can explain differences in households participation rates across countries.

A novel implication of our model is that portfolio investors have a greater incentive to invest in countries which offer better investor protection. We call this the good country bias. Compatibly with this implication of the model, we find that portfolio investors based in weak investor protection countries are more inclined to invest abroad and that they hold equity especially in strong investor protection countries. Nonetheless, deficiencies in investor protection lead to the more familiar home equity bias in the aggregate. All foreign portfolio investors have an incentive to avoid investing in a country where expropriating minority shareholders is easy, while wealthy investors have an incentive to become controlling investors by investing a large proportion of their wealth in the stock market of a country with poor investor protection.

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A Appendix

A Proof of Proposition 1

Define V as the indirect utility function of an investor. An investor acquires control if and only if $E(V|control) > E(V|portfolio)$. For some investors with low initial wealth the no-borrowing constraint ($\alpha^F P^* + \alpha^H P + 2c \leq W_0$) is not satisfied if $\alpha^H = \underline{\alpha}$. Hence they cannot become controlling shareholders. For wealthier investors, we solve the portfolio maximization of a controlling shareholder under the budget constraint and the constraint that investors cannot borrow to invest in the risky assets. We define $\lambda \geq 0$ the multiplier associated to the no-borrowing constraint. Note that $\lambda = \frac{dE(V|control)}{dW_0}$, and for the concavity of the utility function it is weakly decreasing in the initial wealth. It emerges that investors compare the marginal loss in terms of diversification from holding a controlling stake:

$$\begin{aligned}
 & -(\mu_X - B - P) + \lambda + \gamma(\alpha^H \sigma_X^2) + \\
 + \gamma & \left(+\rho\sigma_X^2 \min \left\{ \frac{(\mu_X - B^* - P^*) - \rho(\mu_X - B + \frac{B}{\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)} - P)}{\gamma\sigma_X^2(1 - \rho^2)}, \frac{W_0 - \alpha^H P - 2c}{P^*}, 0 \right\} \right)
 \end{aligned}$$

with the marginal benefit

$$\frac{B}{\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)}.$$

If at the equilibrium prices the marginal benefit is too small for compensating for this loss, no investor becomes controlling shareholder independently from the initial wealth. If instead the marginal benefit is large enough and the no-borrowing constraint does not bind, the investor buys a controlling stake α_{CS}^H to equate marginal loss and marginal benefit. If the borrowing constraint binds before the marginal benefit and the marginal loss are equalized, all wealth is invested in risky assets.

This implies that only investors with wealth above a certain threshold \overline{W} will acquire control. Additionally the utility from having control depends positively on B , negatively on ownership concentration $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)$ (because controlling shareholders are assumed to share private benefits pro-

rata), and negatively on $\mu_X - B^* - P^*$. Hence the wealth threshold above which an individual finds it optimal to become controlling shareholder depends on domestic and foreign prices and on private benefits at Home and in Foreign as stated in Proposition 1.

The conclusion that ownership concentration is increasing in B follows from the fact that for given prices and $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha)$, the benefit of becoming controlling shareholder is clearly increasing in B .

B Proof of Corollary 1

Since we assume that investors cannot borrow to invest in the risky assets, the constraint $\alpha^F P^* + \alpha^H P + 2c \leq W_0$ is binding for individuals with low levels of the initial wealth. As proved in Proposition 1, individuals with wealth lower than $\overline{W}(B, B^*, P, P^*)$ do not find it optimal (or are unable) to acquire control. In this case, the optimal portfolio allocation is obtained solving the constrained optimization problem and comparing the expected utility that can be achieved investing only in the risk free asset, in the risk free asset and the domestic stocks, in the risk free asset and the foreign stocks, and the risk free asset and domestic and foreign stocks. Some tedious algebra shows that the optimal portfolio shares α_{PI}^H and α_{PI}^F are weakly increasing in W_0 . This implies that for low levels of the initial wealth the payoff from investing in risky assets may be very low. Therefore, it is always possible to find a lower bound for the initial wealth $\underline{W}(\lambda, \lambda^*, P, P^*)$ such that it is optimal to choose $\alpha_{PI}^H = \alpha_{PI}^F = 0$ to save the fixed participation cost c . Individuals with initial wealth larger than $\underline{W}(\lambda, \lambda^*, P, P^*)$ find it optimal to invest in the domestic or foreign equity market depending on which one offer higher security benefits, and spend c (but not $2c$). This is the case for individuals who due to the wealth constraint cannot invest a large amount of wealth in the risky assets and therefore have initial wealth lower than the upper bound $\underline{W}(\lambda, \lambda^*, P, P^*)$. Individuals with initial wealth larger than $\underline{W}(\lambda, \lambda^*, P, P^*)$ invest in both risky assets and may eventually reach the optimal level of diversification of their portfolios. However, it is possible to find another lower bound on the level of the initial wealth $\overline{W}(\lambda, \lambda^*, P, P^*)$, such that individuals with initial wealth larger than $\overline{W}(\lambda, \lambda^*, P, P^*)$ maximize utility by forgoing the diversification benefits in favor of the extraction of private benefits of control, as proved in Proposition 1.

C Proof of the existence of the equilibrium

In our economy, individual demands have several discontinuities because of the fixed participation costs and the discontinuity in payoffs due to the possibility of becoming controlling shareholders. We assume however that the distribution of wealth is continuous and that there exist a continuum of investors in both countries. This ensures that at any P and P^* a vanishingly small proportion of investors may display a discontinuity (cfr Mas-Colell, Whinston and Green, 1995, p.122-123 and p. 629). Formally, the aggregate demands in (4) and (5) are equal to the sum of products of continuous functions. Hence the aggregate demands for assets –which are the average demand of a continuum of investors– are continuous. It is straightforward to show that our aggregate excess demands –defined as the aggregate demand minus the initial endowment– goes to ∞ if any of the prices go to zero and they are bounded below at -1 . Hence a Walrasian equilibrium exists (cfr. Mas-Colell, Whinston and Green, 1995, p. 585).

D Proof of proposition 2

As proved in Proposition 1, for given prices, the demand of investors with control is increasing in B . More individuals find it optimal to acquire control if B increases. The contrary is true for the demand of domestic and foreign investors without control.

The aggregate demand for the domestic risky asset is a weighted sum of the demand of investors with and without control. As B increases, the aggregate demand increases if the positive effect on the demand of investors who have control (or find it optimal to acquire control after the increase in B) prevails. It is always possible to find \underline{A} for which the positive demand effects prevails.

If the initial level of investor protection and the distribution of wealth at Home and in Foreign are such that $\int \alpha_{CS}^H I_{\alpha^H > \underline{\alpha}}(\alpha^H) dF(\alpha) > \underline{A}$, a decrease in investor protection increases the aggregate demand for the domestic risky asset. In this case, an increase in B requires an increase in P to bring the aggregate excess demand to zero in the market for the domestic risky asset. The price of the foreign risky asset may decrease as a consequence because for the same reasons an increase in B may provoke a decrease in the aggregate excess demand of the foreign risky asset.

E Proof of Proposition 3

From Proposition 2 we know that the relation between domestic asset prices and quality of law is non-monotonic. This implies that stock prices may either increase or decrease when investor protection becomes weaker. Assume first that P increases as investor protection becomes weaker. In this case, the expected security return from investment, $\mu_X - B - P$, decreases unequivocally. Therefore, the wealth of the marginal investor who is indifferent between buying domestic stocks or not increases. This effect is reinforced by the change in the price of foreign stocks, P^* . Since the security benefits decrease at Home and increase in Foreign, fewer domestic portfolio investors will participate in the domestic market and more of them will buy foreign stocks. Consider now the case in which P decreases as investor protection gets weaker. By contradiction, assume that $\mu_X - B - P$ increases and therefore portfolio investor participation increases. This implies that demand for the domestic risky asset by portfolio investors increases. Since when investor protection gets weaker, the demand for stocks from controlling investors increases and more individuals wish to become controlling investors, this would imply that all investors increase their demand for domestic stocks. In equilibrium, the price for domestic stocks would therefore increase. Since this is a contradiction, we can conclude that investor participation in the domestic market decreases and $\mu_X - B - P$ decreases as well. As before, P actually decreases only if the fraction of initial wealth invested in the domestic market decreases. Hence, the fraction of initial wealth invested in the foreign market must increase and P^* increases because of the increased participation in the foreign market.

The second part of the Proposition derives from the fact that for given wealth distribution demand from controlling shareholder is lower in the strong investor protection country for any price level. In equilibrium, either the risky asset price is lower in the strong investor protection country making security benefits clearly higher there or the risky asset price is higher. If the risky asset price is higher, then the demand for the risky asset from portfolio investors must be larger in the strong investor protection country (because the demand from controlling shareholders is lower). But this can be true in equilibrium only if security returns are higher in the strong investor protection country.

F Proof of Proposition 4

The marginal loss from underdiversification for acquiring control is identical to the one in the previous section. The marginal benefit from acquiring control are also equally defined. Now however investors

can acquire control in both countries or choose between the two. We thus have to consider the marginal loss and the marginal benefit from acquiring control at Home and in Foreign. We solve the constrained optimization problem like in Proposition 1 but allow for the possibility that $\alpha_{CS}^H > \underline{\alpha}$ and $\alpha_{CS}^F > \underline{\alpha}$. From the solution it emerges that investors with initial wealth above $\overline{W}_2(B, B^*, P, P^*)$ are able to acquire control in both countries. They choose the control stake equating the marginal loss from acquiring a control stake to the marginal benefit like in the proof of Proposition 1. For some investors either $\underline{\alpha}(P + P^*) < W_0$ or the marginal loss from acquiring two control stakes is larger than the marginal benefits. Investors with wealth $\underline{W}_2(B, B^*, P, P^*) < W_0 < \underline{W}_1(B, B^*, P, P^*)$ acquire control of one asset only. They choose whether to acquire control of the domestic or the foreign asset by comparing the utility in the two cases. They thus acquire control at Home if B is relatively larger, aggregate demand for control smaller and prices lower than in Foreign.

By contradiction, assume that demand for equity from controlling shareholders is larger in Foreign than in Home. Under our assumptions this may only be optimal if $P^* < P$ because the lower price must compensate for lower private benefits of control. If this were true also the demand for equity from portfolio investors should be higher in Foreign as security benefits would definitively be larger. However, this would imply that the aggregate demand for the foreign risky asset is larger than the aggregate demand for the domestic risky asset making $P^* < P$ a contradiction. Hence, in equilibrium, the aggregate demand from controlling shareholders must be larger at Home for any price level. Similarly since $B > B^*$ in equilibrium the demand from portfolio investors is larger in Foreign than at Home and $\mu_X - B - P < \mu_X - B^* - P^*$.

Table 1

This table presents the data used in Figures 1 and 2. Investor stock market participation rates are from 1999 Share Ownership Survey by the World Federation of Exchanges, Guiso et al. (2003), June 2002 Factbook published by the Deutsches Aktieninstitut, Marktforschungsinstitut Demoscope, Comissão do Mercado de Valores Mobiliários, and Goodbody Stockbrokers. The estimate for foreign equity holdings by domestic investors relative to their stock market wealth uses data for foreign equity assets and liabilities from IMF and it is from year 2002. Antidirector rights index is from La Porta et al. (1998). Private enforcement index is from La Porta et al. (2003). Stock market capitalizations are from World Federation of Exchanges as of December 31, 2002. Percentages for closely held stocks are from Dahlquist et al. (2003).

| Country | Stock Market Participation Rates | Foreign Equity Holdings by Domestic Investors | Antidirector Rights Index | Private Enforcement Index | Stock Market Capitalization in billion \$ | % Market Capitalization Closely Held |
|--------------|----------------------------------|---|---------------------------|---------------------------|---|--------------------------------------|
| Argentina | | 0.464 | | 0.33 | 16.549 | 52.68 |
| Australia | 0.404 | 0.198 | 4 | 0.75 | 380.087 | 24.85 |
| Austria | 0.056 | 0.666 | 2 | 0.17 | 33.578 | 54.85 |
| Belgium | 0.05 | 0.635 | 0 | 0.21 | 115.224 | 47.14 |
| Brazil | | 0.054 | | 0.25 | 126.762 | 67.13 |
| Canada | 0.25 | 0.380 | 5 | 0.96 | 570.223 | 48.82 |
| Chile | | 0.206 | | 0.33 | 49.828 | 64.94 |
| Denmark | 0.28 | 0.373 | 2 | 0.25 | 76.750 | 25.1 |
| Egypt | | 0.028 | | 0.25 | 26.330 | 40.55 |
| Finland | 0.187 | 0.178 | 3 | 0.46 | 138.833 | 23.49 |
| France | 0.15 | 0.278 | 3 | 0.67 | 825.070 | 37.98 |
| Germany | 0.089 | 0.466 | 1 | 0.25 | 686.014 | 44.74 |
| Greece | 0.102 | 0.089 | 2 | 0.58 | 66.040 | 75.18 |
| Hong Kong | 0.138 | 0.265 | 5 | 0.88 | 463.055 | 42.73 |
| India | 0.033 | | 5 | | | |
| Indonesia | | 0.005 | | 0.63 | 55.739 | 68.97 |
| Ireland | 0.17 | 0.742 | 4 | 0.46 | 59.938 | 13.06 |
| Italy | 0.07 | 0.454 | 1 | 0.46 | 477.075 | 37.54 |
| Israel | | 0.093 | | 0.79 | 40.774 | 58.01 |
| Japan | 0.297 | 0.140 | 4 | 0.71 | 2095.516 | 38.38 |
| Korea | | 0.014 | | 0.71 | 246.911 | 39.23 |
| Malaysia | | 0.028 | | 0.83 | 122.892 | 52.15 |
| Netherlands | 0.14 | 0.469 | 2 | 0.46 | 395.560 | 37.74 |
| New Zealand | 0.31 | 0.655 | 4 | 0.38 | 21.715 | 77.48 |
| Norway | 0.21 | 0.580 | 4 | 0.42 | 68.103 | 41.07 |
| Philippines | | 0.013 | | 0.63 | 18.183 | 51.13 |
| Portugal | 0.145 | 0.237 | 3 | 0.63 | 41.931 | 35.04 |
| Singapore | 0.083 | 0.415 | 4 | 0.88 | 101.554 | 57.1 |
| Sri Lanka | 0.023 | | 3 | | | |
| Spain | | 0.142 | | 0.63 | 461.560 | 42.12 |
| South Africa | | 0.384 | | 0.75 | 116.544 | 52.86 |
| Sweden | 0.22 | 0.395 | 3 | 0.42 | 179.117 | 20.99 |
| Switzerland | 0.176 | 0.349 | 2 | 0.50 | 547.020 | 25.73 |
| Taiwan | 0.125 | | 3 | 0.79 | | |
| Thailand | | 0.004 | | 0.71 | 45.406 | 57.83 |
| Turkey | 0.012 | 0.004 | 2 | 0.46 | 34.217 | 70.86 |
| UK | 0.3 | 0.249 | 5 | 0.79 | 1800.658 | 9.93 |
| US | 0.26 | 0.113 | 5 | 1.00 | 11055.578 | 7.94 |
| Venezuela | | 0.007 | | 0.17 | 3.980 | 61.53 |

Table 2

This table presents investor stock market participation rates. The dependent variable is the percentage of households that directly participate in the stock market. Investor stock market participation rates are from 1999 Share Ownership Survey by the World Federation of Exchanges, Guiso et al. (2003), June 2002 Factbook published by the Deutsches Aktieninstitut, Marktforschungsinstitut Demoscope, Comissão do Mercado de Valores Mobiliários, and Goodbody Stockbrokers. The Gini coefficient of income is from Deininger and Squire (1996). Shareholder rights are measured by the antidirector rights index from La Porta et al. (1998). Stock market capitalizations are from World Federation of Exchanges as of December 31, 2002. GDP per capita is from IMF. T-statistics are in parentheses. ***, **, * denote that a coefficient is significant at the 1%, 5%, and 10% levels, respectively.

| Explanatory variable | (1) | (2) | (3) | (4) |
|------------------------|------------------|------------------|------------------|-------------------|
| Shareholder rights | 0.04** (2.66) | 0.04** (2.57) | 0.03** (2.12) | 0.04*** (3.71) |
| Gini income | | -0.00 (-0.30) | -0.00 (-0.44) | |
| Market capitalization | | | 0.03 (0.47) | |
| Log. GDP per capita | | | | 0.10*** (4.58) |
| Number of observations | 26 | 26 | 26 | 26 |
| R-squared | 0.23 | 0.23 | 0.24 | 0.59 |

Table 3

This table presents institutional investors' holdings of foreign equity. The dependent variable is the logarithm of 0.001 plus the (aggregate) proportion of equity relative to total holdings of equity that institutional investors incorporated in the origin country invest in the target country as of December 31, 2002 or June 30, 2003. Private enforcement index is from La Porta et al. (2003). Shareholder rights index (measured by the antidirector index) is from La Porta et al. (1998). Law and order is an indicator of law and order tradition, constructed by the International Country Risk Guide. Market capitalization weight is the logarithm of the target country's stock market capitalization divided by the world stock market capitalization as of December 31, 2002 using data from World Federation of Exchanges. Free float market capitalization weight is the logarithm of the free-float of the target country relative to free-float world stock market capitalization as of December 31, 2002 using the proportion of closely held shares as in Dahlquist et al. (2003). Market capitalization relative to GDP is the stock market capitalization divided by the GDP in the origin countries. Logarithm of distance measures the distance between the domicile of the main stock exchange in the origin country and the domicile of the main stock exchange in the target country. Foreign capital restrictions and access to foreign capital markets are from World Economic Forum, 2003. T-statistics are in parentheses. ***, **, * denote that a coefficient is significant at the 1%, 5%, and 10% levels, respectively. The standard errors have been computed using the Huber-White estimator of the variance, which produces consistent standard errors even in presence of heteroskedasticity. Observations have been clustered by country of origin.

| Explanatory variable | (1) | (2) | (3) | (4) | (5) | (6) |
|-------------------------------------|---------------------|--------------------|--------------------|----------------------|----------------------|---------------------|
| Private enforcement - target | 3.68*** (9.56) | | | 0.41* (1.88) | 1.99*** (6.84) | 0.29*** (3.79) |
| Private enforcement – origin | -1.31*** (-3.54) | | | -1.06*** (-5.05) | -0.67** (-2.37) | -0.14* (-1.86) |
| Shareholder rights – target | | 0.17*** (2.63) | | | | |
| Shareholder rights – origin | | -0.13** (-2.34) | | | | |
| Law and order– target | | | 1.09*** (19.73) | | | |
| Law and order– origin | | | -0.161* (-1.88) | | | |
| Market cap. weight – target | | | | 1.18*** (29.05) | | 0.21*** (14.03) |
| Free-float mkt. cap weight – target | | | | | 33.28*** (18.89) | |
| Mkt. cap relative to GDP - origin | | | | 0.77*** (9.22) | 0.63*** (5.54) | 0.02 (0.76) |
| Log. distance | | | | -0.72*** (-15.87) | -1.03*** (-17.06) | -0.10*** (-5.09) |
| Foreign capital restr. - target | | | | | | -0.01** (-2.02) |
| Access to foreign markets – origin | | | | | | 0.08*** (4.68) |
| Number of observations | 985 | 1173 | 1063 | 964 | 964 | 934 |
| R-squared | 0.10 | 0.01 | 0.14 | 0.67 | 0.45 | 0.39 |

Figure 1
Antidirector Rights vs. Investor Participation

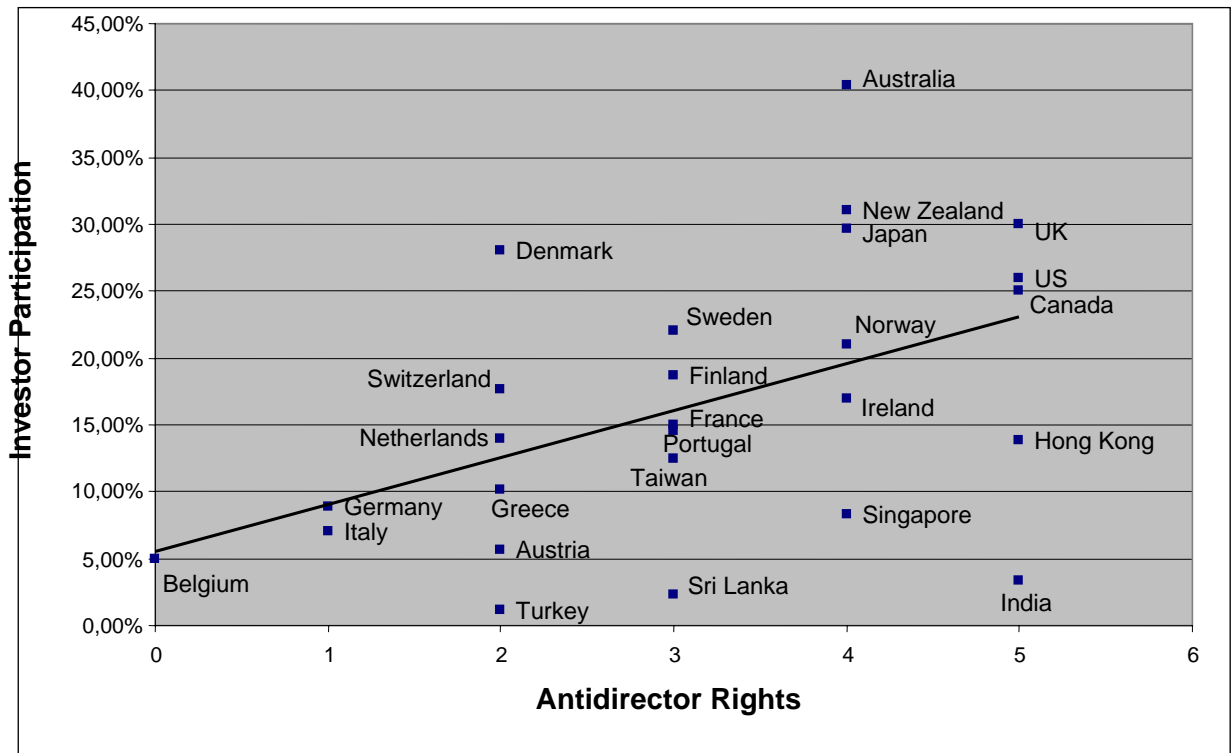


Figure 2
Foreign Equity Holdings and the Private Enforcement Index

