Why does Investor Protection Matter for the Cost of Equity?

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Abstract

The corporate governance literature has provided empirical evidence that regulations and institutions that protect minority investors affect the cost of equity even in well integrated markets. I provide a new theory, which argues that investor protection is priced even in fully integrated markets because it affects redistribution of wealth from minority investors to other agents in the economy. Such redistribution shifts systematic risk to minority investors, which can not be shared by international trade or portfolio diversification. The effect of redistribution on the cost of equity is multiplied by the GDP and standard deviation of GDP growth. Empirical tests show that the effect of investor protection on the cost of equity is economically significant even across well integrated countries. For example, securities laws that improve disclosure requirements decrease the cost of equity by about 2%.

Keywords: Investor protection, cost of equity.

JEL Classification: G15, G18, G38

1 Introduction

The corporate governance literature has provided evidence that country specific factors such as the protection of minority investors and uninformed investors affect the cost of equity (Bhattacharya and Daouk, 2002; Hail and Leuz, 2006; Garmaise and Liu, 2004; Daouk, Lee, and Ng, 2004). However, according to the standard asset pricing theory, there is no reason for investor protection to affect the cost of equity. If investors are not protected from expropriation they will pay less for common stocks, which may cause cross-country differences in valuations but not in the cost of equity.

In order to be priced, country-specific investor protection has to be a risk factor, which cannot be eliminated by risk sharing through trade or by portfolio diversification. The segmented markets theory, which rules out diversification, has been proposed as one explanation for why investor protection is priced. However, the segmented markets theory does not fully explain the empirical evidence. For example, higher covariance of stocks with the world market portfolio in countries with weaker investor protection cannot be explained by the segmented markets theory. Moreover, the segmented markets theory does not explain why investor protection is different from any other country specific risk factor (see some of the other potential factors in Erb, Harvey, and Viskanta (1996)). This introduces an identification problem because it is impossible to control for all country factors given that there are limited number of countries and large number of factors.

It is very important for policy makers to understand whether investor protection affects the cost of equity even in integrated markets. The segmented markets theory suggests that as markets become more integrated, the effect of minority investor protection on the cost of equity should disappear. Therefore, regulators do not have to improve investor protection if markets become more integrated over time. However, if investor protection is priced even in integrated markets, policy implications are very different; regulators have to improve investor protection to decrease the cost of equity even if their markets are well integrated.

I provide a new theory to explain why the effect of investor protection on the cost of equity cannot be fully diversified even in integrated markets and why investor protection is different from other country specific factors that could affect the cost of equity. The theory not only justifies the previous empirical findings but also provides a new prediction; the effect of minority investor protection on the cost of equity is multiplied by GDP and the standard deviation of GDP growth. My empirical results show that the effect of investor protection on the cost of equity becomes stronger after controlling for the effect of GDP and the standard deviation of GDP growth.

I argue that investor protection affects the redistribution of wealth from minority investors to other parties in the economy. I use the term redistribution rather than expropriation to cover a wide range of wealth transfer activities, including taxes and insider trading, in addition to expropriation by managers, controlling shareholders and governments.

Redistribution risk is priced even in integrated markets because redistribution shifts systematic risk to minority investors. The effect of redistribution on the systematic risk of minority investors is very similar to that of leverage. Redistribution shifts systematic risk because minority investors receive residual cash flows after redistribution. Therefore, as the level of redistribution increases the systematic risk of minority shareholders increases. Better investor protection decreases the systematic risk because it decreases the level of redistribution[1].

Unlike other country specific factors that directly affect output, redistribution risk cannot be shared through trade in goods, which makes it possible to identify the effect of redistribution risk on the cost of equity. In an integrated exchange economy, output shocks are cushioned by an opposite shock to the relative prices of goods. This mechanism prevents output shocks from causing cross sectional variation in the cost of equity (Cole and Obstfeld, 1991). My contribution to the international trade literature is to show that pure redistribution, which is the net redistributed amount after social waste, only changes the allocation of goods but does not change the total amount of goods available for consumption. Therefore, prices of goods remain the same, and redistribution shocks to minority investors cannot be cushioned by changes in the prices of goods.

Consider the stock price of an oil company. If the production of oil decreases, oil price with respect to the price of other goods increases. Therefore, the effect of a negative output shock on the stock price of the oil company is cushioned by an increase in the price of oil. On the other hand, if some amount of oil is stolen by managers, the market price of oil does not change because the total amount of oil available for consumption remains the same. In this case, investors are worse off because they receive less oil without the cushioning effect of change in prices.

The redistribution theory provides a testable estimation equation for the relationship between redistribution and the cost of equity. Stocks located in countries with higher

[1]These results hold under reasonable assumptions: Investor protection increases the marginal cost of redistribution (Shleifer and Wolfenzon, 2002; LaPorta, Lopez de Silanes, Shleifer, and Vishny, 2002) and the marginal benefit of redistribution slightly increases, does not change or decreases (Johnson, Boone, Breach, and Friedman, 2000) with the economic shocks. Empirical evidence provided by the literature is sufficient to justify these assumptions.

redistribution have higher systematic risk, hence higher expected returns. The novel prediction is that the effect of redistribution on the cost of equity is multiplied by the size of GDP and by the standard deviation of GDP growth. It is more difficult to diversify the redistribution risk of firms located in larger and more volatile countries because these countries constitute a larger fraction of the change in world wealth.

In segmented markets, predictions of the redistribution theory and segmented markets theory cannot be differentiated. Redistribution also increases the covariance of stocks with their country portfolio. However, redistribution theory uniquely predicts that investor protection should affect covariance of stocks with the world portfolio. Therefore, I differentiate my argument from the segmented markets hypothesis by focusing on the effect of redistribution risk on the covariance of assets with the world portfolio.

Though the redistribution theory does not clearly identify factors that are important in protecting minority investors, several legal and extra-legal factors are suggested to be important for investor protection. In order to prevent variable selection bias, I exogenously select variables from two recent related papers (Dyck and Zingales, 2004; LaPorta, Lopez-De-Silanes, and Shleifer, 2006) to proxy for investor protection. These variables are: "disclosure requirements", "liability standards", "public enforcement", "anti-director rights", "efficiency of the judiciary", "tax compliance", "competition laws" and "newspaper circulation/population".

Most investor protection proxies are significant in explaining cross country differences in systematic risk in the predicted direction. The results are robust to other measures of the cost of equity, endogeneity tests, country or firm level tests and various samples. Multivariate analysis and robustness tests show that the disclosure requirements index is more important than other factors. I also find that both disclosure about related party transactions and controlling shareholders are more important than disclosure about managers.

The impact of redistribution (investor protection) on the cost of equity is also economically significant. For example, improving the disclosure requirements of the stock exchange of a country from the lowest quintile to the highest quintile decreases the cost of equity by about 2%.

The predictions of the redistribution theory are also in line with several seemingly unrelated findings in the international finance literature. Because the effect of redistribution on systematic risk cannot be completely diversified, countries cannot fully benefit from financial market liberalizations (Stulz, 1999) and the risk sharing effect of financial liberalization is even less beneficial for developing countries (Bekaert, Harvey, and Lundblad, 2006) given that these countries have higher redistribution problems. Contrary to Cole and Obstfeld (1991), in perfectly integrated trade markets, portfolio diversification is not redundant because redistribution risk cannot be shared through trade in goods. Therefore, the home bias puzzle cannot be fully explained by risk sharing through trade. Redistribution affects expected return of controlling and minority shares in opposite directions, which can help explain control premia (Nenova, 2003; Dyck and Zingales, 2004).

There are other theories proposed by Stulz (2005) and Garmaise and Liu (2004) to explain why factors like ownership concentration and corruption may affect the cost of equity. Garmaise and Liu (2004) argue that corrupt managers increase the systematic risk of stocks by affecting the output, but they do not consider risk sharing through trade. Stulz (2005) argues that country factors still matter because of friction introduced by concentrated ownership. On the other hand, redistribution risk is priced even when there are no frictions due to concentrated ownership.

Although there are several empirical papers on this topic (Bhattacharya and Daouk, 2002; Hail and Leuz, 2006; Garmaise and Liu, 2004; Daouk, Lee, and Ng, 2004), I provide additional insight on the relationship between investor protection and the cost of equity. For example, contrary to Hail and Leuz (2006), I find that proxies for investor protection explain cost of equity even across developed countries. My results are different from the literature because the effect of investor protection on the cost of equity is properly identified after scaling the cost of equity by GDP and the standard deviation of GDP growth. To the best of my knowledge, this is the first study that accounts for scaling to identify the relationship between investor protection and the cost of equity.

2 The Model

I introduce an international exchange economy model with fully integrated asset and trade markets. Because my goal is to understand whether redistribution affects the cost of equity in fully integrated markets, I ignore complications that will prevent full integration. Zapatero (1995) and Pavlova and Rigobon (2003) have similar international exchange economy models. In both papers, when agents have symmetric preferences, there is a peculiar equilibrium in which all assets perfectly comove due to risk sharing through trade. My important contribution to this literature is to show that redistribution prevents such a peculiar equilibrium.

The economy has a finite horizon $[0, T]$. There are N firms, K countries and $N >> K$. I define an $(N+1)$-dimensional Brownian motion $\boldsymbol{\omega}(t) = (\omega_i, \omega_j, \omega_w)^T$; the component processes in ω are mutually independent. Changes in the Brownian motion $d\omega_i$ are firm-specific shocks, $d\omega_j$ are country-specific shocks, and $d\omega_w$ is the world common shock. There are $N-K$ firm-specific shocks, K country shocks and one world common shock. In order to ensure complete markets, one firm in each country loads only on the country-specific and world-common shocks.[2] Agents in all countries share the same information generated by ω. There are $K+N$ securities, a stock S_i for each firm and a bond B_j for each country. This economy satisfies the standard assumptions: perfect markets, homogenous expectations and price-taking agents.

There are N_j firms in country j, each producing a different good. The production process of company i is Y_i, which has a drift of μ_i and $(N+1)$-dimensional variance term $\boldsymbol{\sigma}_i$. The production processes satisfy the following stochastic differential equations:

$$\begin{aligned} dY_i(t) &= Y_i(t)\mu_i dt + Y_i(t)\boldsymbol{\sigma}_i \boldsymbol{d\omega}(t) \\ \boldsymbol{\sigma}_i &= (..\delta_i, ..\delta_{ij}, \delta_{iw}) \end{aligned} \tag{1}$$

The loading of the production function on the firm-specific shock is δ_i, on the country-specific shock, δ_{ij}, and on the world common shock, δ_{iw}. The production function is exogenously given, and redistribution in the economy does not directly affect production. Redistribution affects the systematic risk of stocks even when redistribution does not have an effect on the production function. Stocks are defined as claims to the output of the production process. Bonds are in zero net supply and riskless in the bundle of home country goods. Asset prices, exchange rates and interest rates are endogenously determined.

[2] This could be a well diversified firm such as the postal service, which is affected only by country and world common shocks.

2.1 Redistribution Activity

Redistribution is simply a wealth transfer among agents. I use the term redistribution risk to define the possibility of wealth transfer from minority investors to any other agent in the economy. Redistribution may happen in a number of ways: managers or board members may use company resources for their private benefits, controlling shareholders may steal from minority investors, informed traders may transfer wealth from uninformed traders[3], or governments may expropriate the output of the company in various ways. In all of these cases, shareholders receive less output than they should.

Fraction X of the output is redistributed after subtracting the social cost of redistribution. Therefore X represents the level of pure redistribution, i.e., the redistributed amount remaining after the social cost. I incorporate the social cost of redistribution by assuming that a fraction k $(0 < k < 1)$ of production is wasted in the redistribution process. This cost can be thought of as money spent on unproductive activities such as hiring creative lawyers and accountants. The output of the company is distributed in the following way:

$$
\begin{aligned}
\text{Minority Investor Share} &= Y_i(t)(1-k_i)(1-X_i(t)) \\
\text{Redistribution} &= Y_i(t)(1-k_i)X_i(t) \\
\text{Social Cost} &= Y_i(t)k_i
\end{aligned}
\tag{2}
$$

The redistribution process may depend on the output levels, regulatory environment and firm-specific characteristics. Firm characteristics, such as the industry of the firm,

[3]Easley and O'Hara (2004) argue that insider trading increases systematic risk.

and the regulatory environment are stable compared to expected future cash flows. As a result, output shocks are the main cause of change in redistribution. The redistribution parameter X_i loads on the same economic shocks as the production of firm i does. The loading of redistribution on the firm-specific shock is δ_i^x, on the country-specific shock is δ_{ij}^x, and on the world common shock is δ_{iw}^x. The loading of X_i on economic shocks is denoted by $\boldsymbol{\sigma}_i^x$ and the change in X_i is represented by the following stochastic process:

$$\begin{aligned} dX_i(t) &= X_i(t)(1 - X_i(t))\boldsymbol{\sigma}_i^x \boldsymbol{d\omega}(t) \qquad (3) \\ \boldsymbol{\sigma}_i^x &= (..\delta_i^x, ..\delta_{ij}^x, \delta_{iw}^x) \qquad (4) \end{aligned}$$

In this formulation, X_i changes between 0 and 1 and $E_t[X_i(T)] = X_i(t)$ for $T > t$. This process ensures that, at a given time, the amount redistributed cannot be negative or more than the output of the company. The modeling approach for the social cost and the redistribution process greatly simplifies the calculation of stock prices but is not important for the conclusions. My results hold as long as the the pure redistribution is larger than zero.

The redistribution loads on the same economic shocks as the production function and does not introduce additional uncertainty to the economy. Therefore, by construction the markets are complete, which allows for a representative agent economy. The complete markets setting is appropriate for the purpose of analyzing the effect of redistribution on the cost of equity in fully integrated markets. However, I want to emphasize that the complete markets assumption does not drive my main results. For example, regardless of how the representative investor is constructed, highly levered stocks have a higher systematic risk. Later, I will show that the effect of redistribution on the minority share is similar to that of leverage. Alternatively, one can assume the existence of both controlling and minority shares: the controlling share receives the redistribution benefits while the minority share is a claim to remaining goods after redistribution. The representative agent holds both shares in equilibrium. The expected return of the minority share will be different from that of the controlling share.

The representative agents of all countries have the same consumption tastes and equal endowments, which ensures that any variation in expected returns is the result of differences in redistribution risks. The dynamic budget constraint of agents has the standard form, and agents maximize their lifetime utility by making portfolio and consumption choices. C_{ji} corresponds to the representative agent j's consumption of goods produced by firm i. The weight a_i denotes the weights of goods in the consumption taste of the representative investor. The representative agent of country j maximizes the Cobb-Douglas utility function below:

$$\max E \int_0^T [\sum_{i=1}^N a_i \log C_{ji}(t)] dt$$

such that

$$\sum_{i=1}^N a_i = 1. \tag{5}$$

2.2 The Effect of Redistribution on the Prices of Goods and Stocks

The prices of goods and stocks reveal an important difference between output risk and redistribution risk. Any output shock is perfectly shared through trade and cannot cause cross-sectional variation in the stock price process in integrated markets. On the other hand, redistribution risk cannot be shared through trade and, therefore, causes cross-sectional variation in stock price processes.

My objective is to find a price system, consumption plan and optimal portfolio such that the representative agents maximize their utility functions and all markets clear. I formally describe the equilibrium as follows:

Definition 1. *A competitive equilibrium is a price system* $(B_j(t), S_i(t))$*, consumption process* (C_{ji}) *and portfolio process* $(w_j(t))$ *such that:*

i. Representative investor j *maximizes lifetime utility,* $\forall j$*.*

ii. Securities markets clear; that is, $\sum_{j=1}^{K} w_{ij} = 1 \quad \forall i$*.*

iii. Goods markets clear; that is, $\sum_{j=1}^{K} C_{ij}(t) = Y_i(t)(1 - k_i) \quad \forall i$*.*

I obtain a Pareto-optimal equilibrium allocation by solving the social planner's consumption allocation problem. The social planner maximizes the total utility of all representative agents. Equivalent initial endowments imply that countries have equal weights in the optimization problem. Because of the intertemporal separability of preferences, the problem takes a static form, which is given below:

$$\max_{C_{ij}} E \int_0^T [\sum_{j=1}^{K} \sum_{i=1}^{N} a_i \log(C_{ij}(t))] dt$$

such that

$$\sum_{j=1}^{K} C_{ij}(t) = Y_i(t)(1 - k_i) \quad \forall i. \tag{6}$$

These constraints ensure that the total consumption is equal to the total available output for each good. λ_i is the Lagrange multipliers of the constraints in the optimization problem. The Lagrange multipliers of resource constraints are equal to the prices of the goods that are going to be provided at time t and state s, where the availability of goods for consumption defines the state. The exchange rate between the two goods is simply the ratio of their Lagrange multipliers, which is equal to the ratio of any country's representative investor's marginal utilities of the two goods. The optimal consumption plan, state prices and the exchange rate e_{mn} between two goods m and n take the following form:

$$
\begin{aligned}
C_{ij}(t) &= \frac{1}{K} Y_i(t)(1-k_i) \\
\lambda_i(t) &= \frac{K a_i}{Y_i(t)(1-k_i)} \\
e_{mn}(t) &= \frac{a_m Y_n(t)(1-k_n)}{a_n Y_m(t)(1-k_m)} \quad m, n \in I. \qquad (7)
\end{aligned}
$$

The equilibrium prices of goods λ_i are not affected by the redistribution X_i because redistribution changes the owners of the goods but does not affect the total amount of goods available for consumption. On the other hand, shocks that change output Y directly affect the equilibrium prices of goods and exchange rates. For example, when firm i experiences a negative production shock, the relative price of the good produced by firm i increases with respect to the prices of other goods. This mechanism allows investors to share output risks through trade.

The same risk sharing mechanism does not work for redistribution risk. The net amount of redistribution is still available for consumption and trade. As a result, pure redistribution does not have an effect on the equilibrium prices of goods. Although redistribution does not affect the prices of goods, it affects the price processes of stocks.

If there are no arbitrage opportunities, the stock price equals the value of expected output that will be received by minority shareholders. I calculate the price process of assets in a common artificial world numeraire ξ_w. The world numeraire is the weighted average of the state price densities of all goods: α_i is the weight of good i, and $\Sigma_i \alpha_i = 1$.

$$S_i(t) = \frac{E_t[\int_t^T \xi_i(s) Y_i(s)(1 - X_i(s))(1 - k_i)ds]}{\xi_w(t)}. \tag{8}$$

The state price densities ξ_i are equal to Arrow-Debreu state prices per unit probability and are proportional to the Lagrange multipliers of the constraints in the optimization problem of the social planner.

Proposition 1. *In equilibrium, the price process of stock S_i in terms of the world numeraire is the following:*

$$\begin{aligned}
\frac{dS_i(t)}{S_i(t)} &= \mu_i dt + \sum_i^N \left(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^N \frac{\alpha_m a_m}{Y_m(1-k_m)}}\right) d\omega_i(t) \\
&+ \sum_j^K \left(\frac{\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) d\omega_j(t) \\
&+ \left(\frac{\sum_{i=1}^N \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) d\omega_w(t) \\
&- X_i \boldsymbol{\sigma}_i^x \boldsymbol{d\omega}(t)
\end{aligned} \tag{9}$$

Proposition 1 shows that the level of redistribution X_i and sensitivity of redistribution to economic shocks $\boldsymbol{\sigma}_i^x$ only affects the price process of stock i. However, any change in social waste $Y_i k_i$ or output Y_i affects all stocks. Shocks to social waste or output are perfectly shared through trade while shocks to redistribution are not. Therefore, shocks to level of redistribution generate cross-sectional variation in stock price processes. These results provide justification for the emphasis of the empirical corporate governance literature on factors that could affect redistribution because these factors are more likely to affect the cost of equity compared to output shocks.

2.3 Redistribution and the Cost of Equity

In order to understand whether the effect of redistribution on stock price process is priced, we first need to derive what is priced in equilibrium. Not surprisingly, individuals hold a combination of the mean-variance optimal portfolio and the risk free asset. Asset returns are determined by their covariance with world wealth (proof is in the appendix). We can see the effect of redistribution on expected returns by simply calculating the covariance of a stock with world wealth.

Proposition 2. *The covariance of stock i located in country j with world wealth is:*

$$
\begin{aligned}
Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}) = \quad & A & (1) \\
& +(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}})X_i\delta_i^x & (2) \\
& +(\frac{\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}})X_i\delta_{ij}^x & (3) \\
& +(\frac{\sum_{i=1}^{N} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}})X_i\delta_{iw}^x & (4)
\end{aligned}
\qquad (10)
$$

where N_j is the set of firms that are in country j and A is the common component, which is equal to:

$$A = \sum_{i}^{N}\left(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right)^2 + \sum_{j}^{K}\left(\frac{\sum_{i \in N_j}\frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right)^2 + \left(\frac{\sum_{i=1}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right)^2$$

The first component of Proposition 2 is denoted by A, which is common to every stock in the world. The other three components represent the loading of redistribution activity on firm-specific shock, country shock and the world common shock respectively.

In the second component of the covariance, the multiplier of $X_i\delta_i^x$ represents the loading of Y_i on the firm-specific shock multiplied by the sum of the marginal utilities of consuming one good of company i divided by the sum of the weighted marginal utility of consuming one good from each company in the world. The marginal utility of consuming one good produced by a single company in the world compared to the total marginal utility of consuming one good from each company in the world should be very small. Because the number of companies in the world is very large, we can safely conclude that the second component of covariance is close to zero. This indicates that we can effectively diversify the part of redistribution risk that loads on the firm-specific shock. Therefore, contrary to Cole and Obstfeld's (1991) result, portfolio diversification is still useful in spite of perfect risk sharing through trade.

The third component of the covariance formula is the loading of redistribution activity on the country-specific shock. The third component is approximately equal to one divided by the number of countries, multiplied by the weighted average loading of Y_{ij} on the country-specific shock. Although world financial and trade markets are becoming increasingly integrated, the number of countries remains limited. This component cannot be fully diversified. Therefore, the third component affects the cost of equity.

The fourth component of the covariance, which is related to the loading of redistribution activity on the world common shock, cannot be diversified away. The magnitude of the fourth component depends on the magnitude of δ^x_{iw}, i.e the loading of firm redistribution activity on global shocks.

By examining the covariance of a stock with the world wealth, I predict that the loading of redistribution activity on the country or the world common shocks can potentially affect the cost of equity. The following proposition stems from the loading of redistribution activity on the country and world common shocks, which are captured by the third and fourth components in Proposition 2.

Corollary 1. *Ceteris paribus, a stock has a higher beta with respect to world wealth if it has a higher loading of redistribution to country or world common shocks, i.e., higher δ^x_i or δ^x_{iw}, if it has a higher redistribution level, X_i or if it is located in a country with a higher aggregate loading of production on the country-specific shock weighted by the contribution of the good to the marginal utility of the representative investor, $\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}$.*

Higher absolute sensitivity of redistribution to economic shocks and higher level of redistribution increases the systematic risk shifted to minority investors. It is more difficult to diversify the risk of countries that have a higher loading of production to country shocks and countries that have a higher contribution to the the marginal utility of the representative investor: mechanically, these countries have a higher covariance with the world wealth.

2.4 Minority Investor Protection and Redistribution

The corporate governance literature provides evidence about the relationship between redistribution, minority investor protection and economic shocks. The evidence provided by the literature is sufficient to conclude that minority investor protection affects the redistribution and the relationship between redistribution activity and economic shocks.

We can draw three conclusions from the corporate governance literature that examines the relationships among the amount of redistribution, minority investor protection and economic shocks: 1)The amount of redistribution is negatively correlated with economic shocks or investment opportunities (Johnson, Boone, Breach, and Friedman, 2000)[4]; 2) Better investor protection decreases the amount of expropriation (Shleifer and Wolfenzon, 2002; LaPorta, Lopez de Silanes, Shleifer, and Vishny, 2002); 3) Weaker investor protection makes the amount of redistribution more sensitive to economic shocks (Johnson, Boone, Breach, and Friedman, 2000; Baek, Kang, and Park, 2004; Mitton, 2002; Lemmon and Lins, 2003).

The evidence above is sufficient but not necessary for investor protection to affect the cost of equity in the desired direction. In the appendix, I use a simple model similar to that of Johnson, Boone, Breach, and Friedman (2000) to show that much weaker conditions are sufficient. From Proposition 2 and Corollary 1 we need only $X_i\delta^x_{ij}$ or $X_i\delta^x_{iw}$ to decrease with better investor protection and the percent redistribution X to have negative correlation with output shocks.

The literature argues that XY is negatively correlated with economic shocks, which implies that the percentage of goods redistributed X is negatively correlated with output shocks as well. Even if the amount of redistribution has no correlation with economic shocks, i.e. XY is constant, X will be negatively correlated with economic shocks.

[4]Controlling shareholders may use private funds to benefit minority investors (Friedman, Johnson, and Mitton, 2003) in times of negative shocks. This implies a positive correlation between economic outlook and redistribution. However, it will happen only for a short period and when future cash flows or the option value of the firm is higher than the value of the propping required to save the firm. Therefore, we expect to observe a negative correlation between X and production shocks over a long period of time.

The negative correlation of X with the output shocks shifts systematic risk to minority investors. The risk shifting will be larger as X gets larger. The second conclusion of the literature establishes the relationship between X and investor protection. As investor protection gets better the amount of redistribution decreases, which implies that the level of X decreases. Therefore, investor protection decreases the risk shifting by decreasing the level of redistribution. The third conclusion of the literature is not neccessary for investor protection to affect the cost of equity, however if investor protection decreases the sensitivity of redistribution to economic shocks (δ_{ij}^{x} or δ_{iw}^{x}), this will also decrease the cost of equity.

For example, a CEO who uses a company jet for personal trips regardless of output shocks, and who cuts back on the use of the jet as the investor protection increases, satisfies all conditions necessary for investor protection to affect the cost of equity.

2.5 Implications for Financial Markets

Wealth redistribution among agents generates interesting implications for stock markets, home bias, financial liberalization and equity premia. I briefly summarize these implications (all proofs are in the appendix).

The fact that redistribution risk cannot be shared through trade has important implications for the optimal portfolio decision of investors and the home bias puzzle. Contrary to Cole and Obstfeld (1991), portfolio diversification is still used in fully integrated trade markets. Therefore, the home bias puzzle is less likely to be explained by risk sharing through trade.

Several studies have argued that market valuations have improved after stock market liberalizations (Henry, 2000, 2003; Bekaert and Harvey, 2000; Kim and Singal, 2000;

Chari and Henry, 2004) due to reduction in cost of capital. My model predicts that financial liberalization decreases the cost of equity, but countries with redistribution risk cannot realize full benefits of liberalization because redistribution risk cannot be fully eliminated by financial liberalization. The model explains why countries cannot fully benefit from financial market liberalizations (Stulz, 1999) and why the risk sharing effect of financial liberalization is even less beneficial for developing countries (Bekaert, Harvey, and Lundblad, 2006).

Redistribution affects both cash flows and the discount rate. As a result, the relative size of the stock market with respect to the size of the overall economy should be smaller (LaPorta, Lopez de Silanes, Shleifer, and Vishny, 1997) and P/E ratios of firms should be lower in countries with higher redistribution activity. Redistribution increases the discount rate for minority shares and decreases the discount rate for controlling shares. Small differences in discount rates cause large differences in valuations, which might help explain large control and voting rights premia (Nenova, 2003; Dyck and Zingales, 2004; Barclay and Holderness, 1989).

Redistribution divides aggregate output into two parts and the part received by minority investors has higher systematic risk than the aggregate output. In the presence of redistribution, the beta of the world stock market with respect to world wealth is larger than 1, if the controlling shares are not traded in the stock market. This implies that redistribution increases the equity premia of the aggregate stock market.

3 Empirical Tests

In this section, I test the main hypothesis of my model, identify the most important factors in explaining systematic risk, discuss alternative explanations and quantify the economic impact of redistribution on the cost of equity.

In order to disentangle the predictions of my theory from those of the segmented markets hypothesis, I focus on the effect of regulations on the systematic risk instead of on returns. Both the segmented markets hypothesis and the redistribution theory predict that country-specific regulations affect returns through their affect on covariance with the local market. However, my theory uniquely predicts that, even in fully integrated markets, investor protection affects returns through the systematic risk of stocks with the world portfolio.

The policy implications of segmented markets are very different from those of redistribution theory. If investor protection is priced because of segmented markets, as markets become integrated, the problem will disappear. However, according to the redistribution theory regulators have to take action to decrease the cost of equity because redistribution is going to be priced even in perfectly integrated markets.

3.1 Description of Data and Variables

To test the theory and its robustness to alternative explanations, I use various samples that include all countries, OECD countries, non-OECD countries, OECD except US and developed countries within OECD. My main focus is on the OECD countries, which are by definition well integrated to world trade markets. I also check whether these countries have integrated financial markets according to Kaminsky and Schmukler (2002), Bekaert and Harvey (2000) and Henry (2000). All the countries in the OECD sample liberalized their markets before 1998, except for South Korea, which become fully liberalized in January 1999. The OECD sample provides me with an uncontroversial way of choosing well integrated countries and mitigates the possibility of sample selection bias.

The OECD is comprised of 30 member countries that produce 60% of the world's goods and services. I obtain information for 28 of them from Thomson Datastream (Iceland and Slovakia are excluded because of lack of data). I download yearly accounting and monthly return information for the ten years between December 1993 and December 2003 for all firms included in the Worldscope database. Because most proxies for redistribution risks belong to the late 1990's and many emerging economies liberalized their markets in the early 1990's, I initially limit attention to the five-year period between December 1998 and December 2003. Later, I use the 1993-1998 period for robustness tests. I require each firm to have data for country, industry membership, total stock return, asset, debt and market value.

Using monthly returns, I estimate beta of each stock with respect to the Worldscope world index for the period 12/1998 to 12/2003. I require each firm to have at least 24 months of return information to be included in the sample. I drop delisted firms because at the time of delisting event beta estimation is subject to large errors. I also truncate observations that have the highest 1% and the lowest 1% beta in the world sample. Results are robust if I do not impose these restrictions. In total, 18,853 firms in the OECD sample and 23,457 firms in the world sample satisfy all the requirements for the period from December 1998 to December 2003.

Panel B of Table 3 shows the industrial distribution of firms and average betas for industries. The betas seem to be consistent with expectations at the industry level: The average beta of the electricity industry is 0.41, which is much lower than 1.94 of the software industry and 1.88 of the telecommunications industry. Panel A of Table 3 displays the average country betas. The average country betas are significantly different from one another, indicating that country-specific factors could be important in explaining cross-sectional variation in systematic risk.

Minority investor protection and redistribution activity may depend on several country-specific factors including regulations, legal institutions and extra-legal institutions. Several variables are suggested by the literature to proxy for minority investor protection. In order to prevent variable selection bias, I use investor protection proxies from two recent related papers Dyck and Zingales (2004) and LaPorta, Lopez-De-Silanes, and Shleifer (2006).

LaPorta, Lopez-De-Silanes, and Shleifer (2006) analyze the effect of securities regulation on market capitalization and development. Markets that have higher redistribution should have smaller market size with respect to GDP. Therefore, I use all variables that are considered in Table 5 of LaPorta, Lopez-De-Silanes, and Shleifer (2006). These variables are “disclosure requirements”, “liability standards”, “public enforcement”, “anti-director rights” and “efficiency of the judiciary”.

Dyck and Zingales (2004) analyze the effect of extra-legal and legal variables on the private benefits of control. The investor protection proxies used in this paper should be relevant for redistribution because higher redistribution implies higher private benefits. I complement the legal variables taken from LaPorta, Lopez-De-Silanes, and Shleifer (2006) with extra-legal variables: “tax compliance”, “competition laws” and “newspaper circulation/population”. These variables are significant in explaining private benefits in

Table 9 of Dyck and Zingales (2004)[5]. I provide the detailed descriptions of all variables in Table 10. Table 2 summarizes the availability of proxies for each sample.

My goal is to explain the differences in the equity premia of assets that have the same characteristics but are located in different countries. To achieve this goal, I need to control for both firm-level and country-level characteristics that may affect stock betas and the loading of redistribution on economic shocks. Therefore, I control for leverage, industry, size, market liquidity and cross-listed firms.

Leverage can mechanically increase beta and may have an effect on the expropriation incentives of the controlling agents. I measure leverage by using the end-of-year accounting values for total assets and debt. I cannot calculate leverage using the market value of the equity, because equity value is endogenous.

I use 35 industry categories (FTSE Level 4) to control for the production characteristics of industries. The loading of expropriation activity on production shocks may vary across industries. For example, a utility company may have more observable expenses and cash flows compared to those of a high-tech company, thus making it difficult to change the level of expropriation with respect to economic shocks. In addition, if there is no perfect risk sharing through trade, production characteristics affect systematic risk and returns (Roll, 1992; Griffin and Stulz, 2001). Significant variation in industry betas in Panel B of Table 3 justifies controlling for industry dummies.

Lang, Lins, and Miller (2004) argue that firms that are followed closely by analysts and media may have lower risk of redistribution. Unfortunately, analyst coverage data is non-existent for most of the firms. Larger firms are more likely to be followed by media,

[5] I only do not take religion, which I use as an instrumental variable in testing the exogeneity of other variables.

analysts and the investment community. Therefore, in order to proxy for visibility of the firm, I control for the average total assets between 1998-2003.

Using the data provided by Doidge, Karolyi, and Stulz (2004), I include a dummy variable for cross-listed firms in U.S. markets. Cross-listed firms may adhere to the regulations of the host country (Stulz, 1999; Coffee, 1999) and commit not to expropriate minority shareholders. The results are robust to using dummies for different types of cross-listing. I am not able to control for cross-listed firms in markets other than U.S., which should bias my results down if firms choose to cross-list in markets with good investor protection.

I use monthly returns, which largely eliminates the effect of differences in market microstructure on the stock returns. However, market characteristics may still affect the cost of equity. I include average turnover of the market for the sample period to control for differences in market liquidity.

In general, richer countries have higher-quality institutions and law enforcement, which may make them more effective in preventing redistribution, regardless of the content of investor protection (North, 1981; LaPorta, Lopez de Silanes, Shleifer, and Vishny, 1999). I include log GDP per capita as a proxy for richness of the countries. In multivariate regressions I use GDP per capita as a control variable to understand how proposed proxies explain systematic risk above and beyond what is explained by the income level of the countries.

There are several other firm level control variables that could be correlated with redistribution such as the ownership structure of the firm, differences in voting rights or institutional holdings in the firm. However, such information is not readily available for most of the sample countries and it is hard to rule out the endogenous determination of these variables (Stulz, 2005; LaPorta, Lopez de Silanes, Shleifer, and Vishny, 1999). Country level ownership concentration is not significant in explaning systematic risk of stocks after controlling for minority investor protection (not reported).

3.2 The Link Between the Theory and Empirical Predictions

From Proposition 2 and Lemma 1 we know that the two components below affect the systematic risk of stocks. The two components depend on unobservable measures such as the aggregate contribution of a country to the marginal utility of the representative investor. In this section, I derive the main estimation equation, which depends on observable factors.

$$\begin{aligned} Cov_t\left(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}\right) = \quad & +\left(\frac{\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_i \delta_{ij}^x \\ & +\left(\frac{\sum_{i=1}^{N} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_i \delta_{iw}^x \end{aligned} \tag{11}$$

Given that $\frac{Ka_i}{Y_i(1-k_i)}$ is the Arrow-Debreu state price for good i, and Y_i is the total output of good i, and assuming that the weight of each currency α_i is a function of initial output levels such that $\alpha_i = \frac{Y_i(0)}{\sum_i Y_i(0)}$, we can rewrite covariance with world wealth as follows:

Hypothesis. *Cross-sectional variation in systematic risk can be estimated by:*

$$Cov_t\left(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}\right) = A + B\frac{GDP_j \delta_j}{GDP_w} X_i \delta_{ij}^x + C X_i \delta_{iw}^x \tag{12}$$

A, B and C are constants. δ_j is the standard deviation of GDP growth of country j, GDP_j is the GDP of the country j, GDP_w is the total GDP of the world, X_i is the level of redistribution at firm i, δ_{ij}^x is the loading of firm i redistribution on country j shock and δ_{iw}^x is the loading of firm i redistribution on the world common shock.

Under the economic assumptions described in section 2.4, $X_i\delta_{ij}^x$ and $X_i\delta_{iw}^x$ are functions of minority investor protection. There is no reason for any proxy for minority investor protection to affect loading of redistribution on the country shock but not affect the loading of redistribution on the world common shock and vice versa. The same proxies have to be used for both components. Although, proxies for the first component are scaled by $\frac{GDP_j\delta_j}{GDP_w}$, the correlation between the scaled and non-scaled proxies is very high, which introduces multicollinearity problem. I expect country shocks to be more important for redistribution. However, previous empirical evidence does not identify which component is more important (Johnson, Boone, Breach, and Friedman, 2000; Baek, Kang, and Park, 2004; Mitton, 2002; Lemmon and Lins, 2003). Therefore, I empirically test which component is more important.

It is possible to identify the effect of loading of redistribution on the world common shock by using a novel approach. I calculate the systematic risk of each firm with respect to a modified world portfolio that excludes the country of the firm. There is no mechanical correlation between country returns and the modified world portfolio return because the country of the firm is not included in the modified world portfolio. As a result, the covariance between the firm and the modified world portfolio can stem only from the loading of production and redistribution on the world common shock. We can eliminate the component that loads on the country shock, $\frac{GDP_j\delta_j}{GDP_w}X_i\delta_{ij}^x$ in equation 12 to test whether loading of redistribution on the world common shock is important.

Results in Column 6 of Table 7 indicate that the loading of redistribution activity on the world common shock is not an important determinant of systematic risk. Only a few variables are significant, and none of the variables are significant when GDP per capita is excluded (not reported). This result is inline with Hail and Leuz (2006), who also find that there is no significant linear relationship between measures of investor protection and the cost of equity for developed countries. Given that loading of redistribution on the world common shock is not important, I focus on the loading of redistribution on the country shock in the rest of the empirical test. The estimation equation is as follows:

$$Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}) = A + B\frac{GDP_j\delta_j}{GDP_w}X_i\delta_{ij}^x \tag{13}$$

The equation above implies that firms located in larger countries and in countries with higher aggregate volatility of production growth have higher betas with respect to world wealth. This is intuitive because countries with larger size and more volatile growth account for a greater fraction of variation in world wealth. The effect of investor protection on the cost of equity can be identified after scaling beta with $\frac{GDP_j\delta_j}{GDP_w}$.

3.3 Do Proxies for Redistribution Explain Systematic Risk?

In this section, I test whether various proxies for redistribution risk can explain cross-sectional differences in systematic risk. Table 4 column 1 exhibits the coefficients and the standard errors of redistribution proxies in explaining the scaled beta of firms after controlling for firm leverage, cross-listed firms, asset size, market turnover and industry dummies. I repeat the test after taking the logarithm of the dependent variable to account for non-normality in the error terms. Before taking the logarithm I add minimum beta to the numerator because beta can be negative. This substantially improves significance levels. Almost all variables are significant at 1% level in the predicted direction, except for newspaper circulation and public enforcement. Although, I exogenously select variables, seven out of nine variables are significant in the predicted direction. The results of Table 4 strongly support the main prediction of the theory: There is a significant relationship between the systematic risk of firms and the proxies for investor protection.

It is quite possible that a group of factors work together to minimize the effect of redistribution on systematic risk. Thus, it is important to identify the most important variables in explaining systematic risk of stocks. I follow the approach of Dyck and Zingales (2004); I first use redistribution proxies within the same category in a regression and then select the significant ones to include in the final regression. In all regressions, I control for log GDP per capita.

Table 5 displays the results of the multivariate analysis. Disclosure requirements, competition laws, public enforcement and newspaper circulation are selected from the first two regressions. In order to address possible variable selection bias, I use all variables together in the Column 4 of Table 5. Of the selected variables; disclosure requirements, public enforcement and competition laws maintain their significance levels[6]. Moreover, increase in explanatory power is marginal, which implies that the selected variables explain most of the variation in systematic risk. Control variables can only explain 38% of the variation, while selected variables and control variables together explain 88% of the variation.

It might seem surprising to find that public enforcement has a positive and significant marginal effect on systematic risk in the multivariate regressions. One possible

[6] I also run several regressions where selected variables are included with various combinations of variables that are not selected and show that the effect of selected variables are robust across several specifications. Not reported.

explanation is that OECD member countries are sufficiently efficient in decreasing redistribution risks through private enforcement and that additional interference by a regulator is harmful. The sign of this variable could also be plausible, if public enforcement regulations are enacted to increase the rents received by bureaucrats (LaPorta, Lopez-De-Silanes, and Shleifer, 2006).

3.4 Alternative Hypothesis and Robustness Tests

Although, multivariate analysis reveals which variables are important, I address several potential concerns before making any policy recommendations. I emphasize robustness rather than economic impact in identifying variables for policy recommendation because of the potential problems in cross-country studies (Levine and Renelt, 1992).

3.4.1 Country Level Results

Error terms could be clustered at the country level due to omitted country level variables. Although I control for the clustering of error terms, it is useful to repeat analysis at the country level. Table 5 column 4 shows that the country-level results confirms firm-level results. Disclosure requirements and the competition laws variables are significant in explaining the systematic risk of stocks.

I have only 20 or 21 observations in the country level tests for the OECD sample. Therefore, I cannot control for several firm-level characteristics that may affect either the loading of redistribution on economic shocks or the beta of the firm. For example, I do not control for cross-country differences in industrial composition, which is a very important determinant of systematic risk. Therefore, it is normal to observe that the significance levels of investor protection proxies in country level tests are weaker compared to firm level tests.

3.4.2 Are Redistribution Proxies Endogenous?

There is a possibility that disclosure requirements are adopted only in countries where such disclosure actually matters, and these countries are likely to have fewer redistribution problems. In countries with high redistribution risk, where disclosure requirements have a low chance of being effective, governments may place more emphasis on other regulations. In this case, it would be incorrect to conclude that improving disclosure requirements will decrease the cost of equity.

In order to address the endogeneity concern, I employ an instrumental variables approach in Table 6, using British legal origin (LaPorta, Lopez de Silanes, Shleifer, and Vishny, 1998) and Catholic main religion (Stulz and Williamson, 2003) as instrumental variables for the redistribution proxies. These two variables are potentially exogenous in determining the systematic risk of stocks. Since these instrumental variables are shown to be correlated with minority shareholder rights, securities regulation and creditor rights, I also expect them to be relevant in the first-stage regressions. In each column of Table 6, only one variable is assumed to be endogenous, while others are exogenous. Disclosure requirements, public enforcement and competition laws continue to have significant coefficients.

I employ the Anderson LR statistics for the relevance of the instruments and also to show the first-stage regressions. In all of the tests, the instruments are relevant. I also test the exogeneity of the instruments using an over-identification test. Since the classical Sargan test is not valid in the presence of conditional heteroskedasticity, I employ the

Hansen J test for feasible efficient two-step GMM. The joint null hypothesis is that the instruments are valid, i.e., uncorrelated with the error term. In all regressions, I cannot reject the validity of the instruments.

3.4.3 Are the Results Explained by Developing Country Risks?

In this section, I test whether the results are driven by various risks associated with developing countries. Developing countries are plagued with risks such as exchange-rate risk and political risk that might affect the cost of equity. For example, Bansal and Dahlquist (2002) explain the cross-sectional differences in observed equity risk premia between developing and developed nations by the risk of expropriation, i.e. whether the markets will be kept open or not. If correlated with world common shocks, the survival risk of markets (Brown, Goetzmann, and Ross, 1995) may increase systematic risk.

The fact that I control for GDP per capita should mitigate these concerns. However, in order to show that results do not arise from differences between developed and developing countries, I run robustness tests, which exclude developing nations. I exclude the Czech Republic, Hungary, South Korea, Mexico, Poland and Turkey from the OECD members sample. All remaining countries are either included in the Eurozone at the beginning of 1999 or can be categorized as developed nations. The results in Table 7 column 4 show that differences between developing and developed countries do not explain the results.

3.4.4 Robustness of Results for Various Samples

I use firms from OECD member countries and limit analysis to time period 12/1998-12/2003, which guarantees that there are no significant barriers for international trade and portfolio investment in the sample countries for the time period. Although the sampling strategy allows me to run a clean test of the theory by excluding non-integrated countries, it introduces the possibility that the results could be specific to the particular period or sample.

I repeat the univariate regressions for various samples and time periods; all countries, OECD minus US, non-OECD developing countries, developed countries and 1993-1998 time period. Table 7 displays the results, which are very similar to the original sample results. Therefore results are not specific to OECD sample or the 1998-2003 period.

The results are robust except for the non-OECD developing country sample. This may be because the countries in this sample are segmented from the rest of the world, thus making the systematic risk with the world market an inappropriate measure for these countries. For example, Malaysia has physical barriers to foreign portfolio investors. In addition, in this sample, cross-sectional variation in the independent variables is lower compared to that in the OECD sample. These two factors may prevent me from capturing the effect of redistribution on systematic risk in the non-OECD developing country sample.

3.4.5 Model Uncertainty

In my model, I construct the world in such a way that the systematic risk with the world wealth is the only determinant of the cost of equity. However, there could be other other determinants of the cost of equity. One way to account for model uncertainty is to use a model independent proxy for the cost of equity. I use country-level implied cost of capital data from Hail and Leuz (2006). The cost of capital is estimated by using market valuations and analysts' forecasts of future cash flows. The results in Table 5 column 5 show that disclosure requirements and the competition laws are significant in explaining the cost of equity. The significance levels and coefficients are similar to the country level test, where I use systematic risk of stocks as the dependent variable.

3.4.6 Scaling and Variable Selection

One of the main predictions of my theory is that the effect of redistribution on the cost of equity is stronger in larger and more volatile countries. Therefore, I scale the systematic risk of stocks with the inverse of relative country size and standard deviation of country growth.

Although scaling is essential, since we have a limited sample and there is considerable variation in the size of countries, scaling may affect the variable selection. Variables that are correlated with country size and growth volatility have a higher chance of being significant.

In column 8 of Table 7, I use one divided by the relative GDP multiplied by the standard deviation of GDP growth as the dependent variable instead of the scaled beta. Aside from competition laws and disclosure requirements, none of the coefficients are significant. In the world sample, disclosure requirements becomes insignificant but competition laws is again significantly correlated with the scale. Moreover, the insignificant coefficient of the competition laws variable in the OECD-US sample (US has the largest size and the highest score in disclosure requirements and competition laws) indicates that competition laws is significant in explaining the scaled beta mostly because of its correlation with the scaling variable.

On the other hand, the disclosure requirements index is not significantly correlated with the scale variable in the world sample yet it is significant in explaining the cross sectional variation in the scaled systematic risk. Moreover, the disclosure requirements index continues to be significant when US is excluded from the sample.

I conclude that scaling is not important to the significance of antidirector rights, liability standards, efficiency of judiciary, tax compliance and newspaper circulation in explaining cross-country differences in the cost of equity. The disclosure requirements index is positively correlated with the scaling variable, but its significance is not solely determined by scaling. However, the significance of competition laws is largely explained by its correlation with GDP.

3.5 Which Redistribution Proxy Should Regulators Focus on?

The disclosure requirements index has a significant effect on the systematic risk of stocks across different robustness tests. Moreover, other papers also find that the disclosure requirements index is important in explaining the imputed cost of equity (Hail and Leuz, 2006) and the development of markets (LaPorta, Lopez-De-Silanes, and Shleifer, 2006). Therefore, the disclosure requirements index deserves special attention.

The disclosure requirement index is composed of six sub-components: prospectus, compensation, shareholders, inside ownership, irregular contracts and transactions. These sub-indices are described in Table 10. I analyze which sub-components are important.

In Table 8, I repeat the univariate and multivariate tests by using the sub-indices. Sub-indices; irregular contracts, related party transactions, shareholder disclosure and delivering prospectus are significant in explaining the systematic risk of stocks. Related party transactions and irregular contracts are two common mechanism for expropriating minority investors, which explains why these variables are significant. The extent of transparency of the shareholder structure of the firm is also significant, which could also be important for redistribution by the controlling shareholders. It might be important to deliver a prospectus because that would be an affirmative step in making disclosure to investors.

In general, results indicate that disclosure requirements that are related to the expropriation of minority investors by controlling shareholders are important in decreasing the cost of capital. Sub-indices that are related to managers, such as disclosure of managerial compensation and equity ownership, do not seem to be important in explaining systematic risk of stocks. This result is intuitive given that redistribution is mostly conducted by controlling shareholders outside of a few developed markets.

3.5.1 Economic Significance

Given that redistribution risks are important for the cost of capital, regulators should take measures to mitigate redistribution risk. Assuming that the international CAPM holds, I quantify the effect of the policy recommendation on the cost of equity.

Depending on our assumption about equity premia, the last three columns of Table 9 show the expected decrease in the cost of equity when the level of the disclosure requirements index of the first country is increased to that of the second country. I match countries in the lowest quartile with countries in the highest quartile of the disclosure requirements index. In calculating economic impact, I use the coefficient of the disclosure requirements index from regressions at the country level (Table 5 column 5) to be conservative. Moreover, in country level regressions, I do not add minimum beta to the right hand side before taking the logarithm, which makes it easier to interpret economic impact. The effect of improving disclosure requirements on the cost of equity is up to 3%, which is economically very significant. Assuming that the cost of equity of a firm is 10 %, a 2% reduction in the cost of equity increases the firm's value by about 25%.

4 Conclusion

This paper justifies the emphasis of the corporate governance literature on investor protection in explaining cross-country variation in the cost of equity despite the existence of several other country factors. The central prediction of the model is that investor protection affect the cost of equity through redistribution risk, which cannot be fully diversified even in integrated markets. The effect of minority investor protection on the cost of equity is scaled by the GDP and GDP growth volatility of the country.

Univariate test results provide support for the theory by showing that most of the proxies for redistribution risk are significant determinants of systematic risk. The results are robust to different combinations of variables, endogeneity tests, country-level tests, various samples, and choice of time period.

Multivariate tests suggest that regulators should focus on improving the securities regulations that determine disclosure requirements related to the expropriation of minority investors by the controlling shareholders. The economic impact of this recommendation is significant. For example, improving the disclosure requirements of Belgium to the level of the disclosure requirements of France decreases the cost of equity of Belgian firms by 1.2% if the equity premium is 6%.

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A Proofs

A.1 Proposition 1

If there are no arbitrage opportunities then stock prices should equal to the net present value of the total output. I identified the price of goods that are going to be delivered at state s and time t, as λ_i from the optimization problem of the social planner. I can write these terms as the product of Arrow-Debreu state price $s(s,t)$ of the numeraire and the spot price of the good p_i. The spot prices are defined in terms of the world numeraire, $p_w = 1$. If there no arbitrage opportunities the price of stock i should equal to: $S_i(t) = \int_t^T \frac{s(s)p_i(s)Y_i(s)(1-X_i(s))(1-k_i)ds}{s(t)}$. From the relation between Arrow-Debreu state prices and Lagrange multipliers I can write this as follows. $S_i(t) = \int_t^T \frac{\lambda_i(s)Y_i(s)((1-X_i(s))(1-k_i)ds}{\sum_i^N \alpha_i \lambda_i(t)}$. First employ the definition of a conditional expectation appearing on transitioning from the state prices to the state price densities. $S_i(t) = \frac{E_t[\int_t^T \xi_i(s)Y_i(s)(1-X_i(s))(1-k_i)ds]}{\xi_w(t)}$. Then I use the fact that X_i is a martingale. $S_i(t) = \frac{2a_i(1-X_i(t))(1-k_i)(T-t)}{\xi_w(t)}$. Simple application of Ito's Lemma will give the stochastic process of the domestic stock price. The risk free asset in the above formulas is a world bond, which is riskless in the world numeraire. In this economy, bond price process is derived in a similar way to stock price process. I can deduce the interest rates from the state price densities and interest rate parity between any two countries can be calculated by using the no arbitrage condition.

A.2 CAPM Holds

The dynamic optimization problem of investors can be converted into a static optimization problem by using the Cox and Huang (1989) and Karatzas, Lehoczky, and Shreve (1987) martingale representation methodology. The optimization problem below belongs to an investor who evaluates returns in the world numeraire: $\max E \int_0^T [\sum_{i=1}^N a_i \log(C_i(t))]dt$, such that : $W(0) = E\int_0^T [\sum_{i=1}^N \xi C_i(t)]dt$. I can use Karatzas and Shreve (1998) Theorem 7.3 to solve for the optimal portfolio. $w(t) = (V(t)^T)^{-1}\theta_w(t)$. The V_t is the loading of assets on risk factors. θ_w is equal to $V(t)(V(t)V(t)^T)^{-1}[\mu(t) - r_w(t)1]$ and $\mu(t)$ is equal to vector of $\mu_i(t)$. $r_w(t)$ is the risk free rate in the world numeraire which can be derived from ξ_w. Rest of the proof is trivial, international CAPM holds. In an arbitrage free market risk premia on stock i is related to the market price of risk in the following way (Karatzas and Shreve (1998) theorem 4.2). $\frac{E_t(dS_i(t)/dt)}{S_i(t)} - r_w(t) = \sigma_i^T m_w(t)$. m is the market price of risk, so excess return depends on how much the stock is loaded on the components of market price of risk. By using $Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{d\xi_w(t)}{\xi_w(t)}) = \sigma_i^T m_w(t)$ and $\frac{d\xi_w(t)}{\xi_w(t)} = -\frac{dW_w(t)}{W_w(t)} + dtterms$ we conclude that: $\frac{E_t(dS_i(t)/dt)}{S_i(t)} - r_w = Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t))}{W_w(t)})$.

A.3 Minority Investor Protection and Redistribution

I use a simple model similar to that of Johnson, Boone, Breach, and Friedman (2000) to derive the economic assumptions implied by the empirical evidence. The controlling shareholder receives $g = XY$ from redistribution. His total benefit $B(g, r(Y))$ depends on the redistribution income g and the return on investment $r(Y)$. The cost of redistribution $C(g, s, f)$ depends on the amount of redistribution g, the level of investor protection s and firm specific characteristics f. The controlling shareholder maximizes the utility function below: $Max_X U = B(g, r(Y)) - C(g, s)$. I assume that $C_g > 0, C_{gg} > 0, C_s > 0, B_g > 0, B_{gg} = 0, B_r > 0, r_Y > 0$. The first and second order conditions for this optimization problem are as follows: $B_g - C_g = 0$, $-C_{gg} \leq 0$. Differentiate first order condition with respect to $r(Y)$ by using the implicit function theorem: $\frac{\partial g^*}{\partial r} = \frac{B_{gr}}{C_{gg}}$. Therefore $B_{gr} < 0$ is the condition required for the amount of redistribution to negatively correlated with output shocks or return on investment. Given $\frac{\partial g^*}{\partial s} = \frac{-C_{gs}}{C_{gg}}$ and C_{gg} is positive, in order $\frac{\partial g^*}{\partial s}$ to be positive C_{gs} has to be positive. For the third conclusion of the literature, define $f = \frac{\partial g*}{\partial r}$ and differentiate the first order condition with respect to r by using the implicit function theorem. $-C_{gg}f + B_{gr} = 0$. Again differentiate with respect to s:

$-C_{ggg}\frac{\partial g^*}{\partial s}f + -C_{ggs}f - C_{gg}f_s + B_{ggr}\frac{\partial g^*}{\partial s} = 0$. I want to learn the sign of f_s. Given that B_{gg} is zero the sign of f_s is: $sign(f_s) = sign(C_{ggg}\frac{\partial g^*}{\partial s} + C_{ggs})$. Given $\frac{\partial g^*}{\partial s} = \frac{-C_{gs}}{C_{gg}}$ below condition has to be satisfied for $\frac{\partial g^*}{\partial r}$ to be increasing in s: $\frac{\partial(lnC_{gg})}{\partial g} < \frac{\partial(lnC_{gs})}{\partial g}$. I can also write the same equation as follows. Define $u = C_g$ as the marginal cost of expropriation and $v = C_s$ the marginal cost of regulations: $-\frac{u_{gg}}{u_g} > -\frac{v_{gg}}{v_g}$ The condition means that u is more concave than v in g according to the Arrow-Pratt measure of absolute risk aversion. Any cost function in the form of $C = g^\beta s^\alpha$ such that $\beta > 1$, $\alpha > 0$ will satisfy this condition.

The conditions required for investor protection to affect the cost of equity is much weaker than the conditions implied by the findings of the corporate governance literature that are described above. For the percent of redistribution to be negatively correlated with output shocks we need a weaker assumption. First order condition with respect to Y: $\frac{\partial X^*}{\partial Y} = \frac{B_{gr}r_Y}{C_{gg}Y} - \frac{X}{Y}$. I need $B_{gr} < \frac{XC_{gg}}{\partial r_Y}$ for $\frac{\partial X^*}{\partial Y} < 0$ which is a weaker condition than $B_{gr} < 0$ since X, C_{gg} and r_Y are all positive. Instead of the third conclusion of the literature, I need $X\frac{\partial X}{\partial Y}$ to be increasing in s. After some algebra I get the below condition: $-[(-C_{ggg}\frac{C_{gs}}{C_{gg}} + C_{ggs})(\frac{B_{gr}\frac{\partial R}{\partial Y}}{C_{gg}})] > \frac{C_{gs}}{X}(\frac{B_{gr}r_Y}{C_{gg}Y} - \frac{X}{Y}) - \frac{C_{gs}}{Y}$ Given that $C_{gs} > 0$ and $B_{gr} < \frac{XC_{gg}}{\partial r_Y}$ the right hand side of the above equation is always negative making it a much weaker condition than $-\frac{u_{gg}}{u_g} > -\frac{v_{gg}}{v_g}$ Therfore we need weaker condition than the conditions implied by the corporate governance literature for investor protection to affect the cost of equity in the predicted direction.

A.4 Implications for Financial Markets

The beta of a stock with the world wealth is larger when there is redistribution. This can be easily seen from the formula below.

$$\beta_i = 1 + \frac{\left(\frac{\sum_{i \in N_n} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta^x_{mn} + \left(\frac{\sum_{i=1}^N \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta^x_{mw}}{\sum_i^N \left(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^N \frac{\alpha_m a_m}{Y_m(1-k_m)}}\right)^2 + \sum_j^K \left(\frac{\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right)^2 + \left(\frac{\sum_{i=1}^N \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right)^2} \quad (14)$$

Redistribution will increase control premia by decreasing the expected return of the controlling (golden) share. The value of the golden share equals to the present value of expropriation cash flows: $S_{xi}(t) = \frac{E_t[\int_t^T \xi_i(s)Y_i(s)X_i(s)(1-k_i)ds]}{\xi_w(t)}$ By evaluating this integral and applying Ito's Lemma I can derive the price process of the golden share and calculate it's covariance with the world wealth. The covariance of the golden share with the world wealth has three negative terms related to redistribution, which decrease the cost of capital of the golden share.

$$
\begin{aligned}
Cov_t(\frac{dS_{xi}(t)}{S_{xi}(t)}, \frac{dW_w(t)}{W_w(t)}) &= A - \sum_i^N (\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^N \frac{\alpha_m a_m}{Y_m(1-k_m)}})(1-X_i)\delta_i^x \\
&- (\frac{\sum_{i\in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}})(1-X_i)\delta_{ij}^x \\
&- (\frac{\sum_{i=1}^N \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^N \frac{\alpha_i a_i}{Y_i(1-k_i)}})(1-X_i)\delta_{iw}^x \qquad (15)
\end{aligned}
$$

Markets with redistribution problem will not be able to fully benefit from financial liberalization gains. Let's focus on a closed economy j where the investors can perfectly share risks within the economy but financial markets are closed and there is no risk sharing with foreigners. The price process of a firm in this closed economy will be as follows:

$$
\begin{aligned}
\frac{dS_i(t)}{S_i(t)} &= \mu_i dt + \sum_i^{N_j} (\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^{N_j} \alpha_m \frac{a_m}{Y_m(t)(1-k_m)}})d\omega_i(t) \\
&+ (\frac{\sum_{i=1}^{N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N_j} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}})d\omega_j(t) \\
&+ (\frac{\sum_{i=1}^{N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i}}{\sum_{i=1}^{N_j} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}})d\omega_w(t) \\
&+ X_i \sigma_i^x d\omega(t)
\end{aligned}
$$

In this closed economy, assets will be priced according to their covariance with the country wealth. The covariance of stock m with the country j will be:

$$
\begin{aligned}
Cov_t(\frac{dS_m(t)}{S_m(t)}, \frac{dW_j(t)}{W_j(t)}) &= \sum_i^{N_j}(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^{N_j} \alpha_m \frac{a_m}{Y_m(t)(1-k_m)}})^2 \\
&+ (\frac{\sum_{i=1}^{N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N_j} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}})^2 \\
&+ (\frac{\sum_{i=1}^{N_j} \alpha_i \frac{a_i \delta_{wi}}{Y_i(t)(1-k_i)}}{\sum_{i=1}^{N_j} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}})^2 \\
&+ (\frac{\frac{\alpha_m a_m \delta_m}{Y_m(1-k_m)}}{\sum_{i=1}^{N} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}) X_m \delta_m^x \\
&+ (\frac{\sum_{i=1} N_j \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}) X_m \delta_{mn}^x \\
&+ (\frac{\sum_{i=1}^{N_j} \alpha_i \frac{a_i \delta_{wi}}{Y_i(t)(1-k_i)}}{\sum_{i=1}^{N_j} \alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}) X_m \delta_{mw}^x
\end{aligned}
\tag{16}
$$

Assume that country j has a closed economy. Before liberalization, the covariance of stock m in country j with world wealth is:

$$
\begin{aligned}
Cov_t(\frac{dS_m(t)}{S_m(t)}, \frac{dW_w(t)}{W_w(t)}) &= (\frac{\sum_{i=1}^{N_j} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N_j} \frac{\alpha_i a_i}{Y_i(1-k_i)}}) * (\frac{\sum_{i \notin N_j}^{N} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i \notin N_j}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}) \\
&+ (\frac{\sum_{i \notin N_j}^{N} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i \notin N_j}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}) X_m \delta_{mw}^x
\end{aligned}
\tag{17}
$$

We can see the effect of redistribution on financial liberalization gains by comparing the covariance equation before liberalization with the covariance equation in Proposition 2. Given that the aggregate loading of production on the world common shock in country j is similar to that of world wealth, the first component of covariance in the above is equal to the third component of A in Proposition 2. The second component of above equation is equal to the fourth component of Proposition 2. This leaves us with four additional components in Proposition 2: components two, three and the first two components of A. The additional components of A represent the mechanical effect, which is the same for every country. I argued that the second component of Proposition 2 could be fully diversified. Therefore component three determines the overestimation providing us the predictions in the lemma.

Table 1: **The Correlation of Main Independent Variables**

		1	2	3	4	5	6	7	8	9
1	antidirector rights	1								
2	disclosure requirements	0.66	1							
3	burden of proof	0.67	0.54	1						
4	public enforcement	0.43	0.62	0.45	1					
5	efficiency of the judiciary	0.24	0.28	0.12	-0.06	1				
6	tax compliance	0.46	0.48	0.17	0.12	0.84	1			
7	competition laws	0.14	0.46	0.08	0.25	0.41	0.53	1		
8	newspaper circulation/pop	0.08	-0.04	-0.12	-0.45	0.70	0.48	0.06	1	
9	GPD per capita	0.08	0.34	0.07	0.11	0.63	0.43	0.35	0.48	1

Table 2: **Availability of Redistribution Proxies for Different Samples**

This table shows the availability of redistribution proxies for different samples. First two columns are for OECD member countries. Third and fourth columns are for the world sample which includes all countries. Fifth and sixth columns include all non-OECD developing (defined by MSCI) countries.

	OECD		World		Non OECD Developing	
	Countries	Firms	Countries	Firms	Countries	Firms
Antidirector Rights	27	18819	48	23423	19	3484
Disclosure Requirements	24	18666	44	23259	18	3473
Liability Standards	24	18666	44	23259	18	3473
Public Enforcement	24	18666	44	23259	18	3473
Efficiency of Judiciary	24	18666	44	23259	18	3473
Tax Compliance	23	18298	39	22433	14	3015
Competition Laws	23	18298	39	22433	14	3015
Newspaper Circulation	23	18298	39	22433	14	3015

Table 3: **The Country and Industry Distribution of Firms**

Panel A shows the distribution of firms with respect to countries and Panel B shows the distribution of firms with respect to industries. In both panels, Column 3 displays the equally weighted average beta of firms. Firm beta is calculated with respect to Worldscope world index by using monthly returns between 1998-12 and 2003-12. * indicates MSCI developed markets in the non-OECD sample.

A:Country Distribution				**B:Industry Distribution (OECD)**			
Country	**#**	**%**	**Beta**	**Industry**	**#**	**%**	**Beta**
OECD Members							
Australia	1,094	4.7	1.07	Other Utilities	164	0.87	0.38
Austria	93	0.4	0.4	Construction Materials	922	4.89	0.65
Belgium	135	0.6	0.58	Information Tech. Hardware	741	3.93	2.08
Canada	1,053	4.5	0.92	Food Producers	590	3.13	0.46
Czech Republic	34	0.1	0.15	Electronic, Elect. Equipment	802	4.25	1.24
Denmark	174	0.7	0.36	Forestry and Paper	187	0.99	0.66
Finland	133	0.6	0.87	Health	656	3.48	1.02
France	803	3.4	0.84	Oil and Gas	581	3.08	0.91
Germany	912	3.9	1.03	Steel and Other Metals	295	1.56	0.81
Greece	292	1.2	0.91	Personal Care	145	0.77	0.71
Hungary	36	0.2	0.61	Automobiles and Parts	447	2.37	0.72
Ireland	58	0.2	0.64	Beverages	190	1.01	0.42
Italy	245	1.0	0.92	Household Goods, Textiles	1,002	5.31	0.77
Japan	3,298	14.1	0.55	Food and Drug Retailers	221	1.17	0.61
Luxembourg	34	0.1	0.8	Retailers General	707	3.75	0.87
Mexico	102	0.4	0.78	Support Services	817	4.33	1.11
Netherlands	171	0.7	1.01	Chemicals	568	3.01	0.77
New Zealand	105	0.4	0.79	Media and Entertainment	736	3.9	1.24
Norway	150	0.6	1.2	Pharmaceuticals and Biotech.	662	3.51	1.3
Poland	83	0.4	1.14	Aerospace and Defense	94	0.5	0.77
Portugal	86	0.4	0.4	Leisure and Hotels	604	3.2	0.71
South Korea	703	3.0	1.29	Diversified Industrials	320	1.7	0.94
Spain	133	0.6	0.61	Banks	1,119	5.94	0.27
Sweden	301	1.3	1.48	Other Finance	598	3.17	0.94
Switzerland	252	1.1	0.71	Life Insurance	59	0.31	0.69
Turkey	129	0.5	2.27	Insurance	239	1.27	0.7
United Kingdom	1,370	5.8	1.01	Real Estate	657	3.48	0.39
United States	6,874	29.3	1.15	Engineering and Machinery	1,112	5.9	0.84
Non OECD				Mining	631	3.35	0.95
Argentina	69	0.3	0.61	Transport	488	2.59	0.72
Brazil	278	1.2	1.48	Electricity	155	0.82	0.41
Chile	174	0.7	0.61	Telecommunication Services	296	1.57	1.88
Colombia	31	0.1	0.35	Sofware and Computer Serv.	1,676	8.89	1.94
Egypt	12	0.1	0.26	Investment Companies	337	1.79	0.88
Hong Kong*	707	3.0	0.89	Tobacco and Others	35	0.18	0.36
India	336	1.4	0.8				
Indonesia	247	1.1	1.08				
Israel	36	0.2	1.61				
Malaysia	722	3.1	0.85				
Pakistan	80	0.3	0.46				
Peru	71	0.3	0.2				
Philippines	202	0.9	0.69				
Russia	11	0.0	1.64				
Singapore*	413	1.8	1.1				
South Africa	314	1.3	0.68				
Sri Lanka	26	0.1	0.16				
Taiwan	498	2.1	0.66				
Thailand	338	1.4	0.92				
Venezuela	23	0.1	0.4				
Zimbabwe	16	0.1	0.54				
Total	23,457	100.0		**Total**	18,853	100	

Table 4: **Does Redistribution Risk Explain Systematic Risk?**

Table displays the results of univariate OLS regressions for each redistribution proxy in a sample of 18,853 firms from 28 OECD member countries. In column one the dependent variable is the scaled beta, in column two and three the dependent variable is the log of the scaled firm beta. Firm beta is calculated with respect to Worldscope world index between 1998-12 and 2003-12 by using monthly returns. Redistribution proxies are explained in detail in Table 10. The control variables are average firm leverage between 1998-2003, log average firm asset size between 1998-2003, average market turnover between 1998-2003, 35 industry dummies (FTSE level 4) and a dummy that takes the value of 1 if the firm is cross listed in the U.S. and 0 otherwise. In column three log average GDP per capita between 1998-2003 is also included as a control variable. The second row gives the error terms which are robust and clustered by country.

	Exact		Log	
Antidirector Rights	-6.4745	**	-0.5926	***
	2.5755		0.1526	
Disclosure Requirements	-66.0669	**	-4.8521	***
	25.3028		1.1951	
Liability Standards	-29.1274	*	-2.4238	***
	16.7251		0.8849	
Public Enforcement	-4.8576		-0.1448	
	14.8612		1.3398	
Efficiency of Judiciary	-6.7598	**	-0.6806	***
	2.5257		0.129	
Tax Compliance	-13.07	**	-1.23	***
	6.08		0.34	
Competition Laws	-45.0771	***	-3.0903	***
	11.6231		0.3416	
Newspaper Circulation	0.1625		-0.2134	
	3.7695		0.27	
Log GDP per Capita	-38.94	***	-2.94	***
	9.93		0.6	
Average Turnover	yes		yes	
Log Asset	yes		yes	
Leverage	yes		yes	
Industry Controls	yes		yes	
Crosslist Dummy	yes		yes	

Table 5: **Which Variables are Important: Multivariate Analysis**

Table displays the results of multivariate OLS regressions in a sample of 18,853 firms from 28 OECD member countries. The dependent variable are the log of the scaled firm beta in the first four columns. The dependent variable in the fifth column is the scaled beta of the country index and in the sixth column is the scaled and inflation adjusted country level implied cost of equity from Hail and Leuz (2006). Firm beta is calculated with respect to Worldscope world index between 1998-12 and 2003-12 by using monthly returns. Independent variables are redistribution proxies, which are explained in detail in Table 10. Control variables are log average GDP per capita between 1998-2003, average firm leverage between 1998-2003, log average firm asset size between 1998-2003, average market turnover between 1998-2003, 35 industry dummies (FTSE level 4) and a dummy that takes the value of 1 if the firm is cross listed in the U.S. and 0 otherwise. The second row gives the error terms which are robust and clustered by country.

	Firm Level				Country Level	
					beta	implied cost of equity
Antidirector Rights	-0.17			0.06		
	0.27			0.14		
Disclosure Requirements	-6.79***		-5.83***	-5.70***	-3.25*	-3.74*
	1.80		0.64	1.44	1.68	2.03
Liability Standards	1.21			-0.95		
	0.90			0.69		
Public Enforcement	2.74***		3.56***	2.32***	1.97	1.44
	0.58		0.63	0.61	1.15	1.39
Efficiency of Judiciary	0.02			0.10		
	0.23			0.21		
Tax Compliance		0.15		0.89***		
		0.58		0.24		
Competition Laws		-3.34***	-2.82***	-3.71***	-2.07**	-2.54**
		1.05	0.33	0.30	0.81	0.97
Newspaper Circulation		-0.39**	0.16	-0.22		
		0.19	0.14	0.15		
GDPCap	-1.95	-0.44	0.02	-0.12	0.33	2.92***
	1.27	0.80	0.46	0.74	0.63	1.00
Cross List	Yes	Yes	Yes	Yes	No	No
Leverage	Yes	Yes	Yes	Yes	No	No
Log Asset	Yes	Yes	Yes	Yes	No	No
AvgTurn	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	No	No
# Firms	18209	17725	17725	17725		
# Countries	24	21	21	21	21	20
R-squared	0.72	0.69	0.88	0.92	0.34	0.41

Table 6: **Alternative Hypothesis: Are Proxies for Redistribution Endogeneous?**

Table displays the results of IV estimation with two step efficient GMM method in a sample of 18,853 firms from 28 OECD member countries. One redistribution proxy is assumed to be endogenous in each column. The instrumental variables are dummy variables for legal origin and religion: UK legal origin and Catholic religion. Hansen J statistics test the null hypothesis that instruments are valid instruments. Anderson LR statistics test the null hypothesis that instruments are redundant. The dependent is the log of the scaled firm beta. Firm beta is calculated with respect to Worldscope world index between 1998-12 and 2003-12 by using monthly returns. Independent variables are redistribution proxies, which are explained in detail in Table 10. Control variables are log average GDP per capita between 1998-2003, average firm leverage between 1998-2003, log average firm asset size between 1998-2003, average market turnover between 1998-2003, 35 industry dummies (FTSE level 4) and a dummy that takes the value of 1 if the firm is cross listed in the U.S. and 0 otherwise. The second row gives the error terms which are robust and clustered by country.

Endogenous Variable	Disclosure Requirements	Public Enforcement	Competition Laws
Disclosure Requirements	-3.78***	-5.73***	-5.59***
	1.30	0.53	0.49
Public Enforcement	2.52***	3.02***	2.77***
	0.47	0.30	0.27
Competition Laws	-2.96***	-3.03***	-2.79***
	0.42	0.28	0.87
		First Level Regressions	
UK Legal Origin	0.28***	0.63***	-0.15
	0.08	0.14	0.29
Catholic	0.03	0.29*	-0.27**
	0.05	0.14	0.12

Table 7: **Various Robustness Tests**

The table includes the results of several univariate OLS regressions. The first column is the OECD sample and the second column is the World sample that includes all countries. Third column is the non-OECD developing country sample. Fourth column is the OECD members minus the U.S. sample. Fifth column repeats the OECD sample test for the time period 1993-1998, all country and firm level control variables are also for 1993-1998 period. Sixth column includes only developed countries among the OECD sample. In the seventh column the dependent variable is the beta of the firm, which is calculated with respect to the world portfolio that does not include the country of the firm to isolate the loading of redistribution activity on world common shocks. In the eight column, analysis is at the country level, sample is OECD countries, the dependent variable is the scale, which is equal to one over the GDP share of the country and the standard deviation of GDP growth, control variables are log average GDP per capita between 1998-2003 and average market turnover between 1998-2003. The ninth column repeats the test in the eight column for the World sample. Unless stated otherwise above; The dependent variable is the log of the scaled firm beta. Firm beta is calculated with respect to Worldscope world index between 1998-12 and 2003-12 by using monthly returns. Independent variables are redistribution proxies that are explained in detail in Table 10. Control variables are log average GDP per capita between 1998-2003, average firm leverage between 1998-2003, log average firm asset size between 1998-2003, average market turnover between 1998-2003, 35 industry dummies (FTSE level 4) and a dummy that takes the value of 1 if the firm is cross listed in the U.S. and 0 otherwise. The second row gives the error terms, which are robust and clustered by country.

	OECD	World	Non-OECD	OECD-US	93-8 OECD	Developed	World Common	Scale OECD	Scale World
Antidirector Rights	-0.40***	-0.33***	-0.01	-0.57***	-0.53***	-0.34**	0.01	-0.14	-0.018
	0.14	0.11	0.12	0.13	0.16	0.15	0.01	0.19	0.12
Disclosure Requirements	-3.70***	-1.76*	1.11	-4.36***	-4.33***	-3.60**	0.06	-3.35**	-0.57
	1.33	0.89	0.86	0.90	1.40	1.48	0.15	1.27	0.80
Liability Standards	-1.44*	-1.48**	0.75	-1.10**	-2.49**	-1.15	-0.00	-0.44	-0.22
	0.75	0.57	0.73	0.51	1.07	0.75	0.10	1.02	0.67
Public Enforcement	1.12	0.71	0.89	1.21	-0.13	2.06**	0.30***	-0.84	-0.61
	1.03	1.14	0.65	1.53	1.06	0.97	0.08	1.03	0.74
Efficiency of Judiciary	-0.44	-0.21	0.04	-0.25	-0.04	-0.4	-0.02	-0.01	0.15
	0.28	0.13	0.07	0.26	0.22	0.33	0.04	0.25	0.11
Tax Compliance	-0.83**	-0.26	0.39	-0.32	-0.03	-0.88*	-0.01	-0.12	0.094
	0.38	0.25	0.16	0.27	0.33	0.44	0.07	0.36	0.20
Competition Laws	-2.97***	-2.74***	0.04	-1.17	-3.17***	-3.23***	-0.06	-2.37***	-1.47***
	0.61	0.53	0.06	0.93	0.43	0.87	0.10	0.71	0.54
Newspaper Circulation	-0.31	-0.03	0.66**	-0.44***	0.14	-0.54***	-0.06**	0.10	0.08
	0.21	0.21	0.30	0.15	0.20	0.19	0.02	0.21	0.12
Log GDP Capita	yes	yes	yes	yes	yes	yes	yes	yes	yes
Average Turnover	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cross List	yes	yes	yes	yes	yes	yes	yes	no	no
Log Asset	yes	yes	yes	yes	yes	yes	yes	no	no
Leverage	yes	yes	yes	yes	yes	yes	yes	no	no
Industry Controls	yes	yes	yes	yes	yes	yes	yes	no	no

Table 8: **Further Analysis of Disclosure Requirements**

Table displays the results of multivariate OLS regressions in a sample of 18,853 firms from 28 OECD member countries. The dependent variable is the log of the scaled firm beta. Firm beta is calculated with respect to Worldscope world index between 1998-12 and 2003-12 by using monthly returns. Independent variables are the sub indices of disclosure requirements and redistribution proxies that are explained in detail in Table 10. Control variables are log average GDP per capita between 1998-2003, average firm leverage between 1998-2003, log average firm asset size between 1998-2003, average market turnover between 1998-2003, 35 industry dummies (FTSE level 4) and a dummy that takes the value of 1 if the firm is cross listed in the U.S. and 0 otherwise. The second row gives the error terms which are robust and clustered by country.

	univariate	Multivariate Regressions						
Prospectus	-1.62**	-1.34***						-1.60***
	0.61	0.47						0.34
Compensation	1.41*		3.30*					-0.45
	0.75		1.81					1.12
Shareholders	-1.39**			-1.64***				-0.18
	0.61			0.40				0.31
Inside ownership	-0.56				-1.50			-2.09***
	1.04				1.28			0.55
Irregular contracts	-1.84***					-1.52***		-0.63***
	0.58					0.39		0.19
Transactions	-2.51**						-2.23***	-0.11
	1.05						0.81	0.42
Public Enforcement	no	yes	yes	yes	yes	yes	yes	yes
Competition Laws	no	yes	yes	yes	yes	yes	yes	yes
GDPCap	yes	yes	yes	yes	yes	yes	yes	yes
Cross List	yes	yes	yes	yes	yes	yes	yes	yes
Leverage	yes	yes	yes	yes	yes	yes	yes	yes
Log Asset	yes	yes	yes	yes	yes	yes	yes	yes
AvgTurn	yes	yes	yes	yes	yes	yes	yes	yes
Industry	yes	yes	yes	yes	yes	yes	yes	yes

Table 9: **Economic Significance**

The table quantifies the impact of improving the disclosure requirements index of country 1 to the level of disclosure requirements index of country 2 on the cost of equity of country 1. Second column shows the average beta of a firm located in country1. The third and fourth columns display the disclosure requirements score of the first and second countries, respectively. The columns 5,6 and 7 represent the equity premia of 4%, 6% and 8% respectively. The coefficient of disclosure requirements used in calculations come from multivariate regression at the country level to be conservative. Moreover, in country level regressions, I do not add minimum beta to the right hand side before taking the logarithm, which makes it easier to interpret economic impact.

Coefficient	Average Beta	Disclosure Req Score		Equity Premium		
-3.25	Country1	Country1	Country2	4.0%	6.0%	8.0%
				- Cost of Equity		
Greece to Japan	0.91	0.33	0.75	0.93%	1.39%	1.86%
Portugal to UK	0.4	0.42	0.83	0.42%	0.63%	0.84%
Belgium to France	0.58	0.42	0.75	0.79%	1.19%	1.59%
Turkey to US	2.27	0.5	1	1.79%	2.68%	3.58%

Table 10: **List of Variables**

Variables	**Definition**
Anti-director rights	This index of Anti-director rights is formed by adding one when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders Meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders Meeting is less than or equal to ten percent (the sample median); or (6) when shareholders have preemptive rights that can only be waved by a shareholders meeting. The range for the index is from zero to six. Source: La Porta et al. (1998). Pistor et al (2000) for Czech Republic and Poland.
Prospectus	Equals one if the law prohibits selling securities that are going to be listed on the largest stock exchange of the country without delivering a prospectus to potential investors; equals zero otherwise. From La Porta et al. (2005).
Compensation	An index of prospectus disclosure requirements regarding the compensation of directors and key officers. Equals one if the law or the listing rules require that the compensation of each director and key officer be reported in the prospectus of a newly-listed firm; equals one-half if only the aggregate compensation of directors and key officers must be reported in the prospectus of a newly-listed firm; equals zero when there is no requirement to disclose the compensation of directors and key officers in the prospectus for a newly-listed firm. From La Porta et al. (2005).
Shareholders	An index of disclosure requirements regarding the issuers equity ownership structure. Equals one if the law or the listing rules require disclosing the name and ownership stake of each shareholder who, directly or indirectly, controls ten percent or more of the issuers voting securities; equals one-half if reporting requirements for the Issuer's 10% shareholders do not include indirect ownership or if only their aggregate ownership needs to be disclosed; equals zero when the law does not require disclosing the name and ownership stake of the Issuer's 10% shareholders. No distinction is drawn between large-shareholder reporting requirements imposed on firms and those imposed on large shareholders themselves. From La Porta et al. (2005).

Table 10-Continued

Variables	**Definition**
Inside ownership	An index of prospectus disclosure requirements regarding the equity ownership of the Issuer's shares by its directors and key officers. Equals one if the law or the listing rules require that the ownership of the issuers shares by each of its director and key officers be disclosed in the prospectus; equals one-half if only the aggregate number of the issuers' shares owned by its directors and key officers must be disclosed in the prospectus; equals zero when the ownership of issuers' shares by its directors and key officers need not be disclosed in the prospectus. From La Porta et al. (2005).
Irregular contracts	An index of prospectus disclosure requirements regarding the issuers' contracts outside the ordinary course of business. Equals one if the law or the listing rules require that the terms of material contracts made by the Issuer outside the ordinary course of its business be disclosed in the prospectus; equals one-half if the terms of only some material contracts made outside the ordinary course of business must be disclosed; equals zero otherwise. From La Porta et al. (2005).
Transactions	An index of the prospectus disclosure requirements regarding transaction between the Issuer and its directors, officers, and/or large shareholders (related parties). Equals one if the law or the listing rules require that all transactions in which related parties have, or will have, an interest be disclosed in the prospectus; equals one-half if only some transactions between the Issuer and related parties must be disclosed in the prospectus; equals zero if transactions between the Issuer and related parties need not be disclosed in the prospectus. From La Porta et al. (2005).
Disclosure Requirements	The disclosure requirement index equals the arithmetic mean of disclosure scores from: (1) Prospectus; (2) Compensation; (3) Shareholders; (4) Inside ownership; (5) Irregular Contracts; (6) and Related Party Transactions. From La Porta et al. (2005).
Liability Standards	The index of liability standards equals the arithmetic mean of: (1) Liability standard for the issuer and its directors; (2) Liability standard for the distributor; and (3) Liability standard for the accountant. From La Porta et al. (2005).
Public Enforcement	The index of public enforcement equals the arithmetic mean of: (1) Supervisor characteristics index; (2) Rule-making power index; (3) Investigative powers index; (4) Orders index; and (5) Criminal index. From La Porta et al. (2005).

Table 10-Continued

Variables	Definition
Efficiency of the Judiciary	Assessment of the efficiency and integrity of the legal environment as it affects business, particularly foreign firms produced by the country risk rating agency International Country Risk (ICR). Average between 1980 and 1983. Scale from 0 to 10, with lower scores representing lower efficiency levels.
Tax compliance	Assessment of the level of tax compliance in 1995 . Higher scores indicate higher compliance. Data is from La Porta et al. 1999, based on the World Values Survey 1999.
Competition Laws	Response to survey question, ”competition laws prevent unfair competition in your country?” Higher scores suggest agreement that competition laws are effective. World competitiveness yearbook 1996. From Dyck and Zingales (2004)
Newspaper Circulation	Circulation of daily newspapers/population. UNESCO Statistical yearbook 1996, as reported in World Competitiveness Report, for Taiwan based on Editors and Publishers' Association Year Book and AC Nielsen, Hong Kong, as reported in ”Asian Top media-Taiwan”. www. business.vu.edu. From Dyck and Zingales (2004)