Do Regulations and Institutions Matter for the Cost of Equity?

M. Deniz Yavuz*

December 6, 2006

*deniz.yavuz@asu.edu, Arizona State University. I would like to thank Jonathan E. Ingersoll, Nicholas C. Barberis, Judith Chevalier, Benjamin Polak and Geert Rouwenhorst for their valuable comments. I benefited from discussions with Lauren Cohen, Martijn Cremers, William Goetzmann, Florencio Lopez de Silanes, Nagpurnanand R. Prabhala, Anna Pavlova, Heather E. Tookes, Johan Walden, Hongjun Yan and seminar participants at University of Alberta, Arizona State University, Cornell University, Indiana University, Ohio State University, Yale University, Lehman Brothers and Oak Hill Platinum Partners. I would also like to thank Andrew Karolyi for providing me data about cross-listed firms. All errors are mine.

Abstract

The corporate governance literature has argued that regulations and institutions that protect minority shareholders affect the cost of equity even in well integrated markets. This paper asks two important questions: why are investors unable to fully diversify the effect of these factors, and can we really identify their effect among several other country variables? I argue that regulations and institutions affect the redistribution of wealth between minority and controlling shareholders. Such redistribution shifts systematic risk from controlling to minority shareholders and the risk shifting effect is scaled by the size and growth volatility of the country. The effect of redistribution on the cost of equity can be identified because unlike other country specific risks, redistribution risk cannot be shared through international trade in goods. Redistribution also has implications for market development and how much a country can benefit from financial liberalization. I provide strong empirical evidence that regulations and institutions affect the cost of equity according to the estimation equation provided by my model.

1 Introduction

The corporate governance literature has provided evidence that country-specific regulations and institutions that protect minority shareholders from controlling shareholders and insiders affect the cost of equity (Bhattacharya and Daouk, 2002; Hail and Leuz, 2003; Garmaise and Liu, 2004; Daouk, Lee, and Ng, 2004) even in well-integrated markets.

Two fundamental questions regarding the importance of a country's regulations and institutions for the cost of equity remain unanswered. First, why can't investors diversify away these country specific risks in well-integrated markets? According to the standard asset pricing paradigm, there is no reason for country-specific risks to affect expected returns in integrated markets. Risks that directly affect output of companies can be fully diversified through goods trade and portfolio diversification. Second, how can we identify the effect of regulations and institutions on the cost of equity given that there are several other country specific risks? In cross country studies we have only limited number of observations and despite the best efforts it is impossible to control for every country specific variable that may affect the cost of equity. What makes regulations and institutions that protect minority shareholders special among several other country factors?

Although segmented markets hypothesis can explain why any country-specific risk is relevant, it is unlikely to explain the two questions above. Moreover, segmented markets hypothesis suggests that as the physical barriers for foreign portfolio investors are removed, the effect of regulations and institutions on the cost of equity will eventually disappear. However, if these factors are priced even in integrated markets then policy implication is different; regulators should take action to improve regulations and institutions that protect minority shareholders. Therefore it is important to understand whether regulations and institutions affect the cost of equity in integrated markets.

My main contribution is to provide a theory explaining why the effect of regulations and institutions on the cost of equity cannot be fully diversified even in integrated markets and why regulations and institutions are special and it is possible to identify their effect on the cost of equity. Under reasonable assumptions, regulations and institutions affect the redistribution of wealth from minority shareholders to controlling shareholders. 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 and controlling shareholders. Redistribution risk is priced even in integrated markets for two reasons. First, redistribution shifts systematic risk from controlling to minority shareholders. Second, unlike other country risks, redistribution risk cannot be shared through trade in goods, which also makes it possible to identify the effect of redistribution risk on the cost of equity.

The effect of redistribution on the systematic risk of minority shareholders is very similar to that of leverage. Redistribution shifts systematic risk from controlling to minority shareholders because minority shareholders receive residual cash flows after redistribution. As the level of redistribution increases the risk shifting increases. Better regulations and institutions decrease the risk shifting because they decrease the level of redistribution. These results will hold under reasonable assumptions: Regulations and institutions increase the marginal cost of stealing (Shleifer and Wolfenzon, 2002; LaPorta, de Silanes, Shleifer, and Vishny, 2002) and marginal benefit of redistribution slightly increase, does not change or decrease (Johnson, Boone, Breach, and Friedman, 2000) with the economic shocks. I argue that the empirical evidence provided by the literature is sufficient to justify these assumptions.

We can identify the effect of regulations and institutions on the cost of equity in integrated markets because redistribution risk cannot be shared through trade in goods unlike other risks that directly affect output. 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). 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. The prices of goods remain the same in equilibrium regardless of the extent of pure redistribution in the economy. Therefore, redistribution shocks to minority shareholders cannot be cushioned by changes in the prices of goods. This property mostly addresses the identification problem because the output risks are less likely to explain cross country differences in the cost of equity compared to redistribution risk.

I provide a closed form estimation equation for the relationship between redistribution and the cost of equity. Stocks located in countries with higher 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 the empirical section, I test whether several proxies for redistribution explain cross-sectional differences in the cost of equity. The empirical tests in this paper are different from the tests in the literature because I scale the effect of regulations and institutions on the cost of equity by the size and growth volatility of the country as predicted by the theory.

Segmented markets hypothesis predicts that regulations and institutions affect the beta with respect to country portfolio. On the other hand, redistribution affects not only beta with respect to country portfolio but also beta with respect to the world portfolio. In order to separate my argument from the segmented markets hypothesis, I focus on the effect of redistribution risk on the systematic risk of assets with respect to the world portfolio. I choose OECD member countries as my initial sample since these countries are less likely to have impediments to trade in goods and financial markets. I exogenously select variables from two recent related papers

(Dyck and Zingales, 2004; LaPorta, de Silanes, and Shleifer, 2005) to proxy for redistribution. 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 redistribution proxies are significant in explaining cross country differences in systematic risk in the predicted direction. The impact of redistribution 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 results are robust to different combinations of variables, other measures of the cost of equity, endogeneity tests, country or firm level tests and various samples.

My predictions are also in line with several seemingly unrelated findings in the international finance literature. Since the effect of redistribution on systematic risk cannot be fully diversified, the realized financial liberalization gains are lower than the expected gains (Stulz, 1999). Contrary to Cole and Obstfeld (1991), portfolio diversification is not redundant in perfectly integrated trade markets since redistribution risk cannot be shared through trade in goods. The effect of redistribution on the expected return of controlling shares can help explain variation in control premia (Nenova, 2003; Dyck and Zingales, 2004), PE ratios and the stock market capitalization across countries.

2 The Model

I introduce a simple international exchange economy model. My goal is to explain the economic intuition underlying the relationship between redistribution and the cost of equity. Moreover, I want to provide a closed form formula for this relationship so that it can be tested

in the data. Therefore, I ignore complications that do not provide any additional insight about the effect of redistribution on the cost of equity.

I use redistribution processes determined by local regulations and institutions to define the borders of countries. The classic way of differentiating international portfolio decisions from local portfolio decisions is to introduce imperfections in financial markets (Solnik, 1974; Stulz, 1981; Adler and Dumas, 1983). As Stulz (2005) points out, such models are not intended to explain why countries are relevant for the cost of equity when explicit barriers to financial markets are removed.

The economic structure is in the tradition of Lucas (1978). The fundamental parameters are the production processes of firms. Asset prices, exchange rates and interest rates are endogenously determined. 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. One firm in each country loads only on the country-specific and world-common shocks in order to ensure complete markets.[1] 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:

[1] This could be a well diversified firm such as postal services which will be affected only by country and world common shocks.

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

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.

The complete markets assumption allows us to have a representative agent economy.[2] The representative agents of all countries have the same consumption tastes and equal endowments. This 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 weights a_i denote the relative weights of goods in the consumption taste of the representative investor. The representative agent of country j maximizes the Cobb-Douglas utility function below:

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

[2]In complete markets, heterogeneity in initial endowments do not affect portfolio decisions of investors. Therefore consumption of all agents in the economy are perfectly correlated and a representative agent exists. This allows me to arrive at simple closed form solutions. The main predictions of the model does not rely on the complete markets assumption.

such that

$$\sum_{i=1}^{N} a_i = 1. \tag{2}$$

Papers using similar models include Zapatero (1995) and Pavlova and Rigobon (2003). In these papers, when agents have symmetric preferences, there is a peculiar equilibrium in which all assets perfectly comove due to risk sharing through trade. My contribution to this literature is to show that redistribution prevents such a peculiar equilibrium.

2.1 Redistribution Activity

I incorporate the social cost of redistribution by simply 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 establishing and maintaining shell firms and on hiring creative lawyers and accountants. The controlling agents get X percent of the output after subtracting the social cost of redistribution. Therefore X represents the level of pure redistribution, i.e., redistributed amount remaining after the social cost. The modeling approach for the social cost and the redistribution process greatly simplifies the calculation of stock prices but does not derive our conclusions. The output of the company is distributed in the following way:

$$\begin{aligned} \text{Minority Shareholder Share} &= Y_i(t)(1-k_i)(1-X_i(t)) \\ \text{Controlling Agent Share} &= Y_i(t)(1-k_i)X_i(t) \\ \text{Social Cost} &= Y_i(t)k_i \end{aligned} \tag{3}$$

The redistribution process may depend on the output levels, regulatory environment and firm-specific characteristics. The regulatory environment and firm characteristics, such as the industry of the firm, are stable compared to expected future cash flows. As a result, output shocks are the main drivers of changes in redistribution. The redistribution parameter X_i loads on the same economic shocks as the production of firm i does. 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:

$$dX_i(t) = X_i(t)(1-X_i(t))\boldsymbol{\sigma}_i^x \boldsymbol{d\omega}(t) \quad (4)$$

$$\boldsymbol{\sigma}_i^x = (..\delta_i^x, ..\delta_{ij}^x, \delta_{iw}^x) \quad (5)$$

In this formulation, X_i changes between 0 and 1, and $(E_t[X_i(T)] = X_i(t), T > t)$. This process ensures that, at a given time, the amount redistributed cannot be more than the output of the company, and that the controlling shareholder cannot create output himself.

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. Prices of goods are not affected by the redistribution parameter X, because pure redistribution does not affect the total goods available for consumption. Therefore, redistribution cannot be shared through trade, and it affects only the price process of the stock that is subject to redistribution. Redistribution causes cross-sectional variation in stock price processes. On the other hand, any output shock is perfectly shared through trade and cannot cause cross-sectional variation in the stock price process in integrated markets.

Our 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

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

The constraints ensure that the total consumption is equal to the total available output for each good. Define λ_i as 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, with state defined by the availability of goods

for consumption. The exchange rate between 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:

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

The equilibrium prices of goods λ_i are not affected by the redistribution, X. 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 output stolen by the controlling agent is still available for consumption and trade. As a result, pure redistribution does not have an effect on the equilibrium prices of goods. Therefore, shocks to redistribution cannot be cushioned by an opposite shock to prices of goods, which violates the risk sharing mechanism through trade.

Although redistribution X, 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 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 generates 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.

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 m located in country j with world wealth is:*

$$
\begin{aligned}
Cov_t\left(\frac{dS_m(t)}{S_m(t)}, \frac{dW_w(t)}{W_w(t)}\right) = \quad & A \qquad (1) \\
& + \left(\frac{\frac{\alpha_m a_m \delta_m}{Y_m(1-k_m)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta_m^x \qquad (2) \\
& + \left(\frac{\sum_{i \in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta_{mj}^x \qquad (3) \\
& + \left(\frac{\sum_{i=1}^{N} \frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta_{mw}^x \qquad (4)
\end{aligned}
\tag{10}
$$

and A is the common component, which is equal to:

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

The first component of Proposition 2is denoted by A, which is common to every stock in the world. The other three components represent the effect of redistribution risk on the cost of equity, which can be separated into three components based on the loading of the firm-specific redistribution activity on firm-specific shock, country shock and the world common shock. The following paragraphs discuss the magnitude of these components.

In the second component of the covariance, the multiplier of $X_m\delta_m^x$ represents the loading of Y_m on the firm-specific shock multiplied by the sum of the marginal utilities of consuming one good of company m divided by the sum of 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 marginal utility of consuming one good from all companies in the world should be very small. We can safely conclude that the second component of covariance is close to zero, since the number of companies in the world is very large. This indicates that we can effectively diversify the part of redistribution risk that loads on the firm-specific shock. Therefore, portfolio diversification is still useful in spite of perfect risk sharing through trade, contrary to Cole and Obstfeld (1991).

The third component of the covariance formula, which is related to the loading of redistribution activity on the country-specific shock, is not as easy to diversify away. The third component is approximately equal to one over the number of countries times 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. As a result, we expect this component to affect the cost of equity. Empirical evidence (Johnson, Boone, Breach, and Friedman, 2000; Baek, Kang, and Park, 2004; Mitton, 2002; Lemmon and Lins, 2003) also supports the argument that the loading of redistribution activity on the country shocks is important.

The fourth component of the covariance, which is related to the loading of redistribution activity on the world common shock, cannot be diversified away. However, we do not currently have empirical evidence that the loading of redistribution activity on the world common shock is important. Indeed, in the empirical section, I show that this component is not important for the effect of redistribution activity on the cost of equity.

I now summarize the effects of redistribution risk on the systematic risk of similar assets located in different countries. The following predictions stem 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.

Lemma 1. *Ceteris paribus, a stock has a higher beta with respect to world wealth if it has a higher absolute sensitivity of redistribution to country or world common shocks, i.e., higher* δ_i^x *or* δ_{iw}^x*, if it has a higher redistribution level,* X_i*, if it is located in a country with a higher loading of aggregate production on the country-specific shock, or if it is located in a country that has a higher aggregate contribution to the marginal utility of the representative investor.*

These are intuitive results. Higher absolute sensitivity of redistribution to economic shocks and higher level of redistribution increases the systematic risk shifted to minority shareholders as a result of redistribution. It is more difficult to diversify the risk of countries that have a higher loading of aggregate production to country shocks, and countries that have a higher contribution to the the utility of the representative investor, because these countries have a larger effect on the volatility of world wealth. Finally, minority shareholders demand higher compensation as the level of expropriation increases, because the level of redistribution affects the sensitivity of redistribution to economic shocks.

Regulations and institutions are going to be priced if they affect the level of redistribution and/or sensitivity of redistribution to economic shocks. The corporate governance literature

argues that better regulations and institutions decrease the cost of equity. Therefore, regulations and institutions should affect the redistribution process in such a way that loading of stock price on systematic risk due to redistribution should be positive and decreasing with better regulations.

Lemma 2. *Better regulations and instituions decrease the cost of equity, if the loading of stock price on economic shocks due to redistribution, i.e.* $-X_i\sigma_i^x$ *is positive and decreasing with better regulations and institutions.*

If the property in the above lemma holds then regulations and institutions will be priced in the predicted direction. Instead of just assuming this property, I discuss whether there is enough empirical evidence supporting the above relationship between redistribution and country specific regulations and institutions.

2.4 Is There Enough Empirical Evidence?

First, I briefly review the literature describing the relationship between redistribution and regulations and derive the economic conditions underlying empirical results. Afterwards, I show that we actually need weaker economic assumptions than the ones implied by the empirical evidence.

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 country factors that mitigate redistribution s and firm specific characteristics f. The controlling shareholder maximizes the utility function below:

$$Max \quad U = B(g, r(Y)) - C(g, s, f) \tag{11}$$

I assume that the cost of redistribution is increasing and convex in the amount stolen ($C_g > 0$, $C_{gg} > 0$), that the cost of redistribution increases with better regulations ($C_s > 0$), that utility increases linearly in the amount stolen ($B_g > 0$, $B_{gg} = 0$), and that investment opportunities are higher when the current output is higher ($r_Y > 0$).

We can draw three conclusions from the corporate governance literature that examines the relationships among the amount of redistribution, regulations and economic shocks: 1) The amount of redistribution is negatively correlated with country-level economic shocks or investment opportunities (Johnson, Boone, Breach, and Friedman, 2000)[3]; 2) Better regulations decrease the amount of expropriation (Shleifer and Wolfenzon, 2002; LaPorta, de Silanes, Shleifer, and Vishny, 2002); 3) Weaker regulations make 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). These conclusions arise under certain economic assumptions, which are summarized in the following lemma.

Lemma 3. *1) The amount of redistribution and output are negatively correlated provided that $B_{gr} < 0$; that is, if the marginal benefit of the amount redistributed decreases as the return on investment opportunities increases. 2) Better regulations decrease the amount of expropriation provided that $C_{gs} > 0$; that is, if better regulations increase the marginal cost of stealing. 3) Weaker regulations make the amount of redistribution more sensitive to economic shocks in absolute terms (i.e. $\frac{\partial(\frac{\partial g}{\partial r})}{\partial s} > 0$) provided that $-\frac{u_{gg}}{u_g} > -\frac{v_{gg}}{v_g}$, and $u = C_g$ and $v = C_s$; that is, if the*

[3]Controlling shareholders may use private funds to benefit minority shareholders (Friedman, Johnson, and Mitton, 2003) at times of negative shocks. This implies a positive correlation between economic outlook and redistribution. However, this will only happen 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 negative correlation between X and production shocks over a long period of time.

marginal cost of stealing is more concave than the marginal cost of regulations in the amount of redistribution according to the Arrow-Pratt measure of absolute risk aversion.

The economic conditions described in Lemma 3 are sufficient but not necessary for regulations and institutions to affect the cost of equity in the desired direction. We actually need much weaker assumptions.

Lemma 4. *Better regulations and institutions decrease the cost of equity provided that: 1)* $B_{gr} < \frac{XC_{gg}}{r_Y}$*, that is, if the marginal benefit of redistribution decreases, does not change, or does not increase quickly with better economic outlook. 2)* $C_{gs} > 0$*, that is, if regulations and institutions increase the marginal cost of stealing. 3) The sensitivity of the percent redistributed to economic shocks increases, does not change or does not decrease quickly with regulations, such that:*

$$\frac{\partial(\frac{\partial X}{\partial Y})}{\partial s} > \frac{C_{gs}}{C_{gg}XY}(\frac{B_{gr}r_Y}{C_{gg}Y} - \frac{X}{Y}). \tag{12}$$

The first and third property in Lemma 4 are more general than the corresponding properties in Lemma 3. The third property in Lemma 4 holds even if the sensitivity of redistribution to economic shocks is not affected by regulations or if the amount of redistribution is not correlated with the economic shocks [4]. For example, a CEO who uses a company jet for personal trips regardless of output shocks, and who cuts back on his use of the jet after the minority shareholder rights improve, satisfies all three properties in Lemma 4. Therefore current empirical evidence is more than sufficient to justify assumptions required for regulations and institutions to affect the cost of equity in the desired direction.

[4] Lemma 4 does not describe all economic conditions under which regulations and institutions are priced. For example, $C_{gs} > 0$ could be weakened by strengthening the third property. I choose to assume that regulations and institutions increase the marginal cost of stealing.

2.5 The Link Between the Theory and Empirical Predictions

The main prediction depends 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 depending on observable factors.

There is substantial empirical evidence implying that country-level economic shocks are important for redistribution activity (Johnson, Boone, Breach, and Friedman, 2000; Baek, Kang, and Park, 2004; Mitton, 2002; Lemmon and Lins, 2003). Initially, I assume that the loading of redistribution activity on country shocks is more important than the loading of redistribution activity on the world common shock. Later, I will show that this conjecture is supported by the data. Since I expect that the component of redistribution activity that is correlated with country-specific shock is more likely to be priced, I focus on the third component of the equation in Proposition 2.

$$Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}) = A + (\frac{\sum_{i\in N_j} \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N} \frac{\alpha_i a_i}{Y_i(1-k_i)}}) X_i \delta_{ij}^x \tag{13}$$

Given $\frac{Ka_i}{Y_i(1-k_i)}$ is the Arrow-Debreu state price for good i, and Y_i is the total output of good i and assuming that weights 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 the third component of covariance of S_i with world wealth as follows[5]:

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

$$Cov_t(\frac{dS_i(t)}{S_i(t)}, \frac{dW_w(t)}{W_w(t)}) = A + \frac{GDP_j \delta_j}{GDP_w} X_i \delta_{ij}^x \tag{14}$$

[5]I obtain a crude measure of size because I do not allow α_i to change over time, which complicates the calculation of stock prices.

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 and $X_i\delta^x_{ij}$ is a function of regulations and firm specific characteristics given that the properties in Lemma 4 hold.

The formula 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 larger and more volatile countries account for larger fraction of variation in world wealth. We do not directly observe the level of redistribution multiplied by the loading of redistribution on country level shocks $X_i\delta^x_{ij}$ for each firm. However, we know that this term is a function of country-level regulations and institutions if the economic conditions in Lemma 4 hold. Therefore, I use regulations and institutions as proxies for $X_i\delta^x_{ij}$.

2.6 Implications for Financial Markets

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

Redistribution risk cannot be shared through trade. Proposition 2 shows that we can diversify the component of covariance caused by the loading of redistribution activity on firm-specific shocks. Contrary to Cole and Obstfeld (1991), portfolio diversification is still useful in integrated trade markets.

The model explains why countries cannot fully benefit from financial market liberalizations (Stulz, 1999) and why the risk sharing effect of financial liberalization is weaker for developing countries (Bekaert, Harvey, and Lundblad, 2004). I argue that countries with redistribution risk cannot realize full benefits because redistribution risk cannot be fully eliminated

by financial liberalization. We will overestimate financial liberalization gains by using differences in the covariance of the stocks with the country portfolio and the world market portfolio. Ceteris paribus, the overestimation is larger for countries with higher levels of redistribution X and higher loading of redistribution on country-specific shock δ_j^x.

When there is redistribution, not only is the amount expropriated no longer available to minority investors, but also, cash flows are discounted at higher rates. As a result, the relative size of the stock market with respect to the size of the overall economy should be smaller LaPorta, 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 shareholders and decreases the discount rate for the controlling shareholder. Small differences in discount rates result in large differences in valuations, which might help explain large control and voting rights premia (Nenova, 2003; Dyck and Zingales, 2004; Barclay and Holderness, 1989).

In the presence of redistribution, the aggregate beta of the world stock market with respect to world wealth is larger than 1, implying that redistribution increases the equity premia of the aggregate stock market. The intuition is simple. Redistribution divides world wealth into two parts; the part received by minority shareholders has higher systematic risk than the part received by controlling shareholders.

3 Empirical Tests

In this section, I test the main hypothesis of my model, 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 segmented markets hypothesis, I focus on the effect of

regulations on the systematic risk instead of returns. The segmented markets hypothesis also predicts 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, regulations and institutions affect returns through the systematic risk of stocks with the world portfolio.

Policy implications of segmented markets and my theory are very different. If regulations and institutions are priced because of segmented markets, as markets gets integrated the problem will disappear. However according to my theory regulators have to take action to decrease the cost of equity because redistribution is going to be priced even in perfectly integrated markets.

My goal is to understand whether redistribution proxies explain the variation in the systematic risk of similar stocks located in different countries. Given conditions in Lemma 4 hold, $-X_i\delta_{ij}^x$ is a decreasing function $\varphi(RI_j, f_i, c_j)$ of regulations and institutions RI_j, firm specific characteristics f_i and country control variables c_j. However, specific form of this function depends on further assumptions and hence unclear. As a first approximation I assume that φ is either linear or exponential function of the regulations and institutions. The dependent variable is the firm beta with respect to the world market portfolio, divided by the relative GDP of the country with respect to the aggregate world GDP and the standard deviation of the GDP growth of the country. The main estimation equation is as follows:

$$\frac{\beta_i}{\frac{GDP_j\delta_j}{GDP_w}} = \varphi(RI_j, f_i, c_j) + \varepsilon_{ij} \tag{15}$$

3.1 Description of Data and Variables

The initial sample contains firms from the OECD member countries. This sample provides me with an uncontroversial way of choosing well integrated countries and mitigates the possibility of sample selection bias. To make sure that these countries do not have impediments to trade and financial flows, I check market liberalization dates from Kaminsky and Schmukler (2002), Bekaert and Harvey (2000) and Henry (2000). All the countries in the sample liberalized their markets before January 1999 (the latest being South Korea in January 1999). Later, I use different samples to test the robustness of my results.

The OECD comprises 30 member countries that produce 60% of the world's goods and services. I obtain information for 28 of them from Thomson Datastream. I exclude Iceland and Slovakia because of lack of full accounting and return information at Thomson Datastream. I use yearly accounting and monthly return information for the ten years between December 1993 and December 2003 using Worldscope country lists. Since most proxies for redistribution risks belong to the late 1990s, and many emerging economies liberalized their markets in the early 1990s, I initially limit attention to the five-year period between December 1998 and December 2003.

I require each firm to have data for country, industry membership, total stock return, asset, debt and market value. Moreover, each firm must have at least 24 months of total return information between 1998-2003 to be included in the sample. In order to avoid large estimation errors, I eliminate dead and delisted firms and truncate the firms that have the highest 1% and the lowest 1% beta in the world sample. I end up with 18,853 firms in the OECD sample and 23,457 firms in the world sample.

Panel A of Table 3 displays the distribution of firms with respect to countries and the average country betas. The average country betas are significantly different from one another, indi-

cating that country-specific factors could be important in explaining cross-sectional variation in systematic risk, just as they are important in explaining returns (Heston and Rouwenhorst, 1994).

Redistribution activity may depend on several country-specific factors such as rules and regulations, law enforcement and extra-legal institutions. Several variables suggested by the literature can be used to proxy for the redistribution risk, which introduces the possibility of variable selection bias. In order to prevent variable selection bias, I use all variables that are important in two recent related papers Dyck and Zingales (2004) and LaPorta, de Silanes, and Shleifer (2005).

LaPorta, de Silanes, and Shleifer (2005) analyze the effect of securities regulation on market capitilization and development. Markets that have higher redistribution should have smaller market size with respect to GDP. I use all variables that are significant in explaining the market capitalization in the Table 4 of LaPorta, de Silanes, and Shleifer (2005). 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. Higher redistribution implies higher private benefits. Therefore I choose extra-legal variables that are significant in explaining private benefits from Table 9 of Dyck and Zingales (2004)[6], which are "tax compliance", "competition laws" and "newspaper circulation/population". I provide the detailed descriptions of all variables in Table 10.

Redistribution proxies are not available for every country. Table 2 summarizes the data availability for each sample and redistribution proxy. In the OECD sample, several redistribution proxies are missing for Luxembourg, Poland, the Czech Republic and Hungary.

[6]Except religion which I use as an instrumental variable in testing the exogeneity of other variables.

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 firm-level and country characteristics that may affect stock betas and the loading of redistribution on economic shocks. 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 shareholders. 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 firms for two reasons. First, the loading of expropriation activity on production shocks will vary across industries. For example, a utility company might have more observable expenses and cash flows compared to those of a high-tech company, making it difficult to change the level of expropriation with respect to economic shocks. Second, in a world where there is no perfect risk sharing, production characteristics affect systematic risk and returns (Roll, 1992; Griffin and Stulz, 2001). Panel B of Table 3 shows the industrial distribution of firms and average betas for industries. Significant variation in industry betas 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. If large firms are followed by more analysts firm size may affect loading of redistribution activity on economic shocks. I control for the average total assets between 1998-2003.

I include a dummy variable for cross-listed firms in the U.S. using the data provided by Doidge et al. (2004a). Cross-listed firms may adhere to the regulations of the host country

(Stulz, 1999; Coffee, 1999) and commit not to expropriate minority shareholders. Market characteristics may also affect the systematic risk of stocks. I use average turnover of the market for the sample period to control for market liquidity.

3.2 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 and I achieve more significant results[7]. Except newspaper circulation and public enforcement all variables are significant in the predicted direction, indicating that there is a significant relationship between the systematic risk of firms and the redistribution proxies.

In general, richer countries have higher-quality institutions and law enforcement, which could be more effective in decreasing redistribution risks regardless of the content of regulations (North, 1981; LaPorta, de Silanes, Shleifer, and Vishny, 1999). I include log GDP per capita as a control variable in the log specification to understand whether proposed proxies account for redistribution risk above and beyond what is explained by the income level of the country. After controlling for log GDP per capita, efficiency of judiciary is no longer significant.

I cannot quantify the economic impact of redistribution on the cost of equity without multivariate analysis. It is quite possible that a group of factors work together to minimize the effect of redistribution on systematic risk. I follow the approach of Dyck and Zingales (2004)

[7] Before taking the logarithm I add minimum beta to the numerator, since beta can be negative.

to identify a group of important variables; I first use redistribution proxies within the same category in a regression, select the significant ones and include them in the final regression. 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. The selected variables account for most of the variation in the systematic risk of firms. Control variables can only explain 38% of variation, while selected variables and control variables together explain 88% of the variation.

The variable selection method introduces variable selection bias because I do not run regressions with all possible combinations of the variables. In order to address this concern, I use all variables together in the Column 4 of Table 5. The selected variables; disclosure requirements, public enforcement and competition laws maintain their significance levels. Moreover increase in explanatory power is marginal implying that the selected variables explain most of the variation in the dependent variable.

It might seem surprising to find that public enforcement has a positive and significant marginal effect on systematic risk. One possible explanation is that OECD member countries are sufficiently efficient in decreasing redistribution risks through private enforcement 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.

The results of Table 4 strongly support main prediction of the theory. Although, I exogenously select variables, six out of eight variables are significant in the predicted direction. Multivariate analysis reveals which variables are more important. However, I prefer to address several potential concerns before making any policy recommendations.

3.3 Alternative Hypothesis and Robustness Tests

I emphasize robustness rather than economic impact in identifying variables for policy recommendation because of the possible problems in cross-country studies. In cross-country studies the number of countries is limited, which reduces the number of control and explanatory variables that can be used. In the cross-country growth literature, Levine and Renelt (1992) show that results based on regressions with few variables are not robust and small alterations in explanatory variables overturn past results. Therefore, I cannot use only economic significance to identify important policy variables.

3.3.1 Country Level Results

By conducting tests at the firm level, I can control for firm-level characteristics that affect either the loading of redistribution on economic shocks or the beta of the firm. However, error terms ε_{ij} 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 maintain their significance in explaining the systematic risk of stocks. I do not control for the characteristics of country indexes therefore it is not surprising to see that significance levels are slightly lower in the country level tests.

3.3.2 Are Redistribution Proxies Endogenous?

Endogeneity is a major concern for this study. For example, there is a possibility that securities regulations that improve disclosure requirements are adopted only in countries where such

disclosure actually matters, and that 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 regulations that improve the power of the regulator. In this case, it would be incorrect to conclude that improving disclosure requirements will decrease the cost of equity.

I employ an instrumental variables approach in Table 6, using British legal origin (LaPorta, 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. Therefore at least statistically we can reject the endogeneity of these variables in explaining systematic risks of stocks.

I employ the Anderson LR statistics for the relevance of the instruments and also 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 statistics 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.

3.3.3 Are the Results Explained by Various 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 by excluding 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. Table 7 column 4 shows that differences between developing and developed countries do not drive the results.

3.3.4 Robustness of Results for Various Samples

I use OECD member countries and the period from 1998-2003 to make sure that there are no significant barriers for international trade and portfolio investment in the sample countries. 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. In this section, I test the robustness of the results for various sub-samples.

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

My predictions hold for all samples except for the non-OECD developing country sample. The countries in this sample might be segmented from the world. For example, Malaysia has physical barriers to foreign portfolio investors. The systematic risk with the world market may not be the right measure for these countries. 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.

3.3.5 Loading of Redistribution on World Common Shock

I argued that the loading of redistribution on the world common shock is probably much smaller than the loading of redistribution on country-specific shock. In order to investigate whether my conjecture holds, I calculate the beta of each firm with respect to a modified world portfolio that excludes the country of the firm. 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. 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 three variables are significant and none of the variables are significant when GDP per capita is excluded (not reported).

3.3.6 Model Uncertainty

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. There could be other factors and using only systematic risk may not properly represent the cost of equity. One way to account for model uncertainty is to use a model independent proxy for the cost of equity. Therefore, I use a model independent proxy for the cost of equity to measure the effect of redistribution. I use country-level implied cost of capital data from Hail and Leuz (2003). The cost of capital is estimated by using market valuations and analysts' forecasts of future cash flows. Table 5 column 5 shows that results are robust.

3.3.7 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 we have considerable variation in the size of countries, scaling may affect the variable selection. Variables that are correlated with country size and growth volatility has a higher chance of being significant.

In column 8 of Table 7, I use one over relative GDP times the standard deviation of GDP growth as the dependent variable instead of the scaled beta. None of the coefficients is significant except competition laws and disclosure requirements. In the world sample, disclosure requirements becomes insignificant but competition laws variable is again significantly correlated with the scale. Moreover, 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, disclosure requirements 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, disclosure requirements continues to be significant when US is excluded from the sample.

I conclude that scaling is not important in 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. Disclosure requirements is positively correlated with the scaling variable, but its significance is not solely determined by scaling. However, significance of competition laws is largely explained by its correlation with the scale.

3.4 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 find that the disclosure requirements index is important in explaining the imputed cost of equity (Hail and Leuz, 2003) and the development of markets (La Porta et al., 2005). 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 shareholders by the controlling shareholders, which explains why these variables are significant. Shareholder disclosure measures the extend of transparency about the shareholder structure of the firm, which could also be important for redistribution by the controlling shareholders. Delivering a prospectus might be important because it is an affirmative step in making disclosure to investors.

In general, results indicate that disclosure requirements that are specific to the items related to the expropriation of minority shareholders by controlling shareholders are important in decreasing the cost of capital. Sub-indices that are related to managers such as disclosure related to managerial compensation and equity ownership does 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 few developed markets.

3.4.1 Economic Significance of the Policy Recommedation

Given that redistribution risks are important for the cost of capital, regulators should take measures to mitigate redistribution risk. I quantify the impact of improving disclosure requirements index of the stock exchange on the cost of equity.

Assuming that the international CAPM holds, Table 9 displays the effect of the disclosure requirements index on the cost of equity. Depending on our assumption about equity premia, the last three columns show the expected decrease in the cost of equity when I increase the level of the disclosure requirements index of the first country to that of the second country. I match countries in the lowest quartile with countries in the highest quartile of the disclosure requirements index. The impact of improving disclosure requirements on the cost of equity is

up to 3%, which is economically significant. Assuming that the cost of equity of a firm is 10 %, a reduction of 2% in the cost of equity increases firm value by about 25%.

4 Conclusion

This paper justifies the emphasis of the corporate governance literature on regulations and institutions 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 redistribution risk determined by country-level regulations and institutions increases the systematic risk of firms. Moreover this effect is scaled by the relative size and standard deviation of the country growth. Univariate test results justify the theory by showing that most of the proxies for redistribution risk are significant determinants of systematic risk.

The empirical results suggest that regulators should focus on improving securities regulations that determine disclosure requirements related to the expropriation of minority shareholders by the controlling shareholders. After showing that redistribution explains cross-sectional differences in the implied cost of capital and realized returns, I quantify the economic impact of my policy recommendation. For example, improving the disclosure requirements of Belgium to the level of the disclosure requirements of France will decrease the cost of equity of Belgian firms by 1.2% if the equity premium is 6%. The results are robust to different combinations of variables, endogeneity tests, multicollinearity, index-level tests, various samples, and choice of time period.

Several papers link the financial and capital market development to economic growth.[8] It is not hard to imagine that a decrease in the cost of equity may result in larger financial and capital markets. Therefore, this paper supports a link between regulatory and institutional development and economic growth.

[8]Rajan and Zingales (1998); Demirguc-Kunt and Maksimovic (1998); Levine and Zervos (1998); Wurgler (2000); Beck, Demirguc-Kunt, and Levine (2003); Beck, Demirguc-Kunt, and Maksimovic (2004)

References

Adler, M., and B. Dumas, 1983, "International portfolio selection and corporation finance: A synthesis," *The Journal of Finance*, 46, 925–984.

Baek, J., J. Kang, and K. Park, 2004, "Corporate Govrnance and Firm Value: Evidence from the Korean Financial Crises," *Journal of Financial Economics*, 71, 265–313.

Bansal, R., and M. Dahlquist, 2002, "Expropriation Risk and Return in Global Equity Markets," *working paper*.

Barclay, M. J., and C. G. Holderness, 1989, "Private Benefits from COntrol of Puclic Corporations," *Journal of Financial Economics*, 25.

Beck, T., A. Demirguc-Kunt, and R. Levine, 2003, "Law, Endowments, and Finance," *Journal of Financial Economics*, 70.

Beck, T., A. Demirguc-Kunt, and V. Maksimovic, 2004, "Financial and Legal Constraints to Firm Growth: Does Firm Size Matter?," *Journal of Finance*, 60.

Bekaert, G., C. R. Harvey, and C. Lundblad, 2004, "Growth Volatility and Financial Liberalization," *Working Paper*.

Bhattacharya, U., and H. Daouk, 2002, "The World Price of Insider Trading," *Journal of Finance*, 57, 75–108.

Brown, S., W. Goetzmann, and S. Ross, 1995, "Survival," *Journal of Finance*, 50, 853–873.

Coffee, J., 1999, "The future as history: the prospects for global convergence in corporate governance and its implications," *Northwestern University Law Review*, 93, 641–708.

Cole, H., and M. Obstfeld, 1991, "Commodity trade and international risk sharing: How much do financial markets matter," *Journal of Monetary Economics*, 28, 3–24.

Cox, J. C., and C.-F. Huang, 1989, "Optimal consumption and portfolio policies when asset prices follow a diffusion process," *Journal of Economic Theory*, 49, 33–83.

Daouk, H., C. M. Lee, and D. T. Ng, 2004, "Capital Market Governance: Do Securities Laws Affect Market Performance?," *Working Paper*.

Demirguc-Kunt, A., and V. Maksimovic, 1998, "Law, Finance and Firm Growth," *Journal of Finance*, Vol 53, No. 6.

Dyck, A., and L. Zingales, 2004, "Private benefits of control: an international comparison," *Journal of Finance*.

Friedman, E., S. Johnson, and T. Mitton, 2003, "Propping and Tunneling," (9949).

Garmaise, M., and J. Liu, 2004, "Corruption, Firm Governance, and the Cost of Capital," *working paper*.

Griffin, J. M., and R. Stulz, 2001, "International Competition and Exchange Rate Shocks: A Cross-Country Industry Analysis of Stock Returns," *Review of Financial Studies*, 14.1, 215–241.

Hail, L., and C. Leuz, 2003, "International Differences in Cost of Capital: Do Legal Institutions and Securities Regulations Matter," *working paper*.

Henry, P., 2000, "Stock market liberalization, economic reform, and emerging market equity prices," *Journal of Finance*, 55, 529–564.

Heston, S. L., and K. Rouwenhorst, 1994, "Does industrial structure explain the benefits of international diversification," *Journal of Financial Economics*, 36, 3–27.

Johnson, S., P. Boone, A. Breach, and E. Friedman, 2000, "Corporate governance in the Asianfinancial crisis," *Journal of Financial Economics*, 58, 141–186.

Karatzas, I., J. P. Lehoczky, and S. E. Shreve, 1987, "Optimal Portfolio and Consumption Decisions for a "Small Investor" on a Finite Horizon," *SIAM Journal of Control and Optimization*, 25(6), 1557–1586.

Lang, M. H., K. V. Lins, and D. P. Miller, 2004, "Concentrated Control, Analyst Following, and Valuation: Do Analysts Matter Most When Investors Are Protected Least?.," *Journal of Accounting Research*, 42:3, 589–623.

LaPorta, R., F. L. de Silanes, and A. Shleifer, 2005, "What Works in Securities Laws," *Journal of Finance*, forthcoming.

LaPorta, R., F. L. de Silanes, A. Shleifer, and R. W. Vishny, 1997, "Legal determinants of external finance," *The Journal of Finance*, 52, 1131–1150.

——— , 1998, "Law and Finance," *Journal of Political Economics*, 106, 1113–1155.

——— , 1999, "Corporate Ownership around the World," *The Journal of Finance*, 54, 471–517.

——— , 2002, "Investor Protection and Corporate Valuation," *Journal of Financial Economics*, 58, 3–27.

Lemmon, M., and K. V. Lins, 2003, "Ownership Structure, Corporate Governance, and Firm Value: Evidence from the East Asian Financial Crises," *Journal of Finance*, 4, 1445–1468.

Levine, R., and D. Renelt, 1992, "A Sensitivity Analysis of Cross-Country Growth Regressions," *The American Economic Review*, Vol.82.

Levine, R., and S. Zervos, 1998, "Stock Markets, Banks, and Economic Growth," *American Economic Review*, 88(3), 537–58.

Lucas, R. E., 1978, "Asset prices in an exchange economy.," *Econometrica*, 46, 1429–1445.

Mitton, T., 2002, "A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis," *Journal of Financial Economics*, 64, 215–241.

Nenova, T., 2003, "The value of corporate voting rights and control: A cross-country analysis," *Journal of Financial Economics*, 68, 325–351.

North, D., 1981, "Structure and change in economic history," *W.W. Norton and Company, New York, NY.*

Pavlova, A., and R. Rigobon, 2003, "Asset Prices and Exchange Rates," *NBER Working Paper Series*, No:9834.

Rajan, R. G., and L. Zingales, 1998, "Financial Dependence and Growth," *The American Economic Review*, June.

Roll, R., 1992, "Industrial Structure and the Comparative Behavior of International Stock Market Indices," *Journal of Finance*, XLVII, 3–41.

Shleifer, A., and D. Wolfenzon, 2002, "Investor Protection and Equity Markets," *Journal of Financial Economics*, 66, 3–27.

Solnik, B., 1974, "An Equilibrium Model of the International Capital Market," *Journal of Economic Theory*, 8, 500–524.

Stulz, R., 1999, "Globalization, corporate finance, and the cost of capital," *Journal of Applied Corporate Finance*, 12, 8–25.

Stulz, R. M., 1981, "On the effects of barriers to international asset pricing," *The Journal of Finance*, 25, 783–794.

——— , 2005, "The Limits of Financial Globalization," *ECGI Working Paper Series in Finance*, 75/2005.

Stulz, R. M., and R. Williamson, 2003, "Culture, openness, and finance," *Journal of Financial Economics*, 70, 313–349.

Wurgler, J., 2000, "Financial markets and the allocation of capital," *Journal of Financial Economics*, 58.

Zapatero, F., 1995, "Equilibrium Asset Prices and Exchange Rates," *Journal of Economic Dynamics and Control*.

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 Lemma 2 and 3

The controlling agent maximizes: $Max_X U = B(g, r(Y)) - C(g,s)$, such that $g = XY, C_g > 0, C_{gg} > 0, C_s > 0, B_g > 0, B_{gg} = 0, B_r > 0, r_Y > 0$. 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 condition, 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.

For the percent of redistribution to be negatively correlated with output shocks. Differentiating first order condition with respect to Y I get: $\frac{\partial X^*}{\partial Y} = \frac{B_{gr}r_Y}{C_{gg}Y} - \frac{X}{Y}$ 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. The second condition is the same with Lemma 3. Now let's find the assumption required for conditions in Lemma 4 to hold. For the property to hold 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 $-\frac{u_{gg}}{u_g} > -\frac{v_{gg}}{v_g}$

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.

$$\beta_i = 1 + \frac{(\frac{\sum_{i\in N_n}\frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})X_m\delta^x_{mn} + (\frac{\sum_{i=1}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})X_m\delta^x_{mw}}{\sum_i^N(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^{N}\frac{\alpha_m a_m}{Y_m(1-k_m)}})^2 + \sum_j^K(\frac{\sum_{i\in N_j}\frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})^2 + (\frac{\sum_{i=1}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})^2} \tag{16}$$

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.

$$\begin{aligned} Cov_t(\frac{dS_{xi}(t)}{S_{xi}(t)}, \frac{dW_w(t)}{W_w(t)}) &= A - \sum_i^N(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^{N}\frac{\alpha_m a_m}{Y_m(1-k_m)}})(1-X_i)\delta^x_i \\ &- (\frac{\sum_{i\in N_j}\frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})(1-X_i)\delta^x_{ij} \\ &- (\frac{\sum_{i=1}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}})(1-X_i)\delta^x_{iw} \end{aligned} \tag{17}$$

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:

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

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:

$$\begin{aligned}Cov_t\left(\frac{dS_m(t)}{S_m(t)}, \frac{dW_j(t)}{W_j(t)}\right) &= \sum_i^{N_j}\left(\frac{\frac{\alpha_i a_i \delta_i}{Y_i(1-k_i)}}{\sum_{m=1}^{N_j}\alpha_m \frac{a_m}{Y_m(t)(1-k_m)}}\right)^2 \\ &+ \left(\frac{\sum_{i=1}^{N_j}\frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N_j}\alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}\right)^2 \\ &+ \left(\frac{\sum_{i=1}^{N_j}\alpha_i \frac{a_i \delta_{wi}}{Y_i(t)(1-k_i)}}{\sum_{i=1}^{N_j}\alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}\right)^2 \\ &+ \left(\frac{\frac{\alpha_m a_m \delta_m}{Y_m(1-k_m)}}{\sum_{i=1}^{N}\alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}\right) X_m \delta_m^x \\ &+ \left(\frac{\sum_{i=1} N_j \frac{\alpha_i a_i \delta_{ij}}{Y_i(1-k_i)}}{\sum_{i=1}^{N}\alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}\right) X_m \delta_{mn}^x \\ &+ \left(\frac{\sum_{i=1}^{N_j}\alpha_i \frac{a_i \delta_{wi}}{Y_i(t)(1-k_i)}}{\sum_{i=1}^{N_j}\alpha_i \frac{a_i}{Y_i(t)(1-k_i)}}\right) X_m \delta_{mw}^x\end{aligned} \tag{18}$$

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

$$\begin{aligned}Cov_t\left(\frac{dS_m(t)}{S_m(t)}, \frac{dW_w(t)}{W_w(t)}\right) &= \left(\frac{\sum_{i=1}^{N_j}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i=1}^{N_j}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) * \left(\frac{\sum_{i\notin N_j}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i\notin N_j}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) \\ &+ \left(\frac{\sum_{i\notin N_j}^{N}\frac{\alpha_i a_i \delta_{wi}}{Y_i(1-k_i)}}{\sum_{i\notin N_j}^{N}\frac{\alpha_i a_i}{Y_i(1-k_i)}}\right) X_m \delta_{mw}^x\end{aligned} \tag{19}$$

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		Log	
Antidirector Rights	-6.47	**	-0.59	***	-0.40	***
	2.58		0.15		0.14	
Disclosure Requirements	-66.07	**	-4.85	***	-3.70	***
	25.30		1.20		1.33	
Liability Standards	-29.13	*	-2.42	***	-1.44	*
	16.73		0.88		0.75	
Public Enforcement	-4.86		-0.14		1.12	
	14.86		1.34		1.03	
Efficiency of Judiciary	-6.76	**	-0.68	***	-0.44	
	2.53		0.13		0.28	
Tax Compliance	-13.07	**	-1.23	***	-0.83	**
	6.08		0.34		0.38	
Competition Laws	-45.08	***	-3.09	***	-2.97	***
	11.62		0.34		0.61	
Newspaper Circulation	0.16		-0.21		-0.31	
	3.77		0.27		0.21	
Average Turnover	yes		yes		yes	
Log Asset	yes		yes		yes	
Leverage	yes		yes		yes	
Industry Controls	yes		yes		yes	
Crosslist Dummy	yes		yes		yes	
Log GDP Capita	no		no		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 (2003). 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
	Overidentifying/ Relevance Tests		
Hansen J Statistics (p value)	0.13	0.19	0.11
Anderson LR Statistics (p value)	0.00	0.00	0.00

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.

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).
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).

Table 10-Continued

Variables	Definition
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).
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)