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The Cost of Insecure Property Rights: R^2 Revisited

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Abstract

In the conventional CAPM model only a single risk factor is considered. However, using a world market portfolio to estimate systematic risk in national portfolios little of the required rate of return is explained in developing as compared to developed countries. Adding a factor representing institutional risk the predictive power increases substantially. By stressing importance of property and investor rights in this fashion, we add to the research on international differences in R^2 initiated by Morck et al. (2000). Our findings are consistent with the hypothesis that stock price synchronicy depends on the institutional quality.

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1. Introduction

In the required rate of return on investments a special risk premium labeled institutional risk should be included. Different countries present different institutional risks for investors. The various risk factors tied to the institutional framework set the rules of the game facing the investors. La Porta et al (1997) find that the origin of legal systems and the strength of investor protection determine the size of capital markets. In line with these findings Gugler et al. (2004) conclude that the origin of the legal system is the single most important determinant of investment performance. The rules can be of a supportive nature or make long-term investments hazardous due to the lack of secure property rights. It is more or less evident that investors must use a higher discount rate in evaluations of investments in countries where property rights are weekly protected.

How to account for the institutional risk has not received much attention in the finance literature, even though the concept "political risk" is sometimes mentioned. However, a formal treatment is not offered. With a few exceptions, the mechanisms through which weak institutions in general and property right systems in particular influence capital markets have largely been overlooked. One exception is Morck et al. (2000), who address the question why stock prices display more synchronic movements in less developed economies than in rich economies.

Morck et al. (2000) find that institutional risk in the form of insecure property rights can explain why systematic risk to a larger extent determines rate of return on stock in developing than in developed economies. The puzzle they are addressing is the significantly higher R^2 in CAPM models for the emerging than rich economies. They also have a local perspective where the rate of return on individual stocks is explained by co-movement with national market portfolios. Our approach differs from Morck et al. by using a global perspective in which we study how the rate of return on national portfolios can be explained by co-movement with a world market portfolio. Using such a global perspective we find R^2 adopting reverse behavior. The world market portfolio explains more of the rate of return of national portfolios for rich than developing countries.

Similar to Morck et al. (2000) we find that the security of property rights is important in an analysis of required rate of return on stocks in developed and developing countries.

After showing that security of property rights is important we estimate the size of "institutional risk premium" in different countries. It turns out that the level of property and investor protection is a systematic risk that is priced in the national stock exchanges. Therefore, to understand the required rate of return in different countries one should add legal uncertainty as an additional factor to market risk.

But it is one thing to propose the necessity to add an "institutional risk premium" and another thing to prove the existences of such risk premiums and estimate the size of such risk premiums. One reason why few attempts have been made so far is the difficulty to empirically quantify and price institutional risk. The purpose of this paper is to show the existence of property risk premiums and measure their magnitude in countries with differing property rights protection.

The paper starts, in section 2, with a discussion of what is meant by institutional risk and how this affects the cost of capital. How to calculate capital costs and risk premiums for assets with political risk is the subject matter of section 3. The data used in our empirical analysis is presented in section 4. The empirical findings are analysed in section 5. The paper ends with conclusions in section 6.

2. Property rights, contracts and investments

Investments are risky; a cost in the form of a capital outlay is taken today, while the benefits represented by positive net cash flows lie in the future. An investment is therefore like a deferred exchange where a payment is made today in return for enhanced future consumption. When the future unfolds it might turn out that the products produced by the new capital (the investment) cannot be sold at profitable prices.

This is a risk that every entrepreneur has to face. But in addition to this risk there might be an institutional risk caused by insecure property rights and a defective judicial system that makes it difficult to enforce contracts in an effective way. Secure property rights and contract enforcement were put forward already by David Hume and Adam Smith as two of the most important institutional factors for the prosperity of a nation. According to Kasper and Streit (1998), David Hume and Adam Smith stress three institutions of fundamental importance for economic progress and welfare: *"(...) the guarantee of property rights, the free transfer of property by voluntary contractual agreement, and the keeping of promises made"* (p 20). In other words, secure property rights, freedom of contracts and enforcement of agreements are basic cornerstones in the quest for prosperity.

Secure property rights, freedom of contracts and enforcement of agreements are the basic parts of the institutional framework within which an economy is organized. It is the task of the state to develop a well functioning and adequate institutional framework through formal rules. According to North (1990): "*(...) formal rules include political (and judicial) rules, economic rules, and contracts"* (p 47). By economic rules North means property rights which are defined as: *"(...) the bundle of rights over the use and the income to be derived from property and the ability to alienate an asset or a resource"* (p 47). The links to investments are clear as investments mean the creation of new assets. Furthermore, North ascertains a hierarchical order between rules in the sense that: *"the rules descend from polities to property rights to individual contracts"* (p 52). According to North (1990) and Williamson (2000), these institutions are very stable over time.

Hernando de Soto (2000) agues powerfully that the explanation for the varying degree to which countries succeed to support capital formation and accumulation is to be found in the legal structure of the property rights system of the western world. de Soto claims that: *"When advanced nations pulled together all the information and rules about their known assets and established property systems that tracked their economic evolution, they gathered into one order the whole institutional process that underpins the creation of capital. If capitalism had a mind, it would be located in the legal property system"* (p 65).

In other words it is through polity a nation can influence the institutional framework to stimulate investments and growth. The institutional framework might be of a kind that makes investors certain that no one else will appropriate the fruits of their investments or the framework might be one that makes investors think that there is a risk that someone else will reap the benefits. If the property rights are insecure long-term investments will be hampered and come at the cost of lower welfare.

If property rights are not sufficiently safeguarded investors will ipso facto require a higher return on their investments in order to supply capital, which in turn raises the cost of capital for firms and entrepreneurs. Assume that a typical firm has the following profit function:

$$\pi = PQ - wL - rK \tag{2.1}$$

where π is firm profit, P is price, Q quantity sold, w wage, L labor, r required rate of return and K capital. In this profit function $P = f(Q)$ and $Q = f(K,L)$. One first order condition for profit maximization is:

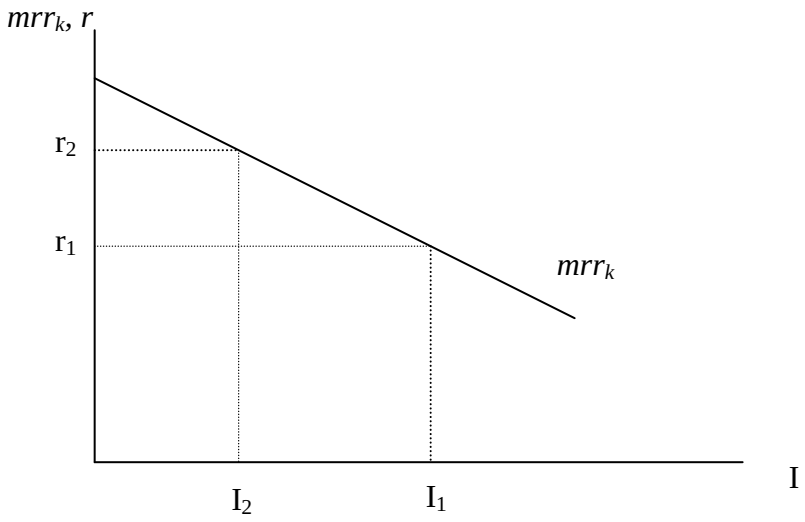
$$P\frac{\partial f(K,L)}{\partial K} = r \tag{2.2}$$

Given equations 2.1, marginal rate of return on capital and labor should equal the cost of capital, *r*, and the wage rate, *w*, respectively. For our purpose only the marginal rate of return on capital and equation 2.2 are of interest. We will refer to the left hand side of equation 2.2 ($P(\partial fK,L)/\partial K)$) as the marginal rate of return on capital (mrr_k). (Note that $\partial K \equiv Investments\,(I)$) The cost of capital, *r*, will simply be the opportunity cost of capital. For investors to be willing to supply financial capital for investments, they will require a return, *r*, on their capital.

The return, *r*, that investors require depends on the systematic risk of the investment (see next section). Systematic risk is risk that is non-diversifiable.

Now suppose that the protection of investors for some reason is weak and the probability that investors will receive their return, *r*, is less than one. Given insecure property rights investors will require a return that is higher than *r* in equation 2.2. Insecure property rights will raise the cost of capital which in turn decreases investment. Figure 1 inspired by Mueller (2003) illustrates this relationship. A state that is able to lower the cost of capital from r_2 to r_1 through more secure property rights will stimulate investments and thereby also growth and welfare.

Figure 1 Cost of capital (*r*) and investments (*I*)



Note: mrr_k = marginal rate of return on capital

3. Risk, return and portfolio theory

Conventional investment theory holds that investors will evaluate alternative investments based on the net present value (*NPV*). According to the *NPV* rule, investments should be evaluated according to the expected cash flows *(CF)* minus the expected investment costs *(I)*. The only project with expected positive net present values should be initiated *(NPV = PV – I)*. When calculating the present value of cash flows generated by an investment, one uses a discount factor;1/(1 + *r*), where *r* is the discount rate. The discount rate is also referred to as the required rate of return or as the cost of capital. For risk free projects the required rate of return equals the risk free interest rate, which also serves as a reference when valuing risky assets. The *PV* of future cash flows is calculated as follows[1]:

$$PV = \sum_{t=1}^{T} \frac{CF_t}{(1+r)^t} \tag{3.1}$$

The discount rate will depend on the riskiness of the future cash flows. With increasingly risky cash flow the discount rate will be accordingly higher. As the discount rate, *r*, increases the present value declines and the aggregate number of investments declines.

The crucial question is therefore how to determine the size of the discount rate and the risk associated with various assets. We argue that the discount rate can be broken down into a multitude of components, among which property rights protection is one. Accordingly the discounted present value formula should be:

$$PV = \sum_{t=1}^{T} \frac{CF_t}{(1+r_f + RP_p + RP_o)^t} \tag{3.2}$$

[1] The present value of future cash flows from all investments made by a firm is equal to the market value of a firm.

where, r_f is the risk free interest rate, RP_p the risk premium associated with weak property right protection, and RP_o a "general" risk premium.[2]

The conventional *Capital Asset Pricing Model* (CAPM) makes a distinction between diversifiable firm specific risk and non-diversifiable systematic risk. Because the specific risk can be diversified away it is only the remaining non-diversifiable risk that matters for the pricing of the asset, i.e. investors are only compensated for the systematic non-diversifiable risk.

As a consequence, the return *r* that investors require depends on the systematic risk of the investment (see next section). On a global capital market firm specific risk can be diversified away. However the institutional risk of insecure property rights and contracts is a risk associated with the institutional framework of rules of a country which cannot be diversified. This institutional framework is made up by both informal rules like norms, customs, tradition and religion and formal rules like property and contract laws and the enforcement of these rules. It is primarily the formal rules that polity can exert an influence on. To change informal rules is a much tougher task. According to North (1990) and Williamson (2000) this institutional framework changes very slowly over time. Even change of the formal rules (like property rights rules) and their enforcement tend to take decades to implement. As an investor you are more or less stuck with the institutional framework for a considerable time. The prospects of balancing changes in the security of property rights by having an international portfolio are small. Hence, insecure property rights represent a truly systematic risk that, according to the theory, (see next section) will increase the cost of capital (the required return on investment, *r*). Raising the cost of capital will, as shown in standard investment theory, decrease investment.

According to CAPM, the expected return on a security can be calculated as:

$$E(r_i) = r_f + \beta_i (E(r_m) - r_f) \tag{3.3}$$

[2] A political risk premium is proposed by Faure & Skogh (2003).

where, β_i measures the sensitivity of a security to market risk (systemic risk), r_m the return on a market portfolio *m*. The model holds that the expected rate of return should equal the risk free interest rate plus a risk premium that varies with β. The expected rate of return, $E(r_i)$, that is obtained, is simply the discount rate *r* used in equation 3.1 to calculate the present value of future cash flows. The term $E(r_m) - r_f$ is the market price of risk for efficient portfolios. In this model it is only one factor the market portfolio that matters in calculation of the risk premium.

This standard CAPM can be extended into the so-called multi beta CAPM by including other factors that influence the size of the risk premium. Merton (1973) is among the first to include a number of uncertainty factors that could influence the price of an asset. Friend, Landskroner and Losq (1976) use, besides the market portfolio, inflation uncertainty as an additional factor that determined cost of capital. We follow their approach and add legal uncertainty in form property rights and protection of investors as additional risk factors.

Roll (1977) has in a seminal article leveled critique against the standard CAPM. One of Roll's points is that all assets in the entire world shall be included in the market portfolio *m*. However, in the empirical literature national stock indices like Standard and Poor 500 and New York Stock Exchange index are used as market portfolios. This is clearly an incorrect measure according to Roll's critique. A step towards a more "correct" market portfolio measure is to use an index containing all securities in the entire world. Such an index for traded corporate shares is Morgan Stanley world market index. That is the index that will represent market portfolio in the present study.

Estimation of Beta and the risk premium can be made according to a two pass procedure.[3]

[3] See e.g. Elton & Gruber (1996)

A number of studies of CAPM using the two pass procedure have been performed. Several of these indicate that a two factor model (a multi-CAPM) can be used.[4] Consequently, there is some empirical support for use of a model where legal uncertainty as well as a market portfolio is included as factors in the calculation of cost of capital. In that case the second-pass regression will contain a second factor representing institutional risk and look like:

$$\bar{r}_i = \alpha_i + RP_m \times \hat{\beta}_i + RP_p \times Institutional\ Risk + \varepsilon_i \qquad (3.4)$$

where RP_p is the right risk premium due to insufficient safeguarding of property and investor rights.

[4] See e.g. Sharpe & Cooper (1972), Douglas (1968) and Black, Jensen & Scholes (1972).

4. Variables, Data and R^2 around the World

To calculate the impact of institutional risk on the risk premium and the required return on investments stock exchange data, data about the quality of property rights and global market portfolio are needed. Table 1 shows the data we have used for these variables.

Table 1 Description of the Variables

Country stock market indexes	Measures the stock price performance including dividends. Expressed in US dollars. *Source: Morgan Stanley*
World market index	Measures the stock price performance including dividends for 49 developed and developing countries. *Source: Morgan Stanley*
Property right protection (PRP_{it})	Assessment of the protection and certainty of property rights. Annual index ranging from 1 to 5, with higher scale meaning weaker protection property rights. *Source: Heritage Foundation index of economic freedom*
Investor right protection *(IRP_{it})*	Investor profile. Assessment of a number of factors influencing the risk of investments. Monthly index ranging from 1 to 12, with a higher scale meaning stronger protection of investors. The index asses contract viability, risk of expropriation, payment delays and profit repatriation. To facilitate comparisons we invert this index so that higher value means weaker investor protection. *Source: International Country Risk Guide*
Returns r_{it} r_{mt}	Different forms of return are calculated. Monthly stock market return on country level. National stock market indexes corrected for dividends and in US dollars are used. *Source: Morgan Stanley* World market return calculated with monthly world market index. *Source: Morgan Stanley*

Monthly stock market indices compiled by Morgan Stanley are used to calculate the rate of return on national stock markets and the world market portfolio.[5] These stock market indexes covering a ten year period 1995 to 2005 (129 months more exactly) are expressed in US dollars, and corrected for dividends. This assures that the indices are consistently defined and include all relevant returns. As a proxy for the market portfolio the world stock market index from Morgan Stanley is used which includes 49 developed and emerging market country indexes (see table 2).

[5] MSCI total return indices with gross dividends

As measures of institutional risk the Heritage foundation index of the insecurity of property rights *(PRP)* and the index of investor rights protection *(IRP)* provided by the International Country Risk Guide (ICRG) are used. The Heritage index ranges from one to five, where one indicates strong protection of property rights. It is an annual index which is available for the period 1995 to 2005. The property right index is an assessment of the quality of contract enforcement, legal protection of property, existence of corruption in the judicial system and the probability of expropriation.

The ICRG index ranges from 1 to 12, where 1 indicates strong protection. The ICRG index is a monthly index that here is used for the period 1995 to 2005. In order to facilitate comparison of the indexes we invert the investor right index, so that 1 indicates strong protection of investors. This index measures factors that have to do with protection of property rights and enforcement of contracts.

Table 2 shows the 49 developed and emerging countries that are included in Morgan Stanley's world market portfolio. The betas and the R^2 from the first pass regression plus three other variables are presented. Among the variables from the first pass regression the R^2-values are of special interest. The R^2-values show how much of the national rate of return that can be explained by variation of the rate of return on a world market portfolio. It is evident that there is a clear difference between developed and emerging countries in this respect. The values tend to be much higher in developed countries. The summary statistics in Table 3 confirm that this difference is statistically significant. These results can be contrasted with those of Morck et al. (2000), who find considerably lower R^2 for individual firms in developed countries using national indices as market portfolios. By correlating the R^2-values reported by Morck et al. with our values we get a negative correlation coefficient that is significant at one percent.

Even though at first sight it might seem odd, our results are in line with those of Morck et al. (2000). Our high R^2 –values for developed countries are due to the fact that we use a global perspective with the world as the market portfolio and look at how national portfolios can be explained by co-movement with a world market portfolio. With well

functioning stock markets with low barriers for international investor opportunities to risk reduction through international diversification will be taken advantage of. In other words the unique risk of the national market will be diversified away and the systematic risk of a world portfolio will to a large extent determine the rate of return on a national portfolio. In Morck et al. (2000) individual stocks are studied. Their argument is that trade in individual stocks is to a large extent driven by firm specific fundamentals. In well developed economies the information about firm specific information is easily accessible and more reliable. (This argument is further developed in Jin and Myers (2006)). Consequently, firm specific fundamentals will be more important in the pricing of individual stocks and the co-movement with national indices lower (i.e. lower R^2 in developed countries).

The reason why information is accessible and more trustworthy in developed countries is, according to Morck et al. (2000) and Jin and Myers (2006), due to investor protection through secure property rights. We will use this to explain why our R^2-values are so low for the developing countries. We conclude that there is a need for more factors than a market portfolio to explain the rate of return, especially if we look at developing countries. This makes the values for property right protection and investor protection of special interest also in our study. Like the R^2-values the values for property right as well as investor protection appear to be significantly higher in Table 2. That these protection values really are significantly higher is also confirmed by a z-test (see Table 3).

Table 2 Country data for 1995-2005 (129 months)

Developed Countries	$\hat{\beta}_i$	**R^2 – values from 1st- pass regression**	**Property right protection (*PRP*) (average)**	**Investor right protection *(IRP)* (average)**	**Average rate of return**
Australia	0.87	0.53	1.00	1.60	0.128
Austria	0.61	0.22	1.00	1.31	0.122
Belgium	0.80	0.40	1.00	1.38	0.127
Canada	1.11	0.68	1.00	1.41	0.160
Denmark	0.84	0.47	1.00	1.46	0.150
Finland	1.62	0.40	1.00	1.37	0.221
France	1.07	0.69	2.00	1.42	0.125
Germany	1.26	0.65	1.00	1.41	0.105
Greece	0.95	0.20	2.36	1.74	0.164
Hong Kong	1.20	0.38	1.00	1.57	0.108
Ireland	0.85	0.48	1.00	1.35	0.107
Italy	0.94	0.39	2.00	1.50	0.131
Japan	0.87	0.37	1.36	1.41	0.011
Netherlands	1.08	0.68	1.00	1.34	0.106
New Zealand	0.81	0.30	1.00	1.42	0.106
Norway	1.07	0.48	1.18	1.46	0.140
Portugal	0.82	0.32	2.00	1.52	0.107
Singapore	1.15	0.37	1.00	1.36	0.045
Spain	1.14	0.59	2.27	1.34	0.178
Sweden	1.42	0.60	1.64	1.48	0.172
Switzerland	0.79	0.45	1.27	1.34	0.124
United Kingdom	0.77	0.69	1.00	1.36	0.103
United States	1.00	0.87	1.00	1.34	0.121

Emerging Economies	$\hat{\beta}_i$	**R^2 – values from 1st-pass regression**	**Property right protection (average)**	**Investor right protection (average)**	**Average rate of return**
Argentina	1.12	0.16	2.73	2.16	0.165
Brazil	1.85	0.43	3.00	1.98	0.200
Chile	1.02	0.38	1.00	1.80	0.083
China	1.14	0.17	4.00	1.89	0.017
Colombia	0.52	0.05	3.36	1.41	0.179
Czech Republic	0.63	0.09	2.00	1.55	0.205
Egypt	0.46	0.04	3.09	1.90	0.274
Hungary	1.30	0.26	2.00	1.54	0.287
India	0.65	0.10	3.00	1.89	0.108
Indonesia	1.46	0.16	3.45	1.96	0.101
Israel	1.07	0.33	2.00	1.73	0.135
Jordan	0.15	0.01	2.36	1.77	0.158
South Korea	1.59	0.24	1.27	1.53	0.149
Malaysia	0.94	0.14	2.45	1.65	0.044
Mexico	1.44	0.44	2.91	1.55	0.175
Morocco	0.06	0.00	3.09	1.76	0.115
Pakistan	0.41	0.02	3.18	2.43	0.141
Peru	0.69	0.12	3.45	1.96	0.156
Philippines	1.06	0.20	2.73	1.90	-0.061
Poland	1.37	0.27	2.27	1.63	0.166
Russia	2.13	0.23	3.36	2.15	0.413
South Africa	1.11	0.35	2.91	1.59	0.114
Thailand	1.63	0.25	1.36	1.32	0.028
Taiwan	1.10	0.26	2.09	1.71	0.022
Turkey	2.15	0.26	2.36	1.87	0.322
Venezuela	1.01	0.09	3.45	2.27	0.172

With regard to average rate of return there are no similar systematic differences between the two types of countries. One observation is that there is more variation of the rate of return for emerging than for developed countries. The negative rate of return for Philippines is troublesome from a theoretical perspective. According to the CAPM model, this rate of return would indicate a negative risk free interest rate which is not possible. We will therefore exclude the Philippines when the risk premiums are calculated.

Table 3 is a table of summary statistics that confirms the picture given. The world market portfolio is significantly a better explaining factor of rate of return in developed than in emerging countries. Property rights protection is significantly higher in developed countries. Also, property rights protection and the rate of return show a much higher variation in emerging countries.

An interesting question is why does the world market portfolio explain more of the national rate of return in developed than in developing countries? We have put forward the hypothesis that variables measuring the degree of investor protection and secure property rights must be included in a CAPM model if differences in national rates of return are to be explained. Another explanation that must be statistically checked for when we test this hypothesis is if it is simply the composition of the world market portfolio that generates this result.

Most of the world market portfolio consists of national portfolios from developed countries with the USA as most important holding. The national portfolio of the USA corresponds to as much as almost half the value of Morgan Stanley's world market portfolio. This can be compared to the weight of the developing countries which is less than five per cent. The simple fact that world portfolio primarily consists of securities from developed countries could be the explanation for the national differences in R^2 values with higher values for developed than developing countries.

Table 4 shows that the correlation between the variables is especially high between property rights and R^2-values, considerably higher than for Index Weights and R^2-values. This result does also point to an interpretation that in countries with insecure property rights the market portfolio alone does not explain as much of the rate of return as in countries with secure rights. And for obvious reasons the property right and investor right indexes are highly correlated.

Table 3 Summary statistics for the aggregates of developed and emerging economies 1995-2005 (129 months)

	R^2 from 1st-pass Regression		Property right protection		Investor right protection		Rate of return	
	Developed economies	Emerging economies	Developed economies	Emerging economies	Developed economies	Emerging economies	Developed economies	Emerging economies
Mean	0.487*	0.194*	1.307*	2.649*	1.43*	1.81*	0.124	0.149
Standard Deviation	0.170	0.128	0.473	0.749	0.103	0.270	0.043	0.101
Minimum	0.2	0	1	1	1.31	1.32	0.011	-0.061
Maximum	0.87	0.44	2.36	4	1.74	2.43	0.221	0.413
Count	23	26	23	26	23	26	23	26

* indicates that z-test shows significantly different means at less than 5 per cent level.

Table 4 Correlation matrix

	R^2	Property rights	Investor rights	Average returns	Index Weights
R^2	1				
Property rights	-0.658*	1			
Investor rights	-0.627*	0.761*	1		
Average returns	-0.071	0.194	0.224	1	
Index Weights	0.502*	-0.246	-0.249	-0.094	1

* indicates significance at 5 percent.

To test if there is a significant link between the R^2-values from the first-pass regression and the institutional framework we first check if property right and investor right can be used as alternative explanatory variables. Then in order to test the robustness of the results, index weights are included as additional explanatory variable in a second round of regressions. In all regressions R^2 from Table 2 is used as dependent variable. Since R^2 is bound between one and zero we do a logistic transformation of R^2:

$$\vartheta_i = \log\left(\frac{R_i^2}{1-R_i^2}\right)$$

The results in Table 5a suggest that in countries with weak institutional protection of property the systematic economics factors influencing the world market return have less explanatory power. In table 5b it is tested how robust these results are when index weights also are used as explanation of the R^2 values. As can be seen the importance of property and investor rights as explanatory factors is not changed much. This suggests that the CAPM provide a less adequate tool for understanding asset pricing in less developed financial markets. Therefore we believe that the R^2-values can be used as proxies for financial development; countries in which the CAPM model displays a lower explanatory power might be interpreted as less developed financially.

To check for multicollinearity between the two indices and the index weights of the world market portfolio we calculate the variance inflation factor (VIF). In both cases VIF is close to one, which means that we can rule out multicollinearity.

Table 5a First pass R^2-values and protection of property and investor rights

	Property right protection (PRP)		Investor right protection (IRP)	
Estimation method	OLS		OLS	
Dependent variable: ϑ_i	Coefficient	t-value	Coefficient	t-value
Property rights $(\overline{PRP}_i)$	-0.425*	-5.72		
Investor rights $(\overline{IRP}_i)$			-1.332*	-4.88
R^2	0.41		0.34	
Adj. R^2	0.40		0.32	
F-value	32.7		23.8	
No. observations	49		49	

* indicates significance at 1 percent.

Table 5b First pass R^2-values and protection of property and investor rights, including index weights

	Property right protection (PRP)		Investor right protection (IRP)	
Estimation method	OLS		OLS	
Dependent variable: ϑ_i	Coefficient	t-value	Coefficient	t-value
Property rights $(\overline{PRP}_i)$	-0.381*	-5.23		
Investor rights $(\overline{IRP}_i)$			-1.171*	-4.36
Index weights	0.024**	2.43	0.025**	2.41
R^2	0.48		0.41	
Adj. R^2	0.45		0.39	
F-value	21.0		16.0	
No. observations	49		49	

* indicates significance at 1 percent and ** significance at 5 percent.

5. Models and results

In the first step monthly data are used to estimate the first-pass regression as in equation 4.4. In the second-pass regression the average Heritage and International Country Risk Guide indexes of property rights protection are included:

$$\bar{r}_i = \alpha_i + RP_m \times \hat{\beta}_i + RP_{PRP} \times \overline{PRP}_i + \varepsilon_i \quad (5.1a)$$

$$\bar{r}_i = \alpha_i + RP_m \times \hat{\beta}_i + RP_{IRP} \times \overline{IRP}_i + \varepsilon_i \quad (5.1b)$$

where $\overline{PRP}_i$ is the average value of the Heritage foundation property right index and $\overline{IRP_i}$ is the International Country Risk Guide index of investor protection for a country *i* respectively. We identify the Philippines as an outlier as the average return for the time period investigated is negative and consequently exclude it from our regression.

Significant coefficients, $RP_{PRP,}$ for the average value of the Heritage index and RP_{IRP} will indicate that the market portfolio is not the only important explanatory variable in calculations of a risk premium.

The result of the estimation of the second-pass equation is shown in Table 6. The security of property rights turns out to be important. The coefficient for *PRP* is statistically significant at less than ten percent level and the *IRP* is significant at five percent. A higher degree of insecurity is consistent with a higher cost of capital. Furthermore, the signs of the coefficients are positive. As both the indices have a scale where low values indicate secure and high values insecure property rights the estimated coefficients indicate that a higher risk premium has to be offered in countries with insecure property rights

Table 6 Risk premium factors: property rights and investor protection

	Property right protection (PRP)		Investor right protection (IRP)		Conventional CAPM	
Estimation method	OLS		OLS		OLS	
Dependent variable: $\bar{r}_i$	Coefficients	t-values	Coefficients	t-values	Coefficients	t-values
Intercept (α)	0.035	1.02	-0.048	-0.77	0.079*	2.99
Property rights $(\overline{PRP}_i)$	0.021**	2.01				
Investor rights $(\overline{IRP}_i)$			0.079**	2.20		
$\hat{\beta}$	0.062*	2.71	0.059**	2.59	0.060**	2.53
R^2	0.19		0.21		0.12	
Adj. R^2	0.16		0.17		0.10	
F-value	5.4		5.9		6.4	
No. observations	48		48		48	

* indicates significance at 1 percent and ** significance at 5 percent.

With the conventional CAPM model we find that the world risk free interest rate ($\hat{\alpha}$), is on average 8 percent. However, assuming that the countries with the best values on the property right index (*PRP* = 1) and the investor protection index (*IRP* = 1.31) have virtually no uncertainty, we find lower risk free interest rates. Using the best values of the two risk factors we estimate the risk free rate to be 5.6 percent for the property right index and 5.5 percent for the investor right index. The influence of security of property rights is significant whichever of the two indices we use. The traditional beta stays approximately the same whatever index is used. This suggests robustness in the result.

Estimated risk premiums for property right protection and investor right protection (plus the estimated risk free interest rate) for all the countries are reported in table 7. We find on average 3 percentage point difference in interest rates between emerging and developed countries, which can be explained by differences in property rights protection. A z-test shows that these differences are significant at five percent. The general beta does not significantly differ between developed and emerging countries. Hence, the developed countries have a much lower risk premium on investments due to the systematic risk that the institutional framework represents. Improvement in the institutional framework will probably be helpful to more investments and higher welfare.

For the conventional CAPM, Ramsey's regression specification error test (RESET) indicate a problem of omitted variables (F-test 8.23), which supports the inclusion of further explanatory variables. This is consistent with the fact that the R^2 and R^2-adjusted almost double with the inclusion of the two indexes.

Table 7 Risk free rate plus risk premiums

Developed Economies	**Property right premium + α**	**Investor right premium + α**
Australia	0.056	0.078
Austria	0.056	0.055
Belgium	0.056	0.061
Canada	0.056	0.063
Denmark	0.056	0.067
Finland	0.056	0.060
France	0.077	0.064
Germany	0.056	0.063
Greece	0.085	0.089
Hong Kong	0.056	0.076
Ireland	0.056	0.059
Italy	0.077	0.071
Japan	0.064	0.063
Netherlands	0.056	0.058
New Zealand	0.056	0.064
Norway	0.060	0.067
Portugal	0.077	0.072
Singapore	0.056	0.059
Spain	0.083	0.058
Sweden	0.069	0.069
Switzerland	0.062	0.058
United Kingdom	0.056	0.059
United States	0.056	0.058
Averages developed economies	**0.062***	**0.065***
Emerging Economies		
Argentina	0.092	0.123
Brazil	0.098	0.108
Chile	0.056	0.094
China	0.119	0.101
Colombia	0.106	0.063
Czech Republic	0.077	0.074
Egypt	0.100	0.102
Hungary	0.077	0.074
India	0.098	0.101
Indonesia	0.107	0.107
Israel	0.077	0.089
Jordan	0.085	0.092
South Korea	0.062	0.073
Malaysia	0.086	0.082
Mexico	0.096	0.074
Morocco	0.100	0.091
Pakistan	0.102	0.144
Peru	0.107	0.107
Poland	0.083	0.081
Russia	0.106	0.122
South Africa	0.096	0.078
Thailand	0.064	0.056
Taiwan	0.079	0.087
Turkey	0.085	0.100
Venezuela	0.107	0.131
Average emerging economies	**0.091***	**0.095***

* indicates that the z-test shows significantly different means at 1 percent

6. Conclusions

How to account for institutional risk has not received much attention in models of risk and return in the finance literature. A recent exception is Morck et al. (2000) who explains why R^2:s achieved in first pass regressions in the capital asset pricing model (CAPM) is so low for the US compared to developing countries. Their explanation is that legal uncertainty is lower in the US which makes it possible for analysts to get access to proprietary firm specific information. This proprietary firm specific information therefore influences the stock price more in the US than in developing countries. As a consequence CAPM explains less.

We do also find that legal uncertainty is important in the explanation of countrywide differences in predictive power of CAPM. But in contrast to Morck et al we use a world market portfolio as explanatory variable and study the return on national portfolios. With such an approach it is possible to see how cost of capital in different national stock markets is influenced by legal uncertainty. We find that the R^2:s in our case is lower in developing countries than in developed countries. Furthermore, we find that this difference in R^2:s can be explained by legal uncertainty in the form of weak property rights and weak investor protection. When property rights protection or investor protection are added the predictive power of the CAPM increases substantially and higher risk premiums in countries with weaker protection are found.

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